BRISTOL WATER'S RESPONSE TO PROVISIONAL FINDINGS

27 JULY 2015

'Our vision is to meet our customers' expectations by providing an outstanding water service in a sustainable and affordable way'

BRISTOL WATER

Bristol Water's response to CMA's Provisional Findings of 10 July 2015

27 July 2015

Contents

1 Executive Summary

1. On 10 July 2015 the Competition and Markets Authority (**CMA**) published its 'Provisional findings regarding Bristol Water's price determination' (**PFs**). This is Bristol Water's response to the PFs.

2. At the outset, we would like to acknowledge the hard work and effort on the part of the CMA that has gone into its analysis to date and the production of the PFs. Carrying out a redetermination of the operational and strategic activities of a water company for a five year price control period, and beyond, is a time intensive and demanding task that calls on a wide range of skills, knowledge and expertise. This is particularly true in a complex engineering environment such as the water sector, with multiple regulatory frameworks to be taken into account.

3. In that context, we appreciate the decision of the CMA to take a critical look at the cost assessment methodology used by Ofwat for PR14. We welcome that the CMA has:

   - recognised the weaknesses in Ofwat's econometric modelling and substituted it with its own;
   - noted that Ofwat's approach to special cost factors would tend to impede companies' ability to make warranted claims;
   - adopted a bottom-up cost assessment as a cross check to econometric modelling and recognised the importance of reviewing separate cost components;
   - implemented an approach to the totex menu choice that should not lead to unintended consequences;
   - recognised that the customer benefits test for cost of capital is not appropriate;
   - noted that a small company premium is observable for both debt and equity;
   - clarified that reviewing the financeability of Bristol Water is part of the CMA's duties and that it is good regulatory practice to review actual credit rating agency metrics as part of that review; and
   - acknowledged the need to make amendments to the price control if the financeability assessment indicates that Bristol Water is not financeable under the determination.

4. [redacted] As such, the CMA has failed to satisfy the requirements of its Finance Duty. [redacted]

   - **revenue and financeability:**
     - the level of average bill set in the PFs at £159 during AMP6 prior to inflation is too low to achieve a sufficient level of revenue to enable us to meet [redacted] in every year;
     - the revenues allowed are too low when compared to a range of benchmarks, and imposing an immediate 19% reduction from the bill levels set by the Competition Commission (**CC**) in 2010 is not comparable to any reasonable benchmark, including the average 5% decrease in bills across the industry (which was in line with Bristol Water's SoC); and
     - there is likely to be an intergenerational effect on bill levels in AMP7 and onwards, which is not in the best interest of our customers.

5. Whilst certain aspects of the CMA's approach and ultimate conclusions are encouraging, the component parts of the PFs do not meet the needs and expectations of our customers, ensure an appropriate level of service, or satisfy that the requirements of the statutory duties are met. In particular:

- **wholesale totex:**
  - the totex allowance, whilst improved from Ofwat's FD14, is insufficient given the scope of activities that must be carried out to meet customer expectations regarding levels of service and achieve the right balance of risk;
  - the reduction in the amount of totex allowed for maintenance does not allow for a sustainable investment strategy, contrary to good practice in the industry and customer wishes; and
  - the allowance for enhancement fails to take due regard of the views of other regulators as expressed through letters of commendation and the WRMP.
- **cost of capital:**
  - the proposed allowance for the weighted average cost of capital (**WACC**) is below Bristol Water's cost of debt and equity and is insufficient, therefore, to secure that a reasonable return on investment can be earned.

6. We believe that whilst these issues are significant they are capable of being remedied in the final determination, without causing undue impact on customers and whilst still preserving one of the largest reductions in bills across the entire industry. During the course of this process the CMA has reinforced the message that these are only its provisional findings which can change. This is of critical importance. We appreciate that during the process to date, the CMA has demonstrated a willingness to take a critical look at the cost assessment methodology, and other aspects of the PR14 approach, relied upon by Ofwat and, where deemed appropriate, to apply its own methodology to determining aspects of our price control.

7. In keeping with that spirit, we have paid particular attention to our internal approach to risk and how this has informed our Business Plan. We recognise that some aspects of our plan reflect the evidence based view of the level of risk that customers are willing to accept or, in certain instances, have been informed by the appetite for risk indicated by the specialist regulators, such as in relation to management of water quality risk. The provisional findings challenge this view, notably for specific enhancement schemes where uncertainty is material, as well as in respect of the overall amount of expenditure envisaged for maintenance within the overall totex allowance. Ultimately, the CMA must decide on the level of risk it believes is appropriate and therefore which schemes form part of the totex allowance and what level of funding is made available for maintenance.

8. As we have noted above, our Business Plan proposals deliver reductions in bills for customers, and even with some adjustments to the PFs the level of that decrease is likely to remain the largest in the industry. We note that whilst customers will always have concerns about bill levels, customer interests are not always best served by targeting the lowest possible bill level. Such an approach creates a significant risk of underfunding, with implications for current and future customers in terms of serviceability and greater costs in the future. Bills should be set with equal consideration of current and future customers as required by the WIA '91 and reflect underlying costs. The question therefore is one of degree, and the final determination should balance important factors such as risk to

serviceability, what customers want in terms of levels of service and supply security, and willingness to pay.

9. This is understood by customers, and has been recognised by the Local Engagement Forum (**LEF**) as a real risk in the context of this determination.[1] To the extent that in making risk-based judgments the CMA is cutting across the views of customers as reflected in our customer engagement, or the views of the specialist regulators such as the Environment Agency (**EA**) or Drinking Water Inspectorate (**DWI**) that have been embedded in the output of a statutory process such as the Water Resources Management Plan (**WRMP**), or in a letter of recommendation, then the CMA must take these considerations into account and give them the appropriate level of reflection and weight.

10. The focus of this response is to provide sufficient evidence and reasoning that will enable the CMA to adjust its position on these issues. If the CMA does so, then we are certain that this will enable the CMA to reach a final determination that balances the interests of our customers, enables us to deliver an appropriate level of service whilst pursuing a sustainable investment strategy, and will ensure that we are able to finance the delivery of our functions. Unfortunately, if the CMA were to retain the positions adopted in the provisional findings, we do not believe that these fundamental measures of success would be met.

11. We had five areas of particular concern with FD14 which were at the heart of our decision to reject FD14 and seek a redetermination. Each of these areas is summarised in the sections below, with reference to our original concerns, the CMA's approach in the PFs, and any outstanding issues that we believe need to be addressed in the final determination. The order of the issues in this executive summary reflects the degree of importance we attach to each in the context of the impact of the PFs. In the remainder of this response we revert to the order in which the topics are raised in the PFs.

1.1 Financeability

12. By not carrying out a full assessment of the financeability of the provisional findings, the CMA has made a revenue allowance that is too low. [redacted] The CMA has confirmed that if its determination creates a financeability problem, it will make adjustments to remedy this. We consider that the concerns with the PFs could be addressed through a higher PAYG or through a combination of higher WACC and higher PAYG.

The CMA's duty to make sure Bristol Water is financeable has not been fully considered in the Provisional Findings

13. In the PFs, the CMA acknowledges that the Finance Duty requires it to determine whether Bristol Water specifically is financeable, but notes that a full review of credit ratios should take place once each of the revenue allowance components has been determined. The CMA concludes that, given these findings are provisional, it is proportionate to assess financeability of the PFs by reference to Ofwat's estimates of credit ratios at FD14 and the implied effects of the differences between the PFs and FD14.

[1] LEF Letter to the CMA 22 July 2015 (RPF069).

14. The CMA has confirmed that its final assessment of financeability will be carried out once the relevant components have all been determined, such as totex, cost of capital and RCV adjustments. The CMA also notes that there are a number of factors that will impact on the financeability assessment, including any notional vs. actual adjustments, the PAYG rate, the RCV run-off rate and depreciation on new RCV additions.

15. It is essential that the CMA's final assessment of financeability should, therefore, consider the full range of elements in line with its statement above. Further the CMA should, as it has suggested it will, review the credit metrics resulting from the final determination to confirm that it is indeed financeable from the viewpoint of the relevant credit rating agencies for Bristol Water, as maintaining an investment grade rating is a condition of our licence and a condition of our debt covenants.

16. However, we are concerned that the CMA's proportionate limited approach at this stage has given it false comfort [redacted].

The revenue in the provisional findings has been set too low compared to relevant benchmarks

17. The CMA assumed an average household bill of £159 in the PFs. [redacted]

18. We have compared revenues to other benchmarks, including past price review processes, PAYG allowances of other companies and average bill levels. Each method confirms the conclusion of our credit rating metrics assessment:

- targeting a [redacted] credit rating on a notional basis suggests a bill of £171;
- applying an industry average PAYG rate to the PFs implies a bill of £172;
- using PR09/CC10 "fast money" methodology leads to a bill of £176; and
- a review of theoretical cash flows indicates a bill of £175.

19. For the scope of expenditure included in the PFs, the appropriate bill level is shown to be c.£173, which would represent a 12% reduction from Bristol Water's 2014/15 average household bill. Service delivery for current customers would be put at risk if bills are set too low and future customers will likely face higher bills. This appears to be the implication of the bill level in the PFs.

Adjusting the PAYG rate to set bills at the correct level has no detriment to customers

20. As KPMG notes in its supporting analysis, adjusting the PAYG rate is NPV neutral and therefore is an appropriate mechanism to address financeability.[2]

21. Adjusting the PAYG to the benchmark range would still lead to a significant bill reduction compared to Bristol Water's 2014/15 average bill. In addition, the bill level would be far lower than our immediate neighbours and in line with industry PAYG averages. We received strong support from customers for the bills proposed in our Business plan, albeit for a

[2] KPMG, Response to CMA Provisional Findings on Bristol Water's Financeability, July 2015 (RPF033) p.22.

different scope of expenditure so a moderate PAYG adjustment would not, therefore, lead to an increase in affordability concerns.

22. We conclude that our customers would be comfortable with a bill level of c. £173 for the PF's scope of expenditure.

23. Given the uncertainty attached to the CMA's approach to this assessment, combined with our concerns [redacted] under the PFs and the importance to the Final Determination, we would welcome further engagement, not least because the CMA has noted it has not fully developed its thinking in respect of credit metrics.

1.2 Wholesale cost assessment

24. In our SoC we set out our position that the FD14 wholesale cost allowance of £409m was insufficient to enable delivery of the outcomes that customers want and an unrealistic assumption of what is required in order to run the business. We believed it to be the result of Ofwat's over-reliance on unreliable cost models and a limited process to review exceptions to those models.

25. Whilst we agree with the CMA's conclusion that Ofwat's cost assessment for Bristol Water was compromised by its approach and models, and accept the CMA's decision to make use of its own econometric models, we consider that the overall level of wholesale totex allowance in the PFs of £429m is too low:

- the provisional analysis, which does not incorporate disaggregated modelling and is based on a central view of costs, has not taken sufficient account of special cost factors. This is of particular importance in relation to the reflection of the increased costs experienced by Bristol Water in relation to upstream assets and the additional costs due to the complexity of the Purton and Littleton treatment works;.
- the business plan assessment has underestimated the business requirements due to unrealistic assumptions about cost increases and unrepresentative cost comparisons:
    - the use of a selectively adjusted average AMP5 spend as a base for operating costs does not reflect underlying drivers that we have shown lead to higher cost in the future. For example, this includes the impact of AMP5 capex on opex. This approach results in a projection for AMP6 that underestimates the costs we will face;
    - the CMA has made adjustments to cost inflation assumptions which appear to be without clear reasons for doing so;
    - the efficiency challenge applied to the projected costs for IRE and MNI capex is not supported by the underlying analysis and creates a real risk to sustainable levels of service and investment in the short and long term;
    - the funding for Bedminster reservoir replacement and the construction of part of the Southern Resilience Scheme have been rejected. We address the concerns raised by the CMA in this response; and
- in selecting the central point of the potential range of base costs (£294m-£332m), the CMA has not fully taken into account the preferences of customers for price and risk, or the balance of risk to their service.

26. Our customer research shows that customers strongly rejected a potential plan that included reductions in bills at the expense of reductions in the levels of maintenance. Inclusion of a sufficient level of cost to support the right level of operating expenditure and maintenance is, therefore, critical. Overall, we consider that the CMA's approach has resulted in a cost estimate that is below the efficient level of expenditure Bristol Water requires to deliver the outcomes included in the CMA determination. Whilst we appreciate that this is driven, in part, by the CMA's view of risk, we reiterate that our customers have indicated that they are willing to pay to maintain acceptable levels of maintenance, and this was reflected in our Business Plan.

27. We note that in reaching its conclusions, the CMA has engaged Aqua Consultants (**Aqua**) to advise on aspects of our planning approach, as well as the content of our wholesale totex Business Plan proposals. As we expressed to the CMA prior to the publication of the PFs, we have serious concerns regarding the credibility and robustness of Aqua's report to the CMA (**Aqua Report**).[3] Where this impacts on particular provisional findings, we have addressed the specific misunderstandings and mischaracterisations in this response. We have also referred to reviews of the Aqua Report by CH2M Hill and KPMG which conclude that the Aqua Report contains errors and flaws of approach and analysis.[4]

28. We also note that the CMA has been keen to emphasise that this process should not be seen as a 'one way bet' for Bristol Water necessarily resulting in a better outcome than FD14. Whilst we welcome the different methodological approaches to Ofwat that the CMA has adopted, the CMA has otherwise adopted a more challenging position on many issues than FD14. We are concerned that the CMA may have focused its attention on challenges to areas of potentially higher expenditure comparative to previous periods, rather than looking at everything in the round. For example, this includes not considering the below average operating environment in 2012/13 in opex scenarios. We note that the CMA has suggested some positive effects have been excluded as they are not sufficiently material. These should be considered in the aggregate in order to understand the overall impact.

Base expenditure

29. As noted above, we consider that the allowance for special cost factors relative to the CMA modelling in the provisional findings is insufficient. In the absence of a disaggregated model, the potential requirement for special cost factors is higher and this should be taken into account in the CMA's assessment of them. Table 1 below summarises our view on the special cost factors that should be taken into account.

---

[3] Technical Support, Report of Findings, June 2015, Aqua Consultants.

[4] CH2M Hill Review of Aqua Appraisal of Bristol Water's FBP (RPF014);
KPMG Review of Aqua Report (RPF013);
KPMG, Response to CMA Provisional Findings on Bristol Water's cost of capital, July 2015 (RPF028);
KPMG, Response to CMA Provisional Findings on Bristol Water's Financeability, July 2015 (RPF033).

Table 1 - Summary of Special Cost Factor Adjustments

Description	CMA Provisional View (£m)	Bristol Water conservative view (£m)	Potential higher estimate (£m)
Canal and River Trust Payments	8.1	8.1	8.1
Treatment complexity	0.0	5.5	6.0
Additional costs at Purton and Littleton	0.0	8.35	14.7
Congestion in Bristol	0.0	3.65	6.2
Regional Wage Data	6.7	11.4	14.8
Mains Renewal Programme	10.6	15.0	26.4
Upstream Infrastructure Maintenance	N/A	12.1	12.1
Total special cost factors	**25.4**	**64.1**	**88.3**
Total special cost factors ex. Regional wage data	**18.7**	**52.7**	**73.5**

Source: CMA Provisional Findings/Bristol Water

30. We consider that these additional cost factors are conservative and reflect the minimum of the plausible range. In our response to the PFs we explain why each of our estimates is appropriate.

31. In combination, these factors result in a modelled cost allowance for base totex that is c£30-50m higher than included in the provisional findings. Excluding the regional wage adjustment, the low end of our range for these special factors represents additional operating costs of £20.1m and additional IRE of £27.1m. CC10 allowed £30.3m special cost factors for operating costs, and £33.1m was included in FD04. As the complexity of our processes has increased over time, the £8.1m allowed in the PFs appears counter-intuitive.

32. A corrected bottom up assessment of our Business Plan would be consistent with this adjusted model range.

Enhancement expenditure

33. The CMA has considered Bristol Water's enhancements requirements by undertaking a bottom-up assessment of our business plan proposals. We agree that this is the most appropriate way to determine enhancement expenditure. In relation to the specific enhancement schemes considered by the CMA, we note the following:

Cheddar Reservoir Two

34. Cheddar Reservoir Two forms part of our WRMP and its inclusion in our Business Plan is, therefore, the result of an intensive and thorough statutory process that involved input and consultation from a wide range of stakeholders, including local customers. The consensus of opinion is that it does need to be built at some point in the near future. The only question mark, therefore, relates to when construction should start. We can demonstrate that to preserve the optimal delivery timeframe, we need to be in a position to commence construction during AMP7. This is only feasible if planning permission is maintained during AMP6 by carrying out some specific works at a cost of c. £1m. It may also be necessary, and advisable to purchase some of the land during AMP6 as well. We believe that the CMA should allow this interim approach so as to not disregard the WRMP process, which, as previously stated, is an intensive and thorough statutory process that involved input and consultation from a wide range of stakeholders, including Ofwat and local customers.

Cheddar Water Treatment Works

35. The CMA has agreed that there is evidence of raw water deterioration at Cheddar Water Treatment Works (**Cheddar WTW**) but did not make an allowance for the Cheddar WTW scheme. Instead the CMA has allocated £1m for further investigations and minor capital works with an uncertainty mechanism should the investigations demonstrate the need for more expensive work.

36. The scheme addresses the risks to water quality caused by algal blooms, which already results in capacity reductions at Cheddar WTW, follows a robust and open comparison of options and has strong support from the DWI. We believe that we have demonstrated it is the best solution in light of the EA's position on raw water deterioration. We recognise, however, that the need for the scheme involves an assessment of the balance of risk. In arriving at its conclusion, the CMA has had to balance the potential risk posed to customers due to raw water deterioration at Cheddar WTW with the financial impact on bills of delivering the proposed scheme.

37. Given the evidence of raw water deterioration, we consider that the approach the CMA proposes is a reasonable alternative, but note that it involves changing the policy approach endorsed by Ofwat, the EA and the DWI. We also note the LEF's view that delaying taking action would not be in the best interests of customers. As such, it is very important that the uncertainty mechanism is clearly drafted with appropriate triggers to ensure that action can be taken during AMP6 if required.

Southern Resilience Scheme

38. We welcome the CMA's view that an allowance should be made for the Southern Resilience Scheme and support the allocation of £22.2m in the PFs. We demonstrate that there is a need for an additional service reservoir as part of this scheme in order to provide local resilience and meet growth demands. Our ongoing design process for the SRS has identified that a service reservoir is required, but an alternative is to build a reservoir at Hutton at a slightly lower cost of £4.3m. We would ask the CMA to consider the inclusion of this service reservoir in its final determination allowance for the SRS. If the Hutton service reservoir is included, the total cost of the scheme would be £27.1m (a saving of £850k).

Overall wholesale totex allowance

39. In reaching its overall wholesale totex allowance of £429m, the CMA has relied upon its econometric assessment of base expenditure and utilised its bottom-up assessment of our Business Plan proposals to sense check the results of its modelling. For enhancement expenditure the CMA has utilised the results of its bottom-up assessment.

40. As set out above, we consider that the overall level of totex is too low because the provisional analysis has not taken sufficient account of special cost factors and the business plan assessment has underestimated the business requirements due to unrealistic assumptions about cost increases and unrepresentative cost comparisons.

41. Moreover, in selecting the central point of the potential range of costs, the CMA has not fully taken into account the preferences of customers for price and risk, or the balance of risk to their service. Our customer research shows that customers strongly rejected a potential plan that included reductions in bills at the cost of reductions in maintenance. Given customer preferences for the balance of bills and service, together with the need to

ensure the right balance of risk, we consider that the provisional findings are not in customers' interest.

42. In the final determination, therefore, we would like the CMA to ensure that the appropriate scope of enhancement activity is supported, based on a proportionate view of the balance of risk, and that it is funded accordingly.

1.3 Cost of capital

43. We are pleased that the CMA has recognised that Bristol Water has a higher cost of debt and equity than a WaSC, and that it has not applied Ofwat's customer benefit test.

44. However, we consider that the estimates of some of the individual parameters by the CMA has led to an underestimate of the wholesale cost of capital for Bristol Water. WACC must be sufficient to enable Bristol Water to secure reasonable returns on its capital. At present, the findings on certain components mean that the overall WACC permitted is too low to satisfy the requirements of the Finance Duty. For instance:

- the cost of new debt has been underestimated due to:
  - use of too high an inflation rate to convert from a nominal to real cost of debt which has affected estimates of the cost of embedded and new debt;
  - underestimation of the actual cost of embedded debt due to inappropriate treatment of artesian debt and other adjustments;
  - an estimate of the range of notional cost of debt that is too low, and for which the lower end is not realistic;
  - underestimation of the cost of new index-linked debt due to the use of a short time frame for estimating the underlying gilt rate, and using a spread that is too low for Bristol Water in respect of index linked debt; and
  - giving undue weight to the cost of new debt compared to old debt in the cost of debt calculation.
- on the cost of equity, the asset beta for Bristol Water has been underestimated due to:
  - an estimation of the range for WaSC asset betas that is too wide as a result of including low confidence estimates;
  - errors in the calculation of the appropriate uplift required for Bristol Water; and
  - use of the centre of the range, rather than considering the appropriate part of the range given the overall balance of risks for customers.
- the adjustment for appointed to wholesale has been overestimated due to the incorrect conversion of a nominal return for retail to a real return in wholesale alongside errors in the treatment of tax and changes in risk. We show an alternative calculation that shows the maximum adjustment that could be made is 0.03%.

45. In particular, the CMA's analysis of our embedded cost of debt results in too low an estimate because, in addition to the points made above:

- the actual cost of Artesian debt has incorrectly used the yield at issuance which results in actual cash costs being underestimated;

- the CMA has excluded some ongoing costs on the basis it was for non-operational purposes. This does not reflect the spread availability of long-term debt at the time, that a constant notional gearing would have led to a higher debt cost and that gearing returned below the notional level before the recent fall in market rates. If a specific adjustment should be made, it would be more appropriate to remove the most recent tranche of debt; and
- regulatory and CMA precedents have clearly used (cash) coupons in debt calculations.

1.4 Reconciling 2010-2015 performance

46. The CMA has retained the £4.1m reduction to RCV imposed by Ofwat in respect of its infrastructure serviceability assessment. This penalty is not reflective of the impact on customers of performance against this measure, and is counter to the regulatory framework for assessment set out at FD09. As such, we maintain that this penalty should not be imposed.

47. To the extent, however, that the CMA disagrees, we show that the magnitude of the penalty is disproportionate given the number of incidents it relates to and the external factors that meant that it was not possible to restore supplies within 12 hours, and is not supported by a consistent application of the PR09 methodology by Ofwat. As such, the maximum penalty that should be applied is £1.6m.

1.5 Outcome delivery incentives (ODIs)

48. On Unplanned Customer Minutes Lost (UCML), the result of the CMA's amendment to Ofwat's calculation is to produce a target for Bristol Water that we consider to be unachievable. This will inevitably lead to a penalty being payable at PR19. The target suggested by the CMA in the PFs is not achievable under any economic level of service such that it does not provide a realistic incentive to improve performance which is contrary to the intention behind the ODI's. Our analysis of industry data suggests that our performance is already upper quartile against this metric, and therefore the level of improvement required by this target is not consistent with comparative performance of other companies.

49. We believe that a sensible approach for UCML is to:

- calculate a reward target based on comparative industry data for unplanned interruptions rather than making an adjustment to data to adjust for the planned and unplanned elements of the total minutes lost; and
- adopt a similar approach to Negative Water Quality Contacts by removing a penalty for delivering the level of service that customers supported in our business plan, but applying an upper quartile target for rewards. We provide an updated version of that calculation based on analysis of industry data.

1.6 Structure of the response

50. In order to assist the CMA with its review of our response, we have outlined in Table 2 below the structure of our response, with a brief overview of the issues addressed in each section. For the sake of clarity, we have followed the same structure as the PFs.

Table 2 Structure of the response

No.	Title	Description
1	Executive Summary	• Overview of Bristol Water's response to the CMA's provisional findings.
2	Wholesale cost assessment based on econometric benchmarking	• Response to PFs Chapter 4 covering: o CMA's assessment of Ofwat's model o CMA's alternative model o Special factors assessment
3	Review of base expenditure from Bristol Water's Business Plan	• Response to PFs Chapter 5 covering: o Opex o Capex – IRE o Capex – MNI
4	Review of enhancement expenditure from Bristol Water's Business Plan	• Response to PFs Chapter 6 covering: o Cheddar Reservoir Two o Cheddar WTW o Southern Resilience Scheme o Other enhancement
5	Overall wholesale totex assessment	• Response to PFs Chapter 7 covering: o Identification of overall wholesale totex allowance
6	Reconciling 2010-2015 performance	• Response to PFs Chapter 8 covering: o serviceability penalty o RCV capping o CIS adjustment
7	Outcome delivery incentives	• Response to PFs Chapter 9 covering: o unplanned interruptions o mean zonal compliance o negative water quality contacts
8	Cost of capital	• Response to PFs Chapter 10 covering: o cost of debt o cost of equity o overall cost of debt
9	Total allowed revenue and financeability	• Response to PFs Chapter 11 covering: o total allowed revenue o approach to financeability in PFs o financeability under the PFs o approach to financeability for final determination

2 Wholesale cost assessment based on econometric benchmarking analysis

2.1 Executive summary

2.1.1 Introduction

51. In Chapter 4 of the PFs the CMA sets out:

- its views on Ofwat's econometric models;
- details of its alternative econometric models; and
- an analysis of Bristol Water's wholesale cost requirements based on the modelling results and special factors.

52. In this Section we set out our response to the CMA on each of these areas.

2.1.2 Key themes

53. We agree with the CMA's conclusion that Ofwat's cost assessment for Bristol Water was compromised by its approach and models.

54. We consider that the CMA's alternative econometric modelling is a clear improvement on Ofwat's modelling and provides a reasonable estimate of the underlying cost function of the water industry. However, we note the following potential issues:

- the modelling has necessarily used only a few explanatory factors and therefore will not capture a number of factors that impact on companies' costs. As a result, there is the potential need for a large number of special cost factors to be taken into account to obtain the efficient costs of a specific company;
- no disaggregated modelling has been undertaken. This would allow more evidence on the potential for different companies to have costs that diverge from the basic models; and
- the results from the modelling show a wide range (£294m-£332m). The CMA's chosen point is at the lower end of this range, and is over-weighted towards the smoothed capex data.

55. In order to address these issues, a reasonable approach towards special cost factors needs to be undertaken, especially if a central estimate from the modelling is used.

56. Overall, we consider that the CMA's approach has resulted in a cost estimate that is below the efficient level of expenditure Bristol Water requires to deliver the outcomes included in the CMA determination.

57. We consider that the allowance for special cost factors relative to the CMA modelling in the provisional findings is insufficient. Table 1 below summarises our view on the special cost factors that should be taken into account.

Table 3 - Summary of Special Cost Factor Adjustments

Description	CMA Provisional View (£m)	Bristol Water conservative View (£m)	Potential higher estimate (£m)
Canal and River Trust Payments	8.1	8.1	8.1
Treatment Complexity	0.0	5.5	6.0
Additional costs at Purton and Littleton	0.0	8.35	14.7
Congestion in Bristol	0.0	3.65	6.2
Regional Wage Data	6.7	11.4	14.8
Mains Renewal Programme	10.6	15.0	26.4
Upstream Infrastructure Maintenance	N/A	12.1	12.1
Total special cost factors	**25.4**	**64.1**	**88.3**

Source: CMA Provisional Findings/Bristol Water

58. Excluding the regional wage adjustment, the central estimate of these special factors represents additional operating costs of £25.6m and additional IRE of £27.1m. We consider that these additional cost factors are conservative and at the low end of the plausible range. For the majority of them we show that higher estimates are plausible.

59. In respect of operating costs it is instructive to compare with previous price reviews. At PR09 Ofwat allowed special cost factors for operating costs of £30.3m.[5] This was also accepted by the CC in CC10. At PR04 Ofwat allowed a £33.1m special cost factor for operating costs.[6] In both cases the additional costs allowed were greater than the special cost factor of £25.6m relating to operating costs we have set out in Table 1 above. This experience shows that cost models for the industry do not work well for Bristol Water and that as a result regulatory precedent is to make relatively large special cost factor adjustments.

60. For infrastructure maintenance, Bristol Water's costs are higher than average due to the older age of our network, and a higher requirement for maintenance on reservoirs and aqueducts as a result of having a significantly greater asset base per customer in these areas. Disaggregated modelling for infrastructure maintenance would have identified that both of these factors were significant drivers of cost, and that Bristol Water's costs should be higher (e.g. Bristol Water's infrastructure model showed that both explanatory variables are significant and material). In the absence of a disaggregated model, the potential requirement for special cost factors in this area is higher and this should be taken into account in the CMA's assessment of them.

61. We acknowledge that in theory there could be special cost factors that result in our costs being lower in some areas than predicted by the model. However, we have not managed to identify any areas of expenditure where this is the case. In addition, neither Ofwat nor any other third party has identified potential areas where this may be so. Moreover, the special cost factors we have set out above are conservative compared to the allowances given to Bristol Water at previous reviews, and are supported by disaggregated costs comparisons between companies. Given this we consider the risk of beneficial cost factors being missed is minimal.

---

[5] See 2010 SoC (SOC128), para 1161, calculated as £5.172m per annum updated from 2007/08 prices to £6.07m in 2012/13 prices.

[6] Ofwat, Final Determination: Future Water Charges 2005-10 Supplementary Report for Bristol Water (RPF048), Table C.2.1a. Calculated as £4.8m pa in 2002/03 prices adjusted to £6.6m in 2012/13 prices.

62. In order to achieve a benchmark cost from its model, the CMA has taken the centre of its range (adjusted for special cost factors) and applied a catch-up assumption of RPI – 1.0%. We broadly accept that this approach is reasonable. However, we consider there are a number of reasons why the catch-up factor should be less than 1%, and that RPI – 0.5% is more likely to be appropriate.

63. In combination, these factors result in a modelled cost allowance for base totex that is c£40m higher than included in the provisional findings. We show in Section 3 below that a corrected bottom up assessment would be consistent with this adjusted model range.

2.1.3 Structure of the Response

64. Our response to the CMA's provisional findings is structured as follows:

- our views on the CMA's findings in respect of Ofwat's econometric models (see **Section 2.2**);
- our views on the CMA's alternative econometric models (see **Section 2.3**); and
- our views on special cost factor adjustments (see **Section 2.4**).

2.2 The CMA's findings on Ofwat's econometric models

65. We are pleased that following an in depth review, the CMA agrees with our views on Ofwat's modelling approach in a number of areas. In particular we agree with paragraph 4.64 of the provisional findings that there were significant risks that Ofwat's cost assessment for Bristol Water had been compromised by its approach and models.

66. Given that we have already provided extensive argument and evidence in support of the CMA's provisional findings in our previous submissions, we do not consider it necessary to make further comment on this aspect of the PFs.

2.3 The CMA's alternative econometric models

2.3.1 Introduction

67. The provisional findings set out the CMA's development of an alternative set of top-down totex models with which to assess Bristol Water's expenditure.

68. The CMA noted in the PFs that there were potential benefits from undertaking additional disaggregated modelling. However, it concluded that the development of such models was not a priority for its determination.

69. The CMA used the results of its modelling to identify a specific cost estimate for Bristol Water.

70. In this section we set out our views on:

- our views on the CMA's modelling approach (see **Section 2.3.2**);
- ours views on the exclusion of more disaggregated modelling (see **Section 2.3.3**); and
- our views on the approach adopted by the CMA to identify a specific cost estimate (see Section **2.3.4**).

2.3.2 Bristol Water's Views of the CMA modelling Approach

71. Overall, we consider that the CMA has used a robust approach to develop its models given the available time and data. The lack of time and data mean that the CMA has not been able to follow the ideal process that it identified in its working paper to consider a range of different approaches. The CMA's models do, however, avoid many of the issues that we identified in Ofwat's models and we consider that they are clearly superior.

72. In respect of the modelling we note the following issues:

- the exclusion of mains age as an explanatory factor (see **Section 2.3.2.1**);
- the use of Ofwat's regional wage factor as an explanatory variable (see **Section 2.3.2.2**);
- the potential impact of economies of scale (see **Section 2.3.2.3**); and
- the over-weighting of results from the smoothed capex models (see **Section 2.3.2.4**).

2.3.2.1 Mains Age

73. The CMA did not include mains age data within its modelling as a result of concerns about the accuracy of the data, and a concern that it only related to a subset of water companies assets.[7]

74. We do not consider that the second of these reservations should be a concern. This is because mains age affects only the level of maintenance required on these assets. The potential impact on mains age would have a material impact on infrastructure maintenance expenditure and therefore should be readily discernible from the expenditure data.

75. Nevertheless we accept that the CMA's proposed approach of treating this matter through the special cost factor assessment is appropriate.

2.3.2.2 Wage data

76. We accept that the CMA's approach of using the regional wage data in the model, and considering adjustments as a special cost factor, is acceptable.[8]

2.3.2.3 Economies of Scale

77. Two of the CMA's modelling approaches were based on unit cost models, and one on an aggregate cost approach. The CMA considered whether there might be economies of scale

---

[7] PFs, para. 4.135.

[8] PFs, para. 4.140.

but did not identify a good reason why a greater number of properties should materially decrease expenditure requirements per connected property.[9]

78. For smaller companies, we consider it is likely that central management, financial and regulatory reporting and other central management overheads might be larger on a per customer basis than for larger companies. This is because some elements of these costs do not scale well for smaller companies. For larger companies, this effect probably dissipates in line with the CMA's reasoning.

79. The potential for such economies of scale could be investigated by testing an additional explanatory variable based on the inverse of the total number of water and sewerage customers. Sewerage customers should be included as the central overhead additional costs would be related to the size of the business overall, not just the size of the water business. The use of the inverse of the number of customers would capture an effect that was relevant for smaller companies but made little difference for larger companies.

2.3.2.4 Over-weighting of results from smoothed capex models

80. We have significant concerns that the use of smoothed capex models will result in an inappropriate modelling formulation because the costs in a particular year are not necessarily related to the values of the explanatory variables in that year. The advantage of a smoothed approach is that the capex in any year can be lumpy, but the disadvantage is that the smoothed approach reflects a number of years which are not consistent with the explanatory factors. In the case of Bristol Water, the second issue outweighs the first because of the constrained investment in AMP4. As a consequence, we consider that it is appropriate to give more weight to the unsmoothed model results.

81. However, following the CMA's process of model selection, the central cost estimate is derived from six smoothed models and four unsmoothed models and consequently gives more weight to the smoothed models.

82. We believe the CMA should consider weighting the results from the different types of models appropriately.

2.3.3 Potential impact of disaggregated modelling

83. The CMA states that it saw potential benefits from the development of more disaggregated models that examined costs of different parts of the business in more detail. However, it decided that this was not a priority for its modelling assessment.[10]

84. We agree that there are significant merits in disaggregated modelling. Whilst we understand the need of the CMA to prioritise its efforts, we consider that the lack of disaggregated modelling has contributed to the cost allowance for Bristol Water in the provisional findings being too low.

85. In this section we show:

- there is a wide range of evidence that disaggregated modelling would have resulted in a higher cost estimate for Bristol Water (see **Section 2.3.3.1**); and

---

[9] PFs Appendices, para. 90.

[10] PFs, para. 4.182(g).

- that this evidence would support a higher level of special cost factors than included in the provisional findings (see **Section 2.3.3.2**).

2.3.3.1 Evidence from disaggregated modelling

86. In the SoC we presented evidence from disaggregated modelling that showed higher predicted costs than those allowed by the CMA in the provisional findings:

- Bristol Water's disaggregated modelling suggested that a reasonable central estimate of capital maintenance expenditure for Bristol Water was £196m compared to £131m in the provisional findings;[11]
- Oxera's disaggregated modelling indicated a range for capital maintenance expenditure of £147m to £168m (using Ofwat's regional wage measure and therefore underestimating Bristol Water costs);[12] and
- Oxera's disaggregated opex modelling identified efficient operating costs of £225m (upper quartile) on an stochastic frontier analysis (**SFA**) (post special factor basis).

87. At PR09, Ofwat's disaggregated modelling showed that Bristol Water's operating costs were relatively efficient (between 5% and 10% within the frontier and in line with upper quartile). This demonstrates that there are a range of disaggregated approaches that support the view that Bristol Water is not inefficient.

2.3.3.2 Support for additional special cost factors

88. We understand that the CMA has not had time to undertake disaggregated modelling. However, we presented a range of evidence on disaggregated modelling within the SoC. In the provisional findings the CMA does not appear to have given any consideration to the modelling results from Bristol Water or Oxera. It is important that the CMA does not disregard this evidence simply because it has not been able to undertake its own disaggregated modelling.

89. In the **Section 2.4** below on special factors below we show that a disaggregated approach to operating costs would show that the additional special costs factors we have identified are appropriate. We also show that this is the case specifically in respect of the difference between Bristol Water and other companies in the direct costs of water treatment. We also show that a disaggregated approach to infrastructure maintenance would have shown that, in addition to higher costs for mains, we have been given a higher allowance to cover the additional costs of maintenance on upstream assets.

90. Given that the CMA has not had time to undertake any disaggregated analysis it is important that it gives weight to the comparative and modelling data that is available on a disaggregated basis.

2.3.4 Overall model baseline

91. The CMA has identified an efficiency benchmark by identifying a point in its modelling range and then applying an assumption of RPI – 1.0%.

92. We have two concerns with this approach:

---

[11] SoC, Section 9.4.4.2.5, p. 304.

[12] SoC, Table 72, p. 310.

- the starting point should include some weighting of companies actual costs and consideration needs to be given to the balance of risk (see **Section 2.3.4.1**); and
- we consider that the catch-up rate of RPI-1.0% is high given the current expectations for inflation and that RPI-0.5% would be more appropriate (see **Section 2.3.4.2**).

2.3.4.1 Placing weight on Bristol Water's actual costs

93. The CMA notes in the PFs that where a company has costs that are above those predicted by the econometric modelling, the actual performance of the company is likely to be better than indicated by the model.[13] We consider that this supports giving some weight to companies' actual costs in the setting of an efficiency benchmark.

94. The CMA states that its view was that the totex incentive cost sharing approach means that in practice the baseline set by Ofwat was not 100% weighted to model results in contrast to previous approaches.[14] We consider that this view is mistaken as it confuses an ex-ante setting of the expenditure allowance with the ex-post sharing of performance between the company and customers. This can be illustrated by comparing an outcome where a company spent £10m in excess of its determination and received £5m from customers' in a subsequent period, to an alternative situation where the company spent the same amount but the determination was £10m higher. In the latter case the customers would have paid for the totex in full, i.e. an additional £5m. This demonstrates that the ex-ante cost allowance and ex-post reconciliation are not equivalent.

95. We consider that there are merits in an approach that places weight on companies' actual proposed costs as well as modelling results. It gives weight to the current level of spend and therefore recognises that modelling and special cost factors would not always be accurate. Moreover, it can be justified in terms of the CMA's principles as it balances accuracy and incentives pretty well.

96. Not giving sufficient weight to actual expenditure data could increase the risk that the cost allowance is too low and therefore have a knock-on impact on customer service and risk.

97. In the provisional findings the CMA notes that regardless of how it makes an assessment of the costs of Bristol Water, Bristol Water would have to meet its obligations and that the CMA would expect Ofwat to safeguard the risks that Bristol Water might expose customers to additional costs as a result of inefficient deferral of investment.[15]

98. We accept the duty upon us to deliver our obligations, and the evidence that our expenditure was above the allowance in the previous period demonstrates that a cost allowance would not be used as an arbitrary cap. However, our duty to meet our obligations does not offset the issue that if a regulator sets a cost allowance too low, then it creates additional risk. The allocation of this risk between customers and shareholders during the period will depend upon the company's investment decisions, but it is unrealistic to assume that none of the risk would fall to customers. In the long run the risk will fully accrue to customers either through higher financing costs or lower service. To illustrate the quantity of the risk, an overspend of £10m for Bristol Water is equivalent to a reduction in return on

---

[13] PFs, para. 4.204.

[14] PFs, para. 4.196.

[15] PFs, para. 4.199.

regulatory equity of 1.2% during the period. [redacted]

99. As a consequence, it is important for customers' welfare that the cost allowance is not underestimated. This reinforces the need to be cautious in selecting the point within the range of econometric results to use.

2.3.4.2 The CMA's proposed efficiency benchmark approach

100. The CMA has proposed a benchmark approach of using average efficiency adjusted by a cost trend of RPI – 1.0%.[16] This is compared to Bristol Water's proposed cost trend for opex of RPI – 0.9%.

101. Overall, we consider that the approach proposed is appropriate subject to the following considerations:

- the average efficiency benchmark will be a point estimate from a range. We consider that it is important that the position of the point estimate within the range is considered carefully taking into account the balance of risk for customers and the evidence of companies actual costs; and
- the catch-up efficiency of RPI-1% represents a mix of input price inflation relative to RPI, frontier (industry wide) efficiency improvements and catch-up efficiency. We consider that given current expectations for input price inflation a catch-up assumption of RPI-0.5% should be used.

102. In the SoC we assumed input price inflation 0.6% relative to RPI for opex, and 0.7% for capex based on a report by First Economics.[17] Subsequently, inflation expectations have fallen substantially, compared to the estimates of likely cost increases. This is reflected in an updated report that reflects the latest forecasts of cost inflation and shows that the forecast of input price inflation has increased to 0.9% for opex, and 1.0% for capex.[18]

103. This paper shows that the forecast for input price inflation has increased overall by 0.3% since the SoC was produced. Taking this into account would have reduced the efficiency assumption in our plan by 0.3% per annum.

104. Given this, we consider that it is appropriate that this reduction is reflected in the CMA's approach to setting the efficiency benchmark and that an assumption of RPI-0.5% is used.

2.4 Special Cost Factor Adjustments

2.4.1 Introduction

105. The CMA models are reasonable top-down estimates of the underlying cost function of companies, but as a result they necessarily have few explanatory variables. As such, it is quite likely that they will not capture some significant variations in cost that companies may face. Consequently, there is a requirement to assess the need for special cost factors carefully.

---

[16] PFs. para. 4.211.

[17] First Economics price inflation productivity growth Dec 14 (SOC475).

[18] First Economics: Wholesale Input Price Inflation and Frontier Productivity Growth, Report for BW, July 2015 (RPF071), and explanatory notes (RPF073).

106. In addition, the absence of more disaggregated modelling means that significant additional costs in some areas of the business could be overlooked by the top-down models as they will not include the explanatory factors that relate to such additional costs. As a consequence, there is a potential requirement for significant cost factors in some areas.

107. The CMA included special costs factors of £25.4m for Canal and Rivers Trust payments, a regional wage effect, and additional mains replacement costs. The provisional findings excluded any allowance for special cost factors relating to additional costs for treatment complexity, treatment costs for Purton and Littleton, and congestion.

108. We consider that the allowance for special cost factors is extremely low, and not consistent with historical assessments, or the range of available evidence. In this section we set out our views on each of the following special cost factors:

- Canal and Rivers Trust (see **Section 2.4.2**);
- Treatment complexity (see **Section 2.4.3**);
- Purton and Littleton (see **Section 2.4.3.2**);
- Congestion (see **Section 2.4.4**);
- Regional Wage (see **Section 2.4.5**);
- Mains Age (see **Section 2.4.6**);
- Upstream Non-infrastructure maintenance (see **Section 2.4.7**); and
- Bedminster (see **Section 2.4.8**).

109. The overall position on special cost factors is then summarised (see **Section 2.4.9**).

2.4.2 Canal and River Trust Payments

110. The provisional findings supported inclusion of a special cost factor of £8.1m relating to the additional cost of payments to the Canal and Rivers Trust.

111. We agree with this finding because these additional costs are largely outside our control, and not incurred by other water companies so will not be represented in the models.

2.4.3 Treatment Complexity

112. The provisional findings consider two areas of argument in relation to treatment complexity:

- treatment processes characterised as W3 or W4 (see **Section 2.4.3.1**); and
- additional costs of treatment at Purton and Littleton (see **Section 2.4.3.2**).

2.4.3.1 Treatment Processes characterised as W3 or W4

113. The CMA's finding was that it did not identify grounds to make further adjustments to take account of the W3/W4 data.[19]

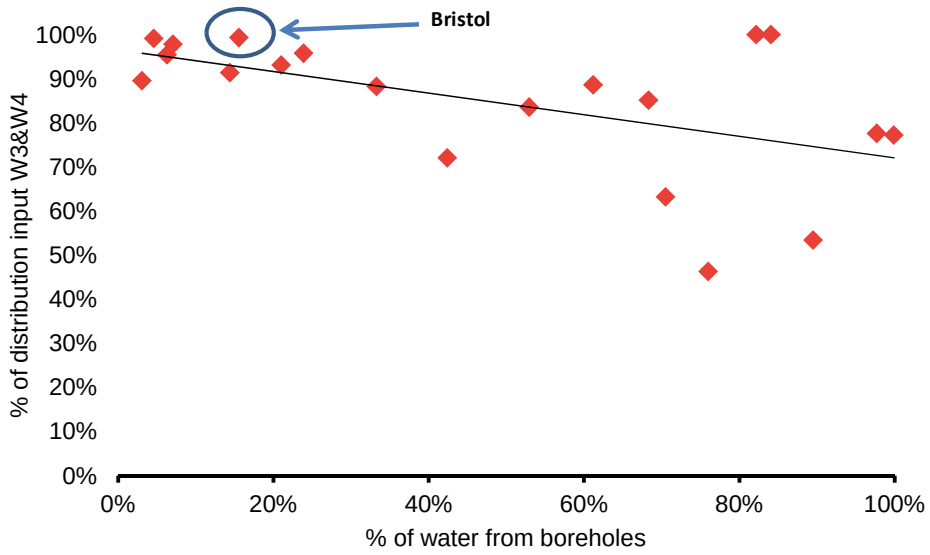
114. We consider that this view is likely to result in the efficient cost estimate for Bristol Water being underestimated. The CMA acknowledges that the allowance for treatment complexity in its modelling of £12.7 million is less than the allowance made by Ofwat of £18.2 million.[20] The fact that the models that included the W3/W4 variable resulted in a lower allowance

[19] PFs, para. 4.247.

[20] PFs, para. 4.244.

than those that used the proportion from river sources does not prove that the additional costs of treatment in W3 & W4 plants is not a legitimate cost driver and merit inclusion as a special factor. It may just reflect the weaknesses in the W3 & W4 data.

Figure 1 Proportion of water treated by W3/W4 compared to proportion from boreholes



Source: Bristol Water

115. Figure 1 plots the proportion of water treated by W3 and W4 against the proportion of water from boreholes (which is effectively the inverse of the proportion from rivers). This shows that Bristol Water is 'above the line', which means that its proportion of treatment in the most complex and expensive treatment works is higher than would be expected on the basis of the water source. Accordingly, one would expect the modelling based on W3 and W4 to result in a higher level of predicted cost for Bristol Water. The fact that it does not reflects a concern in that aspect of the modelling.

116. The other issue that the CMA raises is in relation to Bristol Water's lower distribution input (**DI**). The CMA noted that the cost is lower due to lower DI and that this is partly due to lower leakage.[21] There are two factors that the CMA has not taken in account.

117. First, the measure of DI excludes the water we treat to supply Wessex Water (typically 5 Ml/d), which is supplied from Purton Treatment Works.

118. Second, the fact that Bristol Water has a below average rate of leakage implies that Bristol is spending more on leakage control and reduction than other companies (and/or is being more efficient). We incur higher ongoing costs in terms of active leakage control than companies that have lower levels of leakage. The CMA models do not allow for the higher costs of leakage activity. As a result, we are being penalised in the cost assessment because the models allow for the cost benefit of lower volume but not the additional cost to achieve lower leakage. The CMA estimates that an average level of DI would increase the cost

[21] PFs, para. 4.245(b).

assessment by £6 million.[22] We consider that the appropriate adjustment for the leakage costs should be up to but not more than that amount, reflecting the fact that the lower leakage should be an efficient outcome.

119. At PR09, Ofwat and the CC gave a special cost factor allowance of £6.9m in relation to additional costs of treatment complexity because their model underestimated the costs of treatment for W3/W4 treatment works.[23] This was relative to the resources and treatment opex model that included explanatory variables of proportion of treatment from rivers and proportion from reservoirs. This model is analogous to the model developed by the CMA.

120. Overall, we consider that an additional special cost factor of £5.5m should be included to represent the difference between the allowance calculated by the CMA modelling and the allowance made by Ofwat in its determination. We note that this is lower than the equivalent special factor allowed by Ofwat and the CMA in 2010.

2.4.3.2 Additional costs of treatment at Purton and Littleton

121. The CMA considered the evidence provided is insufficient to make an adjustment to the modelled cost baseline.[24] In particular it was concerned that a comparison with one reference site only was insufficient, and that Bristol Water had not shown that its costs for Purton are high relative to the costs of an average river source, nor an average works with W3/W4 processes.[25]

122. We are disappointed by this conclusion. The treatment works at Purton are significantly more complex than typical W3/W4 treatment works, and moreover, together they typically represent 45% of our water into supply. As such they have a material impact on our costs.

123. In this Section we show:

- the CMA's approach is not consistent with regulatory precedent (see **Section 2.4.3.2.1**);
- that Bristol Water has very high direct costs of treatment (on a pound per m3 basis) compared to other companies (see **Section 2.4.3.2.2**); and
- that the costs of Purton and Littleton are high compared to the costs of an average river source or an average treatment works with W3/W4 treatment processes (see **Section 2.4.3.2.3**).

124. The additional cost adjustment we have set out for Purton and Littleton is £8.35m. We consider this is a conservative estimate as it does not include any allowance for additional indirect costs as was accepted by Ofwat at PR09 and PR04.[26] Including an allowance for

---

22 PFs, para. 4.246.

23 See 2010 SoC (SOC128) para. 1161, calculated as £1.18m per annum in 2007/08 prices updated to £1.38m per annum in 2012/13 prices.

24 PFs, para. 4.251.

25 PFs, para. 4.252.

26 If no increases in indirect costs are assumed as an increase in direct costs, then this is equivalent to assuming significant economies of scale and would imply that larger companies should have significantly lower unit costs.

indirect costs the special cost factor claim should be £14.7m in line with the cost exclusion case in our June submission.[27]

2.4.3.2.1 Regulatory Precedent

125. At PR09 Ofwat and the CC allowed a special cost factor of £13.3m for the additional costs of Purton and Littleton Treatment works.[28] This was in relation to an econometric model for resources and treatment costs based on the proportion of distribution input sourced from rivers.

126. This was in addition to a special factor allowance of £6.9m that related to additional costs of treatment complexity because the model underestimated the costs of treatment for W3/W4 treatment works.[29]

127. In addition, in PR04 Ofwat allowed £10.3m for the additional costs at Purton and Littleton.[30]

128. This demonstrates that the CMA's approach is not consistent with regulatory precedent.

2.4.3.2.2 Bristol Water has high direct costs of treatment

129. Bristol Water has comparatively high direct costs of water treatment as a result of the more complex water it has to treat. Figure 1 below compares the direct costs of treatment for each water company in terms of pence per m^3. The data is based on June Return data for direct water resources and treatment costs excluding abstraction charges and power.[31]

---

[27] Cost Exclusion cases (SOC006), p.250 to 262. The amount included in the response to the draft determination (and the SoC) was reduced by excluding the indirect cost element. This was done to address concerns raised by Ofwat and to try to have some account taken of the additional costs in the Final Determination.

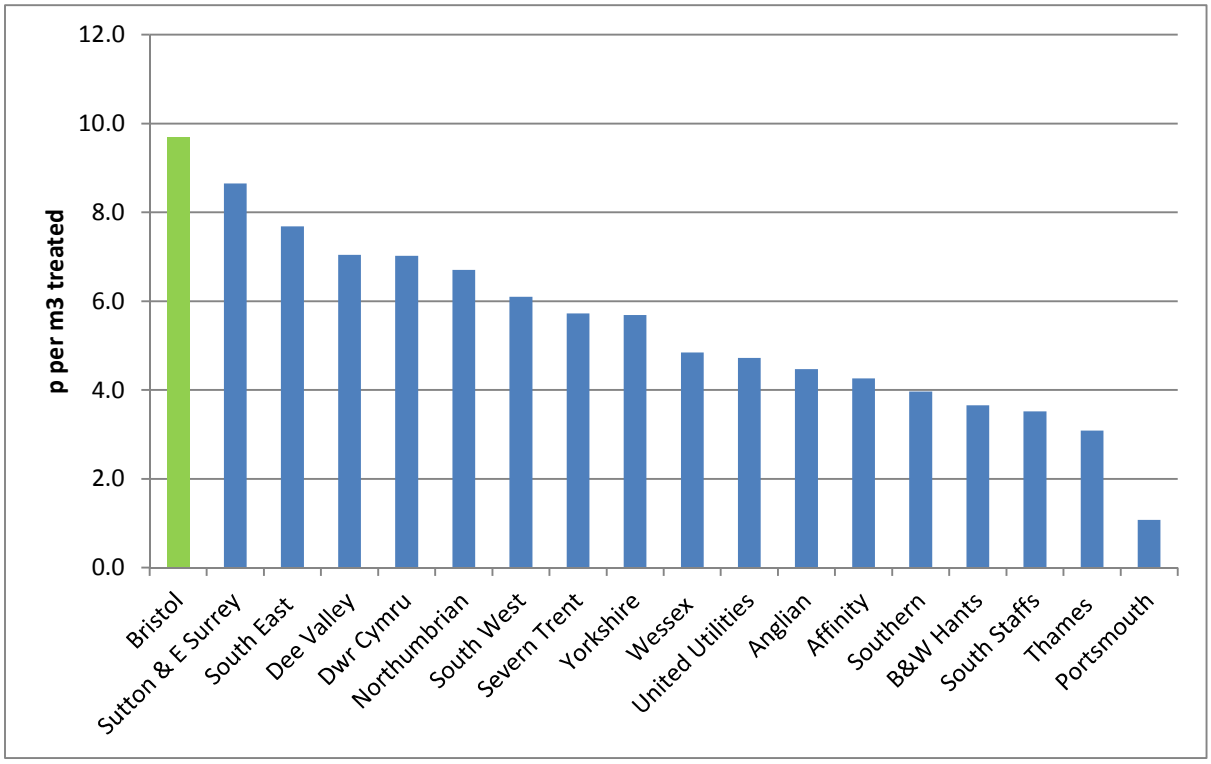
[28] See 2010 SoC (SOC128) para. 1161, calculated as £2.27m per annum in 2007/08 prices updated to £2.66m per annum in 2012/13 prices.

[29] See 2010 SoC (SOC128) para. 1161, calculated as £1.18m per annum in 2007/08 prices updated to £1.38m per annum in 2012/13 prices.

[30] Ofwat, Final Determination: Future Water Charges 2005-10 (SOC562) Supplementary Report for Bristol Water, Table C.2.1a. Calculated as £1.5m per annum in 2002/03 prices adjusted to £2.07m per annum in 2012/13 prices.

[31] Abstraction charges were excluded as these are largely outside companies' control. Power costs were excluded as these mostly relate to pumping rather than treatment costs. June Return 2014 (SOC3112). Data after 2011 is not available, but costs do not vary significantly year to year.

Figure 2 - Direct costs of water treatment 2009-2011



Source: June Returns 2009-2011/Bristol Water analysis.

130. The chart shows that Bristol Water's actual costs are high compared to the rest of the industry. If Bristol Water's costs were in line with the industry average of 5.1p per m3, they would be £4.7m per annum lower. This equates to £23.6m over a five year period, compared to actual Bristol Water costs of £49.3m.

131. In addition, Bristol Water has higher indirect costs of resources and treatment. Higher additional indirect costs would be expected as a result of central factors relating to the higher costs (e.g. greater allocation of HR and finance costs, additional process science and DWI reporting costs etc).[32] At PR09, Ofwat allowed 33% of the additional indirect costs as part of the Purton and Littleton additional cost factor claim. Our claim for £8.35m does not include any indirect costs. Allowing 33% of the additional indirect costs results in additional costs of £4.5m over five years.

132. This additional cost of £23.6m should be compared to the relevant special cost factors we have identified. This is illustrated in the table below, which also compares the upper end case to a difference of £28.1m that includes the additional indirect costs.

[32] If indirect costs were not to increase in relation to direct costs then there ought to be significant economies of scale as the unit costs of larger companies would reduce. Given that there is not strong evidence for economies of scale, indirect costs must be reasonable strongly related to direct costs.

Table 4 - Summary of resources and treatment special cost factor adjustments

Description	CMA Provisional View (£m)	Bristol Water Central View (£m)	Bristol Water Upper Limit (£m)
Canal and River Trust Payments	8.1	8.1	8.1
Treatment Complexity	0.0	5.5	6.0
Additional costs at Purton and Littleton	0.0	8.35	14.7
Total cost factor relating to treatment	**8.1**	**22.0**	**28.8**
Bristol Water additional direct costs	23.6	23.6	28.1
Amount of additional costs assumed to be inefficiency	**15.5**	**1.6**	**-0.7**
Implicit assumption about % overspend	**46%**	**3%**	**-1%**

Source: CMA Provisional Findings/Bristol Water

133. Table 4 shows that the CMA's approach is equivalent to assuming that £15.5m of Bristol Waters costs are inefficiently above average. This represents over 30% of Bristol Water's actual costs. Assuming that this represents inefficiency is effectively assuming that Bristol Water spends 46% more than it needs to on resources and treatment.[33] We do not consider that this is a reasonable assumption.

134. In contrast, Table 1 shows that even taking into account the special cost factors we have included in our response to the provisional findings that our costs would be slightly above average. We consider that this demonstrates that the special cost factors we have estimated are conservative.

2.4.3.2.3 Other comparative data

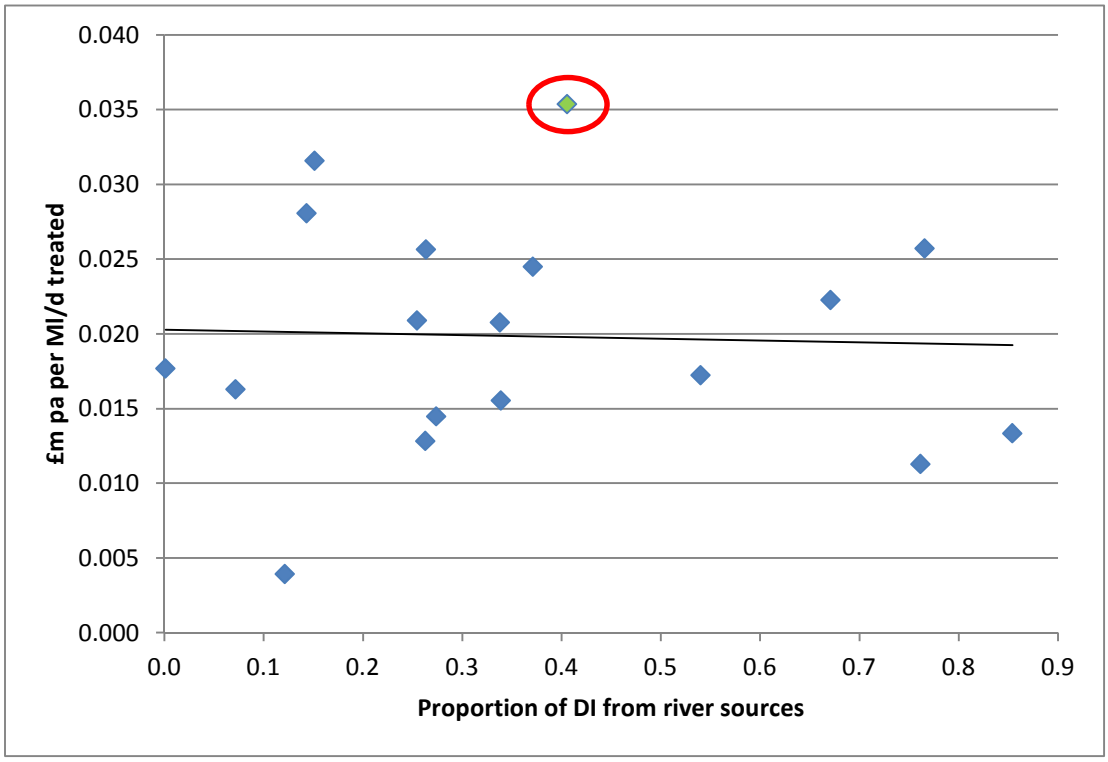
135. In the provisional findings, the CMA noted that our analysis does not show Bristol Water's costs are high relative to the costs of an average river source.[34] We do not have specific data on the costs of other companies' treatment works. However, we can use the available information on overall resource and treatment costs to partially answer this question.

136. Figure 3 below compares the direct costs of treatment with the proportion of distribution input from rivers (based on the average between 2009 and 2011 consistent with the cost data). The data point for Bristol Water and the trend line are identified.

[33] Calculated as actual cost of £49.3m compared to adjusted average cost of (£25.7m+£8.1m).

[34] PFs, para. 4.252(a).

Figure 3 Variation of direct resources and treatment costs with proportion of water treated from rivers



Source: June Returns/Ofwat PR14 modelling data/Bristol Water analysis

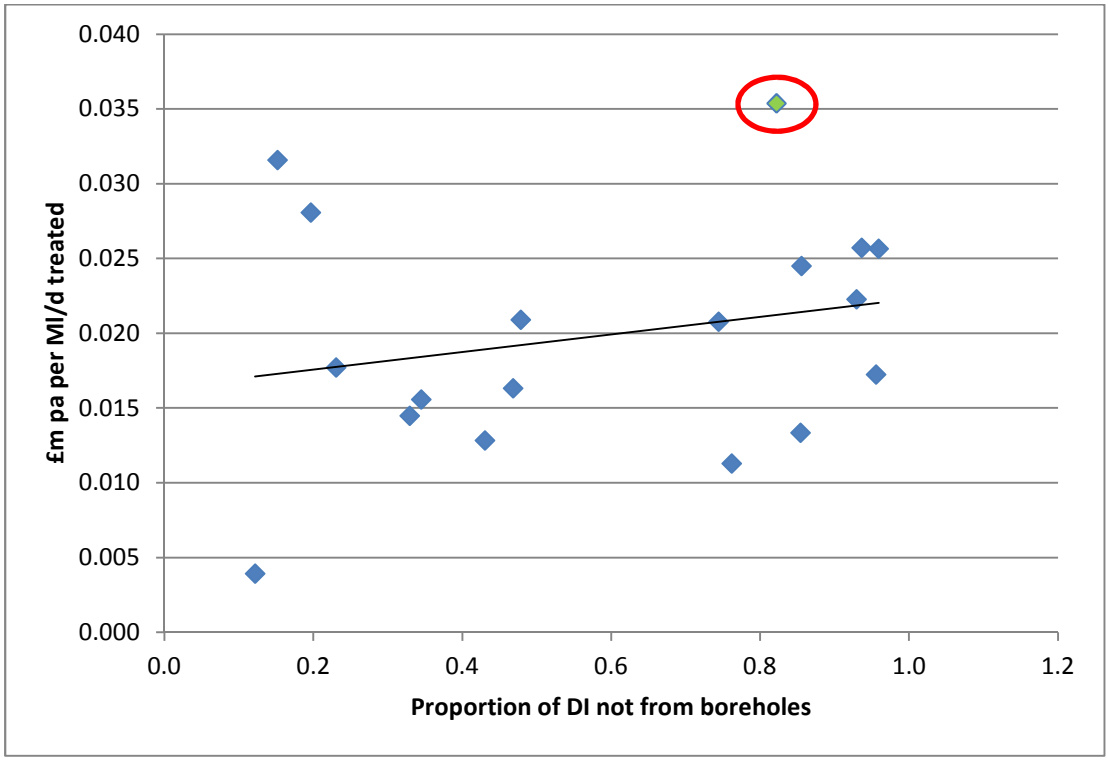
137. Figure 3 above shows that the overall costs for Bristol Water are high relative to the industry average relating to the same proportion of input from river sources as Bristol Water.

138. Figure 3 also shows that actual treatment operating costs are not strongly correlated with proportion from river sources.[35] This reflects the wide difference in the quality of water in different rivers, and hence the differences in treatment cost for them. This reinforces the importance of specific river characteristics for treatment costs.

139. Figure 4 below compares the direct costs of treatment with the proportion of distribution input from rivers and reservoirs (equivalent to the amount not from ground water sources). The data point for Bristol Water and the trend line are identified.

[35] This does not rule out a correlation between proportion from rivers and overall totex, as the proportion from rivers may have a significant impact on capital maintenance costs.

Figure 4 - Variation of direct treatment costs with proportion of water from rivers and reservoirs



Source: June Returns/Ofwat PR14 modelling data/Bristol Water analysis.

140. Figure 4 shows a more discernible trend between costs and water not sourced from boreholes. As for river sources, the costs actually incurred by Bristol Water are significantly greater than the industry average for the same proportion not from boreholes as Bristol Water.

141. These Figures show that Bristol Water's direct costs of resources and treatment are higher than would be expected simply from the proportion of water derived from river sources, or derived from river and reservoir sources. We consider that this demonstrates that our costs overall are high relative to these factors. Since Purton and Littleton are our most expensive treatment works, we consider that this demonstrates that the costs of Purton and Littleton are high relative to the average treatment works with a river water source.

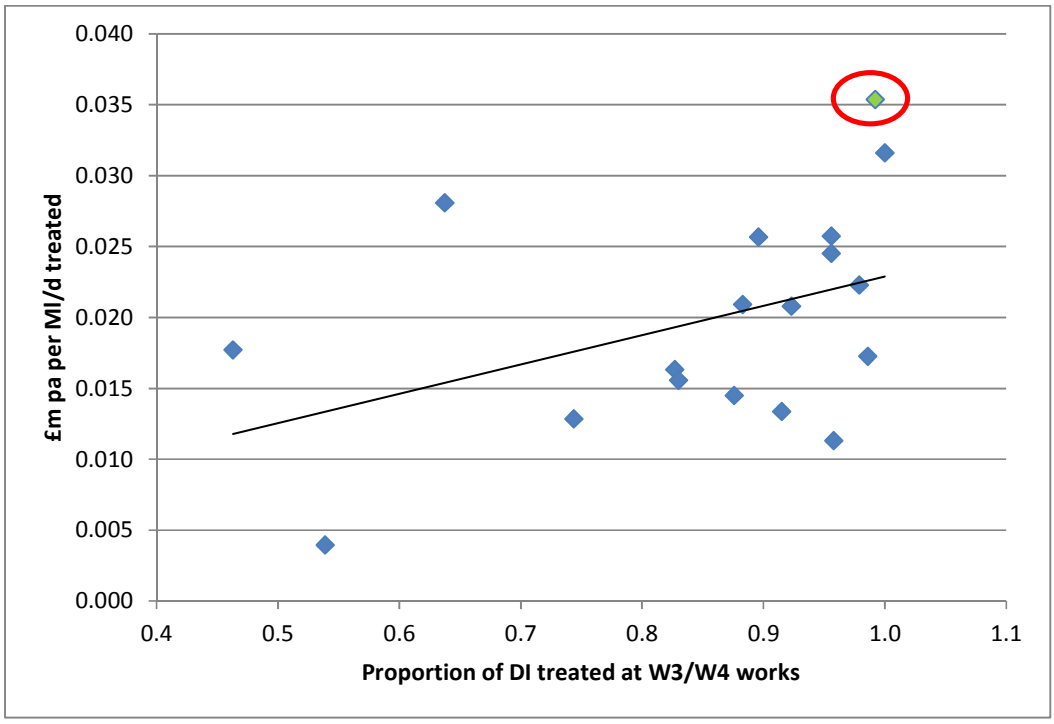
142. In the provisional findings, the CMA also stated that we did not show that our costs for abstracting and treating water at Purton are high compared to the average treatment works with W3/W4 treatment processes.[36]

143. Again, apart from the detailed comparison we have provided with Hampton Loade which is a W4 river treatment works, we do not have information on the costs of treatment for other companies. We do not consider that the fact such data is not available should be, in itself, a sufficient reason for rejecting the special factor claim. In any event, as stated above we believe that the available data on direct resources and treatment costs can partially answer this question. We also note that Ofwat was satisfied at both PR04 and PR09 that this was an appropriate and reasonable comparison.

[36] PFs, para. 4.252(b).

144. Figure 5 below compares the direct costs of treatment with the proportion of distribution input from works categorised as W3/W4. The data point for Bristol Water and the trend line are identified.

Figure 5 - Variation of direct treatment costs with proportion of water from W3/W4 works



Source: June Returns/Bristol Water analysis

145. Figure 5 shows that the relationship between direct resources and treatment costs and proportion of works that are W3/W4 is much stronger than for the relationship relating to proportion of rivers or boreholes. In addition, it shows that Bristol Water's costs are higher than those of an average company with the same proportion of W3 and W4 works.

146. We consider that this demonstrates that our costs overall are high relative to the typical costs associated with the proportion of W3 and W4 works. Since Purton and Littleton are our most expensive treatment works, we consider that this demonstrates that the costs of Purton and Littleton are high relative to the average treatment works with W3/W4 treatment processes.

2.4.4 Congestion in Bristol

147. The CMA considered that the evidence in respect of congestion was not sufficient to include a special cost factor to address these additional costs. This was because:

- we did not assess whether the journey speeds across the whole of the area of appointment are slower than would be expected from the CMA's models;
- the data was based on morning peak speeds that might not be representative of the speed across the day; [37] and
- the scale of the claim was relatively small.[38]

[37] PFs, para. 4.270.

148. We have set out our approach to this claim in detail in our response to DD14. [39] This addressed the concerns raised here by the CMA and would be useful for further reference. The case set out four estimation methods that resulted in a range of special cost factor costs of between £2.4m and £6.2m. The estimate of £3.65m included was in the lower half of this range. We consider that a fair assessment of this cost factor claim would lead to its re-instatement.

149. We address each of the concerns raised:

- inter-relation of additional congestion costs with density effects of the model (see **Section 2.4.4.1**);
- the use of morning peak speeds (see **Section 2.4.4.2**); and
- the small scale of the claim (see **Section 2.4.4.3**).

2.4.4.1 Inter-relation between congestion costs and modelling

150. The key reason the CMA appears to have excluded additional costs due to congestion is that it considers that the additional costs might already be picked up through the density terms in its model. We consider that this concern is misplaced and that the additional costs are not reflected in the modelling. In particular:

- congestion is independent of density as identified by the model. Two cities with equal density could have quite different traffic conditions and costs (see **Section 2.4.4.1.1**);
- the claim for congestion relates only to travel within Bristol, and to the additional cost compared to operating in an average major city (see **Section 2.4.4.1.2**);
- by using an average over the whole of Bristol Water's area, the model may underestimate the costs of operating in our area (see **Section 2.4.4.1.3**); and
- that overall the special cost factor is reasonable (see **Section 2.4.4.1.4**).

2.4.4.1.1 Congestion is independent of connection density

151. The amount of congestion in a particular area reflects a number of factors (e.g. such as the availability of public transport) and there could be large variations between areas with a similar density of connections. Therefore, although the model might reflect the differences of cost due to congestion on average for differences in the overall density of connections, it will not reflect specific differences between areas that have higher congestion for the same density.

152. To the extent that costs may be higher (or lower) in urban areas, the CMA's models will predict costs that effectively relate to the average level of congestion in an area with a particular density. Therefore, if the congestion in a particular area is higher than typical for the density of that area, then the actual costs of operating in that area would be higher than predicted by the model.

153. Conversely, the model would predict the same costs for Bristol Water irrespective of the actual amount of congestion within Bristol.

---

[38] PFs, para. 4.271.

[39] Bristol Draft Determination (SOC048) p.174 to 187.

154. As a consequence the model will underestimate costs of companies operating in areas where congestion is higher than average for a particular density of connections.

2.4.4.1.2 The claim for congestion relates to Bristol in comparison to other major cities

155. The additional costs for Bristol Water have been calculated by comparing average traffic speeds in Bristol (14.9 mph) with an average of those in Leeds, Birmingham, Liverpool, London and Manchester (18.1 mph).[40] These cities are likely to have similar connection densities to Bristol Water.

156. This speed difference was applied to the 1.90m miles driven by our staff and network maintenance contractor within the Bristol urban area in 2013/14. Therefore it relates only to travel in the specific area of greater congestion.

157. Consequently, the quantum of the claim arises from a comparison of the cost of operating in Bristol compared to operating in an average major city with similar density.

2.4.4.1.3 Model issues due to averaging

158. The impact of density of connections within the model is taken into account by using company-wide measures of length of mains and number of connections. It is possible that the use of company-wide averages can result in an underestimate of the costs of a particular company.

159. This can be illustrated by considering an underlying industry cost function that has higher costs for high density areas and low density areas, but lower costs for medium density areas. If a company consists of a high density area and a low density area, then both areas would be high cost. However, the company wide average for these two areas would be a medium density area. As a result, the industry cost function applied to the overall area will result in the company's costs being underestimated.

160. Bristol Water effectively consists of a high density area in Bristol, and a low density area (Somerset and the Mendips). As a result, there is a significant risk that using average data for the company area has resulted in the CMA's modelling underestimating its costs. Although we have not quantified this impact, we consider it contributes to the estimate of congestion costs that we have made being conservative.

2.4.4.1.4 Overall conclusion on modelling

161. In **Section 2.4.4.1.1** we show that the model will underestimate the costs of companies operating in areas where congestion is higher than for a particular density of connections.

162. In **Section 2.4.4.1.2** we show that Bristol Water has greater congestion than a range of other major cities that will have similar connection densities and that as a result there are greater costs arising from the miles driven in this area of higher congestion.

163. We consider that this clearly demonstrates that the additional costs due to congestion faced by Bristol Water are not captured in the model.

---

[40] Cost exclusion cases (SOC006), Table 22, p.268.

2.4.4.2 Use of morning peak speeds

164. The use of the morning peak speeds as a proxy for the overall day was justified in detail in Section 1.3.2 of the cost exclusion case.[41] This was based on Department for Transport data on the distribution of traffic speeds throughout the day. The data showed that the morning peak (07.00-10.00) traffic is 70% above average (the average includes night traffic), and the afternoon peak volumes of traffic are 100% greater than average. Furthermore, the average density of traffic between 0.700 and 18.00 Monday to Friday is 67% above average, very similar to the average morning peak.

165. This demonstrates that it is reasonable to adopt the average of morning peak speeds as an average for the working day.

2.4.4.3 The small scale of the claim

166. The CMA states that it considers the potential scale of the adjustment at £3.65m to be "*relatively small-scale*".[42]

167. Firstly, we note that the estimate is a conservative estimate as it does not include the additional fuel costs arising from congestion, nor the additional insurance premiums or accidents that arise from operating in an area of high traffic density.

168. Secondly, we note that the regulatory precedent for identifying a cost as trivial is to compare it to the turnover of the business. For its assessment of the change protocol and IDOKs, Ofwat has adopted an approach for operating costs that considers them to be trivial if the NPV of the additional cost over 15 years is less than 2% of turnover. We note that the £3.65m of this claim over just the five year period amounts to around 4% of turnover and therefore should not be regarded as trivial.

169. Finally, we observe that expressed as a proportion of regulatory equity, £3.65m over 5 years represents a reduction in the return on regulatory equity of 0.5%. We do not consider that this is trivial.

170. As such we do not consider that the CMA should decline to make an adjustment on the grounds of materiality.

2.4.5 Regional wage data

171. The CMA provisionally concluded that the impact of regional wages would lead to costs being £6.7m higher than predicted by the models.[43]

172. We support the approach taken by the CMA but we believe that the magnitude of the effect has been underestimated.

173. The key parameter affecting the magnitude of the effect of regional wage data is the weight of regional salaries in the overall costs. CEPA's view was that this weighting would be "*relatively high and positive, circa 0.6-0.7*".[44] The implied value from the CMA's estimate is

---

[41] Cost exclusion cases (SOC006), p. 267.

[42] PFs, para. 4.271.

[43] PFs, para. 4.281.

[44] PFs, Appendix 4.1, para. 62.

considerably lower at 0.29.[45] Using the mid-point of CEPA's range would result in a regional wage adjustment of £14.8m.

174. Our view, consistent with the approach we have used for estimating input price inflation,[46] is that the weighting of wages in operating costs is 0.58 (excluding policy items) and 0.4 for capital expenditure. Overall (based on the mix of opex and capex in the SoC), this results in an estimated weight for wages of 0.5.[47] Based on this weighting, the regional wages adjustment should be £11.4m.

175. In the provisional findings the CMA notes a concern that the adjustment of 7.4% may be too high, because the higher wages in the city of Bristol will reflect differences in the mix of occupations and not necessarily the wage rates for the types of employees that Bristol Water needs.[48]

176. We consider that this risk is minimal:

- the mix of Bristol Water staff is representative of the employment in the area;
- potential staff have scope to switch between occupations within the area to some degree;
- people living within and close to Bristol can (and do) easily commute to locations within the Thames corridor where wages are even higher; and
- wage rates in Bristol affect some living costs (e.g. housing) and this has a knock on rate on wage rates in other occupations.

177. In practice we consider that there is a risk that local factors mean that the costs of the mix of occupations employed by Bristol Water are likely to be underestimated by the overall wage data. Bristol has a number of major engineering companies (e.g. British Aerospace, Rolls Royce and GKN aerospace), plus it houses the regional offices of a number of major engineering contractors (e.g. Arup, Atkins and Mott Macdonald). An additional potential factor that would impact on local wages is the construction of Hinkley Point C nuclear power station. This is a £14bn engineering scheme in commuting distance of Bristol, that would be expected to have a significant local impact on wage costs for technical staff.[49]

2.4.6 Mains age/Mains renewal programme

178. The CMA provisionally concludes that the cost of mains renewal for Bristol Water would be greater than the amount included in the modelling by £10.6m.[50]

179. We are concerned that this allowance is not sufficient. We consider that there are a number of factors that result in the amount being underestimated:

---

[45] The calculation is not set out in the provisional findings. We have estimated the 0.29 from £6.7m / (7.4% * £307m), where the £307m is the central model estimate.

[46] First Economics: Wholesale Input Price Inflation and Frontier Productivity Growth, Report for BW, July 2015 (RPF071).

[47] Calculated as (198*0.58+156*0.4)/(198+156), where 198 is opex excluding policy items, and 156 is capital maintenance.

[48] PFs, para. 4.282.

[49] It should be noted that the cost of this scheme is significantly higher than the Olympics which was thought to have a significant impact on the wages of skilled staff in London. Taking into account the smaller population within commuting distance of Hinkley, the effects of this development would be expected to have a greater impact on costs for technical staff in the Bristol area than the Olympics in London.

[50] PFs, para. 4.294.

- the amount is based on a unit cost derived from the Aqua report that we show to be unrepresentative and not appropriate for the purpose for which it is used;
- the costs included in our plan for maintenance on 'mains and communication pipes', and 'infrastructure other' amount to £259 per metre of mains renewed. The equivalent figure for the industry average between 2009 and 2011 is £412 per metre.[51] This shows that the unit costs included in our plan are significantly less than the industry average unit costs that would be reflected in the model (see **Section 3**);
- the approach makes no allowance to reflect that our costs are already efficient due to the highly targeted approach we use for mains replacement; and
- it may not make a full allowance for the impact of greater network age on the amount of mains replacement required relative to average (albeit this is partially recognised).

180. Using industry wide data between 2009-2011, the average industry expenditure is £412 per metre (see **Section 5**). Applying this cost estimate to the 64km of additional replacement identified in Para. 4.293(a) results in a special cost factor adjustment of £26.4m. This is considerably greater than the allowance included in the provisional findings.

181. We consider that an alternative approach to assessing the size of the adjustment would be to consider an econometric modelling approach. This would depend less on particular characteristics of our plan, and be more consistent with the purpose of the special cost factors, which is to adjust a cost benchmark relative to an econometric model.

182. There is a wide range of evidence from different econometric models that network age has an impact on expenditure:

- the CMA's sensitivity testing of their own models showed an impact of £10 to £20m for Bristol Water;[52]
- inclusion of mains age as an explanatory variable in Ofwat's models resulted in an estimated cost increase of £6m to £11m;[53] and
- Bristol Water's own infrastructure maintenance model indicated an additional cost of £30m.[54]

183. These different modelling approaches all show a consistent picture that mains age is a significant and material driver of differences in costs of infrastructure maintenance between companies. We consider that the centre-point of the CMA range (£10m-£30m) is a reasonable lower bound estimate of the effect. This results in a special cost factor adjustment of £15m.

2.4.7 Upstream Infrastructure Maintenance

184. The CMA did not assess the potential impact of additional upstream maintenance costs for Bristol Water, and therefore there was no discussion of a special factor relating to these costs.

---

[51] See Chapter 3.5.3.2.

[52] PFs, para. 4.133.

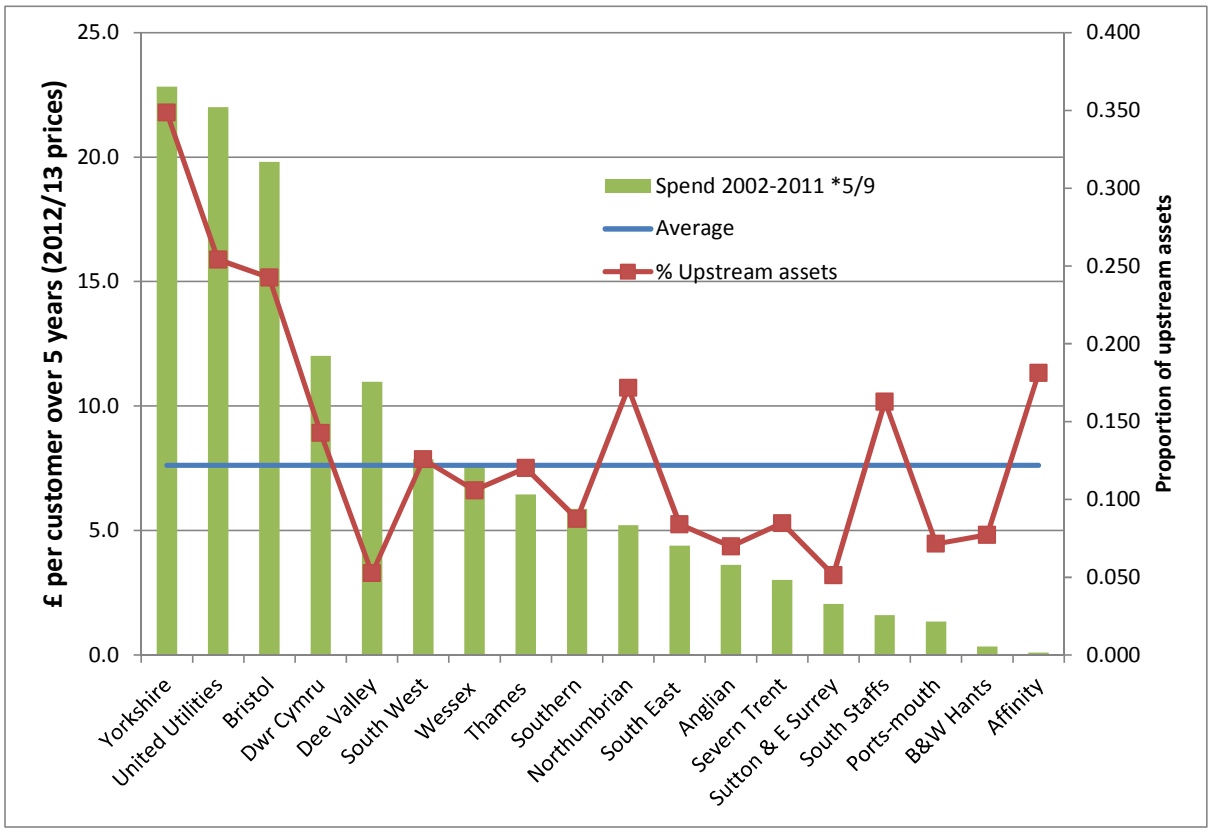
[53] SoC, para. 1507.

[54] SoC, Table 67.

185. 'Upstream assets' includes aqueducts, raw water mains, and raw water reservoirs. In the SoC we set out that Bristol Water had a greater number of these assets relative to the number of customers it serves, and that therefore it was likely to incur higher maintenance costs per customer.[55]

186. Figure 6 below sets out the average spend per customer for all companies over the nine-year period 2002/03-2010/11 (the years for which data is available from June Returns).

Figure 6 - Company spend per customer on upstream assets 2002-2011



Source: June Returns 2002/03 to 2010/11; Bristol Water Analysis

187. Figure 6 shows that the three companies with a significantly higher proportion of upstream assets have tended to have significantly higher maintenance spend per customer on upstream assets.

188. The econometric modelling undertaken by the CMA does not include any explanatory variable relating to upstream assets. Consequently, it will implicitly include an allowance for upstream expenditure equal to the average expenditure per company and as a result will underestimate the expenditure requirements of the companies with higher levels of upstream assets. The average expenditure per company is £7.62 per customer over a five year period, which for Bristol Water is equivalent to £3.9m capital maintenance on upstream assets.

189. Bristol Water's required expenditure on these assets is £16.0m. As shown above however, the model only includes an allowance of £3.9m. As a result, Bristol Water's costs are £12.1m higher than assumed by the model.

[55] SoC, Section 11.3.2.2.2.

190. Given this a special factor of £12.1m should be allowed for maintenance requirements on upstream assets above and beyond the implicit allowance included in the econometric models.

191. The econometric model for infrastructure maintenance developed by Bristol Water identified that the additional upstream assets would be expected to increase costs by £19m.[56] In addition, econometric modelling undertaken by Oxera identified a range of between £0m and £20m.[57] This suggests that the proposed adjustment factor of £12.1m is likely to be conservative.

192. Expenditure on upstream assets can be relatively lumpy. For a specific asset, there may be no expenditure for many years, and then a requirement for a substantial element of maintenance. Therefore, actual expenditure on these assets will exhibit variations around the long term underlying level that might be expected from the assets. As a result, companies' expenditure in any one period could vary considerably from the average.

193. The proposed expenditure of £16m on these assets over the five years is a reduction of almost 30% compared to expenditure in AMP5. It represents an effective replacement rate of 0.4% per annum of the £725m MEAV of these assets.[58] As such we consider the level of expenditure is likely to be below the long-term expectation.

2.4.8 Bedminster Service Reservoir

194. The need for Bedminster Service Reservoir (**Bedminster SR**) was considered in Chapter 5 of the PFs, and we address the specific points in relation to this scheme in **Section 3.6.2**. However, were the CMA to change its view for the final determination, then the treatment of the reservoir in relation to the econometric benchmark needs should be considered.

195. Our view is that the proposed level of expenditure should be treated as a lumpy item, and therefore the expenditure would not be expected to be predicted by the econometric model. Given this, the expenditure if allowed should be treated as a special cost factor adjustment.

196. Ofwat has noted that it considers that its models included an allowance of £1m for reservoir replacement for Bristol Water. This suggests that an implicit allowance of £1m should be taken into account, reducing the special cost factor claim to £5.1m

2.4.9 Overall Special Cost Factor Adjustments

197. Table 5 below summarises the various special cost factor issues.

Table 5 Summary of Special Cost Factor Adjustments

Column 1	CMA Provisional View (£m)	Bristol Water Upper Limit View	Bristol Water View (£m)	Cost Category
Canal and River Trust Payments	8.1	8.1	8.1	Opex
Treatment Complexity	0.0	6.0	5.5	Opex
Additional costs at Purton and Littleton	0.0	14.7	8.35	Opex

56 SoC, Table 67.

57 SoC, para. 1504

58 FBP Tables (SOC539) Table W5, sum of MEAV lines 1, 2, and 5

Column 1	CMA Provisional View (£m)	Bristol Water Upper Limit View	Bristol Water View (£m)	Cost Category
Congestion in Bristol	0.0	6.2	3.65	Opex
Regional Wage Data	6.7	14.8	11.4	Totex
Mains Renewal Programme	10.6	26.4	15.0	IRE
Upstream Infrastructure Maintenance	N/A	12.1	12.1	IRE
Total special cost factors	**25.4**	**88.3**	**64.1**	
Lumpy item – Bedminster Reservoir	N/A	5.1	5.1	MNI
Total Adjustments	25.4	93.4	69.2	

Source: Bristol Water

198. Excluding the regional wage adjustment, these special factors represent additional operating costs of £25.6m, additional IRE of £27.1m, and additional MNI of £6.1m (depending upon the treatment of Bedminster Reservoir). We consider that these additional cost factors are conservative and at the low end of the plausible range. For the majority of them we have shown that higher estimates are plausible.

199. In respect of operating costs it is instructive to compare these additional cost factors with those allowed at previous price reviews. In FD09 Ofwat allowed special cost factors for operating costs of £30.3m.[59] This was also accepted by the CC in the 2010 Determination. At PR04 Ofwat allowed a £33.1m special cost factor for operating costs.[60] In both cases the additional costs allowed were more than the special cost factor of £25.6m relating to operating costs we have set out in the table above. The provisional findings allowance of £8.1m represents only a quarter of the allowance for opex made at CC10.[61]

200. We show in **Section 2.4.3.2.2** that Bristol Water's actual direct costs of resources and treatment are high compared to those of other companies. Moreover, we show that the special cost factors we have included do not account for all of the difference between our actual costs of treatment and the industry average. If the CMA does not alter its position in respect of these cost factors, it is effectively assuming that our actual costs in this area are 45% higher than they should be. We do not consider that this is a reasonable assumption.

201. For infrastructure maintenance, Bristol Water's costs are higher than average due to the older age of our network, and the higher requirement for maintenance on reservoirs and aqueducts as a result of having a significantly greater asset base per customer in these areas.

202. Disaggregated modelling for infrastructure maintenance has shown that both of these factors were significant drivers of cost, and that Bristol Water's costs should be higher (e.g. Bristol Water's infrastructure model showed that both explanatory variables are significant and material, as did Oxera's modelling for mains age). In the absence of a disaggregated model, the potential requirement for special cost factors in this area is higher and this should be taken into account in the CMA's assessment of them.

---

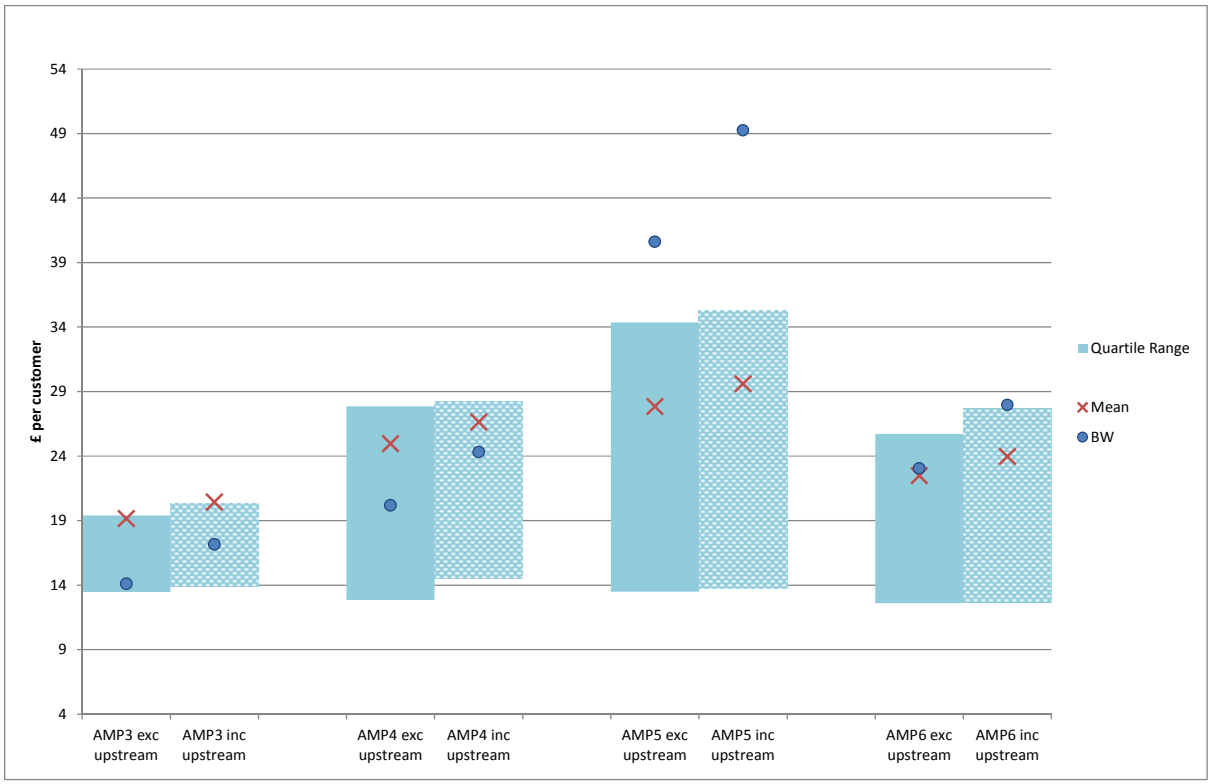
59 See 2010 SoC (SOC128), para 1161, calculated as £5.172m per annum updated from 2007/08 prices to £6.07m in 2012/13 prices.

60 Ofwat, Final Determination: Future Water Charges 2005-10 Supplementary Report for Bristol Water, Table C.2.1a. Calculated as £4.8m pa in 2002/03 prices adjusted to £6.6m in 2012/13 prices.

61 The regional wage factor has been excluded from this comparison because Ofwat did not include a regional wage adjustment in its 2009 opex modelling.

203. Figure 7 compares the range of industry costs per property for infrastructure maintenance with and without expenditure on upstream assets.[62]

Figure 7 - Industry Expenditure on Infrastructure Maintenance



Source: June Returns/Ofwat PR14 data/Bristol Water/Bristol Water analysis

204. The data shows that Bristol Water's proposed expenditure excluding upstream assets is in line with the industry average. We consider that the available data strongly supports the need for a special cost factor relating to maintenance on upstream assets. Moreover the graph shows that these differences in cost have occurred in each of the past periods and are persistent.

205. We acknowledge that in theory there could be special cost factors that result in our costs being lower in some areas than predicted by the model. However, we have not managed to identify any areas of expenditure where this is the case (other than those already captured by the CMA modelling). In addition, neither Ofwat nor any other third party has identified potential areas where this may be so. Moreover, the special cost factors we have set out above are conservative compared to the allowances given to Bristol Water at previous reviews, and are supported by disaggregated costs comparisons between companies. Given this we consider the risk of beneficial cost factors being missed is minimal.

[62] Expenditure on upstream assets is only available up to 2011 for other companies. The expenditure on upstream assets for them after 2011 is based on the specific company average over the preceding 11 years.

3 Review of base costs from Bristol Water's business plan

3.1 Executive Summary

3.1.1 Introduction

206. This section provides our response to the CMA's provisional findings on its assessment of the base expenditure projected in our Business Plan, as set out in Section 5 of the PFs.

3.1.2 Key themes

Opex

207. We welcome the CMA's decision to base the provisional findings on bottom-up analysis of operating costs. We believe this has led to a determination that is much closer to an appropriate range than Ofwat's FD14. However, we believe the reductions the CMA has made from our SoC are inappropriate:

- the use of an adjusted average AMP5 spend as a base ignores underlying drivers that we have shown lead to higher cost in the future. We believe the overall level of adjustments made are selective and go further than the narrative describes;
- we set out additional analysis of the impact of AMP5 capital expenditure that clearly demonstrates that it will lead to higher costs in the future. The adjustment is not consistent with the CC10 findings; and
- in its calculation of opex build up the CMA appears to have included an efficiency challenge for 2014/15 despite using average AMP5 costs (including 2014/15) as its base costs. We don't consider this is appropriate and estimate that adjusting the CMA calculation for this would increase opex by £4.4m due to the related impact on the efficiency challenge for AMP6.

208. Many of the CMA's adjustments reflect concerns, not analysis. We believe the CMA should take comfort in Oxera's disaggregated modelling, which shows our cost projections are below an upper quartile benchmark (with the amended regional wage adjustment) and reverse the adjustments made.

209. If Cheddar WTW were to be reinstated in the CMA's Final Determination, we would expect the additional impact of £0.5m to be added back.

210. We agree with the CMA's decision to deduct increased Carbon Reduction Commitment costs from our AMP6 forecasts on the basis that these would be captured by our assumptions for real price inflation.

211. Updated forecasts for cost inflation suggest that input prices could increase by 1.1% above RPI. This is an increase compared to 0.6% above RPI as assumed in our SoC and considered by the CMA. We suggest the CMA considers using this updated figure in its final determination to ensure logical consistency with other inflation assumptions (for example in cost of capital).

Capex – IRE

212. We welcome the CMA's view that Bristol Water's proposed mains replacement programme of 233km is appropriate. However, we do not accept the CMA's concerns that our strategic modelling is not aligned with our approach to actual delivery, as these are based on Aqua's misunderstanding of our mains modelling. Both our modelling and our selection of pipes to replace are based primarily on historic burst rates.

213. We do not agree with the CMA's view that we are able to deliver further efficiency savings over and above the 10% programme efficiency we have already assumed. Aqua's analysis is based on a misunderstanding of Bristol Water's costs. In addition, Aqua has used too few comparators to draw a valid conclusion as to whether our costs are reasonable.

214. We present an analysis using data from all companies that shows the costs included in our plan are well below average.

215. The assumption that any efficiency challenge applied to mains replacement costs would be relevant for maintenance activities on, say, raw water reservoirs, is unsubstantiated. There is no case made as to why mains replacement efficiency would be similar to that of raw water reservoirs, particularly given that the asset groups are not equivalent either in type or maintenance needs.

216. Overall, we believe that our business plan proposal of £76.3m is an appropriate level of infrastructure renewal expenditure for AMP6.

Capex – MNI

217. We do not support the CMA's conclusion that it is reasonable to assume that we may be able to achieve additional efficiencies and/or scope reductions relative to our plans. The plan we have identified has been based on sound data using accepted good practice in modelling to identify a robust central estimate of the level of expenditure required to deliver stable non infrastructure asset reliability during AMP6, to which we then applied a 10% efficiency challenge. The level of expenditure required is slightly higher than in AMP5 due to the need to replace Bedminster SR, the need for which in terms of emergency requirements and design standards have been justified as not risk averse compared to other companies.

218. In assessing our submissions, particularly with respect to MNI, Aqua made no particular requests for data at its meeting with us. Given our business plan approach and the submissions supporting it have been based on Ofwat's requirements, we do not think it is appropriate to interpret Aqua's assessment that we have not provided data in formats that it expects as a failure to appropriately forecast the investment needs of our asset base.

219. We also do not agree with the CMA's assessment that our plans are conservative. The modelling has been validated as part of the development process. The outputs from the models have been reviewed and challenged by the operational parts of the company.

Assessment of base expenditure in the Business Plan

220. As we have demonstrated in the sections above:

- we do not agree that the evidence supports an assumption that we will be able to achieve additional efficiencies and/or scope reductions of the scale or type envisaged by the CMA;

- the opex baseline on which the CMA has relied is not reflective of accepted cost increases so results in projections that underestimate our expenditure; and
- by leaning towards the low investment case, the CMA creates a serious threat to our ability to meet a sustainable level of investment in maintenance activities.

221. We consider that we have provided the evidence to support the expenditure proposals in the SoC. In the absence of clear evidence to the contrary to support the assumptions the CMA has relied upon regarding efficiencies and scope reductions, the reductions in funding envisaged by the PFs are not justifiable.

3.1.3 Structure of the Response

222. Our response to the CMA's provisional findings in relation to its assessment of the base costs outlined in our Business Plan is structured as follows:

- the CMA's approach to the review of the base costs in our Business Plan (see **Section 3.2**);
- assessment of operating expenditure (**Opex**) (see **Section 3.3**);
- assessment of capital maintenance (**Capex**) (see **Section 3.4**); and
- total view of base expenditure (**Botex**) (see **Section 3.7**).

3.2 CMA's approach to the review of our Business Plan

223. The CMA has carried out a review of the base costs in our Business Plan, looking separately at opex, capex IRE and capex MNI, in order to estimate an appropriate level of expenditure for an efficient company.[63] The purpose of the review is to act as a cross-check for the econometric assessment of efficient base costs, given the CMA's concerns regarding its ability to take sufficient account of our needs and circumstances, and the limitations of the special factors to properly mitigate this risk.[64]

224. We agree with the CMA that it is important for it to understand the base expenditure presented in our plan, and we appreciate that such a review has been carried out. Our comments in relation to the conclusions reached from that review are set out in the following sections. Our thoughts on the weight that those conclusions have been given, comparative to the output of the CMA's modelling, is addressed in Section 5 below.

3.3 Assessment of Opex

3.3.1 Introduction

225. In the PFs, the CMA has reviewed the opex of £228m proposed in our Business Plan and identified projected total opex of £215m.[65]

---

[63] PFs, para. 5.2.

[64] PFs, para. 5.4.

[65] PFs, para. 5.56.

3.3.1.1 Adjustments made by the CMA to our operating costs

226. Table 6 sets out the adjustments the CMA has made in the PFs to the opex projections set out in our SoC. It also includes a summary of our response to each of these adjustments, which is set out in more detail in this section.

Table 6 CMA's PF adjustments to Bristol Water's proposed opex

Description	£m	Bristol Water's response
BW proposed operating cost	**228.4**	
Removal of the impact of Cheddar WTW	(0.5)	Based on the totex in the PFs, we agree with this adjustment. If Cheddar WTW is reinstated, this adjustment should be reversed (see **Section 3.3.3.2**).
Removal of above inflation increase for Carbon Reduction Commitment	(0.8)	The CMA suggested this may be covered by our assumptions for real price inflation. We have reviewed these in **Section 3.3.3.1** and can confirm that it is, so we agree that this adjustment should be removed.
Updated BW proposed operating cost	**227.1**	
Use of average cost over AMP5 for base costs	(4.7)	The CMA's analysis, which is based on averaging spend, does not take account of the underlying drivers that lead to higher cost in the future. In addition the assumption is inconsistent with the approach used in CC10 and with the CMA modelling approach relating to costs per customer. As set out in **Section 3.3.2**, we continue to believe that the CMA should use 2013/14 as the base costs for AMP6.
Removal of impact of AMP5 capital expenditure on operating costs	(5.4)	In **Section 3.3.3.3** we provide additional analysis of the impact of AMP5 capital expenditure and note that the CMA has made this adjustment based on a concern, not analysis. The adjustment is not consistent with CC10 findings.
Impact of including an efficiency challenge for 2014/15	(4.4)	Given that base costs in the PFs have been calculated based on an average of AMP5 actual costs (including 2014/15), we do not believe it is still appropriate to include an efficiency calculation for 2014/15 in the calculation of AMP6 costs. This is considered in **Section 3.3.5.3**.
Recalculated efficiency challenge for AMP6	2.4	Due to lower base opex and lower AMP6 adjustments, the AMP6 efficiency challenge is reduced.
Provisional findings operating cost	**215.0**	

Source: Bristol Water analysis, PFs

3.3.1.2 Overall level of operating costs in the provisional findings

227. Whilst we welcome the CMA's decision to carry out analysis of operating costs, we believe inappropriate adjustments have been made from the projections set out in our SoC. Many of the reductions the CMA has made reflect concerns about the potential proposed level, as opposed to analysis which demonstrates that costs should be lower.[66]

228. We have provided the CMA with analysis, based on Oxera's disaggregated modelling, that shows the operating costs included within our SoC are lower than an upper quartile industry benchmark.[67] We believe the CMA should take comfort in this analysis, which indicates that the CMA's concerns are unfounded. We therefore believe the CMA can conclude that the

[66] For instance, the CMA notes Ofwat's request that the CMA ensures that base operating costs are efficient relative to other companies (PFs, para. 5.28).

[67] Response to CMA question 1 (Opex) raised at Hearing 3 June 2015. This analysis has been further updated in this response – see Table 7.

opex in our SoC, as updated in Table 6 above and which uses 2013/14 base operating costs as a starting point, is appropriate.

229. Table 7 below sets out a range of alternative calculations for AMP6 opex, based on the analysis previously provided to the CMA but updated to exclude the impact of Cheddar WTW and the increased Carbon Reduction Commitment costs. We believe that the level of opex determined by the CMA in its final determination should be within this range.

Table 7 A comparison of AMP6 opex forecasts (£m, 2012/13 prices), adjusted for the removal of Cheddar WTW and CRC

Method	AMP6 opex
Oxera SFA modelling, μ	225
Bristol Water Statement of Case (2013/14 base), with revised impact of AMP5 opex (£0.9m p.a. instead of £1.1m p.a.), ϕ	226.3
2014/15 actuals (excl one-offs) as the base year, with revised impact of AMP5 opex (£0.6m p.a. over 2014/15 actuals), ϕ	226.4
Bristol Water SoC, ϕ	**227.1**
2014/15 actuals (excl one-offs) as the base year, with revised impact of AMP5 opex (£0.6m p.a. over 2014/15 actuals), plus potential impact due to mix of sources (£0.5m p.a.), ϕ	228.9
Oxera SFA modelling, with amended regional wage adjustment,[68] μ	232

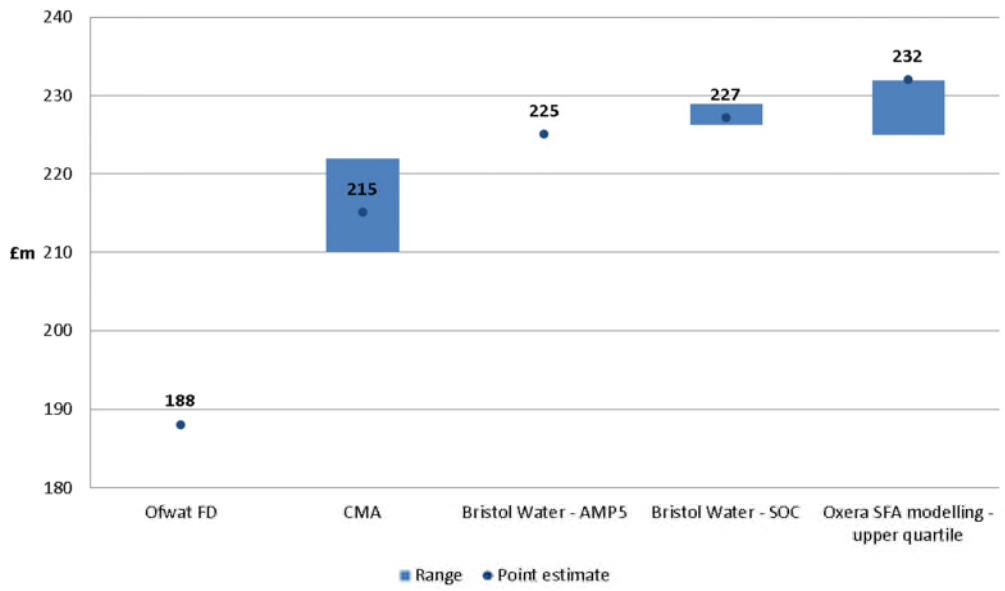
Source: Bristol Water

ϕ - Figure adjusted for the removal of Cheddar WTW and CRC, μ - figure not adjusted for Cheddar WTW and CRC as not directly included.

230. The chart below compares the different views on Bristol Water's operating costs discussed above, along with the figure from the Ofwat FD14 (the Ofwat DD14 figure of £145m is not shown).

[68] The Oxera SFA modelling, which does not require an adjustment for special factors, suggests AMP6 opex of £225m. We note that the SFA modelling uses Ofwat's value for regional wages in the South West, whilst analysis shows that staff costs in our supply area are 7.4% higher (see section 4.6 of our response to the Alternative Modelling working paper). If the SFA models were amended to reflect the higher staff costs then the estimate of total operating costs would increase by approximately £7m (calculated as current SFA forecast of £225m x 40% labour element of opex x 7.4% wage adjustment).

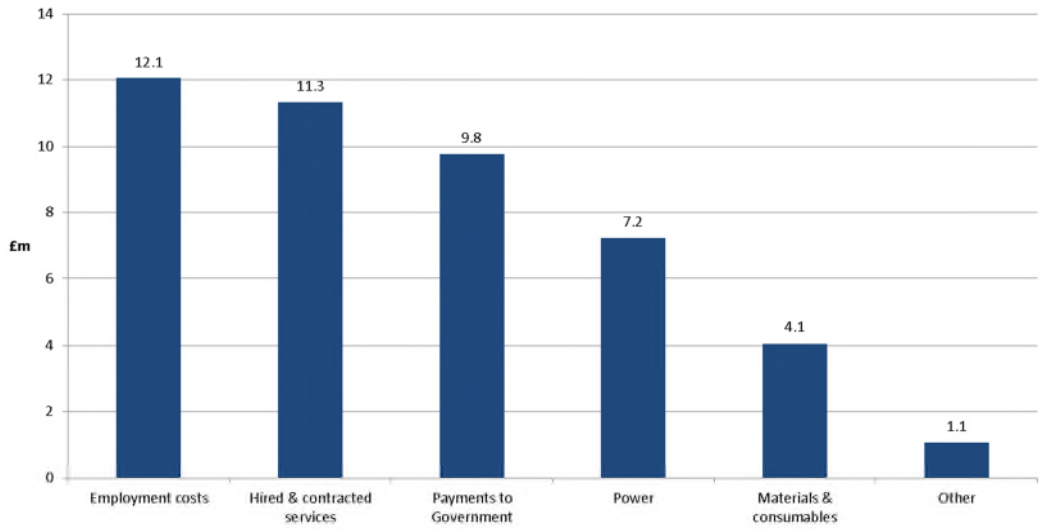
Figure 8 Comparison of different views on AMP6 operating costs (2012/13 prices)



Source: Bristol Water analysis[69]

231. The estimate used by the CMA in the PFs of £215m is £12m lower than our updated SoC estimate and £17m lower than upper quartile efficient costs as indicated by Oxera's SFA modelling.[70] To illustrate the potential impact of this on our operating costs, we refer to the below breakdown of our base year (2013/14) operating costs.

Figure 9 Bristol Water 2013/14 wholesale base operating costs by nature (2012/13 prices)



Source: Bristol Water

69 CMA figures taken from opex sensitivity analysis presented in Table 9 of PFs Appendix 5.2. Bristol Water AMP5 actuals calculated on a PR14 basis (i.e. after PR14 cost allocations to retail and including cash pension contributions). Bristol Water SoC and Oxera SFA figures are as presented in Table 7 above

70 Including a regional wage estimate.

232. The difference to the SoC and Oxera estimates equates to £2.4m p.a. and £3.4m p.a. respectively. This represents an additional efficiency challenge over and above that already assumed in our calculations, which would be effective from the start of AMP6. On the assumption that Payments to Government, Power, Materials & consumables, and Other will be difficult to reduce by anything close to the reduction implied, we consider below the impact of applying this additional challenge solely to Employment costs or Hired & contracted services.

Table 8 Impact of CMA PF implied opex reduction

Cost group	Impact of £2.4m reduction	Impact of £3.4m reduction	Comments
Employment costs	20% reduction	28% reduction	This would represent a further reduction on top of the 10% headcount reduction we have already announced through our AMP6 efficiency project. It is not believed that an overall reduction in staff by 1/3rd is realistic.
Hired & contracted services	21% reduction	30% reduction	These costs include network and production maintenance, laboratory sampling, IT and telecoms, security, facilities management etc. It is difficult to see how such a reduction, above and beyond the scope of the difficult efficiency challenge we have already included for AMP6, would be possible.

Source: Bristol Water

233. We appreciate that the PF calculation of £215m has excluded costs that the CMA believes are not required. However we provide further reasoning and evidence to support our position in the following sections, which follow the structure of the PFs.

3.3.2 Identifying an efficient level of recurring costs – setting the base cost

234. In the PFs the CMA has used an average cost over AMP5 as the base cost for projecting opex. Overall, we welcome the CMA's use of base cost analysis to identify opex, as it reduces the risk that an allowance is unachievable. However, the use of an average cost over AMP5 to set the base cost significantly understates our efficient cost base. We continue to believe, therefore, that the CMA should use 2013/14 (as adjusted) as a base year for operating cost projections.

235. The AMP5 average cost used by the CMA understates our efficient cost base for the following reasons:

- it is inconsistent with the approach used at previous price reviews, including CC10;
- it does not reflect the cost increases experienced in 2013/14 that have not been disputed by the CMA;
- it is inconsistent with the picture presented by the scenarios looked at by the CMA. For instance, the scenarios detailed by the CMA in Table 9 of PF Appendix A5(2) which utilise an adjusted 2013/14 base year point to an opex total that is significantly higher than the CMA's AMP5 average (i.e. £221m and £222m compared to £215m). It is also worth noting that the CMA's provisional determination of £215m is also below the mid-point of the range of scenarios detailed in that Table 9;
- the below average operational conditions, set out in Table 9 below, have not been taken into account by the CMA's analysis;

- the analysis ignores underlying effects that have led to costs rising, as expected in CC10.[71] An average over five years will underestimate expenditure at the end of the period when efficient cost levels are rising. We do not have detailed evidence to fully demonstrate the full impact of AMP5 capital expenditure on operating costs as capturing sufficiently granular data to illustrate the impact of incremental processes is impractical and would be costly. However, it was clear that CC10 anticipated costs would rise during the period[72]. Further analysis of the opex impact of AMP5 capex is presented in **Section 3.3.3.3**;
- the approach is inconsistent with CC10 efficiency assumptions and is retrospectively resetting the target set out in that determination; and
- it is not consistent with the CMA's own modelling approach that assumes costs will increase in line with customer numbers; and
- the AMP5 average cost appears to have been used due to a concern that costs may be overstated, but it is not reflective of analysis of our cost base. We provide further analysis below of cost movements throughout AMP5 to demonstrate further why the CMA should not be concerned.

236. In the PFs, the CMA sets out its position on the potential adjustments to 2013/14 to reflect recurring and non-recurring costs during AMP5. Each of these is addressed in turn below to address the concerns that 2013/14 might overstate our costs.

237. In relation to burst rates, the CMA notes that it agrees "*that the 2013/14 burst rate is in line with the average*".[73] As the CMA acknowledges in the previous paragraph, however, we have advised the CMA that "*the burst rate in 2013/14 is below observed average levels and should be seen as recurring*".[74] It is not clear, therefore, which position the CMA intends to adopt, but in the absence of any evidence to support an alternate view, we will assume that the CMA agrees with our analysis and that this will be reflected in the final determination.

238. In respect of 2013/14 base costs, the CMA agrees with our base line with the exception of adjustments to reflect: above average regulatory costs of £0.4m;[75] £0.1m due to back-dating an EA refund payment (which we consider is not required);[76] and capitalisation effects of £0.2m.[77] We note that this analysis does not take into account the fact that a number of key cost drivers were significantly lower than average in that year, as set out in our response to the base expenditure working paper,[78] and replicated below:

Table 9 Movement in key operating cost drivers

Measure	Unit	2012/13	2013/14	2014/15	10 year average
Distribution Input	Ml/d	257	264	267	275

[71] CC Determination 2010 (SOC011).

[72] The CC10 financial model shows operating costs of £54.5m in 2010/11 (after removing one-off for CC appeal costs) rising to £55.8m in 2014/15 (figures expressed in 2012/13 prices and post-efficiency). Also the cost profiles in the CC10 financial model did not take account of the constrained first year and subsequent 4 year catch-up that we incurred due to the time and bill impact of the appeal process.

[73] PFs, para. 5.33(a).

[74] PFs, para. 5.32(a).

[75] PFs, para. 5.33(b).

[76] PFs, para. 5.33(d) and Table 9, PF Appendix 5(2). Note that the EA refund related to years before 2012/13, and the 2013/14 level is that expected going forward. The adjustment, therefore, is not necessary.

[77] PFs, para. 5.33(c) and Table 5.7.

[78] Table 9, Response to Working Paper 7 - Base Expenditure, May 2015.

Consumption	Ml/d	224	229	231	235
Power consumption	MwH	74,993	79,971	78,762	81,071
Burst mains	No.	823	880	972	1,049

Source: Bristol Water

239. Therefore, the CMA's analysis of 2013/14 appears to significantly understate cost levels by removing items that reduce the base cost, but at the same time disregarding factors that indicate potential for higher cost levels. Any adjustment to the base cost should reflect factors that increase our costs, as well as decrease them, if it is to accurately reflect the right level of recurring cost.

240. We consider that removal of £0.2m for capitalisation from every year is inappropriate. In the analysis below, we show that changes in capitalisation from 2010/11 led to reduced costs, suggesting it is inappropriate to adjust for capitalisation.

241. To address the CMA's concern that 2013/14 may be un-representative of normal opex levels, in Table 10 below we set out analysis of the £2.2m movement in costs from 2010/11[79] to 2013/14[80] according to our regulatory accounts, in 2012/13 prices.

Table 10 Operating cost variance analysis from 2010/11 to 2013/14 (12/13 prices)

	One-off variances		Operational variances		Total
	£m	Explanation	£m	Explanation	£m
Power	0.0		1.4	£1.0m increase in power costs. Consumption fell by 5% from 84,014 to 79,971 MwH, however the average price increased by 20% from £74/MWh to £89/MWh (in 12/13 prices). This was largely driven by the introduction of the Feed in Tariff and increases in Distribution and Transmission charges. £0.5m increase due to the introduction of the Carbon Reduction Commitment in 2012.	1.4
Service charges	0.0		-0.5	-£0.5m reduction in abstraction charges due to the dropping of the EIUC charges post 2011/12	-0.5
Staff	0.0		-0.5	-£0.4m due to staff reductions through Project Avon and redeployment of staff to capital programs following the CC appeal in 2010/11.	-0.5
Consumables	0.0		0.5	Includes a net £0.2m increase in chemical costs (net of Project Avon+ savings of c. £0.4m)	0.5
Rates	0.0			£0.2m above inflation increase in business rates	0.2
Other	-1.5	One-off costs relating to the PR09 CC appeal	2.5	£0.8m increase in regulatory costs primarily due to periodic review (2013/14 level is £0.4m higher than the average for the AMP) £0.6m increase in maintenance costs, which includes the impact of increasingly complex treatment process £0.4m increase in scientific services costs due to new DWI sampling requirements. £0.4m increase in telecoms and IT costs, includes the additional costs of the microwave point-to-point network allowed at PR09 £0.3m other	1.0
Third party opex	0.0		0.2	This spend fluctuates from year to year, but is recovered from third parties.	0.2
Total	-1.5		3.7		2.2

[79] £42.5m.

[80] £44.7m.

Source: Bristol Water

242. The analysis in Table 10 shows that the cost increases reflected in the base year are ongoing in nature. Movements in staff costs (-£0.5m) are shown to have offset the higher than average regulatory costs in 2013/14 (£0.4m). This would imply that the 2013/14 is an appropriate base year, particularly when considering the below average operational conditions in that year.

3.3.3 Additional cost changes that may arise in AMP6

243. In the PFs the CMA concludes that:

- the £0.8m increase in the payment of the carbon reduction commitment (**CRC**) is covered by the real price inflation assumptions, so a specific additional cost allowance is not required;[81]
- costs associated with Cheddar WTW should be removed as the scheme is not allowed in the PFs;[82] and
- conclusive analysis of the impact of AMP5 enhancement expenditure on operating costs has not been provided, so the forecast costs of £5.4m have been excluded.[83]

244. In addition, the unit cost models used by the CMA are based on unit costs per customer. Therefore, under this methodology, it follows that AMP6 operating costs should increase in line with the predicted change in customer numbers (subject to efficiency). However the operating costs suggested by the CMA do not follow this approach.

245. Each of these issues, and our response, is covered in turn below.

3.3.3.1 Inclusion of the CRC increase in the RPE analysis

246. We have reviewed the details behind the real price inflation assessment performed by First Economics and can confirm that increases to the Carbon Reduction Commitment would be covered in that analysis through the power forecasts taken from DECC. Therefore we agree with the CMA that this adjustment is not required for AMP6, and we have reflected this in Table 6.

3.3.3.2 Impact of Cheddar WTW on opex

247. We agree that if the Cheddar WTW scheme is not included within the scope of the final determination, the associated impact on opex should be removed.[84] To the extent, however that is included in the final determination, we would expect the operating cost adjustment to be re-instated. Our comments on Cheddar WTW are set out in **Section 4.4**

3.3.3.3 Impact of AMP5 enhancement expenditure on opex

248. As the CMA notes in the PFs, the additional £1.1m included for the impact of AMP5 capital expenditure on operating costs in 2013/14 was based on the increase allowed in the CC10

---

81 PFs, para. 5.37.

82 PFs, para. 5.39.

83 PFs, paras. 5.40-5.41.

84 PFs, para. 5.39.

determination.[85] This overall CC10 allowance for AMP5 enhancement opex was based on a clear list of schemes with cost forecasts that we developed as part of the PR09 process. The costs were also accepted by Ofwat at FD09.

249. In a submission to the CMA, we calculated the element of the CC10 allowance for enhancement opex that would not be captured in our 2013/14 base year at a scheme level. This calculation utilised the CC10 allowance for the specific schemes combined with actual completion dates to estimate the amount of the allowed increases that would not be reflected in our actual operating costs in 2013/14 and 2014/15. This analysis is reproduced below.

Table 11 Opex impact of schemes delivered at the end of AMP5 (£m, 2012/13 prices)

Scheme	Date in use	Planned impact in 2013/14[86]	Estimated impact in 2013/14[87] A	Planned impact in 2014/15 B	Estimated impact in 2014/15 C	Expected impact in AMP6 pa (over 13/14 base year) (B-A) = D
Cheddar UV	Jun 2014	0.083	0.000	0.083	0.062	0.083
Stowey UV	Dec 2013	0.030	0.015	0.060	0.060	0.045
Egford Blending	Sep 2014	0.000	0.000	0.057	0.028	0.057
Sherborne Lead removal	Mar 2015	0.140	0.000	0.420	0.000	0.420
South East trunk mains (inc Millmarsh Reservoir)	Sep 2014	0.128	0.000	0.255	0.128	0.255
Banwell to Hutton main	May 2014	0.000	0.000	0.054	0.045	0.054
Total		**0.381**	**0.015**	**0.929**	**0.323**	**0.914**

Source: Bristol Water

250. At the time of CC10, the expectation was that capital enhancements being delivered in final two years of AMP5 would increase operating costs by £0.4m in 2013/14 and £0.9m in 2014/15. Delays to the relevant projects, partly due to the uncertainty and duration of the CC10 process, meant that only £0.02m is estimated to have actually impacted on operating costs in 2013/14. The expected impact on 2014/15 would be a £0.3m increase, with the full £0.9m increase not being realised until 2015/16.

251. The CMA notes that it is not persuaded that it should rely on the assumption that all relevant costs were zero in 2013/14.[88] As a general point, it is worth noting that given the time involved in design and construction of enhancement schemes, it is unlikely that such schemes approved as part of a periodic review will have an impact on opex during the early years of the relevant price control period. In addition, the costs incurred prior to the scheme being brought into use (including commissioning costs) would be capital expenditure.

252. The CMA also comments that it would have expected actual costs to be used when performing this assessment.[89] As explained earlier, capturing sufficiently granular data to illustrate the impact of incremental processes is impractical and would be costly. Moreover,

---

85 PFs, para. 5.40.

86 These figures are taken from the yearly PR09 allowances for the schemes listed, then converted to 2012/13 prices.

87 These figures are calculated by pro-rating the planned figures to reflect the actual timing of when the scheme was completed and brought into use. Delays were experienced primarily due to CC appeal process

88 PFs, para. 5.41.

89 PFs, para 5.40.

regulatory precedent is to use the costs approved at the previous price review for this purpose as this retains effective incentives for efficiency.

253. However, taking note of the CMA's concerns, we have been able to perform detailed estimates of actual costs for three of the schemes in the table above. The results are presented below, and include the Sherborne Lead removal scheme which is the most significant element of the estimated £0.9m increase.

Table 12 Comparison of CC10 opex allowances for enhancement scheme with estimates of actual costs

Scheme	Date in use	CC10 allowance	Increase from 2013/14 based on CC10 allowance A	Estimate of actual operating costs incurred	Increase from 2013/14 based on estimate of actual costs B	Difference (B – A)
Cheddar UV	Jun 2014	0.083	0.083	0.093	0.093	0.009
Stowey UV	Dec 2013	0.060	0.045	0.082	0.062	0.017
Sherborne Lead removal	Mar 2015	0.420	0.420	0.276	0.276	-0.126
Total		**0.563**	**0.548**	**0.451**	**0.431**	**-0.117**

Source: Bristol Water

254. This analysis shows that our estimated actual costs have out-turned slightly lower than the original allowance from CC10.

255. The main reason for the difference in the cost due to Sherborne lead removal is the membrane maintenance cost, which is required every seven years. As the project has been delayed, the first instance of this cost will now be in AMP7. It should be noted that the CC10 allowances used in the above analysis are pre-efficiency numbers that are being compared to actual costs post efficiency. In addition, any allowance that the CMA awards for AMP6 will also be subject to an overall efficiency challenge (0.9% p.a. in our SoC).

256. Therefore, in the round, we believe that the CMA should be satisfied in accepting the assumptions proposed.

3.3.3.4 Changes in customer numbers

257. The unit cost models used by CMA are based on a cost per customer and assume that costs will increase in line with customer numbers. Therefore, under this methodology, AMP6 operating costs would be expected to increase from the base level by the change in customer numbers multiplied by the unit cost.

258. Taking the base costs used by the CMA in the PFs of £220m for AMP5 (£43.9m on an annual basis) and dividing by the average number of properties (503,094) gives an AMP5 unit cost of £436 per property (£87 on an annual basis).

259. Applying the average property numbers forecast for AMP6 (521,679) to this unit cost would suggest an AMP6 base cost of around £227m (£45.5m on an annual basis).

260. This figure, calculated using the methodology inherent in the CMA's cost models to estimate the impact of an additional c.20,000 customers, would suggest operating costs should be substantially higher than the level allowed by the CMA.

3.3.4 Identifying an appropriate cost inflation assumption

261. The CMA states that it has provisionally concluded that RPI+0.5% is a reasonable estimate for cost inflation.[90]

262. In the preceding paragraphs, however, the CMA notes that the forecast contained in our Business Plan of RPI+0.6% is broadly in line with regulatory precedent, citing Ofgem's 2014 RIIO-ED1 determination which assumed RPI+0.6%.[91]

263. Our own recalculation of operating costs, based on the decisions in the provisional findings, suggests that the CMA has in fact used RPI+0.6% for cost inflation.

264. First Economics have updated its report,[92] which we used for our SoC, to reflect the most recent forecasts. This update shows that whilst nominal input price inflation is only very slightly different, forecasts of RPI inflation (taken from OBR July 2015) have moved down markedly since December 2014. As a matter of simple mathematics, lower RPI inflation combined with broadly unchanged nominal input price inflation translates into higher real input price inflation, as shown in Table 13 below.

Table 13 Real opex input price inflation - comparison of forecasts

Forecast	2015/16	2016/17	2017/18	2018/19	2019/20	Average
December 2014	1.2	0.7	(0.4)	0.2	1.1	0.6
July 2015	2.3	1.1	(0.1)	0.5	1.6	1.1

Source: Bristol Water

265. The RPI + 0.6% figure was calibrated against a now out-dated RPI forecast, and the updated view shows that this should become a forecast of RPI + 1.1%. The RPI inflation assumed in the revised estimate aligns more closely to the 2.5-2.6% inflation rate that the CMA is using elsewhere in its price control calculations, e.g. in the analysis of the cost of capital. Therefore, to ensure logical consistency, the CMA should consider using this revised number in its final determination.

3.3.5 Identifying an appropriate forward-looking efficiency assumption

266. Having assessed the evidence in the round, in the PFs the CMA has made the same efficiency assumption as set out in our Business Plan.[93]

267. Overall, we believe our assumptions are based on detailed analysis and are in line with a number of comparisons. We therefore believe the CMA's proposal to use our efficiency assumption is appropriate.[94] To use an alternative assumption, that is not supported by robust analysis, would be inappropriate. As noted in **Section 2** we would support the CMA performing its own disaggregated modelling which incorporates special factors, to further benchmark operating costs.

---

[90] PFs, para. 5.45.

[91] PFs, paras. 5.43-5.44.

[92] First Economics: Wholesale Input Price Inflation and Frontier Productivity Growth, Report for BW, July 2015 (RPF071).

[93] PFs, para. 5.51.

[94] PFs, para. 5.51.

268. Despite reaching this conclusion, the CMA has set out some potential concerns with our efficiency assumption, namely in relation to:

- the risk that that the catch-up target is understated;[95] and
- the potential upside opportunities in relation to operational synergies.[96]

269. In addition, in the CMA view of opex build up,[97] the CMA appears to apply an efficiency challenge to 2014/15 despite using a base figure based on the average of AMP5 costs (including 2014/15).

270. Each of these concerns is addressed in the following sub-sections.

3.3.5.1 Catch-up target

271. The CMA notes that Oxera's relative efficiency analysis is based on analysis up to 2012/13 and does not reflect the step up in costs shown in 2013/14.[98]

272. As presented earlier, the results of the Oxera disaggregated modelling (which include 2013/14) show that Bristol Water's upper quartile efficient operating cost for AMP6 is £232m (with amended regional wage adjustment).[99] Our proposed costs of £228m fall below the upper quartile efficient operating cost calculated by that analysis indicating that our catch-up target is not understated, and may even be overstated.

273. In addition, we set out in our SoC that our cost reductions in AMP5 (including 2013/14) are in line with the rest of the industry.[100] This should give the CMA further comfort that the catch-up target is not understated.

3.3.5.2 Potential upside opportunities

274. The CMA also notes that Bristol Water has invested in head office refurbishment and made IT investments and suggests this may lead to potential upside opportunity.[101] In respect of these investments we note:

- as explained in our SoC, the head office refurbishment is the first major renovation since it was built in the 1960s. It brings the building up to modern standards and will add to the long-term value of the building.[102] The development is also a facilitator for better ways of working. The benefits of the changes we are now able to make are already captured in our efficiency programme, Project Channel. As also noted in our SoC, the analysis performed in Project Channel, supported by Baringa, shows that the efficiency targets in our plan will be challenging;[103]
- £2m of the investment in IT relates to the Retail Price Control;

---

95 PFs, para. 5.50.

96 PFs, para. 5.49.

97 PFs, Table 5.8.

98 PFs, para. 5.48.

99 £225m without the regional wage adjustment.

100 SoC, Figures 57 and 58.

101 PFs, para. 5.49.

102 SoC, para. 187.

103 SoC, para. 979.

- much of the IT expenditure related to replacement of infrastructure within normal cycles. For example, the IT network implemented as part of the Head Office refurbishment was ten years old, under capacity and failing; and
- some IT expenditure did lead to efficiency improvements and helped us to meet the challenging efficiency targets that were set at CC10. For example, Avon+ led to £3.8m of IT investment that included new procurement, customer handling, HR and payroll and field force systems. Direct benefits from these improvements affect both operating and capital expenditure and were recognised at the time or are enablers for Project Channel. For example, changes to the scheduling capability for our mobile despatch system led to FTE reductions at the time. Also, the procurement systems have enabled the planned improvements in the "Commercial Management" workstream of Project Channel.

275. It appears the CMA may be considering increasing the efficiency challenge based on actions we have taken to deliver the efficiency challenges already included in the CC10 redetermination and our PR14 plan. We believe the CMA should be careful not to mix the process of setting additional challenging targets with the company's plans to deliver those targets by adding the two together, as this double counting would result in an overstated efficiency target that is inconsistent with the detailed analysis performed by our economic consultants.

3.3.5.3 Efficiency challenge for 2014/15

276. The CMA calculation of efficiency in its opex build up includes an efficiency challenge for 2014/15.[104] This appears to be have been calculated using a rate of 1.9%, which agrees to that set at CC10.

277. However the base opex used in the CMA calculation of £43.9m is based on average operating costs for AMP5, and therefore already considers actual 2014/15 data. Accordingly we do not consider that the efficiency challenge applied in 2014/15 (which also subsequently impacts on the efficiency challenge for AMP6) is appropriate. We estimate that removing the challenge in 2014/15 will increase the CMA opex calculation by £4.4m.

278. Should the CMA decide for its final determination that base opex should be based on 2013/14 actuals, as we continue to believe is appropriate, then applying an efficiency challenge in 2014/15 would be acceptable. In this context, the CC10 rate of 1.9% would appear to be appropriate.

3.3.6 Conclusions on provisional findings on opex

279. We welcome the CMA's decision to perform an assessment of operating costs and believe this has led to a determination that is much closer to an appropriate range than Ofwat's FD14. However, we believe some of the reductions the CMA has made from our SoC are inappropriate.

280. We continue to believe that the CMA should use 2013/14 (adjusted as necessary) as the base year for AMP6, consistent with previous price reviews and the approach taken at CC10. The use of average AMP5 spend as a base ignores underlying drivers that lead to an increasing trend in operating costs, as recognised by the cost profiles awarded at CC10.

---

[104] PFs, Table 5.8.

281. We believe that the CMA should include an adjustment to base opex to reflect the additional opex arising from AMP5 enhancements. We have responded to the CMAs concerns and show that an allowance of £0.9m p.a. is reasonable and in line with the CC10 decision.

282. The CMA appears to have included an efficiency challenge for 2014/15 in its opex calculation despite using average AMP5 costs (including 2014/15) as its base costs. We don't consider this is appropriate.

283. We agreed with the CMA's decisions on operating costs concerning Cheddar WTW and CRC costs, however if Cheddar WTW is reinstated in the CMA's Final Determination we would expect the additional impact of £0.5m to be added back.

284. We note that more up-to-date forecasts of cost inflation suggest that input prices could increase by 1.1% above RPI compared to 0.6% used in our SoC and considered by the CMA. We suggest the CMA considers using this updated figure in its final determination to ensure logical consistency with other inflation assumptions (for example in cost of capital).

285. We have provided the CMA with analysis, based on Oxera's disaggregated modelling, that shows the operating costs included within our SoC are lower than an upper quartile industry benchmark. We believe the CMA should take comfort from this analysis.

3.4 Assessment of Capital Maintenance

286. As with opex, the CMA has carried out an assessment of the capital maintenance proposals contained in our Business Plan to test whether it represents a reasonable base for comparison to the econometric analysis.[105]

287. In order to do that, the CMA has considered the scope of the activities presented in our plan, including the relationship to serviceability, and the efficiency of the associated cost estimates. The CMA has also considered whether there are any factors specific to Bristol Water that might mean our costs are likely to be higher or lower than the industry generally.[106]

288. The CMA has split its provisional findings by reference to infrastructure renewals expenditure (**IRE**) and maintenance non-infrastructure expenditure (**MNI**). Details of the CMA's findings for each area of capex, and our response, are set out in the following sub-sections.

3.5 Infrastructure Renewals Expenditure (IRE)

289. The CMA has provisionally found "*a range of £65-70 million for the efficient level of IRE in AMP6*".[107] This compares to the expenditure proposed in our Business Plan of £76.3m.

290. The CMA notes that its "review of Bristol Water's programme has revealed some concerns with the approach to defining the planned level of mains replacement activity, and also the potential for efficiency improvements in unit costs."[108] In particular, the CMA concludes:

---

[105] PFs, para. 5.66.

[106] PFs, para. 5.67.

[107] PFs, para. 5.100.

[108] PFs, para. 5.97.

- **IRE scope**: the CMA has accepted our assumed replacement rate of 46km per year as it appears to be a "*reasonable starting point*", but has voiced concerns "*that there remains significant uncertainty over this figure, due to the lack of a clear link between certain aspects of Bristol Water's approach to planning (which has regard to asset age) and its actual approach to replacement*";[109]
- **unit cost efficiencies**: based on the benchmarking analysis carried out by Aqua, the CMA has assumed that we can achieve "*further efficiencies in unit costs of mains replacement … [of] up to 14%"*;[110] and
- **cost efficiencies on remaining IRE spend**: extrapolating that logic, the CMA has assumed that similar additional efficiencies could be obtained in relation to the remaining IRE spend.[111]

291. As we set out in the following sub-sections, whilst we appreciate the CMA's conclusions in relation to the scope of our IRE activities, we do not agree with the concerns expressed regarding our planning approach, or with the additional cost efficiencies that have been imposed:

- **IRE scope**: The CMA considers that the level of activity we proposed is appropriate as a starting point as it is consistent with our historic replacement rates. We do not agree, however, that there is no clear link between our approach to planning and our approach to actual replacement. We believe that the CMA's concerns about our approach to defining the level of mains replacement activity are based on Aqua's misunderstanding of the methodology applied. As set out in **Section 3.5.1** below, our strategic model is based primarily on the historic burst rate of pipes, as is our actual replacement programme. Age is only used in our models to estimate an initial expected burst rate when the historic burst rate is zero. The approach adopted for PR14 is a development of that used (and accepted by the CC) at PR09 and is entirely consistent with our approach to actual delivery. As such, we believe that we can adequately address, and dismiss, these concerns;
- **unit cost efficiencies**: The CMA's conclusions are based on the benchmarking analysis conducted by Aqua, which in turn is based on a misunderstanding of Bristol Water's costs. Aqua's analysis also uses too few comparators to be meaningful. As is shown and explained in more detail in **Section 3.5.3** below, Bristol Water's unit cost expenditure is below the industry average. As such, it is difficult to see why an assumption of additional efficiencies should be applied to our costs, in excess of the 10% we have already applied; and
- **cost efficiencies on remaining IRE spend**: even if it were possible to demonstrate additional unit cost efficiencies, there is no reason why this analysis should imply that there are further efficiencies for other, unrelated, expenditure. In any event, the case for additional efficiencies on mains replacement unit costs has not been made out, in excess of the 10% efficiency challenge we have already applied.

292. In the following sections we evidence that our scope and cost of infrastructure renewal expenditure is reasonable and consistent with both Bristol Water's historic expenditure and expenditure at other water companies, to which we have applied a 10% efficiency challenge. On that basis, we consider that the range of IRE expenditure identified by the CMA is too low, and that our proposed cost estimate of £76.3m is already stretching.

---

[109] PFs, para. 5.99(a).

[110] Para 5.99 (b).

[111] Para 5.99 (d).

3.5.1 Scope (including serviceability) – mains replacement

293. The CMA's review has focused on our assumptions regarding the level of IRE needed within AMP6.[112] In doing so, the CMA instructed Aqua to review our approach to define our mains replacement programme and to opine on "*whether the process to establish the appropriate level of mains replacement required to maintain serviceability had been robustly calculated*".[113]

294. Ultimately, despite concerns raised by Aqua that our approach to assessing mains replacement activity "*is not considered adequate*",[114] the CMA has concluded that on the balance of factors, the scope of IRE mains replacement in our Business Plan is reasonable.[115] We agree with the CMA's conclusion, and the reasoning on which it is based. We note, however, the CMA's comment that "*this is based on relatively limited evidence, given the lack of a clear link between Bristol Water's business plan for the level of mains replacement and its actual approach to implementation of mains replacement based on bursts (actual and projected)*".[116]

295. This is not the case, as there is a clear link between our business plan modelling and our actual approach to mains replacement. We believe that the CMA's view is derived from Aqua's misunderstanding of Bristol Water's approach. For instance, Aqua has advised the CMA that:

- the reliance of the mains replacement model on age is not appropriate as age "*is not a direct driver of the optimal level of mains replacement*". This misunderstanding of our model is corrected in **Section 3.5.1.1** below; and
- our model used "*to determine the total length of mains that should be replaced is inconsistent with the actual approach to targeting of mains replacement*", with model focused on the age of mains, and targeting of spend based on burst history.[117] This alleged inconsistency is explained in **Section 3.5.1.2** below.

296. The CMA has also made comments on the relationships between mains replacement and maintaining stable serviceability, and the level of leakage. These comments are addressed in **Section 3.5.1.3** and **Section 3.5.1.4** below.[118]

3.5.1.1 Bristol Water's mains replacement model

297. Our mains replacement model used to identify the length of mains that should be replaced primarily relates to the existing burst rate of mains, not to the age of mains. For those mains that have never previously burst, the model takes into account the observed variation in burst rate for different ages of mains.

---

[112] PFs, para. 5.74.

[113] PFs, para. 5.81.

[114] PFs. para. 5.86.

[115] PFs, para. 5.87.

[116] PFs, para. 5.88.

[117] PFs, para. 5.82.

[118] The CMA also noted that we replaced 58km of mains per year during AMP5 compared to the 47.5km per year assumed by the CC in CC10 (PFs, para. 5.77). It should be noted that the figure of 58km per year includes trunk mains lining at around 12 km per year. This work is undertaken to reduce discoloured water contacts. Over the AMP5 period, we are in line with the CC's assumed level of replacements for distribution mains.

298. As such, it is wrong to suggest that our model is "*disconnected from the reality of the burst[s]*" in our area.[119] The inputs to the model are:

- the length of mains at each burst rate in increments of 0.1 bursts/per km/pa (determined from actual burst data over the last 10 years);
- the observed relationship between observed bursts and expected new bursts (determined from actual burst data since 1994); and
- the observed expected burst rate of mains that have never previously burst (also derived from burst data since 1994).

299. Each of these inputs is based directly on our data and reflects the actual performance of our network.

300. The model we have used for PR14 is largely the same as that used at PR09 which was examined in detail by Halcrow for the CC10 Determination. Halcrow considered that the model was robust and that "*the burst model methodology used by Bristol Water generates reliable burst rates for the Bristol Water network in the short term (AMP 5 period)*".[120]

301. In concluding that our model is not adequate, Aqua has not supported this with any underlying analysis of the strengths and weaknesses of our model. Instead, it appears to be predominantly based on the misunderstanding as to the role of age in the application of the model. As such, Aqua's concerns about the model are unfounded and should not be given any weight.

302. This is supported by the CH2M review of Aqua's appraisal of Bristol Water's maintenance expenditure, which concludes that the "*infrastructure models were given an overall good rating*".[121]

3.5.1.2 Relationship between the mains replacement model and targeting spend

303. Aqua has advised the CMA that our approach to determining the total length of mains to be replaced is inconsistent with our actual approach to targeting which mains are replaced. This is predicated on the assumption that our model utilises age of mains to establish the level of planned spend, whilst targeting of that expenditure is based on burst history.

304. As we have demonstrated in **Section 3.5.1.1** above, however, our mains replacement model is based on historic burst rates for our pipes. Our mains replacement programme targets those mains with the highest historic burst rates, consistent with the model. Thus both the forecasting of future investment requirements and the actual interventions delivered are based on actual burst performance of the mains.[122]

305. As such, there is a clear link between our mains replacement model, and our mains replacement activity, meaning that the concerns expressed by the CMA are unfounded and can be dismissed.

---

[119] Aqua Report, para. 135.

[120] Halcrow Technical Reports for Competition Commission Bristol Water Price Determination, Workstream 1, p. 7 (ENQ044).

[121] CH2M - Review of Aqua Appraisal of Bristol Water's FBP (RPF014), p28. CH2M have significant experience in mains rehabilitation and asset replacement modelling, as detailed in section 4.1 on page 22 of their document.

[122] Further information on our mains rehabilitation tool is provided in ENQ062 Mains Rehabilitation Tool Details.

3.5.1.3 Relationship between mains replacement and stable serviceability

306. The CMA notes that Aqua has said that maintaining serviceability will be related to ongoing smarter asset management.[123]

307. This is correct. Our mains replacement modelling actually suggests there will be a slight increase in burst rates overall, but we have set ourselves an efficiency target to offset this increase by finding better ways of managing our assets. This is consistent with Ofwat's requirement that we set ourselves "*stretching targets*".[124]

308. The CMA has indicated that it is not convinced by the argument that a network in good condition will require greater activity to maintain stable serviceability.[125] To assist the CMA in its understanding of the relationship between serviceability and asset reliability, and how this impacts on the activities of a water company, we have set out an explanation below.

309. The sub components of serviceability (a historical measure of performance) and asset reliability (our performance measure for AMP6) are identified on the basis of historic performance relevant to each company. Thus all companies have different targets for the maximum number of bursts they are allowed each year. This target has historically been based upon Ofwat's assessment of best performance. Therefore, if a company has been able to manage its system to minimise the number of bursts, this will need to be maintained.

310. Therefore, where a company has a network in poor condition, its burst target will be relatively high and it will be able to identify lengths of mains to replace with high levels of bursts. This will allow it to keep its burst target at a relatively high level with relatively low levels of activity. For companies with networks in better condition, their target number of bursts will be lower (based on their historic performance). Inevitably, this means that such companies will need to target their mains replacement more effectively in order to ensure that the targets are met, and that they will need a higher level of activity in order to maintain the target performance. This is illustrated by the graph below, which arranges all the pipes in order of decreasing burst rate.

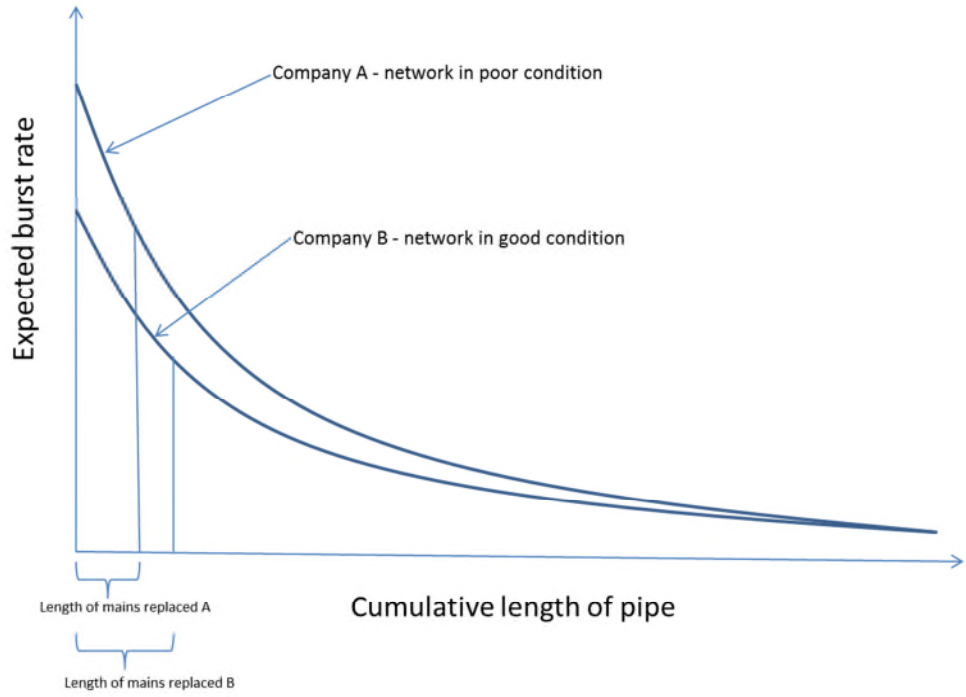
---

[123] PFs, para. 5.83.

[124] Ofwat Risk and Reward Guidance Jan 2014 (SOC079).

[125] PFs, para. 5.84.

Figure 10 Illustration of maintenance requirements for companies with different network conditions



Source: Bristol Water

311. The two curves represent the expected burst rates for pipes for Company A and Company B. To define their mains replacement programmes, each company will sort their pipes by expected burst rate, from highest to lowest.[126] The improvement in the total number of bursts is represented by the area under the curve, with both companies delivering the same expected improvement. As Company A's network is in worse condition, it can achieve an equivalent improvement in bursts by replacing a shorter length of mains than Company B.

3.5.1.4 Relationship between mains replacement and leakage

312. The CMA notes that Bristol Water's leakage is "*less than most other water companies*"[redacted] and suggest that leakage reductions will be impacted by mains replacement, "*particularly where zones with the worst leakage are targeted*".[redacted]

313. Whilst some of our mains replacement is targeted to reduce leakage, the majority is targeted to reduce the number of bursts. Mains replacement for leakage management does have a small impact on burst rates, but mains replacement for burst management has no noticeable impact on leakage as only short sections of pipe will be replaced in any zone. The CMA is correct that low levels of leakage do not directly correlate with mains replacement.

---

[126] This simple example looks only at the benefit of pipe replacement, actual replacement will also include an assessment of relative costs.

[redacted]

3.5.2 Scope – other aspects of IRE

314. The CMA has not reviewed the other aspects of our proposed IRE activity in detail, and has accepted the need and scope. We agree that, given the consistency with historic levels of activity, this is a proportionate approach.

3.5.3 Efficiency of cost forecasts for IRE

315. In looking at the efficiency of our cost forecasts for IRE, the CMA has relied upon Aqua's benchmarking of our proposed unit costs. The CMA has concluded that its assumption on IRE spend should reflect an incremental unit cost efficiency range of 10% to 15%. This range is based on the following two scenarios:

- **high incremental efficiency scenario**: this is based on an overall reduction of 15% to the whole programme which would reduce costs by £11 million, and is based on the unit cost differentials identified by Aqua. The CMA suggests that this would bring our spend "*more in line with other water companies*"; and
- **low incremental efficiency scenario**: this is based on 10% efficiency savings on main replacement costs, and 5% efficiency savings across the rest of the programme, which would reduce overall costs by £6 million. It is at the lower end of Aqua's estimates.[129]

316. In developing these scenarios, the CMA has relied on a range of evidence:

- in terms of overall IRE spend per customer, Bristol Water was ranked 18th of 18 for AMP5 (i.e. the highest cost of all companies),[130] with our expenditure being 83% higher than the average;[131]
- for IRE spend by kilometre of mains, Bristol Water is ranked 17th, with Thames Water at 18th being an outlier;[132]
- benchmarked unit cost data produced by Aqua which suggests that our mains-laying costs may be up to 14% less efficient than one comparator company;[133]
- our rate for 250mm pipes appears high compared to other data points;[134] and
- our costs for trunk mains rehabilitation appear to be 7% higher than the single comparator company.[135]

317. We are concerned by the CMA's use of this evidence because:

- the benchmarking by Aqua is not across the whole industry and not necessarily on a comparable basis (see **Section 3.5.3.1**);
- when looking at comparative IRE expenditure for AMP5, after adjusting for the difference in expenditure for upstream assets, the proposed expenditure by BW for

---

129 PFs, para. 5.95.

130 PFs, para. 5.92(a).

131 PFs, Table 5.2.

132 PFs, para. 5.92(b).

133 PFs, para. 5.92(c).

134 PFs, para. 5.92(d).

135 PFs, para. 5.92(e). However, we note that in the Aqua report the TMR costs were compared with two other companies and were within the extrapolated rates.

AMP6 is in line with the industry average for infrastructure maintenance (see **Section 3.5.3.2**); and

- an industry wide comparison of mains replacement costs on a fully comparative basis shows that the unit rates in our plan are at the lower end of the industry range (see **Section 3.5.3.3**).

318. The CMA considers that the weight of this evidence supports a conclusion that the costs included in our Business Plan for mains replacement may be high compared to industry levels, so it is appropriate to assume an additional efficiency challenge.[136] On the premise that we would have prepared our costs for all IRE expenditure on a similar basis, the CMA concludes that it could be appropriate to make an adjustment to all IRE.[137] This is countered by the CMA's recognition that "*there is uncertainty over Bristol Water's ability to achieve such an adjustment*".[138]

3.5.3.1 Aqua benchmarking

319. We have serious concerns regarding the reliability of the benchmarking evidence produced by Aqua, and do not agree that the weight of the evidence referred to by the CMA supports a conclusion that an additional efficiency challenge is appropriate. Instead, and as we demonstrate in the following sections:

- Aqua's benchmarking analysis is based on a single comparator, and there are significant flaws which impact the reliability of the underlying data and the accuracy of the assumptions made when adjusting our unit costs (see **Section 3.5.3.1.1**);
- the comparison of the rates for 250mm pipes is meaningless, as the Bristol Water data on which Aqua has relied does not reflect the actual rates, but merely an illustrative rate based upon 2015 prices that has been used out of context (see **Section 3.5.3.1.2**);
- cost estimates we have prepared for 250mm pipes are not high in comparison to other companies' data (see **Section 3.5.3.1.2);** and
- our costs for trunk mains lining are not high in comparison to other companies' data (see **Section 3.5.3.1.3**).

320. The scale of the efficiency challenge has been set by reference to the Aqua comparator. Leaving aside questions of the accuracy of the comparative data, we note that it is inappropriate to rely on a single comparator to set the size of such a significant efficiency challenge. Robust conclusions can only be drawn from a larger sample size.

321. As such, we consider that the case for applying an additional efficiency challenge to the IRE costs set out in our Business Plan has not been made.

3.5.3.1.1 Benchmarking of the mains replacement unit cost

322. Aqua has carried out a benchmarking analysis of our unit costs for mains replacement. There are a number of elements associated with that analysis which give rise to concern about the validity of the comparison:

---

[136] PFs, para. 5.93.

[137] PFs, para. 5.94.

[138] PFs, para. 5.94.

- our unit cost per metre is quoted as £163;[139]
- the unit cost of the comparator company is quoted as £166;[140]
- no evidence is provided to substantiate why that unit cost can be held out as being comparable. For instance, no information is provided on the mix of diameters, techniques used, surface type, price base, accounting policies, or scope of work. Without this information, we are not able to confirm whether this is a viable comparator;
- considerable care is required when comparing unit rates to make sure that the treatment of overheads and central contractor costs, such as contractor management fee or the allocation of company overheads, are treated consistently. Aqua has not evidenced that it has taken such care and there is a significant risk that the unit rates quoted are not comparable;
- no adjustment has been made for regional wage differences;
- Aqua has asserted that our unit cost was not directly comparable to the comparator as the latter contains certain costs that we have accounted for separately. On that premise Aqua adjusted for the perceived differences and calculated a restated unit cost for Bristol Water of £193 per metre.[141] The basis on which this adjustment has been calculated is not clear, and we are concerned that it significantly overstates our unit costs:
    - the restated Bristol Water unit cost includes the full costs for communication pipe replacements. This is not correct, as not all of these costs relate to communication pipes replaced as a result of mains replacements;
    - Aqua has included the cost of trunk mains cleaning in the adjusted cost. We do not understand why. This is a separate programme and is not related to distribution mains replacements. It should not be included; and
    - Aqua has included an element of 'other' costs. We do not understand the reason for this or the basis for apportionment or what was included.

323. In addition to the specific concerns about the numbers used, it is important to note that Aqua has relied on a sole point of comparison. The CMA recognises that this is a weakness in the strength of the evidence, but nevertheless has apparently given it a lot of weight in setting the scale of the efficiency challenge.[142]

3.5.3.1.2 Rates for 250mm pipes

324. The CMA states that "*Bristol Water has also supplied a build up of the specific rate for 250mm pipes (which would form part of the overall mix)*".[143] This is not the case.

325. At the meeting on 27 May 2015, Aqua specifically requested an electronic copy of Schedule 6 from the Term Contract which was drafted in the context of being a fictitious example of how the rates could be built up. This specific fictitious example was provided in the response to CMA0195 with the Excel file "Example Quote Breakdown_Sch6.xls" attached as requested by Aqua.

---

[139] PFs, para. 5.90.

[140] PFs, para. 5.90.

[141] PFs, para. 5.90 and Table 5.11.

[142] PFs, para. 5.92.

[143] PFs, para. 5.92(d).

326. As indicated in the file name, this is an example only. It is purely illustrative and was intended to show the rates in the schedule; this is consistent with the nature of the information that we offered to provide to Aqua. It is not the cost for laying a 'real' 250mm diameter main and should not be used as such. Examination of the work elements included in the example show inconsistencies which would indicate that it is illustrative only. For example, it includes traffic management for the full duration which would be used in highway, but also includes topsoil strip and reinstatement for the full length which would be used in field. Furthermore, the rates are from the Term Contract which came into operation in October 2014 so the price base in the example is end Quarter 1 2015. For the rate to form part of our 'all in' rate as suggested by Aqua, it would need to be adjusted to bring it to 2012/13 prices.

327. To clarify our rate for laying 250mm diameter main, we have used Schedule 6 to prepare cost estimates for four different but representative scenarios involving a variety of techniques. The cost build up for these is provided as RPF021. The results are summarised in Table 14.

Table 14 - Unit Cost for 250mm Diameter Pipe

Scenario Description	Unit Rate from Schedule 6 £ per metre	Unit Rate adjusted to 12/13 Prices £ per metre
Directional Drilling in field	154.38	146.93
Open cut in field, 20% rock	196.72	187.23
Slipline in type 3/4 carriageway	132.55	126.16
Open cut in type 3/4 carriageway	326.70	310.95

Source: Bristol Water Term Contract

328. We provided information on the mix of techniques used at the meeting with Aqua on 27 May 2015 with additional information in CMA0194. This indicated a split of 73% 'no dig' techniques such as sliplining, pipebursting and directional drilling, and 27% open cut. Using this split, the weighted average of the above unit costs is £166.93,[144] significantly lower than the figure of £223.27 per metre[145] calculated by Aqua and included in its cost comparison graph.[146]

329. The CMA states in para 5.92(d) of the PFs that on the basis of Figure 5.1, the specific rate appears high compared to other data points. This is based on the benchmarking exercise carried out by Aqua. Given the explanation provided above regarding the numbers relied upon by Aqua, the CMA's conclusion is unsurprising. On that basis we do not consider that the conclusions drawn from this benchmarking have sufficient validity and they should not, therefore, be relied upon as evidence that our IRE costs are inefficient as:

- as explained above, the 250mm rate relied upon is not a real rate so cannot form the basis of an effective comparison; and
- we have estimated our costs for a range of representative scenarios which give a weighted average unit cost of £166.93 per metre. This clearly indicates that the data point for a 250mm diameter main is not high in comparison to the other data

[144] If a simple average of these costs is used with no allowance for weighting by technique, the unit cost is £192.82 per metre which is still below Aqua's calculated figure.

[145] Aqua Report, para 162.

[146] Aqua Report, Figure 6.

points in Figure 5.1 and the CMA's use of Aqua's assessment to apply additional efficiency assumptions is inappropriate.

3.5.3.1.3 Trunk mains rehabilitation costs comparison

330. The CMA refers to Aqua's analysis of the trunk mains rehabilitation costs as another useful comparator.

331. Bristol Water considers trunk mains rehabilitation to be a capital maintenance base activity and trunk mains lining to be a quality enhancement activity.

332. We have identified 30km of trunk mains lining as a quality enhancement activity and 4km of trunk main rehabilitation as a capital maintenance base active. The primary technique used in trunk mains lining is sliplining.

333. In 5.92e of the PFs the CMA has referred to trunk mains rehabilitation as being classified as enhancement activity and thus we believe this comment refers to trunk mains lining.

334. 5.92 (e) mentions that "*….costs of the trunk mains rehabilitation supplied by Bristol Water, and these appear to be 7% higher than the single comparator company*". On the basis that this comments refers to trunk mains lining then this is not the case. Further details are contained within **Section 4.9.1** and Aqua's figure 7 shows that our trunk mains lining (sliplining) costs were compared with two comparator companies. Although Aqua lack lining (sliplining) data for mains above 300mm in diameter an extrapolation of the data indicates that our estimates compare well with the two comparator companies.

3.5.3.2 Comparative IRE expenditure in AMP5

335. The CMA has quoted Bristol Water's AMP5 average cost per head of population for IRE at £20.08 and indicated that compared to an industry average of £10.97, this value places Bristol Water 18th out of 18 companies.[147] The detail supporting these comments is provided in Table 5.2 of the PFs.

336. We have not been able to replicate the CMA's figures, so have concerns on the accuracy of the data. For instance, if the total value of IRE (excluding trunk mains lining) from Table 5.9 of the PFs of £102.1m is calculated against the total population at 2013/14 of 1,160,066,[148] this results in a value of £17.60. It is not clear if this would change Bristol Water's ranking. We consider that if it is to be meaningful, comparison of AMP5 IRE should be at a constant price base. The use of 2012/13 prices is sensible as this gives consistency with other PR14 data. For Bristol Water it should exclude trunk mains lining.

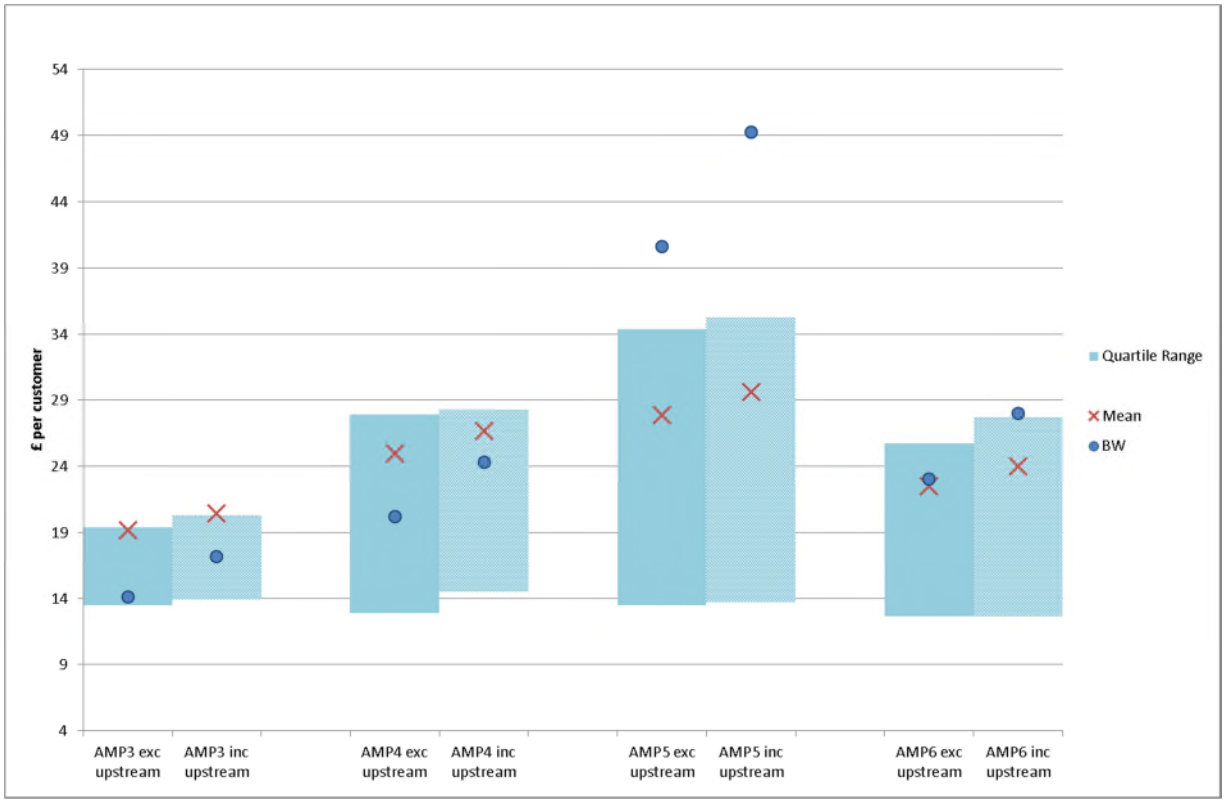
337. A comparison of our proposed expenditure with that allowed for other companies, shows that excluding upstream maintenance costs, our proposed costs per customer are in line with the industry average. Given the higher level of proposed mains replacement, this demonstrates that our costs in this area are efficient.

---

[147] PFs, para. 5.92(a).

[148] Annual Report 2014 (SOC052), Table 5, row 22.

Figure 11 Comparison of industry infrastructure expenditure



Source: June Returns/Ofwat PR14 Data/Bristol Water/Bristol Water analysis.

338. The CMA has also stated that we are ranked 17th in terms of IRE spend by kilometre of mains.[149] The underlying data and analysis to support this conclusion have not, however, been provided, which means that we are unable to properly comment on whether the ranking attributed to Bristol Water is correct.

339. We consider the evidence presented in Figure 11 shows that our costs excluding maintenance on upstream assets are in line with the industry average. In the next section, we show that our unit costs are at the lower end of the industry range.

3.5.3.3 Comparative industry data for main replacement unit cost

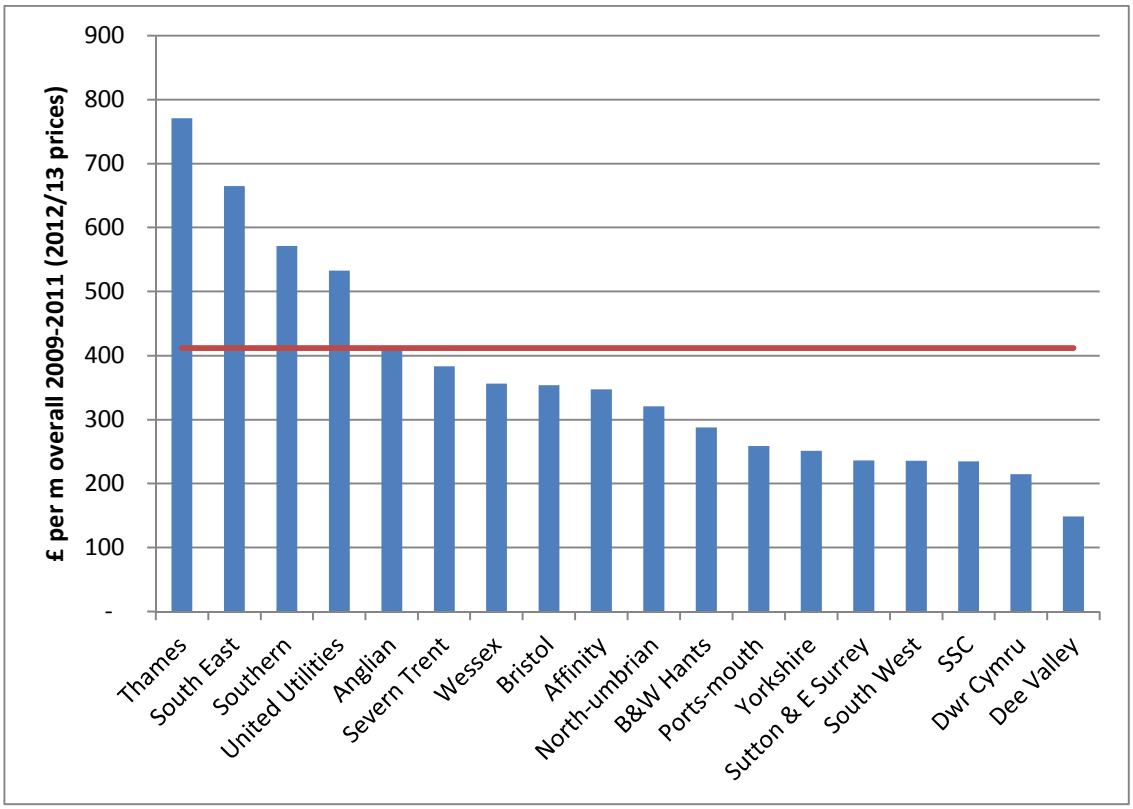
340. The comparative data from Aqua relates to a single company with a unit cost that may not have been prepared on a comparable basis.

341. Rather than relying on a potentially misleading comparison with a single company, it is more robust to consider the available data on the cost of mains replacements for all companies. Data is available from June Returns for the amounts of maintenance and enhancement expenditure on water distribution mains over the period 2003-2011. In addition, data on mains replacement and new mains installed rates is available from the Ofwat PR14 modelling dataset for the period 2009-2013. This allows the overall expenditure of each

[149] PFs, para. 5.92(b).

company in terms of cost per metre for distribution to be obtained. Figure 12 shows the average results for 2009-2011, the period for which overlapping data is available.[150]

Figure 12 Cost of overall mains replacement expenditure 2009-2011



Source: Bristol Water analysis based on June Return data

342. Figure 12 shows that Bristol Water's expenditure (£354 per metre) during this period was below the industry average (£412 per metre). Some differences between companies would be expected as a result of their different operating environments. For example, costs tend to be higher in more urban environments. Moreover, some companies, such as South West Water, were completing water quality programmes that used spray lining techniques which have a lower unit cost.[151] In addition, there will be an element of fixed costs (related to customer numbers rather than length of mains replaced) included in this category, and therefore companies with relatively higher levels of activity would be expected to have lower costs.[152]

343. In relation to the expenditure included in our plan, the amounts shown in Figure 12 represent the expenditure on Mains and Communication Pipes plus Infrastructure Other

---

150 The chart shows infrastructure expenditure on mains (base and enhancement) divided by the length of mains replaced, relined and new mains installed. Both base and enhancement expenditure were included because some companies were proportionally allocating some of their mains replacement cost to enhancement. For example, Thames Water allocated a lot of its replacement expenditure to reducing leakage (i.e. enhancement).

151 This technique is often used for water quality reasons where a thinner application is suitable on ferrous pipes to prevent further corrosion of the internal surface. In these circumstances it does not enhance the structural integrity of the pipe and will not contribute to reducing bursts.

152 Based on our analysis, the correlation between lower costs and higher activity per customer is significant and explains 18% of the variation in unit cost.

(£60.3m).[153] Based on this expenditure and the proposed length of mains replacement in AMP6, the expenditure included in our plan is £259 per metre on an equivalent basis.[154] This is at the lower end of the actual costs shown in Figure 12.

344. We believe this demonstrates that the costs included in our plan are efficient and will be challenging to deliver.

3.5.4 Conclusions on the provisional findings on IRE

345. We welcome the CMA's view that Bristol Water's proposed mains replacement programme of 233km is appropriate. However, we do not accept the CMA's concerns that our strategic modelling is not aligned with our approach to actual delivery, as this is based on Aqua's misunderstanding of our mains modelling. Both our modelling and our selection of pipes to replace are based primarily on historic burst rates.

346. We do not agree with the CMA's view that we are able to deliver further efficiency savings over and above the 10% programme efficiency we have already assumed. Aqua's analysis is based on a misunderstanding of Bristol Water's costs. In addition, Aqua has used too few comparators to draw a valid conclusion as to whether our costs are reasonable.

347. An analysis of infrastructure maintenance unit costs across all companies using a fully comparable basis demonstrates that the costs included in our plan are at the lower end of the industry range.

348. The assumption that any efficiency challenge applied to mains replacement costs would be relevant for maintenance activities on, say, raw water reservoirs, is unsubstantiated. There is no case made as to why mains replacement efficiency would be similar to that of raw water reservoirs, particularly given that the asset groups are not equivalent either in type or maintenance needs.

349. Overall, we believe that our business plan proposal of £76.3m is an appropriate level of infrastructure renewal expenditure for AMP6.

3.6 Non-Infrastructure Maintenance (MNI)

350. In the provisional findings, the CMA has concluded that whilst it believes we will be able to spend less than proposed in our Business Plan, there is a wide range of outcomes for potential replacement.[155] As such, the CMA has identified a range of MNI of £49m to £74m, which compares to the £80m proposed in our Business Plan.[156]

351. The CMA's assumption that we will be able to spend less than we have projected is based on its review of our approach to planning, and the evidence to support our proposed expenditure. The CMA has raised some concerns about the strength of those plans and the quality of the supporting evidence:

- limited detail has been provided to support how the £80m will be spent; and

---

[153] SoC, Table 59.

[154] Calculated as £60.3m divided by 233km.

[155] PFs, para. 5.150.

[156] PFs, para. 5.152.

- the forecast expenditure appears to be based on the output of models, but is not reconciled to actual assets and their condition through supporting evidence.[157]

352. This means that the CMA considers that "*there appears to be significant uncertainty about whether the level of spend proposed will actually be required in practice*".[158] Given, in particular, that "*much of the spend does not relate to identified assets that need replacing*", the CMA believes that it is likely that we may be able to spend materially less than projected.[159]

353. The CMA has also commented that it believes that "*A significant amount of information was received late in the process. This has made us generally concerned about the quality of supporting evidence that Bristol Water had available, both in respect of the assumptions within its plan and within its SoC*".[160]

354. We believe that we can demonstrate that the evidence to support our proposed level of MNI spend exists, and that we can satisfy the CMA that there is an appropriate degree of certainty over actual activity levels in AMP6. We also believe we can assuage the CMA's concerns regarding the timing, and quality, of our evidence using the priority area of water treatment works as identified by the CMA. In particular:

- **reasonableness of overall level of spend**: the models identify processes for which replacement at a specific point in time is an efficient way to balance risk given the processes' predicted performance or expected end of life; it provides a central estimate of need. This is a standard way to model future investment need based on asset performance.[161] Therefore, modelled expenditure is identified based on assets that form part of processes forecast to require replacement;
- **planned expenditure:** we do have a clear vision for how the £80m will be spent during AMP6. For the M&E assets modelled in the water treatment works model this is at an individual site process level, with the near term plan being at an individual asset or equipment level. For other asset groups such as the operational structures, it is on an asset by asset basis. The reality of maintenance activity means that this may change during the period where the individual asset and equipment level view is defined. All companies' approaches to modelling maintenance interventions have similar levels of uncertainty, which can never be completely eliminated as there will always be assets that perform better or worse than expected (**Section 3.6.3.1.1)**.
- **reconciling the model to the assets (long term):** whilst it is true that the forecast expenditure is based on the output of the models, it is not correct to suggest that this cannot be reconciled to actual assets. The models for WTW MNI all link to specific processes at specific treatment works and, therefore, identify the nature of specific interventions that are expected to be needed at those works during the AMP on a year by year basis. The industry's approach, using the common framework, incorporates the forecasting of expenditure needs based on performance. Therefore,

---

[157] PFs, para. 5.149.

[158] PFs, para. 5.149.

[159] PFs, para. 5.150.

[160] PFs, para. 5.148.

[161] Companies will develop their asset level models based on different levels of detail and granularity with different levels of model coverage; our models are considered by our assurers Mott MacDonald, to be an improvement on the PR09 models (Mott MacDonald Assurance Report (SOC136)) which formed the basis of our CC10 appeal. We have extensively extended the coverage of the ALMs so that as much of our asset base could be modelled as was possible.

not defining specific individual asset needs through site surveys etc, is not enough by itself to act as a justification for reaching the assumption that we may be able to spend a lot less. (**Section 3.6.3.2.1)**;

- **reconciling the model to the assets (short term):** in delivering the appropriate levels of maintenance, we rerun the modelling using the latest data, re-optimise the programme and review the outputs against the most up to date information on the asset base and its performance history. We use observed performance of component assets across the asset base to identify the actual interventions required to deliver the appropriate levels of maintenance to the correct assets. This is identified through specific site assessments[162] with expenditure prioritised based on customers' expectations and our performance commitments. In many cases these interventions will be the component assets for the processes identified by the models as requiring replacement; in others it will be assets which have deteriorated faster than expected. We have a programme of interventions planned for the near future based on actual asset performance. (**Section 3.6.3.2.1**)
- **uncertainty of actual spend**: given the nature of MNI spend, there will always be a degree of uncertainty regarding actual spend. Whilst the named schemes are a response to known issues not driven by deterioration, the asset level models predict the average of what will happen and there will be outliers with either better or worse performance than expected. In practice, this means that for the individual assets there may be a lesser or greater investment requirement, but the forecast from the modelling is a robust central estimate of the overall need (to which we have applied a 10% efficiency challenge). As such, the unavoidable uncertainty should not be seen as a reason to reduce the allowance from that predicted by the models (**Section 3.6.3.3**);
- **timing of provision of evidence**: that some of the evidence appears to have been provided at a late stage of the CMA's process should not be misinterpreted as an indication that the evidence was not available to inform the assumptions in our Business Plan and SoC. At the most it should be seen as reflecting the nature of the PR14 process, including the expectations around the volume of supporting data required as part of the submissions, and a natural feature of the Q&A aspect of the CMA's review. The criticisms that the CMA has made in relation to specific pieces of evidence are addressed in the relevant substantive sections below. The CMA has already noted the large amount of information provided.[163] (**Section 3.6.3.4)**

355. In the following sections we evidence that our proposed scope and cost of non-infrastructure maintenance expenditure is reasonable, that the strategic methods of forecasting are both soundly based and consistent with the tactical approach to interventions, and that the tactical interventions for the short term have been identified based on real asset performance. This supports our assertion that it is not appropriate to significantly reduce the level of MNI expenditure.

356. Our response is structured as follows:

- the CMA's view on scope of the overall MNI programme (including serviceability) (see **Section 3.6.1**);
- assessment of Bedminster Service Reservoir (see **Section 3.6.2**);
- assessment of (1990s) water treatment works (see **Section 3.6.3**); and

[162] This in turn feeds into future modelling

[163] CMA hearing with Ofwat and Bristol Water 3 June, Chair's introduction, p.3-4.

- assessment of other areas of MNI (see **Section 3.6.4**); and
- efficiency cost forecasts for MNI (see **Section 3.6.5**).

3.6.1 Scope of the overall MNI programme (including serviceability)

357. The CMA notes that it has not reviewed all of our MNI programme in detail but, along with Aqua, has focused on the three largest categories of spend, each of which are considered in separate sections below: Bedminster Service Reservoir; water treatment works assets; and increasing areas of M&G expenditure.

358. As set out in this response, we have identified significant errors and misunderstandings within Aqua's analysis and assessment of the six areas of investment identified for its review. Given this, we are concerned that Aqua's opinion may have unduly influenced the CMA's conclusions. As a result of this, we asked KPMG[164] to provide an overview of Aqua's findings from a process perspective, and CH2MHill[165] to look specifically at the approach to assessment of Base expenditure.

359. As a general point, the CMA states that serviceability for non-infrastructure assets (measured via the non-infrastructure asset reliability performance measure for AMP6) has no obvious link to short-term levels of MNI investment.[166] On that basis, the CMA feels comfortable in rejecting the link between our achievement of stable serviceability during AMP5, and the reasonableness of our AMP5 spend as a reference point for expenditure in AMP6. Instead, the CMA appears to lean towards Ofwat's view that it would be reasonable to revert to AMP4 levels of MNI expenditure, which are around 50% below what we believe is required for AMP6. [167]

360. We consider that the link between maintaining stable serviceability and the level of MNI expenditure should not be dismissed.

361. For AMP6, the 'serviceability' measure has been replaced by the 'non-infrastructure asset reliability' measure. This includes unplanned maintenance events[168] and DWI enforcement orders,[169] both of which link strongly to MNI investment.[170]

362. The sub components of the serviceability (AMP5) and asset reliability (AMP6) measures are identified on the basis of historic performance relevant to each company. As a result, all

---

164 KPMG Review of Aqua Report (RPF013).

165 CH2M Hill Review of Aqua Appraisal of Bristol Water (RPF014)

166 PFs, para. 5.106.

167 PFs, para. 5.107.

168 Unplanned maintenance events cover maintenance carried out on an asset that does not conform to or is not included in a maintenance plan. This may refer to maintenance carried out on failed critical assets or for maintenance carried out on assets damaged through third party actions or consequential effects of other work. It may also refer to reactive work on assets that have not yet been subjected to a full Planned Maintenance regime. The level is monitored as an early warning sign of too few or too many interventions.

169 DWI Enforcements Orders related to the 'non-infrastructure asset reliability' measure are associated with poor bacteriological quality at treatment works. Reduced maintenance of treated water storage structures and equipment associated with the treatment process would lead to an increased risk of coliform failures. A copy of the DWI Enforcement policy is provided at (RPF078)

170 It is fair to note that the other performance measures in this group, such as turbidity at treatment works and coliforms non-compliance do not have such a strong link to short term levels of MNI investment. For example, interventions such as maintenance work on filters, or on membranes on reservoir roofs, impact on these measures, but lack of maintenance will not necessarily impact immediately

companies have different targets for the different components. These targets have historically been based upon Ofwat's assessment of an individual company's best performance. We therefore have to maintain assets to deliver performance at or around our historic best performance levels.

363. Of the five component performance measures, we have a zero target for four of them:[171]

- Water Treatment Works Coliforms non-compliance (%);
- Service Reservoir Coliforms non-compliance (%);
- Turbidity performance at Treatment Works (nr); and
- Enforcement orders from DWI (nr incidents).

364. This means that even though immediate levels of MNI investment may not appear to impact on these measures, appropriate maintenance of MNI assets is imperative to ensure that performance of the assets can be maintained, as slight deviations from good performance can impact the measure significantly. Three examples are provided below:

- reduced maintenance of treated water storage structures leads to an increased risk of coliform failures (both at service reservoirs in the distribution network and treated water reservoirs at treatment works). Any structural deficiencies that allow ingress would be identified by water quality failures as opposed to proactively as part of a programmed inspect and maintain schedule.

For example an inspection at Pucklechurch identified the following:

Name of structure:	**Pucklechurch Reservoir - A Compartment**			
Date of inspection:	**01 September 2014**			
Item No.	**Remedial measures required**	**Time-scale**	**Date completed**	**Signature**
1	Remove sections of fiberboard that is present and falling from internal roof joints.	A		
2	Seal hole within the upstand of the level probes around cabling, remove plastic vent covers and repair with concrete, holes through upstand.	A		
3	Repair column within valve house where concrete repair mortar cracked.	A		

Source: Bristol Water, extract from Pucklechurch Inspection report. This is unsigned prior to the work being completed

Identification of the holes (item 2), enabled their repair to be implemented prior to coliform failures, which would have occurred as a result of ingress into the reservoir.

- reduced maintenance and calibration of on-line turbidity monitoring at treatment works significantly increases the risk of treated water turbidities > 0.5 NTU not being identified and prompting a works shutdown i.e. a turbidity meter which had not been maintained and calibrated could be showing 0.3 when actual results 0.6 NTU.

[171] A zero target is where the target it to have either no failures or a sufficiently small number of failures that the reported figure rounds to zero at the defined number of decimal places; other companies also have zero targets.

- Enforcement orders associated with coliform failures at a treatment works would be linked to reduced maintenance of structures at treatment works (as per Pucklechurch example above) and reduced maintenance of on-line equipment associated with primary disinfection at the sites.

365. The DWI notes that:

> *"Companies should also be able to demonstrate to the Inspectorate and CCGs that business plans include sufficient levels of base maintenance expenditure to operate and maintain existing assets to ensure that compliance with the Principal Regulations is maintained; that the quality of drinking water does not deteriorate and, where it is deficient, is improved."*[172]

366. It is therefore important that the CMA allows appropriate levels of MNI spend (see **Section 3.6.5**).

3.6.2 Bedminster Service Reservoir

367. The CMA's provisional findings with regard to Bedminster Service Reservoir (Bedminster SR) are that:

> *"Taking the evidence in the round, we consider that Bristol Water's case for an MNI investment in a new reservoir at Bedminster has not been made, without more detailed evidence by Bristol Water of why this is the best option for customers."*[173]

368. The evidence on which the CMA has relied includes:

- the lack of evidence to suggest a consequential effect on our ability to supply the areas previously supplied by Bedminster during the two years it has been out of service;[174]
- Aqua's analysis which they believe indicates that there are *"credible alternatives to the rebuilding of Bedminster Reservoir at Bedminster"*;[175]
- the lack of evidence to demonstrate that these alternatives have been fully considered and compared in order to identify replacement as the best solution;[176]
- Aqua's analysis which states *"that there is significantly more storage than currently required"*;[177]
- Aqua's finding *"that zonal demand can be supplied through various mains"*;[178]
- the fact that there has been *"no apparent impact on relevant serviceability measures"* during the last two years;[179]
- the belief that we require a higher margin of storage than other companies in the region experiencing similar seasonal fluctuations; [180]

---

[172] DWI Information letter 01/2013 "The 2014 Periodic Review of Prices – Guidance on Drinking Water Quality Requirements' dated 1st Feb 2013 (RPF051) para 5.12.

[173] PFs, para. 5.123.

[174] PFs, para. 5.113.

[175] PFs, para 5.116.

[176] PFs, paras. 5.114-5.115.

[177] PFs, para. 5.117.

[178] PFs, para. 5.117.

[179] PFs, para. 5.117.

- the failure to consider locating the reservoir elsewhere, bearing in mind the broader context of total network requirements, or to demonstrate that Bedminster is the optimum location;[181] and
- the potential impact of the Southern Resilience Scheme. [182]

369. We continue to believe the case for Bedminster is clear and that it is the best option for our customers, particularly taking into account their views as expressed through our customer engagement.[183] Each of the concerns raised by the CMA can be addressed. For instance:

- any concerns regarding the lack of impact on our ability to supply or serviceability during the last two years must be seen in the context that Bedminster SR is required for resilience, rather than storage (see **Section 3.6.2.1**);[184]
- this also means that a simplistic calculation of available storage is misleading, given that the purpose is to provide localised storage to meet the resilience needs of the local zonal demand. Seen in that context, suggestions that we have too much storage are unfounded (see **Section 3.6.2.2**);
- equally, we do not consider that we require greater levels of storage than other comparable companies and provide evidence to this effect (see **Section 3.6.2.3**);
- because of the nature of the Bedminster supply zone, the resilience risk can not effectively be mitigated either through supply from other mains or the Southern Resilience Scheme (see **Section 3.6.2.4**); and
- our assessment of the site, informed by engineering consultants,[185] concluded that the only viable option is to replace Bedminster SR. We can demonstrate that the alternative options put forward by Aqua are not 'credible' by reference to the potential impact on customers, a whole life cost analysis of the best solution, and the need to manage the resilience risk (see **Section 3.6.2.5**).

370. Consequently, we believe that replacement of Bedminster SR is the best option for customers. We recognise, however, that with all investment associated with resilience objectives, there will always be a level of uncertainty about whether it is required. We consider that the right balance of risk is that voiced by our customers, but understand that the CMA may wish to apply its own view of risk.

3.6.2.1 What has been the impact of the reservoir being out for 2 years?

371. The CMA concludes that we have been able to manage without Bedminster SR since it was taken out of service in 2013, and that this casts doubt on the need for it to be replaced. This suggests a misunderstanding of the fact that Bedminster SR is needed for resilience rather

---

[180] PFs, para 5.119.

[181] PFs, paras. 5.121-5.122.

[182] PFs, para. 5.121.

[183] The driver for Bedminster SR is emergency water supply: Customers ranked 'making sure water is always on tap' as their equal top priority for service in our customer priorities research and the value they placed on avoiding interruptions to supply was the reason for the scheme's selection in the Cross Asset Optimiser.

[184] PFs, para. 5.113.

[185] B&V Bedminster Reservoir Replacement at Barrow Proposal July 2015 (RPF002; B&V Bedminster Reservoir Refurb/Replacement Costing Calculations 2013 (RPF003); B&V Bedminster Reservoir Options Comparison July 2015 (RPF004); B&V Bedminster Reservoir roof repair sketches (RPF005); B&V Bedminster Reservoir costs and risk register (RPF006); B&V Barrow replacement of Bedminster scale plan (RPF007); B&V Bedminster Reservoir Refurbishment Proposal July 2015 (RPF008); B&V Structural Comments on Bedminster Reservoir 2013 (RPF011); B&V report. Option Agreement Summary Note. 8 June 2015 (RPF029); BV inspection June 2013 (RPF034);

than for operational storage. In practice, this means that the storage at Bedminster SR is required in times of emergency, as opposed to on a day-to-day basis. Seen in that context, and given that we have been fortunate enough not to experience any resilience issues in that period that would have called on that storage, it is unsurprising that normal supply and serviceability have not been impacted.

372. During the development of our Business Plan, replacement of Bedminster SR was included in the Cross Asset Optimiser (**CAO**) as a named scheme. It was not included as a 'must invest' scheme, so the CAO had free choice as to whether to select it as part of the optimisation process. Replacement of Bedminster SR was selected by the CAO on the basis of the value customers placed upon the benefits of the emergency storage it offers.

373. The key issue when considering Bedminster SR, therefore, and the role it plays in a broader network context, is the level of resilience risk to which customers are exposed. The primary purpose of Bedminster SR is to prevent interruptions to supply in the case of the loss of either a trunk main or another service reservoir.

374. In the area that Bedminster SR covers, at a zonal level there are approximately 48,000 connections currently at risk of service failure in the event of a major incident. At a local level there would be approximately 25,100 connections at risk of service failure with the future zoning arrangements.

375. This risk has not materialised in the two years since Bedminster SR was taken out of service. However, we have experienced two major bursts in the zone in the last thirteen years; one in 2002 (Bridge Valley Road), one in 2007 (Hotwells) Our customer research identified the value customers place on the avoidance of interruptions, and this in turn informed the CAO.

3.6.2.2 Do we already have more storage than we require?

376. The CMA notes that Aqua has concluded that we have more storage than we require. We understand why Aqua may have reached this conclusion, but it reflects total storage, as opposed to localised storage, so has no bearing on the resilience case for Bedminster SR.

377. Looking across the totality of our supply region, if total storage available is divided by the total storage required, this indicates that we have an apparent storage surplus and that there is sufficient storage available. There are various reasons for this, including the fact that we have existing storage aimed at satisfying historic local demand that no longer exist (e.g. industrial demand at Avonmouth). Storage will only be relevant, however, in the context of the resilience of a supply zone if it is in the right location. It is, therefore, inappropriate to take into account storage at sites that are so far distant from the centres of demand being protected as the water stored cannot be delivered to the centres of demand.

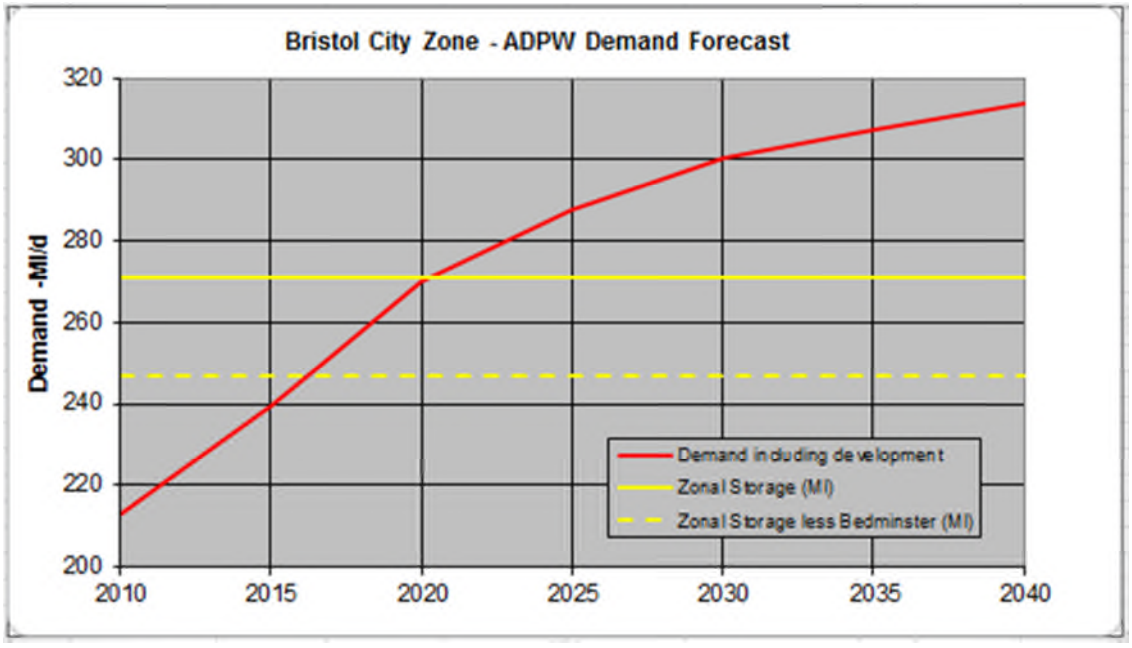
378. It is clear from the CMA's consideration of growth expenditure (see **Section 4.7**) that it has understood the role of service reservoirs to meet local requirements and the resilience impact that such reservoirs have.[186] We would expect the CMA to reflect this in its consideration of the availability of relevant storage, and to discount Aqua's analysis accordingly.

379. The original analysis compared the total zonal demand for the City of Bristol with the total local reservoir storage available with and without Bedminster SR up to the year 2040. The

[186] PFs, Appendix 6.1, para. 39.

demand forecast was based on County Council Core Regional strategies and 'received requests' for water supplies from developers. The conclusion was that there is an overall shortfall, in the event of an emergency, from 2016 (without Bedminster SR) and by 2020 (with Bedminster SR). By 2040 there is an overall storage shortfall of 43 Ml (with Bedminster SR) as illustrated below (Figure 13).

Figure 13 Bristol City Zone - ADPW Demand forecast



Source Bristol Water

3.6.2.3 Do we require a greater level of storage than other companies?

380. The CMA notes that we appear to "*require a higher margin than other water companies in the region who have similar seasonal fluctuations*".[187] This appears to be based on the assessment in the Aqua Report.[188]

381. We challenge the basis of this analysis, and the interpretation that Aqua has placed on the data that it has.

382. Aqua's analysis cites four companies, although data is only included for three and for one of those the definition of demand is not provided. We have requested information from other companies and consultants to better understand whether Aqua's sample is representative, and whether we are taking a risk averse approach to sizing our service reservoirs.

383. From the data we have received (see Table 15), it is apparent that

- there is no particular standard that companies use;
- some companies use average demand, others use peak demand;
- most companies use 24hrs, with some using more and a few using less.[189]

---

[187] PFs, para. 5.119.

[188] Aqua Report, Section 4.3.

384. We have been unable to find a standard approach to sizing service reservoirs either nationally or internationally. Individual companies will have developed their approach to service reservoir sizing base on operational experience of their own networks. This approach will be influenced by the existing resilience in the distribution network.

385. Our approach to sizing service reservoirs has been based on a report by Sir William Halcrow & Partners relating to reservoir sizing, dated October 1987[190] and has been the basis of sizing all of our service reservoirs post privatisation.

386. Given that there are other companies that size service reservoirs based on greater hours of storage (48hrs) or that use a higher demand (peak day) and that use combinations of the two that result in more generous storage sizing than our own, we consider that Aqua's conclusion that we have significantly more storage than currently required is not correct.

---

[189] With regards to the hours of storage required, interpretation of operational and emergency need varies, and many companies (including ourselves) include the positive benefits of local resilience in order to reduce service reservoir capacity where necessary.

[190] Sir William Halcrow and Partners - Inception Reports on Future Water Supply Strategies – Standard Appendices (RPF061)

Table 15 Water Company Service Reservoir sizing - basic components

Company	Based on demand measure	Peak Day	ADPW	Average demand	Target/typical storage (time)	Operational component	Emergency component	Planning horizon
Bristol[191]	Average day peak week zonal demand		Y		24hrs	12hrs	12hrs	25 years
Portsmouth[192]	Average zonal demand			Y	48hrs	All	None	40 years
Wessex[193]	Annual average demand,			Y	15hrs	6hrs	9hrs	15yrs from date of completion
	unless area has seasonal demand from tourism industry, then peak week or peak day	Y	Y		Qualifications regarding when allowances may be lower (alternative feeds) or higher (insecure bulk supplies); approach includes risk analysis			
South East[194]	Average day peak week				24hrs emergency storage with sufficient working component to accommodate operation daily supply demand balance			25 years
Southern[195]	Average day peak week		Y		Typically 24 hours but no more than 48 hours due to water quality issues			25 years from WRMP forecast
South West[196]	Annual daily average demand			Y	min 30 hrs unless 2 or more feeds/alternative source/upstream reservoir			n/a
Thames[197]	Average day peak week		Y		max capacity to be provided to cover for trunk mains failure would be 36 hours or 1.5x the average daily demand, maximum provision only used in most unfavourable circumstances			Suitable planning horizon'
United Utilities[198]	The volume of storage must be sufficient to balance the fluctuations in demand in a defined zone of supply during peak periods, and maintain supplies under defined emergency or planned maintenance conditions				Min 24hrs; max 48hrs	24	Up to 24	n/a
Welsh[199]	n/a				24 hrs contingency storage, 48 hrs in places with large daily fluctuations	min 6hrs to balance flows	n/a	n/a
Academics / Consultants								
Imperial College[200]	Average day peak week		Y		24hrs	12hrs	12hrs	n/a
Atkins general	Average day peak week		Y		24hrs	12hrs	12hrs	n/a

191 Bristol Water.

192 Portsmouth Water (by email); available on request.

193 DS660 Service Reservoirs cited by Aqua; provided to BW by Wessex (by email); available on request.

194 South East Water (by email); available on request.

195 Southern Water (by email); available on request.

196 TS399 Design and Maintenance of Service Reservoirs 2008 (cited by Aqua); available on request.

197 Thames water design standard for service reservoirs (via Atkins); available on request.

198 United Utilities, (by email, taken from Water Network: Service Reservoirs Jan 2013); available on request; NB Aqua cited this report as a null return.

199 Water Distribution Manual 2005 (cited by Aqua); available on request.

200 Imperial college (by email); advises 24hrs ADPW is best practice; available on request.

Company	Based on demand measure	Peak Day	ADPW	Average demand	Target/typical storage (time)	Operational component	Emergency component	Planning horizon
agreement [201]								
Hydroco general agreement [202]	Average day peak week		Y		24hrs	12hrs	12hrs	n/a

Source: various

387. The following table (Table 16) shows the number of hours of storage companies have relative to their distribution input. This shows that our hours of average storage is at the low end of the range for the companies for which we have the data

Table 16 Hours of service reservoir storage (company supply area)

Estimated Capacities	Ml	Hours average	m^3 per prop
Severn Trent	3572	46.49	1.08
South West	1176	66.90	1.55
Anglian	2297	47.52	1.17
South East	1611	70.84	1.88
Bristol Water	537	45.54	1.10

Source: Bristol Water analysis of 2009 asset inventories[203]

3.6.2.4 Can zonal demand be mitigated through other mains or the Southern Resilience Scheme?

388. The CMA refers to Aqua's finding that "*zonal demand can be supplied through various mains*" in the context of suggesting that the need for Bedminster SR has not been established.[204]

389. Demand under normal conditions can be met from other mains in the zone as is the case at the moment without Bedminster SR in service. Other mains will not necessarily help in an emergency situation, which is when the storage at Bedminster SR would be required, because incidents can occur anywhere within the network meaning storage is needed close to the centre of demand.

390. The Southern Resilience Scheme (**SRS**) would not necessarily assist with mitigating zonal demand in times of an emergency. The SRS will allow treated water to be supplied from Cheddar to Barrow, but Bedminster SR is still needed to help with any incidents in the Bristol city zone. We could have Purton, Barrow and Littleton in service and have a major burst in the city and still lose supplies to customers regardless of whether or not the SRS is supplying Barrow.

---

201 Atkins (by email); available on request

202 Hydroco (by email); available on request

203 We requested this data from Ofwat as a FOI request; only four companies agreed to this data being shared.

204 PFs, para. 5.117.

3.6.2.5 Are there credible alternatives to replacing Bedminster SR?

391. The CMA states that in reaching the decision to include replacement of Bedminster SR in our Business Plan it would expect to see a full review of the need, along with a comparison of the four options Aqua has identified as being credible.[205]

392. While some of this analysis has been provided in our submissions to the CMA,[206] we accept that we have not provided a full description as to why the option of refurbishment was dismissed as unviable, and why we did not consider locating the replacement reservoir at Barrow. We do not consider, however, that this is a relevant factor in determining whether the need and best solution have been established.

393. In order to put this into context, we have produced **Appendix 3.1** which sets out in detail the history of Bedminster SR, the circumstances that led to it being taken out of service, and the basis for the decision that it needs to be replaced. It also sets out the four options identified by Aqua, and our position on each of those options, the conclusion being that of these options, replacement of Bedminster SR at Bedminster is the best solution to address the resilience risk. The key points in relation to each option are summarised below.

3.6.2.5.1 Do nothing[207]

394. When the total demand of the Littleton/Purton/Barrow zone is compared with the total storage in the zone there is a shortfall in 2016 without Bedminster SR.

395. A 24Ml reservoir at Bedminster provides storage for well over 30,000 customers.[208] Should there be a failure of a major trunk main in the city rezoning would allow Bedminster SR to provide considerable extra time for a repair to be made before customers lose their water supply. Consequently, a replacement reservoir would significantly reduce the risk to customers of losing their water supply.

396. Based on avoiding a 6-12 hour interruption to supply, the benefit per customer is £337.[209] Having experienced two major burst main events in the zone in the last thirteen years, a risk of 1 in 10 years is a conservative figure. This gives benefits of £1m p.a.[210] Compared with an annualised cost of providing the reservoir of £0.31m,[211] this demonstrates that the benefits of replacement exceed the costs by a factor greater than 3. By contrast, doing nothing would increase the risk to customers of supply interruptions in the Bristol zone.

397. As we have explained above, the fact that there have been no supply interruptions in the two years since Bedminster SR went out of service is not relevant to this assessment (see **Section 3.6.2.1** above).

---

[205] PFs, para. 5.114.

[206] B&V Bedminster Reservoir Options Comparison July 2015 (RPF004).

[207] See Section 3.1 of Appendix 3.1.

[208] A customer is the who pays the bill and is equivalent to a connection. A consumer is an individual that receives water and is part of the population.

[209] June Company Wide Plan, Table 16, (SOC005).

[210] Calculation (0.1x30,000x 337) = £1.0m.

[211] At 4.5%, 100 years and £6.14m.

3.6.2.5.2 Refurbish Bedminster SR[212]

398. Contrary to the conclusions of Aqua, refurbishment of Bedminster SR is no longer a viable option. The reservoir has a history of extensive leakage and cracking dating back to when it was built. We have undertaken a repair and refurbishment programme for over 25 years since the first recorded recommendation to replace the reservoir in 1986. As such, at the time the decision was taken to recommend replacement, we were already operating a refurbishment strategy.

399. The situation in the 2013 inspection identified significant structural cracking and displacement, despite the reservoir having been operated at a lower top water level for over 15 years. Any further refurbishment would have to address the movement in the roof and this would be extremely expensive.

400. Black and Veatch was asked to consider refurbishment and estimated that refurbishment would cost more than replacement and would not provide any guarantee of serviceability improvements.[213] Assuming further refurbishment would be required in twenty years time, the NPV of replacement is much lower than refurbishment.

401. It was identified in the 1986 report by Sir William Halcrow and Partners that remedial work to address the movement in the roof, which had been identified as being the primary cause of cracking in the structure, was structurally undesirable and would be expensive. The repair and refurbishment programme that has been followed since that date has been based upon interventions that did not require remedial work to curtail movement in the roof. The extent of cracking and displacement noted in the 2013 report demonstrated that further repairs and refurbishment would no longer be successful and, as we knew that major remedial work to address the movement was undesirable and expensive, the decision to finally abandon the structure was straightforward and subsequently supported by consultants.

3.6.2.5.3 Replace Bedminster SR with a new service reservoir at Barrow[214]

402. As Aqua acknowledges in its report, we did initially consider the option of replacing Bedminster SR by building a replacement at Barrow.[215] Aqua criticises us, however, for dismissing Barrow as a potential site without detailed costing, given that it believes if located there the stored volume could supply any of four trunk mains.[216]

403. Black and Veatch have since costed the option of building a replacement service reservoir at Barrow.[217] This confirms that construction of a 24Ml reservoir at Barrow would be a similar cost to that of building the storage at Bedminster.

404. If positioned at Barrow, the service reservoir will be over two miles away from its area of supply. The trunk main between Barrow and the existing Bedminster site was laid around 1847 and consequently must be at greater risk of failure than the renovated trunk mains from the existing Bedminster reservoir site to the city of Bristol. Given that the purpose of

---

212 See Section 3.2 of Appendix 3.1.

213 B&V Bedminster Reservoir Refurb/Replacement Costing Calculations 2013 (RPF003).

214 See Section 3.4 of Appendix 3.1.

215 Aqua Report, para. 115.

216 Aqua Report, para. 116.

217 B&V Bedminster Reservoir Refurb/Replacement Costing Calculations 2013 (RPF003).

the reservoir is resilience, it makes more sense to locate the service reservoir at Bedminster rather than factor in the additional risk relating to the condition of the trunk main from Barrow and the additional distance from the population affected.

3.6.2.5.4 Replace Bedminster SR at Bedminster[218]

405. Replacing the service reservoir at Bedminster is our preferred option. Following a review by Black and Veatch, we determined that it is the best solution both in terms of cost and operational flexibility. We note that the CMA has reviewed our proposal, and concludes:

> *"Bristol Water provided us with analysis of the proposed plans for Bedminster Service Reservoir provided by Black and Veatch, and it appeared to indicate a reasonable and well-costed proposal for a new reservoir (ie option (d)).*"[219]

3.6.3 (1990s) Water Treatment assets

406. Our Business Plan proposes expenditure of £34m in AMP6 on replacement of water treatment assets. The CMA's provisional finding is that we have not justified the increase in expenditure in water treatment works maintenance in AMP6 comparative to AMP4 and AMP5, specifically with respect to 1990s water treatment assets.[220] As such, the CMA has identified a range of potential expenditure from £15m-£34m based on low, medium and high investment scenarios.[221] The CMA indicates that it believes costs should be able to reduce towards AMP4/AMP5 levels (i.e. the low and medium investment scenarios).[222]

407. In reaching this conclusion, the CMA has relied on the following factors:

- the expenditure proposed for AMP6 is over 50% more than was spent in AMP5 and over 200% more than was spent in AMP4;[223]
- criticisms of our approach, forecasts and evidence by Aqua;[224]
- the perceived lack of detail of what needs replacing in the near term based on the condition and performance of the assets;[225] and
- despite this accounting for over 40% of total MNI expenditure, the information to support it has been provided at a late stage of the process.[226]

408. We disagree with the CMA's conclusions on the following basis:

- we believe that the increase in expenditure in AMP6 compared to previous periods is justified and can be evidenced[227]**;**
- we consider that Aqua's review of water treatment investment planning and proposals and, therefore, the Aqua Report, have been tainted by multiple

---

218 See Section 3.3 of Appendix 3.1.

219 PFs, para. 5.115.

220 PFs, para. 5.133.

221 PFs, para. 5.134.

222 PFs, para. 5.133.

223 PFs, para. 5.125.

224 PFs, para. 5.130.

225 PFs, para. 5.132.

226 PFs, para. 5.128.

227 SoC Table 60; CMA0140 Bristol Water's response to CMA Question 2 of 12 May and Appendix 3.2 of this document.

misunderstandings and misrepresentations of our approach that have resulted in erroneous and misleading conclusions. Details of these concerns, and how they impact on the validity and reliability of the Aqua report, are set out in **Section 3.6.3.1.1** (use of named schemes and deterioration modelling) and **Section 3.6.3.1.2** (challenges to specific named schemes);

- we have provided details of the near term replacement needs which should address the perceived information gap (see **Section 3.6.3.2**); and
- whilst we accept that the information the CMA has sought has been provided at various stages through the process, this does not mean that it did not exist, nor should it be seen as impacting the quality of our proposals (see **Section 3.6.3.4**).

409. In relation to the Aqua Report, we note that the criticisms contained therein and relied upon by the CMA were not raised during the meeting with Aqua on 27th May 2015. Our planning process and proposals for water treatment works investment was not discussed at all. As a result, we do not feel that we have had adequate opportunity to formally respond to these challenges in advance of the PFs. This means we have not been able to provide Aqua with the information it has either not been able to find, or which we have not previously submitted, such as the detailed outputs from the asset level models and the analysis of the named schemes. The Aqua Report should, therefore, be read in this context.

3.6.3.1 Identification of planned expenditure

3.6.3.1.1 Use of named schemes and deterioration modelling

410. As we have explained, our approach to projecting AMP6 spend on water treatment assets was based on a combination of the scenario outputs of the asset level models (ALMs), and the identification of named schemes, both of which were fed into the cross asset optimiser (CAO) in order to determine the optimal programme of investment.

411. The CMA instructed Aqua to review our approach in order to assess whether it is consistent with best practice in identifying a five year investment plan.[228] In relation to the interaction between the ALM and the named schemes, the CMA refers to the following commentary from Aqua:

> *"it was unclear why the £14 million of named schemes were required in addition to the outputs identified by the modelling approach. If the model predicts accurately any additional work would be expected to be exceptional."*[229]

412. In making this criticism of the robustness of our model, we consider that Aqua has misunderstood the scope of each of the components of our planning approach, and how they interact with each other. The water treatment works and operational structures ALMs are based on risk and performance and, therefore, identify only those maintenance interventions required in response to the deterioration of the assets over time. The named scheme process is intended to capture schemes where the requirement to intervene is not driven by deterioration over time, or where the factors that drive the investment are not capable of being modelled. An example of this is investment linked to health and safety drivers. Given that the ALMs and named schemes capture investment required by different drivers, it is entirely logical that our programme would be based on a combination of both.

---

228 PFs, para. 5.130.

229 PFs, para. 5.130(a).

As such, any conclusion that the use of named schemes implies that the model does not make accurate predictions is unfounded.

413. As we explained at the hearing on 3 June 2015 in relation to econometric modelling, models will only ever tell part of the story.[230] For econometric models, this is mitigated through the use of special factors. The role of named schemes in this context as a supplement to the ALMs can, therefore, be seen as being equivalent to the use of special factors to support the econometric modelling. In taking this approach of not expecting deterioration models to explain all maintenance needs, we are following industry standard practice.[231]

414. In order to support this, we have set out more details in **Appendix 3.2** about the parameters of the ALMs used in the context of water treatment asset expenditure – namely the water treatment works model, and the operational structures models. This information was provided in the supporting documents[232] for the modelling. [233] We have also provided details of the named schemes that were input into the CAO alongside the scenarios from the ALM, as well as identifying which named schemes were excluded because we considered that they were already covered by the output of the ALMs.

415. We accept that, over time, models can be continually improved, more granular data can be collected and asset coverage can be improved. Indeed, this is the process that we have followed if our approach at PR14 is compared to how we approached PR09. For instance, the move to extending our intervention modelling beyond mains, treatment works and pumping stations to cover the wider asset base[234] at PR14 was a significant improvement compared to PR09. Also, by having all the models based on the same platform and optimised on the same basis through the CAO, we were able to consider all aspects equally.

3.6.3.1.2 Challenges of specific named schemes

416. In the PFs the CMA raises challenges and concerns regarding the named schemes relating to chlorination, environmental compliance, media replacement and UV replacement. Each of these is addressed in the following sections.

---

230 Main Party Hearing of 3 June 2015, p.141..

231 CH2MHill notes that "*These types of approach are, in our experience, quite typical of the approaches used in the UK water industry*." (RPF014) section 5.3.1

232 Previously submitted: ALM Output Record Treatment Works (SOC417); PR14 Wilco Model Inputs Outputs v4 (SOC426); ALM Technical Description Operational Structures (SOC443); ALM Technical Description Water Treatment Works (SOC450); WP2-3 Operational Structures (SOC458); WP1 Operational Structures (SOC355); WP1 Treatment Works (SOC358); WP2-3 Water Treatment Works (SOC469); Additional document ALM Output Record Operational Structures (RPF077)

233 CH2MHill notes that "*Intrinsically, we do not think there is anything wrong with these models and in fact, we consider them to be good practice in that they support forecasting of maintenance and service, operate at process level, take account of criticality and provide appropriate outputs for the optimisation process. Other, larger companies use equivalent models.*" (RPF014) section 5.3.2

234 SoC Figure 39:

- Infrastructure: Mains (distribution, trunk, raw water), Supply demand balance, zonal, line of works, raw water reservoirs
- Non-infrastructure: Water treatment works, pumping stations, service reservoirs, operational structures, metering
- Management and General: IT, vehicles; buildings; telemetry & communications, standby generation NB, ultimately only the building model was successfully developed.

3.6.3.1.2.1 Chlorination

417. The CMA refers to the following comments from Aqua regarding chlorination named schemes:

> *"Some £5.5 million is allocated to chlorination schemes. Aqua suggested that Bristol Water should provide further evidence that these are consistent with wider policy on replacement with 'On Site Electrolytic Chlorination' and to demonstrate that there is no duplication".*[235]

418. The challenge from Aqua relates to whether the maintenance of chlorination equipment identified due to deterioration is consistent with our move to On Site Electrolytic Chlorination (**OSEC**). Our approach is consistent and justifiable by reference to the underlying evidence. In particular, we can demonstrate:

- that the move to OSEC is driven by health and safety and resilience risks;
- how OSEC interfaces with the existing chlorination system;
- that the move to OSEC was initiated in 2012 and was, therefore, not part of the planned maintenance interventions funded at PR09;
- the approach to identifying potential AMP6 expenditure based on delivering the residual AMP5 programme and the sites impacted; and
- the approach to OSEC implementation and the limiting and promoting impacts of other interventions.

419. Thus whilst we accept the comment regarding the potential for overlap between the chlorination scheme maintenance work identified from the model (based on the deterioration of existing chlorination assets) and the planned installation of OSEC, where this occurs (at Cheddar and Chelvey TWs), the impact (£350k) is not significant.236 The detail to support this position is provided in **Appendix 3.2**.

3.6.3.1.2.2 Named environmental schemes

420. The CMA refers to Aqua's comment that:

> *"Additionally, there are two named schemes, each to the value of £2 million, that appear to deal with environmental compliance".*[237]

421. The implication is that there may be duplication across these schemes, and that they are not appropriate. The two named schemes are:

- Various Sites: Environmental compliance upgrades (SERA); and
- Various Sites: Environmental compliance upgrades (Oil Containment).

422. Whilst part of the environmental compliance upgrades, these two schemes are different, the similarity in costs is coincidental and inclusion of both schemes is therefore not a duplication. Further details are included in **Appendix 3.2.**

---

[235] PFs, para. 5.130 (b).

[236] CAO WTW Data (RPF062).

[237] PFs, para. 5.130(b).

3.6.3.1.2.3 Media & UV lamp replacement

423. The CMA also challenges the inclusion of £3.6 million for media replacement, following expenditure of £2.1 million in AMP5[238] and suggests that the replacement of UV lamps is a relatively inexpensive maintenance intervention. [239]

424. In Appendix 3.2 Section 5 we explain the basis of the media costs, the UV costs and compare forecasts with experienced and expected annualised costs.

3.6.3.2 Reconciling the models to the assets

3.6.3.2.1 Model validation

425. Our individual models were subjected to an extensive sensitivity and uncertainty analysis, based on Monte Carlo simulations. The analysis was conducted by SEAMS as part of their work on the CAO.[240]

3.6.3.2.2 Detail of near term replacement

426. The CMA notes that it "*would have expected that better detail of what needed replacing in the near term would be readily available based on the condition and performance of these assets*."[241]

427. The models include the performance of the assets as an input and the specific processes requiring interventions as an output. We provided this information in diagrammatic form in our response to a CMA query.[242]

428. The modelling output is translated into specific schemes as part of the development of the investment programme during AMP6. The CMA is correct in its assumption that we have already identified the detail of what needs replacing in the near term and that this is based on the condition and performance of individual assets. The investment programme will continue to develop during the AMP as real asset performance is identified. Such performance data will also form part of the updates to our models for PR19 and will be used to validate forecast performance.

429. Due to the impact of needing to abide by FD14 during year one of AMP6 pending the outcome of the CMA redetermination process, we have constrained our maintenance programme to levels below the optimum, therefore identifying a higher risk/cost constrained capital programme for 2015/16. Within this programme we have identified the schemes shown in Table 17 below which have been through internal approval procedures for delivery.

---

238 PFs, para. 5.131(b).

239 PFs, para. 5.131(b).

240 Summary of CAO including sensitivity analysis SOC364; Technical appendices SOC427 to SOC439 detail all sensitivity analyses,

241 PFs, para. 5.132.

242 Bristol Water's response to CMA Main Party Hearing Question 3 on MINI,3 June 2015, Figure 1.

Table 17 AMP6 WTW maintenance - approved interventions (in 15/16 price base)

Name	Details of scheme	Forecast delivery cost	Reference of IAG Paper	Document Date	Where included in PR14 BP	Total allowed in model
Littleton GAC Replacement	Regeneration of Filter 10 media Programme of replacing life expired media (10-11 year replacement cycle) but expenditure constraints have required an additional regeneration. Littleton prioritised over Purton as Littleton media >10 years old	£20,000	RIP-BN2085-001[243]	08/04/2015	WTW model	zero
Littleton GAC Filter No 9	Replacement of Filter No 9 media Programme of replacing life expired media (10-11 year replacement cycle) but expenditure constraints have required an additional regeneration. Littleton prioritised over Purton as Littleton media >10 years old	£20,000	RIP-BN-2085-002[244]	21/04/2015	WTW model	zero
Purton GAC Replacement	Regeneration of Filter No 2 & No 3 media Programme of replacing life expired media (10-11 year replacement cycle) but expenditure constraints have required an additional regeneration.	£156,000	RIP-BN-2085-003[245]	13/05/2015	WTW model	£60,000
Shipton Moyne Vacuum Pumps	Part of UV process; triggered by pump failure of No 1 pump, No 2 pump assessed as near to failure. Refurbishment option only 3/5th cost and may not be successful so replacement selected. Additionally, 2 x water separators & 1 x electronically operated valve (EOV)	£16,200	RIP-BN-2112-003 (Awaiting Signature)[246]	13/07/2015	WTW model	£225,000 for expenditure on whole UV process; expected to be for UV lamps.
Banwell Membrane Replacement	Membranes have manufacturers' guaranteed life of 7years. Programme of replacing life expired assets. Performance is monitored through daily pressure decay tests; if the pressure decay on a rack is too fast the required	£921,000 (14/15 price base); £941,000 (15/16 price base)	RIP-BN-1850-002[247]	19/09/2014	WTW model	£930,000

[243] RIP-BN-2085-001 (RPF089)

[244] RIP-BN-2085-002 (RPF090)

[245] RIP-BN-2085-003 (RPF092)

[246] RIP-BN-2112-003 (RPF093)

[247] RIP-BN-1850-002 (RPF088)

Name	Details of scheme	Forecast delivery cost	Reference of IAG Paper	Document Date	Where included in PR14 BP	Total allowed in model
	log4 removal won't be delivered, leaving us in breach of the cryptosporidium standard.					
Banwell Membrane Management System	Procurement of MEMBOARD 3-yr contract for web based membrane management system. Included as part of Banwell membrane replacement. To comply with crypto regulations membranes can only be refurbished 3 times and then they need to be scrapped. The refurbishment process requires them to go off site and be returned, meaning reliable membrane records are required. Due to the number of membranes at Banwell (1500) this additional system is required. Due to their smaller number of membranes, other sites can be managed effectively by spreadsheet.	£10,420 (incl above)	RIP-BN-1850-004[248]	07/05/2015	WTW model	incl in Banwell Membrane replacement (above)
Remedial works to civil structures	Planned inspections of 10 culverts (£30k), 35 structures (£105k) Remedial repairs to Stowey ozone tank covers due to ozone gas leak (£5k)	£140,000 (£116,000 approved)	RIP-BN-2120-002 (Awaiting Signature)[249]	02/07/2015	Operational structures	
	Total	£1,303,620				

Source: Bristol Water

430. The table above details £1.3m of expenditure that has been identified as needing to be completed immediately on WTWs and operational structures, this is against a constrained Year 1 capital programme for MNI of £10.954m (15/16) of which WTW investment account for £4.039m (15/16).

431. Interventions in bulk storage tanks (excluding the SERA assessment related work[250]) have been postponed until 2016/17 pending the decision from the CMA. This work has been supported by an assessment by Atkins which included site surveys.[251]

432. Investment Group papers for specific interventions are being prepared for the remainder of Year 1 and for Year 2 for the following schemes:

[248] RIP-BN-1850-004 (RPF091)

[249] RIP-BN-2120-002 (RPF094)

[250] See Appendix 3.2 Section 4

[251] Chemical Tank Storage Replacement Feasibility Report and Appendices (RPF085, RPF086, RPF087)

Table 18 Interventions being investigated for the remainder of 2015/16 and/or 2016/17

	2015/2016	2016/2017
Multiple GAC replacements at Littleton and Purton		Y
Purton Nozzles	Y	Y
Barrow Nozzles	Y	Y
Purton GAC Lining	Y	Y
Barrow DAF Relining		Y
Littleton-Purton Raw Water Surge Vessel		Y
BARROW TW Primary Screening at the Inlet Works		Y
PURTON TW Post Ozone Tanks Remedial Work		Y
STOWEY TW - Replacement of Seprol Control System		Y
Electrochlorination Multiple Sites (2015/2016 - Tetbury OSEC)	Y	Y
Chlorination Equipment Safety (Multiple Sites)	Y	Y
Electrical Safety (Multiple Sites)	Y	Y
Pressure membrane (Multiple Sites)	Y	Y
Purton PACL Bulk Tanks	Y	
Bulk Tanks Multiple sites (excludes SERA assessments)		Y
Refurb of Purton Clarifiers	Y	
Barrow RGF Refurbishment		Y
BARROW TW SSF Decommissioning		Y
PURTON TW High Lift Pumps and Intake PS		Y
PURTON TW Clarifiers		Y
PURTON TW Washwater Recovery and Densadeg Replacement		Y
Rocks Lane Surge Vessel	Y	
ICA Upgrades (Multiple Sites)		Y
Littleton & Purton Surge Vessel Refurb/reline		Y
Surge Vessel Pressure Relief Upgrades		Y

Source: Bristol Water

433. These schemes have been prioritised for the early part of AMP6 due to their critical nature.

3.6.3.3 Uncertainty of actual spend

434. Maintenance activity will always be driven by the actual needs of the asset base. Maintenance named schemes are a response to known issues not driven by deterioration; whereas forecasting maintenance activity in future years due to deterioration is carried out through deterioration modelling. Asset level models predict the average of what will happen; there will be outliers with either better or worse performance than expected.

435. In practice, this means that for the individual assets there may be a lesser or greater investment requirement, thus there will always be a degree of uncertainty regarding actual spend. However, the forecast from the modelling is a robust central estimate of the overall need (to which we have applied a 10% efficiency challenge).

436. As such, the unavoidable uncertainty should not be seen as a reason to reduce the allowance from that predicted by the models.

3.6.3.4 Availability of evidence

437. Within the provisional findings, with respect to the water treatment works expenditure reference is made a number of times that some of the evidence appears to have been provided at a late stage of the CMA's process. Whilst this may appear to be the case from the CMA's perspective, this should not be misinterpreted as an indication that the evidence was not available to inform the assumptions in our Business Plan and SoC. At the most it

should be seen as reflecting the nature of the PR14 process, including the expectations around the volume of supporting data required as part of the submissions, and a natural feature of the Q&A aspect of the CMA's review.

438. Ofwat's expectation for a 'high quality' business plan was one that "*has a coherent narrative based on sound reasoning and contains proportionate evidence*".[252] We believe that the Business Plan we submitted to Ofwat satisfied this expectation and was confirmed by ICS who provided analysis for other companies.[253] This should be seen in light of the outcome of the Grey Review which commented:

> *"We saw considerable evidence to suggest that Ofwat goes too far into the detail of company business plans and that, as a result, the companies are very Ofwat-focussed and very cautious and conservative in their approach. Rectifying this will require a substantial change of approach by both Ofwat and the companies it regulates."*[254]

439. Despite providing a similarly significant amount of information to the CMA alongside the SoC as was provided to Ofwat, it is clearly neither practical nor desirable to provide absolutely every piece of potentially relevant evidence with such a submission.

440. The CMA and Aqua's request for much of the detailed data is, therefore, the first time we have been asked detailed questions during the PR14 and CMA process. We consider that whenever the need for additional evidence has become apparent, we have provided it in a timely fashion.

441. We also note that whilst we have had extensive external review of our programme and the detail behind our business plan, much of this review has taken the form of repeated interactive discussions and demonstration of system data rather than through the production and external reviews of reports. It is therefore not surprising that it takes some time to collate information into a report format.

442. We therefore find the criticism levelled at us regarding the availability of evidence misplaced and misleading. The CMA has already noted the large amount of information provided.[255]

443. A number of the issues around the WTW model would have been easily and quickly resolved if this had been an agenda topic for the meeting on 27 May 2015 and Aqua could have raised the issues it later identified in its report.

3.6.4 Other areas of MNI

444. In relation to other areas of MNI, the CMA looked at Management & General (**M&G**) expenditure, particularly in comparison to equivalent expenditure in previous periods.[256] The CMA notes that despite relatively limited evidence, it believes that in a low investment scenario it should be feasible for us to reduce our M&G expenditure to AMP4 levels, thereby

---

[252] Setting price controls for 2015-20 – final methodology and expectations for companies' business plans, p. 11-12 Section 1.2.1 (SOC063).

[253] ICS letter to the board of Bristol Water (SOC337).

[254] Review of Ofwat and consumer representation in the water sector (The Gray review 2011) (RPF080) , p. 6.

[255] CMA hearing with Ofwat and Bristol Water 3 June, Chair's introduction, p.3-4.

[256] PFs, paras. 5.136-5.137.

removing around £6m of investment.[257] The CMA concludes that it has not seen clear evidence to support a continuation of expenditure above AMP4 levels.[258]

445. The CMA also notes that it has not investigated the pumping station expenditure as, whilst it remains above AMP4 levels, it is significantly decreased from AMP5.[259]

446. We do not agree with the CMA's provisional finding that we should be able to reduce M&G expenditure to AMP4 levels. As we set out in the following sections, we believe that the evidence supports the need for the increase in investment.

3.6.4.1 M&G Investment

447. For M&G investment, the CMA notes that "*in AMP5 Bristol Water spent substantially more than in AMP4 and this spend does not recur in AMP6. Apart from the switchgear replacement, it is therefore unclear why this higher level should continue*".[260]

448. Table 5.12 of the PFs gives details of MNI expenditure for the periods AMP4, AMP5 and AMP6. From this table, the M&G expenditure can be summarised as shown in Table 19 below.

Table 19 Summary of Management & General Expenditure

Expenditure Area	AMP3 (£m)	AMP4 (£m)	AMP5 (£m)	AMP6 (£m)
M&G Buildings	1.6	0.3	10.3	2.5
M&G H&S	0.2	0.1	0.4	4.3
M&G Information Technology	9.2	7.1	13.8	9.6
M&G Other	5.5	7.9	6.1	5.3
TOTAL	**16.5**	**15.4**	**30.5**	**21.8**

Source: PFs Table 5.12

449. In **Appendix 3.2** we provide detailed reasons why the level of M&G expenditure proposed for AMP6 is justified, and why there should not be an assumption that it is reasonable for expenditure to continue at the levels in AMP4 in relation to each of the categories identified in Table 19 above.

3.6.5 Efficiency of cost forecasts for MNI

3.6.5.1 Overall cost forecasts

450. The range of costs for MNI assumed in the provisional findings is below an appropriate level. This is illustrated in Figure 14 below which compares the range of industry costs included in the FD for MNI with the range included in the provisional findings and the amounts included within our plan.

---

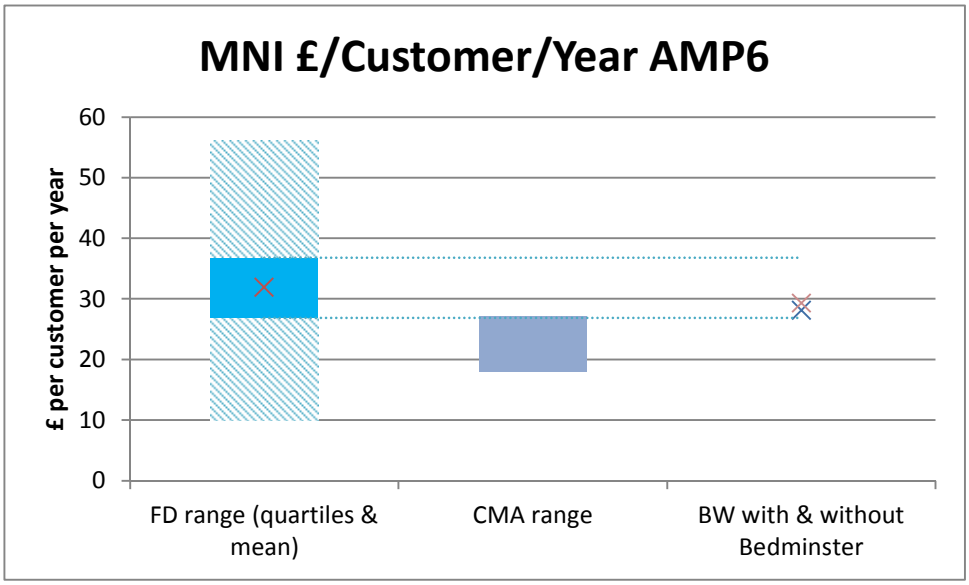
[257] PFs, para. 5.139.

[258] PFs, para. 5.138.

[259] PFs, para. 5.140.

[260] PFs, para. 5.137.

Figure 14 - Comparison of ranges for MNI



Source: Ofwat FDs/Bristol Water analysis

451. The figure shows that the top of the range assumed by the CMA in the preliminary findings is below the lower quartile range of companies' allowed spend. In addition, it shows that the cost included in our plan (excluding Bedminster Reservoir) is in line with the industry lower quartile.

452. Maintenance expenditure on treatment works for companies with higher levels of treatment complexity is likely to be higher because of the greater number and complexity of treatment processes that will require maintenance. Bristol Water has a comparatively high level of treatment complexity, and therefore would be expected to have higher maintenance costs than an average company in this area. Typically, maintenance expenditure on treatment works across the industry represents around 35% of non-infrastructure maintenance, with a range of 16% to 55%.[261]

453. In addition, Bristol Water would be expected to incur higher maintenance costs on its pumping plant as a result of greater pumping plant capacity because of the higher than average pumping head. Taken together with the impact from treatment works, it should be expected that our costs would be above average. Bristol Water's proposed overall level of infrastructure maintenance is below the industry average despite these factors that should lead to higher cost. We consider that this should give the CMA confidence that the costs included in our plan for non-infrastructure maintenance are efficient.

454. This is discussed in the context of the benchmark modelling in **Section 5.2.4**.

3.6.5.2 Aqua analysis of costs

455. The CMA notes that it asked Aqua to review our cost efficiency in relation to Bedminster SR and the water treatment asset replacement work.[262]

---

[261] Based on industry expenditure between 2009 and 2011

[262] PFs, para. 5.141.

456. For Bedminster SR, the proposed costs were within Aqua's range of cost estimates and our approach was considered good practice.

457. For water treatment works (post 1990s assets), the CMA concludes that we did not provide sufficient detail on what we intend to spend the MNI on or evidence of unit costs trends.[263] We consider that given we have not had a formal opportunity to respond to the Aqua report and that water treatment works was taken off the agenda for the Aqua visit on 27 May 2015 the CMA's conclusion should be reviewed in light of the evidence presented in this paper.

458. With regard to the costs of bulk chemical storage tank replacement, we consider Aqua's conclusions to be based on misunderstandings regarding what is required to operate modern chemical storage tanks in a water treatment environment and best practice regarding current construction. This is discussed in **Appendix 3.2 section 6**.

459. Overall, the CMA acknowledges that the analysis was fairly limited but did indicate the potential for some additional unit cost efficiency. Given, however, that the CMA had already made adjustments to move to the low investment scenario in some areas, which could in practice be achieved through a mixture of scope and efficiency challenges, it did not consider it necessary to apply a further efficiency adjustment.[264]

460. We agree with the CMA's conclusion that it is not necessary to apply a further efficiency adjustment. In our view, this is not, however, tied to whether the low, medium or high investment scenario is supported, but is justified on the basis that we have already applied a significant efficiency challenge of 10% to all MNI costs proposed in our Business Plan, following the CKBS challenge.[265]

3.6.6 Conclusions on provisional findings on MNI

461. We do not support the CMA's conclusion that it is reasonable to assume that we may be able to achieve additional efficiencies and/or scope reductions relative to our plans. The plan we have identified has been based on sound data using accepted good practice in modelling to identify a robust central estimate of the level of expenditure required to deliver stable non infrastructure asset reliability during AMP6. The level of expenditure required is slightly higher than in AMP5 due to the need to replace Bedminster SR, the need for which in terms of emergency requirements and design standards have been justified as not risk averse compared to other companies.

462. In assessing our submissions, particularly with respect to MNI, Aqua made no particular requests for data at its meeting with us. Given our business plan approach and the submissions supporting it have been based on Ofwat's requirements, we do not think it is appropriate to interpret Aqua's assessment that we have not provided data in formats that it expects as a failure to appropriately forecast the investment needs of our asset base.

463. We also do not consider the CMA's assessment that our plans are conservative. The modelling has been validated as part of the development process. The outputs from the models have been reviewed and challenged by the operational parts of the company.

---

[263] PFs, para 5.143

[264] PFs, para. 5.146.

[265] CKBS assessment PR14 AMP6 project costs elemental (SOC531).

3.7 Conclusions on provisional findings on total base expenditure

464. The CMA conclusions in relation to its assessment of our proposals for base expenditure are:

> *"(a) our review suggests it is reasonable to assume that Bristol Water may be able to achieve additional efficiencies and/or scope reductions relative to its plans;*
>
> *(b) on opex, we have primarily assumed an updated baseline, as Bristol Water appears to be assuming that certain costs are recurring which we consider may be avoidable in future years;*
>
> *(c) on IRE, we consider Bristol Water is likely to be able to achieve efficiencies, either on unit cost or potentially on scope reduction; and*
>
> *(d) on MNI we are uncertain over efficient levels due to lack of evidence. However, where we have been able to review Bristol Water's plans, they appear to be conservative and suggest a potentially material ability to implement reductions in scope."*[266]

465. As we have demonstrated in the sections above:

- we do not agree that the evidence supports an assumption that we will be able to achieve additional efficiencies and/or scope reductions of the scale or type envisaged by the CMA;
- the opex baseline on which the CMA has relied is not reflective of accepted cost increases so results in projections that underestimate our expenditure; and
- by leaning towards the low investment case, the CMA creates a serious threat to our ability to meet a sustainable level of investment in maintenance activities.

466. We consider that we have provided the evidence to support the expenditure proposals in the SoC. In the absence of clear evidence to the contrary to support the assumptions the CMA has relied upon regarding efficiencies and scope reductions, the reductions in funding envisaged by the PFs are not justifiable.

[266] PFs para 5.157.

4 Review of enhancement expenditure from Bristol Water's Business Plan

4.1 Executive Summary

4.1.1 Introduction

467. This section provides our response to the CMA's provisional findings on its assessment of the enhancement expenditure projected in our Business Plan, as set out in Section 6 of the PFs. For ease of reference we have followed the same order as the PFs.

4.1.2 Key themes

Approach to assessment of enhancement expenditure

468. The CMA has considered Bristol Water's enhancements requirements by undertaking a bottom-up assessment of our business plan proposals. We agree that this is the most appropriate way to determine enhancement expenditure.

Cheddar Reservoir Two

469. Cheddar Reservoir Two forms part of our WRMP and its inclusion in our Business Plan is, therefore, the result of an intensive and thorough statutory process that involved input and consultation from a wide range of stakeholders, including local customers. We note that the consensus of opinion is that it does need to be built at some point in the near future. The only question mark, therefore, relates to when construction should start. We can demonstrate that to preserve the optimal delivery timeframe, we need to be in a position to commence construction during AMP7. This is only feasible if planning permission is maintained during AMP6 by carrying out some specific works at a cost of c. £1m. It may also be necessary, and advisable to purchase some of the land during AMP6 as well. We believe that the CMA should allow this interim approach so as to not offend the WRMP process, which, as previously stated, is an intensive and thorough statutory process that involved input and consultation from a wide range of stakeholders, including Ofwat and local customers.

Cheddar WTW raw water deterioration

470. The CMA has agreed that there is evidence of raw water deterioration at Cheddar Water Treatment Works (**Cheddar WTW**) but did not make an allowance for the Cheddar WTW scheme. Instead the CMA has allocated £1m for further investigations and minor capital works with an uncertainty mechanism should the investigations demonstrate the need for more expensive work.

471. The scheme addresses the risks to water quality caused by algal blooms, which already result in capacity reductions at Cheddar WTW, follows a robust and open comparison of options and has strong support from the DWI. We believe that we have demonstrated it is the best solution in light of the EA's position on raw water deterioration. We recognise, however, that the need for the scheme involves an assessment of the balance of risk. In arriving at its conclusion, the CMA has had to balance the potential risk posed to customers due to raw

water deterioration at Cheddar WTW with the financial impact on bills of delivering the proposed scheme.

472. Given the evidence of raw water deterioration, we consider that the approach the CMA proposes is a reasonable alternative, but note that it involves changing the policy approach endorsed by Ofwat, the EA and the DWI. We also note the LEF's view that delaying taking action would not be in the best interests of customers.

Southern Resilience Scheme

473. We welcome the CMA's view that an allowance should be made for the Southern Resilience Scheme (**SRS**) and support the allocation of £22.2m, which it has made within the provisional findings. We note that the CMA was not convinced by the element of the scheme that involved building a service reservoir at Rowberrow and has removed £6m from our proposed SRS costs.

474. The actual cost of Rowberrow service reservoir is costed within the SRS cost at £5.4m and this would be the appropriate adjustment should the CMA conclude it is not required. As such the amount allowed for the SRS would increase to £22.7m.

475. Removing the service reservoir from the SRS means there may not be sufficient water available to provide local resilience and meet growth demands. Our ongoing design process for the SRS has identified that a service reservoir is required, but an alternative is to build a reservoir at Hutton at a slightly lower cost of £4.3m. We would ask the CMA to consider the inclusion of this service reservoir in its final determination allowance for the SRS. If the Hutton service reservoir is included, the total cost of the scheme would be £27.1m.

Other enhancement

476. The CMA has also reviewed enhancement schemes totalling £42.5m covering raw water deterioration, growth, National Environment Programme and asset reliability – discoloured water contacts,

477. We support the allowances the CMA has made for all these schemes bar the asset reliability – discoloured water contacts where the CMA has made a cost challenge based on advice from Aqua. We provide evidence in **Section 4.9** that the actual cost for delivering the mains relining work is £10.9m (12/13 prices) and ask the CMA to allow this in full in its final determination.

478. The CMA has also allowed £18.9m for other enhancement schemes that it did not review in detail. We agree with the CMA's view that our 12.5% efficiency challenge should give comfort that in aggregate the smallest enhancement schemes are appropriately costed.

4.1.3 Structure of the Response

479. Our response to the CMA's provisional findings on its review of the enhancement expenditure in our Business Plan is structured as follows:

- the CMA's approach to enhancement (see **Section 4.2**);
- Cheddar Reservoir Two (see **Section 4.3**);
- Cheddar WTW (see **Section 4.4**);
- Southern Resilience Scheme (see **Section 4.5**);
- raw water deterioration (see **Section 4.6**);

- growth (see **Section 4.7**);
- National Environment Programme (NEP) (see **Section 4.8**);
- asset reliability (see **Section 4.9**);
- other enhancement (see **Section 4.9.3**); and
- provisional findings on enhancement expenditure (see **Section 4.11**).

4.2 CMA's approach to enhancement

480. The CMA has reached its provisional view on the appropriate scope of enhancement activity, and the associated expenditure, by carrying out a detailed analysis of the proposals within our Business Plan. The CMA has focused its review on the larger schemes, considering need, optioneering and robustness of cost estimates.[267] In taking this approach, the CMA has chosen not to follow Ofwat's reliance upon econometric assessment of enhancement expenditure.[268]

481. We agree with the overall approach taken by the CMA to the assessment of enhancement expenditure. It is important that the CMA incorporates an appropriate allowance to ensure customers receive the full benefit of schemes. Our costs already include a stretching efficiency target of 12.5% on average and so further challenge may impede delivery of the optimum solutions.

482. Each of the individual schemes given particular scrutiny by the CMA are considered in the following sections.

4.3 Cheddar Reservoir Two

483. The CMA has concluded that we have not sufficiently demonstrated the need for construction of Cheddar Reservoir Two to commence in AMP6. This is based on various reasons relating to uncertainty regarding non-domestic demand and the impact of climate change, debate around the appropriate level of headroom, and the willingness of customers to pay an increased amount for security of supply.[269]

484. As a result, the CMA has made no provisional allowance for expenditure in AMP6. In addition, the CMA has declined to make a provisional allowance to enable us to discharge our obligations to maintain planning permission during AMP6. The CMA concluded that:

> *"It was not clear that incurring around £4 million of expenditure to maintain planning permission for the project was cost-effective compared to the around £1 million it would cost to re-obtain planning permission in the uncertain event that there was demand from a power station."*[270]

485. In this section we demonstrate that even if the CMA has not accepted the need for construction to commence in AMP6, it is accepted by all relevant stakeholders that the additional supplies it represents will be needed at some point in the future. At a minimum, therefore, we need to be funded in AMP6 to carry out the activities necessary to maintain our existing planning permission in order to preserve the option of commencing

---

[267] PFs, para. 6.5.

[268] PFs, paras. 3.27-3.31.

[269] PFs, para. 6.116.

[270] PFs, para. 6.119.

construction of Cheddar Reservoir Two in AMP7. A decision not to permit any investment at all, thereby ensuring that the planning permission will lapse, is inconsistent with the letter and spirit of the WRMP, as well as the principles behind sustainable resilience planning.

486. To support this, we set out in the following sections:

- an overview of the Cheddar Reservoir Two scheme, set in the context of the WRMP and the weight that should be given in the CMA's considerations (see **Section 4.3.1**);
- an explanation as to why we consider we need to take steps in AMP6 to preserve the planning permission, and what that would entail (see **Section 4.3.2**); and
- a summary of the broader long-term considerations that should influence the CMA's thinking (see **Section 4.3.3**).

4.3.1 Cheddar Reservoir Two in the context of the WRMP

487. The proposals for Cheddar Reservoir Two are contained in our WRMP which concludes that commencing construction of Cheddar Reservoir Two in AMP6 is a key part of the best solution based on whole life cost to address our supply demand balance requirements and to achieve an appropriate degree of resilience to the range of uncertainties considered in the WRMP.

488. As is explained in advice provided by legal counsel, the WRMP is the product of a process established by the WIA '91 and is intended to be the definitive statement of how the supply demand balance should be managed.[271] It is developed in accordance with detailed rules and guidance, overseen by the EA, the specialist regulator with responsibility for managing water resources, and it is approved by the Secretary of State. It is also subjected to statutory consultation with key stakeholders and regulators, as well as going through a public consultation process.

489. We consider that the WRMP process provides a robust approach to long term planning of water resources management of public water supply. In particular, it provides protection against short-term thinking in water supply management and enables planning for investment to create long-term resilience against issues such as climate change.

490. From the detailed guidance that governs how the WRMP should be developed and utilised it is clear that the WRMP's recommendations will form part of companies' business plan proposals in a price review context.[272] It is also clear that any objections Ofwat has to the assessment of the supply demand balance, as well as the solutions put forward as the best options to address it, should be raised in the context of the draft WRMP, and not held back until the review of the business plan.[273] No comments were made by Ofwat during the WRMP consultation in relation to Cheddar Reservoir Two.

491. In that context, significant weight should be placed on the WRMP and its outputs, an opinion supported by EA.[274]

---

[271] Role of the WRMP in a price control determination, Greenberg Traurig Maher – provided as **Appendix 4.4**.

[272] Role of the WRMP in a price control determination, Appendix 4.4, Section 3.

[273] Role of the WRMP in a price control determination, Appendix 4.4, Sections 2 and 3.

[274] Letter 21 July 2015 from Dr Pete Fox, Director Water, Land and Biodiversity, Environment Agency (RPF027).

492. Development of our WRMP included assessment of over 150 schemes, encompassing demand-side reduction plans such as increased metering and leakage management. Inclusion within the WRMP of a project to develop a new reservoir at Cheddar involved assessment of a range of scenarios on climate change, population growth and changes in non-household demand, followed by investigation of multiple potential reservoir sites across the local region with geotechnical assessment of land condition at shortlisted sites. In seven of the nine scenarios we examined, commencement of works on Cheddar Reservoir Two during AMP6 was the part of the optimal solution to water resource management.

493. We consider that our business plan proposals are in the best interests of customers and provide the best balance of investment and resilience for a range of risks and scenarios. We consider that it is appropriate for investment in Cheddar Reservoir Two to proceed in AMP6.

4.3.2 Why we believe we need to act now

494. We accept that long-term planning includes a degree of uncertainty. We do not, however, believe that the response to this should necessarily be to defer action until this uncertainty is fully resolved, but rather to identify actions that create multiple benefits across the range of likely scenarios.

495. If an allowance for development of the reservoir is not made as part of the CMA's final determination, and furthermore if no allowance is made to enable the existing planning consent to be retained, the process of regaining consent and the consequent delays mean it will not be possible to bring Cheddar Reservoir Two into service until 2032 at the earliest. Details of this are given in the Arup report.[275] Effectively there are certain preparatory works that have a longer lead time and need to be done in AMP6 to allow for all the preparatory works that are required to allow works to start to meet the planning permission deadline.

496. If no action is taken to retain the planning permission granted for Cheddar Reservoir Two, this consent will lapse by 2021. As noted in the paragraph above It will not be possible to carry out any significant works to meet the requirements of this consent unless investment is carried out in AMP6.

497. The CMA state in the PFs[276] that there was some merit in work to retain the planning permission but that it was not clear that the proposals were an efficient approach to expenditure if the cost would be additional to the planned build cost of CR2. We believe that this is a sensible approach and avoiding wasted expenditure is the right way forward in exploring the option to preserve the planning permission and the ability to develop the reservoir in AMP7 without the wasted cost of another planning application.

498. As a result we have changed our approach which previously was to consider Option 3 in the Arup report which involved some £3m of costs in being able to implement a Compulsory Purchase Order ready to buy the land once funding was secured in AMP7.[277] Such costs could be viewed as wasted if the CR2 project was not to proceed in AMP7 as they would need to be done again. The cost identified and estimated by Arup as c£1m for design and

---

[275] Arup, Bristol Water Cheddar Reservoir Two Programme Implications Report (RPF067), see Option 3.

[276] PFs, Para 6.114 and footnote 252.

[277] Confidential and privileged legal advice is that we cannot use our CPO powers without having the funding in place for the CR2 project.

consultancy work to satisfy pre-commencement conditions have to be done for the project in any event and so could not be characterised as wasted were CR2 not to proceed in AMP7.

499. Our preferred approach is to buy the land which the affected landowners are willing to sell to us since this is a cost which is clearly part of the CR2 project and so cannot be seen as additional or wasted cost.

500. If the CMA did not adjust the final determination and as a result we need to reapply for planning permission in a later period, additional costs will be incurred in future in order to regain the planning consent that currently exists. The cost of obtaining the existing planning permission, which included investigation and project management, was £4m. Renewal of the consent is likely to be at lower cost, approximately £1.2m, but this is an unnecessary cost that can be avoided. Also, a renewed planning consent may be subject to more onerous conditions than the existing consent and there is a risk that repeat planning consent may not even be granted.

501. The alternatives considered (expenditure in AMP6 vs. expenditure in AMP7 with additional cost to regain planning consent) show that the net present cost of action in AMP6 is only £292k higher than if the costs are deferred to AMP7. The proposed investment in AMP6 will help address concerns that affected landowners might raise regarding blight, maintain part of the flexibility of the existing statutory WRMP and allow for necessary site investigations, maintain the validity of the existing planning consent and enable better negotiation on land price than if the full project is delivered in a compressed timescale in future.

502. The scenarios in Table 20 below build on "Option 3" put forward by Arup in its January2015 report.[278] This report identified the cost of regaining planning consent once lost as approximately £1.2m and the cost of design & consultancy work required to maintain consent as just over £1m. Land purchase costs have been developed further since this report to identify the properties with a "good" or "fair" prospect of Bristol Water being able to buy the land in AMP6 from willing sellers (see **Section 4.3.2.1** below).[279] This is a total of 66% of the land area required for Cheddar Reservoir Two, with an anticipated purchase value of £6.89m.

503. This analysis indicates that the cost of acting to keep this planning consent active, resolving issues of legal property blight and maintaining the option to carry out project development in AMP7 is only £292k higher than if these costs are deferred to AMP7.

Table 20 Comparison of alternative investment scenarios for Cheddar Reservoir Two

Comparison of net present value of limited Cheddar Reservoir Two investment within AMP6 and investment in AMP7	Scenario A: Minor investment in AMP6 to retain planning consent	Scenario B: No investment in AMP6, investment in AMP7
Cost to purchase land from willing vendors (no compulsory purchase). This will help address potential blight issues and enable required surveys	£6,890,000	£0
Design and consultancy work to satisfy pre-commencement conditions	£1,000,019	£0

[278] Arup, Bristol Water Cheddar Reservoir Two Programme Implications Report (RPF067).

[279] Bristol Water confidential internal document " Analysis of the potential acquisition of land for CR2 from willing sellers during AMP6", July 2015 (RFP081)

Comparison of net present value of limited Cheddar Reservoir Two investment within AMP6 and investment in AMP7	Scenario A: Minor investment in AMP6 to retain planning consent	Scenario B: No investment in AMP6, investment in AMP7
AMP7 other land purchase as per AMP6 purchase above	£0	£6,890,000
AMP 7 other surveys as per AMP6 activity above	£0	£1,000,019
Additional work to regain planning consent	£0	£1,200,000
AMP7 other land purchase	Same in both scenarios	Same in both scenarios
AMP 7 other surveys	Same in both scenarios	Same in both scenarios
Scenario A: NPV of minor land purchase in AMP6 and consultancy work	**Scenario B: NPV of the same land purchase and consultancy work deferred to AMP7, with additional £1.2m cost to regain planning consent**	
-£7,890,019	-£7,598,332	
Difference between Scenario A and Scenario B	£291,687	

Source: Bristol Water

504. The consensus of opinion is that Cheddar Reservoir Two does need to be built at some point in the near future. By continuing in AMP6, as set out above, would be consistent with the WRMP process and the cost of maintaining the option to deliver in AMP7 is immaterial at £0.3m.

4.3.2.1 Land purchase

505. Our alternative proposals in AMP6 allow for purchase of some of the land required for the development of the reservoir. There are some key points to note with regard to this strategy:

- **avoiding use of compulsory purchase powers**: land purchase carried out in a timely fashion is less likely to require compulsory purchase powers - and time should be available to negotiate a fair price. Early purchase of land from willing sellers[280] at a fair price will also enable a reasonable "benchmark cost" to be set for the local landholders and enable better management of purchase values. This is a better way to work with these individuals (who are also our customers) and is in line with our good neighbour approach to corporate citizenship;
- **future fluctuation in land prices:** It is difficult to predict with any certainty whether it is better value to buy the land subject to development now or in the future because of potential price fluctuations. We note that according to the Savills Market Survey report referred to agricultural land prices increased by approximately 270% in real terms in the ten years to December 2013 (national average, most recent values available)[281] and this trend is continuing. If this trend were to continue above inflation it is likely that land purchase in later AMP periods will be at higher cost than current values. If land price inflation continues at historic above inflation rates (at December 2013 this was 7.2% in the South-West), the cost of land required for Cheddar Reservoir Two could be higher in AMP7 than in AMP6;
- **mechanism for returning unspent costs:** if land purchase negotiations are not successful during AMP6 for all the land suggested, unspent costs can be returned to

[280] Bristol Water confidential internal document "Analysis of the potential acquisition of land for CR2 from willing sellers during AMP6", July 2015 (RFP081).

[281] Savills Market Survey, UK Agricultural Land (RPF066).

customers and we suggest that the CMA should to consider an appropriate mechanism for this;

- **potential property blight:** properties in the footprint of Cheddar Reservoir Two could be considered as currently potentially blighted for the duration of the reservoir planning consent. Owing to the current uncertainty over the status of the Cheddar Reservoir Two project a query was received on 24 July 2015 from the agent of landowner holding some 29 acres in the area affected by this planning consent, regarding compensation for the loss of a specific business opportunity at this landholding. We believe that a significant proportion of landholders are willing to sell and wish to move their farms and businesses to new locations, which is not currently possible - purchase of land in this area will help avoid potential claims for blight;
- **land purchase costs are not sunk costs:** if projected growth does not occur in Bristol Water's supply area and Cheddar Reservoir Two is shown not to be an appropriate part of the long-term water resource management plan, land purchased can be sold and the cost returned to customers: this purchase of land is therefore not a sunk cost; and
- **allows timely implementation of other activities**: land purchase in AMP6 will allow for implementation of "material development" activities at reasonable cost, including planning for the flood compensation nature area required as part of the planning conditions for the development. Land purchase will also allow for timely implementation of other works such as detailed geotechnical investigations, archaeology and river ecology.

4.3.3 Other relevant considerations

506. As noted above, we believe that there are other considerations the CMA should take into account when reaching its final determination on Cheddar Reservoir Two. To assist the CMA in that process, we have provided a detailed response to some of the concerns raised by the CMA in relation to need and timing in **Appendix 4.2**.

507. In relation to climate change, we believe that it is a significant risk to the resilience of public water supply, a position supported by recent public reporting to Parliament.[282] We also believe that our approach to climate change risk is proportionate[283] and that the impacts of climate change may arise without significant warning.[284]

508. Investment in Cheddar Reservoir Two will increase climate resilience. Given that the consequences of climate change may become apparent without a clear signal being discernible in the observed record, consideration should be given to the timely development of infrastructure such as water storage which requires a significant time to deliver its outputs. Preserving our ability to commence construction of Cheddar Reservoir Two in AMP7 is, therefore, consistent with this long-term planning outlook.

---

[282] Committee of Climate Change 2015 Progress Report to Parliament June 2015 Reducing emissions and preparing for climate change (RPF046) "*significant decisions in terms of new water storage, treatment and supply infrastructure will need to be taken. These must fully account for climate change*." P.18, para. 2.

[283] Climate chance HR Wallingford report (Exec summary) (RPF010) "*With the best available knowledge at the moment BW are undertaking the right processes to manage these risks*."

[284] Climate chance HR Wallingford report (Exec summary) (RPF010).

509. It is also worth noting that although the Southern Resilience Scheme (**SRS**) will enable the support of Cheddar from other sources, it serves a wholly different purpose than Cheddar Reservoir Two. The SRS will be a means by which operational support and flexibility can be delivered across the Bristol Water supply area, providing resilience against operational failures. Cheddar Reservoir Two will provide a stored resource of water to increase the total water available for use and address long-term issues of increasing demand. Provision of additional water is not the function of the SRS and is not a function the SRS can perform: the function of the SRS is to move existing water to customers in a more flexible manner while the function of Cheddar Reservoir Two is to provide an additional volume of water resource.

4.4 Cheddar WTW raw water deterioration

510. In relation to the proposed Cheddar WTW scheme, the CMA has provisionally concluded:

- an allowance of £1m should be made to fund additional investigation into the raw water deterioration and reservoir management and minor capital works to manage the problem in the interim; and
- that if the investigation indicates that more expensive work is needed, that should be assessed and funded in-period (i.e. it should be provided for through use of one of the uncertainty mechanisms).[285]

511. The CMA's decision is based on the following reasoning:

- we have demonstrated that raw water deterioration has occurred which impacts on the treatment works;[286] but
- on balance, and taking into account the significance of the cost and other relevant factors, there is insufficient evidence that replacement of the treatment works is the most appropriate solution at this stage.[287]

512. In constraining our overall investment programme for our Business Plan we considered whether the Cheddar WTW scheme should be included or excluded. The scheme selection itself followed a robust and open comparison of options, informed by technical consultants.[288] Other significant factors included the expectations of the EA and DWI as the regulators responsible for managing water quality issues, and as expressed in the EA's Water Framework Directive Safeguard Zone Action Plan 2012 for the Drinking Water Protected Area Cheddar Reservoir for Total Algae (**SgZ Action Plan**)[289] and the DWI's communications in relation to Cheddar WTW.[290] In order to provide clarity on the regulatory context in which our Cheddar WTW proposals should be seen, we have provided a detailed description of the evolution of the scheme, and the role and views of the EA and DWI, in **Appendix 4.2**.

513. Given the strong regulatory support and the low risk appetite of customers in relation to water quality, the scheme was included in our plan as submitted to Ofwat.

---

285 PFs, para. 6.159.

286 PFs, para. 6.149.

287 PFs, para. 6.150.

288 Further analysis is set out in the Atkins response to CMA technical note (RPF037).

289 Cheddar SgZ Action Plan (RPF001).

290 Cheddar WTW DWI commendation for support 2013 (SOC316).

514. We continue to consider there is a good case for the scheme, driven by the fact that during an algal bloom, capacity at Cheddar WTW is reduced from a sustainable 50 Ml/d to 30 Ml/d, as shown historically. It is also worth noting, in particular, the views of the LEF on the CMA's provisional findings:

> *"The provisional findings suggest that more work is required to justify the need for new treatment at Cheddar Treatment Works. While acknowledging the problems affecting the treatment works, the CMA proposes to overturn Ofwat's decision to make financial provision for this scheme; to make a small financial provision for further investigation and minor remedial works; and to invoke Ofwat's uncertainty mechanism during AMP6 to make financial provision for the scheme when Bristol Water provides further evidence of need.* ***We are concerned that the delays and uncertainty this position creates is not consistent with the risk based approach to water quality that is for the Company to manage as part of its statutory duties****. In addition, customers have told us that "Making sure water is always on tap with no interruptions" is their top priority, and that Bristol Water's plan which included this scheme was acceptable to customers.* ***We believe that there is agreement by all parties that action needs to be taken, and that completion of detailed assessments by Bristol Water should be provided if necessary, but should not delay or impede efficient business planning. We do not believe excluding this scheme is likely to be in customers interests, and therefore it should be included in the final determination****."*[291] (emphasis added)

515. We appreciate that in reaching its provisional findings on Cheddar WTW the CMA has, effectively, sought to balance the potential risk posed to water quality, customers and service levels by the raw water deterioration, against the financial impact to customers of funding a scheme that has some uncertainties attached to it (e.g. the source of the algae increase and the impact that might have on alternative, and potentially lower cost, solutions). We note that our analysis showed that customers' willingness to pay was clearly greater than the cost of the scheme.[292] The risks the CMA is balancing against financial impact are also highlighted by Atkins:

> *"Failure to enhance performance of the works will increase the immediate risk to supply with consequential impact on customers and Bristol Water's reputation as well as legislative implications for failing to meet Supply obligations".*[293]

516. In order to inform the CMA's final determination we address some of the concerns and questions raised in the PFs. This is set out in **Appendix 4.3** which provides a detailed response to the comments made in relation to need, identification of the right solution, and cost estimation. Clearly, to the extent that the CMA's view of the need and solution for the raw water deterioration changes as a result of this additional information, we would also support a return to the approach outlined in our Business Plan.

517. We note that the CMA has considered a range of options for the interim steps that could be carried out to identify the appropriate solution to address the water quality issues.[294] If the

---

[291] Bristol Water Local Engagement Forum, Letter to Competition and Markets Authority, 22nd July 2015 (RPF069).

[292] NERA stage 1 household report (SOC182).

[293] Atkins response to CMA technical note (RPF037), p.10.

[294] PF's para. 6.153.

CMA remains concerned about the scheme, we consider that the CMA's proposal is a reasonable approach.[295]

518. We agree with the CMA that, if its approach of an uncertainty mechanism is adopted, it is proportionate and sets the right incentives to make an allowance of £1m to cover further investigation and introduce a modest capital improvement, such as replacing the microstrainers.[296] Given that the further investigation may conclude that more expensive work than included in our business plan is required in order to effectively manage the water quality risk, we also agree that it is important to put in place an uncertainty mechanism that is sufficiently clear to enable the necessary funding to be obtained, should it be required. In our view, given the position adopted by the EA, DWI and LEF in relation to our current proposals for Cheddar WTW, we consider that this represents the minimum that must be allowed for in AMP6.

519. We consider the £1m that the CMA has provisionally allowed would be sufficient to undertake additional investigations, reservoir management and minor capital works based on the following:

- carry out investigations into the raw water deterioration issues at investigations into Install additional screens to one of the slow sand filters (circa £0.1m);
- cover one of the slow sand filters (circa £0.5m);
- additional monitoring of biological activity of filter and comparable filtrate quality from the covered and uncovered filters (£0.2m); and
- carry out investigations into improving the existing reservoir management/ destratification (£0.2m).

520. Whilst this is a very simplistic view of how that funding might be spent, we hope that it offers some comfort that £1m is a reasonable allowance. Other potential costs that could be incurred will include those associated with providing the right level of evidence to trigger the uncertainty mechanism.

4.4.1 Uncertainty mechanism

521. As noted above, the CMA has invited ourselves and Ofwat to engage with it "*on how any such uncertainty mechanism could best be implemented and governed*".[297] Our initial thoughts on an uncertainty mechanism in the form of a notified item are set out in the following sections:

- the right trigger for further investment (see **Section 4.4.1.1**);
- the consideration of the solution (see **Section 4.4.1.2**); and
- the funding for the costs required (see **Section 4.4.1.3**).

4.4.1.1 The right trigger for further investment

522. Bristol Water will undertake more frequent testing as part of its investigative works funded by the CMA's allowance.

---

[295] In such a situation, we note that it will be for the CMA to satisfy itself that the course of action it allows for in the final determination is consistent with the views and expectations of the DWI and EA.

[296] PF's para. 6.156.

[297] PFs, para. 6.158.

523. We have a duty under s68 WIA '91 to ensure no deterioration of drinking water quality. Consequently, any significant deterioration in water quality associated with algal blinding should be considered as a reasonable trigger for investment for remedial works.

524. The most likely parameters that could be used to demonstrate this would be the metal content and the colour and turbidity of the final treated water.

525. Metals from the raw water adsorb onto the sand in the slow sand filters at Cheddar WTW. Consequently, if algal blinding causes the lower levels of the slow sand filter to start to become anaerobic the metals will be released back into the water (i.e. will be reduced back to their soluble state). Essentially noticing metals in the final water shows the slow sand filters have been affected by the algae.

526. The metals in Cheddar WTW final water are normally below their respective analytical detection limits so if any metal in the final treated water reaches a concentration >20% of the regulatory standard this would demonstrate a deterioration in water quality. The metal content of the water will have an impact on the colour and turbidity of the treated water also.

527. Accordingly the suggested triggers for looking at further investment are as follows:

- should either of the two events set out below occur, Bristol Water shall notify both Ofwat and the DWI of that fact and ask the DWI to then review its proposed solution(s) to remedy the algal problems in the raw water at Cheddar WTW:
  - if the results of samples taken during any one calendar month show a concentration of any metal, turbidity or colour in the final treated water with a 95th percentile greater than 20% of the regulatory standard; or
  - a DWI notifiable event associated with sufficiency of supply driven by algal blinding of the slow sand filters has occurred.

4.4.1.2 The consideration of the solution

528. As the DWI is the expert regulator responsible for water quality, we believe that involving the DWI in the analysis of concerns over water quality and the identification of the right solution is the best approach and is consistent with current industry practice. Ofwat can then review the cost of the solution proposed, based upon its role as the economic regulator.

529. If the DWI is convinced that there is a need for intervention and that the solution proposed is appropriate, we suggest that the DWI should notify both Bristol Water and Ofwat of this by letter. That support from the DWI should, therefore, constitute evidence of the need and the validity of the proposed solution, such that Ofwat then can scrutinise the proposed costs of the solution.

4.4.1.3 The funding for the costs required

530. If the DWI confirms its support for the proposed investment, Bristol Water should make an application for an IDOK to provide the funding for this scheme at the next suitable occasion.

531. It is possible that the timing for the IDOK and subsequent price adjustment might be out of step with when the DWI might require the investment to be made, but ideally this is a matter for the DWI to consider when it makes its decision to agree with the need and proposed solution.

532. We also note that the CMA will need to ensure that the terms of the notified item are such that it believes it is likely that any IDOK to carry out further necessary works will not be prevented from proceeding by reference to the materiality of the numbers involved.

533. In order to help Ofwat analyse the costs of the scheme, Bristol Water could supply a report from an independent adviser that has reviewed the costs of the scheme.

4.4.2 Conclusions on Cheddar WTW

534. In conclusion, whilst we believe that sufficient justification has been provided for Cheddar WTW, and that to proceed would be in accordance with the wishes of the specialist regulators, our customers and the LEF, and even Ofwat based on its funding decision at FD14, we accept that the CMA's proposed approach is a reasonable way to deal with Cheddar WTW raw water deterioration as an interim measure and would support the £1m allowance with an uncertainty mechanism provided that the triggers are set appropriately.

535. Given the importance of ensuring that any uncertainty mechanism is drafted appropriately, we welcome the opportunity to engage further with the CMA and Ofwat on this in advance of the final determination.

4.5 Southern Resilience Scheme

536. The CMA has provisionally found that there is a need for the Southern Resilience Scheme (**SRS**) and has allowed £22.2m in funding for its growth and resilience aspects combined.[298] However, whilst the CMA is open to the possibility of a service reservoir being constructed somewhere on the network, "*further evidence to demonstrate need and site selection is necessary*".[299] Based upon the "*issues identified by Aqua with respect to the design and location of a service reservoir at Rowberrow*", the CMA has reduced the cost of the SRS as set out in the SoC by £6m[300] – i.e. its estimated cost for the construction of a 20Ml service reservoir.[301]

537. We agree with the CMA's conclusion that the SRS is required, and with the level of funding for the aspects of the scheme that have been approved. In relation to the service reservoir, we believe that we can demonstrate that the concerns expressed by Aqua regarding an additional service reservoir can be addressed, and that we can provide the requisite evidence to support both the need and site selection for our proposals.

4.5.1 Evidence to support need and site selection for an additional service reservoir

538. The CMA concludes that "*further justification for a service reservoir with a substantial capacity and in the location proposed was needed*".[302] In particular, the CMA notes the following:

> *"(a) the elevation of the reservoir at 95m AOD.*

---

298 PFs, para. 6.190.

299 PFs, paras. 6.184-6.186.

300 £6m is the CMA's estimate. The cost in the capital programme is £5.4m post efficiency. This is the appropriate figure to use should the CMA want to make the adjustment.

301 PFs, para. 6.190.

302 PFs, para. 6.184.

(b) Aqua's identification of Barrow as a possible alternative location at a lower elevation but still delivering similar operational benefits.

(c) Aqua's observations on the operational benefits of a service reservoir at Barrow (as an alternative to Bedminster).

(d) Aqua's observations on the overall capacity of service reservoirs."[303]

539. We believe that the need for the service reservoir can be justified on the following grounds:

- the SRS combines resilience with growth requirements;
- one of the individual growth schemes identified was for 15.2Ml of storage at Hutton to supply Weston-super-Mare. This is described in the Preliminary Design report for Hutton reservoir;[304]
- the resilience aspect of the SRS required 5Ml of resilience storage at Rowberrow Hill. It was identified that the 15.2Ml of storage for Weston-super-Mare could be combined with this. Combining the storage produces efficiencies through economies of scale and only having one construction site;
- design of the SRS is continuing and has identified that 5Ml of resilience storage can be provided by an existing reservoir at Barrow. As a result, resilience storage is no longer required at Rowberrow Hill so the efficiency of moving the Hutton storage requirement to Rowberrow Hill is lost, and the best location for storage to supply Weston-super-Mare reverts back to being Hutton (see **Section 4.5.1.5**).

540. Taking account of the CMA's comments, and in line with our own design progress we have identified that a reservoir at 95m AOD is not required (see **Section 4.5.1.1**).

541. Barrow will provide a suitable location for the buffer storage element of the Rowberrow Hill reservoir but not the local operational storage required in Weston-super-Mare (see **Section 4.5.1.2**).

542. A reservoir at Barrow would not be any cheaper than a reservoir at Bedminster, and Bedminster is a better location as it is closer to the area supplied from Bedminster reservoir (see **Section 4.5.1.3**)

543. We have found no evidence to support Aqua's assertion that we are oversizing our local storage reservoirs. Our requests to other companies have found that Average Day Peak Week is used as the design variable more often than average demand, and for those companies using ADPW, storage is designed for 24 – 36 hours (see **Section 4.5.1.4**)

544. The reasoning and evidence to support our position is set out in more detail in the following sections

4.5.1.1 Elevation of the reservoir

545. The Rowberrow Hill location was identified as being a suitable location for a 20.2Ml reservoir that would provide 15.2 Ml of storage to meet current demand and predicted growth in

---

[303] PFs, para. 6.184.

[304] B&V report. GSf-Hutton Service Reservoir Preliminary Design Report. September 2013 (RPF030).

Weston-super-Mare and 5Ml of buffer storage.[305] Building just one reservoir at a location that meets both requirements is more cost effective than building a 15.2Ml reservoir close to Weston-super-Mare and 5Ml of buffer storage at Rowberrow.

546. The design process that is currently underway has identified that existing storage at Barrow can be used to provide the buffer storage, so the cost benefit of building the storage for Weston-super-Mare at Rowberrow is lost. Hutton, which is on the outskirts of Weston-super-Mare, and where we have an existing reservoir, is a better location for a stand alone reservoir and is at a lower elevation.

4.5.1.2 Barrow as an alternative location to Rowberrow

547. There is storage at Barrow that was constructed as part of Northern Strategic Support Scheme (**NSSS**). As it is unlikely that the NSSS will be required at the same time as the SRS, given that such a scenario would involve the simultaneous outage of two key assets, this storage can be used to provide buffer storage for the SRS as well as the NSSS.

548. As explained above, the 15.2 Ml element of the 20.2 Ml Rowberrow Hill reservoir that was required to supply Weston-super-Mare is better located at Hutton.

4.5.1.3 Barrow as an alternative to Bedminster

549. B&V have considered the option of building a replacement for Bedminster service reservoir at Barrow and concluded that there would be no cost benefit in so doing as the saving on demolition of the existing Bedminster reservoir is outweighed by the land purchase and additional excavation required at Barrow (see **Section 3.6.2.5.3**). We cannot use land we own at Barrow as the available land is higher than the treatment process and pumping would be required to fill the reservoir. A new reservoir would have to be built adjacent to the existing Barrow reservoir. In addition Barrow is 3km further away from the Bedminster supply zone. The implications are considered further in the report into the options for replacing Bedminster Service Reservoir contained in **Appendix 3.1.**

4.5.1.4 Overall capacity of service reservoirs

550. Aqua has indicated that our approach to sizing service reservoirs based on 24 hours storage of Average Day Peak Week (**ADPW**) is atypical of the industry and risk averse on the basis of its interpretation of data from South West Water, Welsh Water, and Wessex Water's design standards.[306]

551. In response to Aqua's analysis we have requested data from other companies and investigated standards used by other companies (see Table 16 above in **Section 3.6.2.3**). There appears to be no standard across the industry, nationally or internationally. Although Aqua cited two companies that used average demand x hours storage, feedback to our request shows that ADPW is more common. Additionally, the usual level of storage varies from 24hrs ADPW to 36 hrs ADPW with the maximum storage being 48hr Average demand.

---

[305] This buffer storage is to allow supplies to be maintained in the event of an emergency while rezoning and/or ramping up of treatment works output is taking place.

[306] Aqua cites four companies despite incomplete data for both United Utilities (no data) and Welsh Water (form of demand unspecified).

552. Thus we refute Aqua's conclusion that sizing service reservoirs at 24hrs ADPW is either atypical or risk averse. Companies make design decisions based on local drivers; companies that take a more risk averse approach to service reservoir sizing than ourselves will no doubt do so based on their operational experience within their supply boundaries.

4.5.1.5 Justification for positioning Rowberrow Hill reservoir at Hutton

553. The selected solution for the SRS was determined following a rigorous analysis of several options.[307] The resilience requirement was considered in conjunction with the growth requirements in the area to produce a cost effective scheme that considered both strategic drivers. Although B&V produced a Preliminary Design report for a reservoir at Hutton, an initial strategy report[308] that considered growth and resilience was followed by a more detailed report[309] that focussed on the preferred solution identified in the strategy report. Furthermore a matrix of interdependent schemes[310] was produced to ensure that all related schemes were considered in the final chosen solution.

554. An analysis of storage requirements[311] identified a number of service reservoir requirements where even current demand was not met by the storage available. One of the areas affected was Weston-super-Mare for which Hutton reservoir is undersized and additional storage is required at this location to meet our operational and resilience requirements and thus fulfil our obligations to our customers. Our analysis also identified a shortfall in storage at Rowberrow Hill reservoir and Cheddar Cliffs reservoir. As described in our Cost Exclusion casein the Final Business Plan this amounted to 19.7Ml.[312]

555. The matrix of interdependencies[313] and the strategy study into growth and resilience requirements informed a decision that the current shortfall and future requirements for Weston-super-Mare, Rowberrow Hill and Cheddar Cliffs could be met in a cost effective fashion by combining the growth storage with resilience 'buffer' storage at a high point on the route between Cheddar and Barrow, at the site of an existing service reservoir at Rowberrow. Buffer storage is required to provide an instantaneous supply of water to customers in the event of a system failure whilst treatment works ramp up to deliver the extra water required and re-zoning takes place. The growth accounted for 19.7Ml and the buffer requirement for a further 5Ml of storage, resulting in a total storage of 24.7Ml. As part of the solution optimisation process[314] three options were modelled by the Cross Asset Optimiser and the model helped to inform a decision that the option that provided the most benefit to customers included a 20.2Ml service reservoir at Rowberrow Hill comprising 5Ml of buffer storage and 15.2Ml of growth storage for Weston-super-Mare. Although this does not address the current shortfall at Rowberrow Hill and Cheddar Cliffs this can be addressed in AMP 7.

---

307 Banwell/Cheddar Zone Strategy Optioneering Report Sept 2013 (SOC207).

308 Banwell/Cheddar Zone Strategy Optioneering Report Sept 2013 (SOC207).

309 Southern Support Scheme Preliminary Design Report November 2013 (SOC208).

310 B&V spreadsheet. Bristol Water PR14. Matrix of Interdependencies. (RPF020).

311 Storage deficiencies spreadsheets (RPF057 & RPF058).

312 BW Final Business Plan. Cost Exclusion Cases (SOC006) p.116 .

313 Matrix of Interdependencies. (RPF020).

314 Cost Exclusion cases (SOC006), p.118.

556. By combining reservoir requirements a cost saving can be achieved through economies of scale and only having one construction project. Reference to 'the little black book'[315]- an estimating guide produced by Mott MacDonald - shows that constructing one 20.2Ml reservoir results in a saving of just under £1m compared with constructing 5 Ml of buffer storage at Rowberrow and 15.2 Ml storage at Hutton to meet growth requirements in Weston-super-Mare.

557. In 2013 the 160 year old Montpelier No 1 reservoir in Weston-super-Mare, which was constructed in 1854, was taken out of service due to its poor structural condition reducing the overall storage in Weston-super-Mare by 2.4Ml.

558. In April 2015 B&V were appointed to commence the design of the SRS in more detail from which it has been identified that the buffer storage could be provided from existing Northern Strategic Support Scheme (NSSS) storage at Barrow. This is on the basis that coincidental requirement of a use of the SRS at the same time as the NSSS is a risk averse example of double jeopardy and not warranted.

559. As a result, the cost benefit of constructing one reservoir at Rowberrow is lost and there are benefits in terms of customer resilience of providing the identified current day storage and growth requirement for Weston-super-Mare at Hutton; local to the area of supply.

560. Taking account of the design progress since April, it is now proposed to construct the 15.2Ml of storage required to satisfy operational and growth (to 2040) requirements at a location closer to Weston-super-Mare rather than at Rowberrow Hill.

561. 15.2Ml is a conservative requirement as it does not include the 2.4Ml of storage that Montpelier No 1 reservoir used to supply. It also results in a saving of c£1m as the 5Ml of buffer storage will be provided from an existing asset at Barrow.

4.5.2 Cost estimation

562. In its assessment of our costs, the CMA has said that one of the benchmark costs is higher and one lower than our forecast, and concluded that we have demonstrated appropriate cost estimation. However, post efficiency our cost estimate is lower than both benchmarks suggesting the CMA should conclude that our estimate itself is acceptable.

563. There appears to be some confusion regarding the comparability of the pre and post efficiency figures. Para 6.170 compares our pre-efficiency estimate of £36.2 million to the CKBS estimate of £34.8m. This CKBS estimate should be compared to our post-efficiency estimate of £31.7m for the comparable scope. [316]

564. On this basis the Bristol Water estimates are below both CKBS and Aqua.

565. We note that the CMA does not make any allowance when Bristol Water's costs are below the comparator estimates, but applies an additional efficiency challenge when the costs are higher. We consider it is important to consider the investment programme as a whole when comparing cost estimates and we therefore view the CMA's approach in this area as inconsistent.

---

[315] Mott MacDonald. Little Black Book Second Edition. This book is available from Mott McDonald on request.

[316] Capex Cost Adjustments Query – Scheme Cost Details – Appendix 1, CMA0217.

566. The CMA uses both the CKBS benchmark and a benchmark provided by Aqua for the Southern Resilience Scheme. This is different to other areas where either only the Aqua benchmark is provided (mains) or no benchmark is provided when Aqua could not provide one (Cheddar algae removal), even though both CKBS and Mott MacDonalds successfully benchmarked the scheme. We therefore consider that, for consistency, the CMA could consider the CKBS and Mott MacDonald benchmarking across its analysis.

4.5.3 Costs attributed to the exclusion of Rowberrow

567. As indicated above, in the event that the CMA decides to stay with its provisional approach of excluding the service reservoir, we do not agree that £6m is the right amount of costs to have been excluded. The post efficiency cost allowed for the service reservoir is identified as £5.4m.[317]

4.5.4 Conclusions on the provisional findings on Southern Resilience Scheme

568. We agree with the CMA conclusion that the SRS is required.

569. With regard sizing of service reservoirs at 24 hours ADPW we have demonstrated that this is in line with much of the industry and is a lower standard than that followed by some other water companies. It is therefore an appropriate design standard to use.

570. Our holistic approach to optimising solutions had originally resulted in a cost effective combination for meeting resilience and growth requirements by positioning a 20.2Ml service reservoir at Rowberrow Hill. This reservoir was conservative in its capacity as it did not include for identified shortfalls at Rowberrow or Cheddar Cliffs or for lost storage resulting from the abandonment of Montpelier No 1 reservoir. More recent design has identified that more efficiencies can be gained as now only the 15.2Ml of storage to satisfy growth is required; this does not have to be located at Rowberrow Hill but can be positioned at Hutton. This is a better location than Barrow as it is much closer to the zone to be supplied at Weston-super-Mare.

571. The estimate in our FBP for the SRS is below the benchmarks provided by CKBS and Mott MacDonald and the additional efficiency reduces the estimate by a further £1m whilst still allowing us to meet our resilience and growth obligations. We believe that the SRS should be allowed in full to include a 15.2 Ml service reservoir at Hutton at a cost of £4.4m to give a total estimated cost of £27.1m.

4.6 Raw water deterioration

572. In relation to the three other enhancement schemes proposed in the SoC to address raw water quality deterioration, the CMA has provisionally found:

- **Barrow WTW UV**: the CMA has accepted the need, proposed solution and cost estimate for this scheme, and allowed £6.8m.[318] We agree with the CMA's approach in relation to this scheme;

[317] Extract from the Capital Programme (SOC546).

[318] PFs, paras. 6.193 and 6.197(a).

- **Stowey WTW pH correction**: the CMA has accepted the need, proposed solution and cost estimate for this scheme, and allowed £0.8m. [319] We agree with the CMA's approach in relation to this scheme; and
- **Metaldehyde catchment management**: the CMA has accepted the need, proposed solution and cost estimate for this scheme, and allowed £0.4m.[320] We agree with the CMA's approach in relation to this scheme.

573. **Barrow WTW UV** - The CMA accepts the:

- Need based on the DWI Undertaking;[321]
- Proposed solution based on the standard nature of the use of UV and it being a requirement of the DWI undertaking;[322]
- Cost on the basis of the Mott MacDonald benchmarking and the value of the received tender.[323]

574. **Stowey WTW pH correction** - The CMA accepts the:

- Need based on the evidence of reducing alkalinity;[324]
- Proposed solution because it is a relatively low cost capital project and would address the impact of algae in the short term, subject to the longer term catchment management plan;[325]
- Cost on the basis of the Mott MacDonald and CKBS benchmarking.[326]

575. **Metaldehyde catchment management** - The CMA accepts the:

- Need based on the DWI Undertaking;[327]
- Proposed solution as it is a requirement of the DWI undertaking;[328]
- Cost on the basis of the Mott MacDonald advice to the LEF that it "*was likely to be lowest totex solution until such time as an effective treatment process is available*" and given its relatively low size compared to other enhancement projects.[329]

4.7 Growth

576. The CMA has provisionally found that "*Bristol Water had demonstrated the need for the [growth] enhancements, and that it had taken a proportionate approach in choosing individual projects to pursue*."[330]

---

319 PFs, paras. 6.193 and 6.197(b).

320 PFs, paras. 6.193 and 6.197(c).

321 PFs Appendix 6.1 para. 10.

322 PFs Appendix 6.1 para. 13.

323 PFs Appendix 6.1 para. 14.

324 PFs Appendix 6.1 para. 20.

325 PFs Appendix 6.1 para. 23.

326 PFs Appendix 6.1 para. 26.

327 PFs Appendix 6.1 para. 30.

328 PFs Appendix 6.1 para. 31.

329 PFs Appendix 6.1 para. 34.

330 PFs, Para. 6.203.

577. Whilst noting that it found "*the evidence on cost estimation to be particularly finely balanced*"[331] the CMA concluded that, because of the efficiencies we had already applied, the post-efficiency level of investment was appropriate.[332] As such, the CMA has approved the proposed schemes and made an allowance of £12.5m.The CMA reached this conclusion for the following reasons:

- **Need**: Ofwat had indicated that "*the projects planned to deal with growth were likely to be required*"[333] and the CMA placed weight on our modelling of the localised effects of future growth, with particular reference to 2020 and 2040 and the additional resilience that the schemes would provide to the respective local communities;[334]
- **Most suitable option**: Ofwat and Mott MacDonald had confirmed the existence of a line of sight from our plans to accommodate population growth to outcomes for customers;[335] and
- **Cost estimation**: The post efficiency figure was close to both Mott MacDonald and CKBS benchmarks.

578. We agree with the CMA's finding and consider the basis for the CMA's conclusions to be justified. We note the CMA's concern that the original cost proposed was significantly above the industry benchmarking by Mott MacDonald and CKBS; we accept this concern, which was the reasoning behind the adjustments made to some of the schemes and application a blanket efficiency of 12.5% across our enhancement expenditure.

4.8 National Environment Programme (NEP)

579. The CMA has provisionally found that the need and proposed solutions within the NEP scheme have been demonstrated, and has made an allowance of £11m.[336]

580. The CMA reached this conclusion for the following reasons:

- **Need**: based on the a statutory obligation to achieve the requisite standards that these schemes seek to deliver;[337] and
- **Cost estimation**: no evidence could be found to suggest that our cost estimate was not appropriate, given it had passed the cost gateway at the risk based review and Mott MacDonald had observed that it may even be too low given the uncertainty around the proposed solution.[338]

581. We agree with the CMA's position and consider the basis for its conclusions to be justified.

---

331 PFs, Para. 6.204.

332 PFs, Para. 6.205.

333 PFs Appendix 6.1 Para. 38.

334 PFs Appendix 6.1 Para. 39.

335 PFs Appendix 6.1 Para. 43.

336 PFs, para. 6.213.

337 Email from Emma Townsend on mandatory nature of NEP (RPF075).

338 PFs Appendix 6.1 Para. 63.

4.9 Asset reliability – discoloured water contacts

582. The CMA has provisionally concluded that the need for the scheme and proposed level of mains relining activity are appropriate and should be funded, but that the forecast cost of delivery is too high. As such, it has relied on the cost benchmark analysis carried out by Aqua and reduced the allowance proposed in the SoC to £9.54m.

583. The CMA has reached its conclusions on need and solution on the following basis:

- **Need**: there is no apparent disagreement around need and we have appropriately investigated, identified and targeted those mains which gave rise to a relatively high proportion of contacts;[339] and
- **Most suitable option**: given the nature of customer complaints on discoloured water and our approach to investigating the cause of discolouration.[340] The CMA notes the reduction in activity we have made in response to customer priorities.[341]

584. We agree with the CMA's position regarding the need and the level of activity as this is consistent with our Business Plan.

585. The CMA challenged the costs based on Aqua's conclusion which contains:

- a misunderstanding regarding the level of risk included in our costs;
- the inappropriate application of an additional efficiency assumption
- a misunderstanding regarding the example data provided for the cost build up for mains rehab.

586. Para 73 of Appendix 6.1 of the PFs indicates that Aqua believes that £9.54 million would be an appropriate level of expenditure on the scheme compared to the Bristol Water estimate of £10.2 million.

587. We do not support the CMA's finding regarding the cost of delivery or the means by which it has calculated the adjustment. Our comments on the benchmarking analysis carried out by Aqua are set out in the following sub-section.

4.9.1 Aqua's misunderstanding regarding level of risk and contingency included in cost

588. In Appendix 6.1 para 73, the CMA notes Aqua's belief that the trunk mains lining work can be completed for £9.54 million and that risk and contingency were higher than they would have expected. The CMA has used Aqua's view to apply an additional efficiency challenge to our mains replacement costs. We have a number of concerns with this and disagree that our costs should be reduced. In its report, Aqua states:

> *"..the inclusion of 25% is far in excess of any contingency amount we have seen included elsewhere"*[342]

---

339 PFs Appendix 6.1 Para. 68.

340 Distribution Operation and Maintenance Strategy (RPF079).

341 PFs Appendix 6.1 Para. 68.

342 Aqua Report, Para. 173.

589. The AMP6 estimates provided in the Draft Determination Response, were based upon a schedule of tendered rates received for the AMP5 work. These were based upon limited information and do not represent all-in rates. The 25% in the AMP6 estimate represents an allowance for non-scheduled items based upon the experience gained in AMP5, not a 'contingency' as the term is commonly understood. The actual percentage addition for non-scheduled items experienced in AMP5 was 34%. However when one exceptional project is removed (where the scope changed to an open cut scheme) this reduced to 27%. We therefore consider that a 25% allowance is reasonable and based on historic experience. Contingency is not meant to replace the development of an accurate estimate commensurate with the stage of the project and the associated definition at that stage. This addition is not a contingency but an allowance to cover unspecified items that experience shows will occur.

590. Aqua also states:

> *"We would not expect to see this level of risk being applied in this type of work, or even most construction projects".*[343]

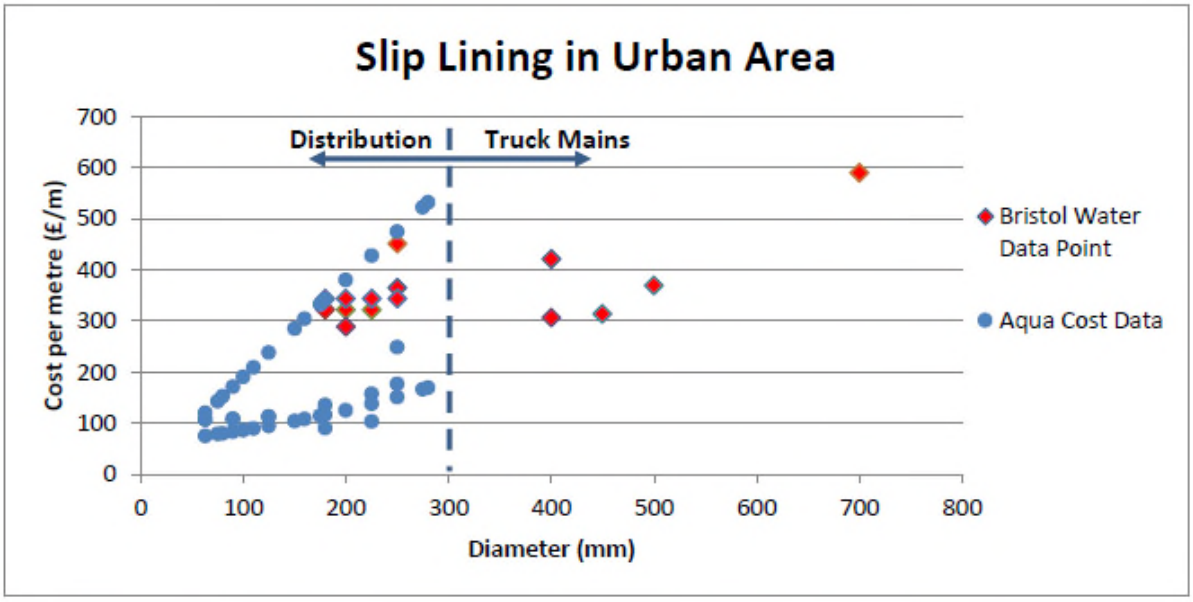
591. As mentioned above this statement makes no reference to the level of design that has been undertaken. The percentage of risk to apply will vary depending upon how advanced the design is. In this case, the design is based upon a GIS plan only. The risk items identified reflect actual experience and are appropriate for a project at this level of design development.

592. One aspect that is unknown is the actual rehabilitation technique that will be used. Where the diameter of the existing main is very close to the diameter of a standard modern polyethylene pipe it may not be possible to pull the new pipe through the existing pipe. Alternative, but more expensive, techniques exist and we have a schedule of tendered rates for these alternatives. On average over AMP5 these were 69% greater than the rates for conventional sliplining which we have used in the AMP6 estimate. An analysis provided to Aqua showed that a number of the AMP6 schemes were at risk of having to use these alternative techniques. However, we appreciate that in some instances hydraulic analysis may demonstrate that we can downsize the new pipe and continue to use conventional sliplining. To reflect this opportunity we have only used an allowance of 5%.

593. Despite the inference that these estimates contain far too much risk, comparison with Aqua's own data suggests this is not the case. Figure 15 shows all of the Bristol Water data to be within the envelope of outturn data supplied by Aqua. Although Aqua appears to have no data for sliplining of mains above 300mm diameter a sensible extrapolation of the data they do have indicates that for schemes above 300mm diameter the estimated rates are not only well within the envelope but towards the lower end of the data points. Although it is difficult to establish which projects the BW data points refer to it appears that at least three of the six schemes for which AMP6 estimates have been provided are contained within the lower set of BW data points for 300mm diameter and above and around 80% of the trunk mains relining length is 300mm or above

[343] Aqua Report (track changes version), p. 17.

Figure 15 Slip lining in urban area



Source: Figure 7 from Aqua Report (track changes), p.16.

594. Aqua makes the following comments:

> *"The majority of BW's rates are on the higher end of our cost data for the sliplining work, as shown above and open cut shown below"*[344]
>
> and:
>
> *"The smaller diameter pipework is higher than we would expect, whilst the larger diameter pipework is within the range we would have expected"*[345]

595. The comments that relate to figure 8 are reasonable.[346] In figure 8 the difference between Bristol Water data and Aqua data for the larger diameter mains are similar to the difference between Aqua and Bristol Water data for many of the rates used in Figure 7, yet for figure 7 the comments infer that the Bristol Water rates are too high. This is an inconsistent interpretation of the data.

596. Tenders have now been returned for the AMP6 trunk mains relining projects and indicate that costs will be greater than the original Final Business Plan submission. When the tendered rates are substituted into the FBP estimate it increases to £10.9 million (12/13 prices). The tender cost is therefore £0.7m higher than the cost included in our SoC.

4.9.2 Aqua's inappropriate application of an additional efficiency assumption

597. As discussed under IRE, for trunk mains relining Aqua has calculated a cost on the basis that it believes our risk allowance is too high rather than by comparison with a single comparator company. As explained above the Bristol Water estimates for trunk mains relining are

[344] Initial Aqua Report, p. 43.

[345] Aqua Report (track changes version), p. 17.

[346] Aqua Report (track changes version), p. 17.

compared with two comparators in Figure 7 of Aqua's report. Around 80% of the trunk mains relining is 12" (300mm) or above. When compared with Aqua's extrapolated data the trunk main schemes are well within the other two companies' costs. It should be noted that following receipt of tenders the revised AMP 6 trunk mains rehabilitation estimate is now £10.9 million (12/13 prices).

4.9.3 Aqua's misunderstanding regarding the example data provided for the cost build up for mains replacement

598. As discussed in **Section 3.5.3.1.2 above**, the CMA has based its application of an additional efficiency assumption partly on the results of Aqua's belief that the information given to them in CMA0195 was the Bristol Water unit rate for a 250mm diameter main. This is not the case as the information was purely illustrative and intended to show the rates in Schedule 6 of the Term Contract.

599. We have prepared estimates for four different but representative scenarios for laying a 250mm diameter main. Our weighted average cost for this is £166.93 per metre. This is significantly lower than the figure of £223.27 per metre calculated by Aqua.[347] We consider that the CMA should reconsider its reliance on this inaccurate information to apply additional efficiency assumptions.

4.10 Other enhancement expenditure

600. The CMA has found that an allowance of £18.9 million should be included for Bristol Water's other enhancement schemes.[348] Whilst the CMA has not reviewed these schemes in detail, it has reached this decision because it considers the 12.5% efficiency challenge should give comfort that in aggregate that the smallest enhancement schemes are appropriately costed.[349]

601. We agree with this finding and consider the basis for the CMA's conclusions to be justified. We note the CMA's observation that the efficiency challenge we have applied should give comfort regarding the costing of these smaller schemes. Our desire to reflect the industry cost benchmarking we carried out drove our application of a blanket efficiency of 12.5% across our enhancement expenditure (excluding Cheddar Reservoir Two).

4.11 Conclusions on the provisional findings on enhancement expenditure

602. In summary, the CMA's provisional findings in relation to enhancement expenditure are to:

- exclude Cheddar Reservoir Two on the grounds of failure to demonstrate need;
- exclude Cheddar WTW on the grounds of failure to demonstrate the most suitable option;
- allow other Raw Water Deterioration schemes at Barrow and Stowey and for Metaldehyde catchment management;
- partially allow the Southern Resilience Scheme, with the exclusion of the service reservoir at Rowberrow;
- allow the Growth schemes in full;

---

347 Aqua Report para. 162.

348 PFs, para. 6.223.

349 PFs, para. 6.222.

- allow the NEP in full;
- allow the Asset reliability (discoloured water contacts) scheme in terms of scope, but constrain the costs; and
- allow the lead and 'other' schemes in full.

603. We welcome the CMA's provisional findings in relation to the raw water deterioration, growth, NEP, lead and other schemes. We ask the CMA to revisit its cost constraints imposed on the asset reliability scheme in light of the evidence we have provided.

604. We appreciate the decision to fund the Southern Resilience Scheme, but believe that the case has been made to increase the total funding to £27.1m to include the cost of an additional service reservoir.

605. Whilst we consider that the proposals for Cheddar WTW have the support of a broad range of stakeholders, we note the CMAs approach to risk in this area and agree that, as a minimum, the CMA's proposal to allow funding of £1m for further investigation and minor remedial works, alongside an uncertainty mechanism, is a reasonable approach.

606. In relation to Cheddar Reservoir Two, we believe that the need for the scheme has been established. We also note that the inclusion of the scheme reflects the fact that it was subject to a rigorous and thorough statutory process in order to be included in the WRMP and, as a result, it has the endorsement of the EA, Defra and the Secretary of State as being the right solution to accepted supply demand balance issues. At the very minimum, therefore, we should be funded to maintain planning permission during AMP6 so that we preserve the ability to commence construction during AMP7.

5 Overall Wholesale Totex

5.1 Executive summary

5.1.1 Introduction

607. This section provides our comments on the CMA's provisional findings in respect of the overall assessment of totex as set out in Section 7 of the PFs.

5.1.2 Key themes

608. In Section 7 of the PFs the CMA sets out its provisional view that the overall level of wholesale totex assumed for the determination should be £429m. The approach taken by the CMA was to:

- compare the results of its econometric modelling with its business plan assessment;
- select the central point of its econometric assessment; and
- directly add its view of enhancement costs.

609. We consider that the overall level of totex is too low because the provisional analysis has not taken sufficient account of special cost factors (see **Section 2**) and the business plan assessment has underestimated the business requirements due to unrealistic assumptions about cost increases and unrepresentative cost comparisons (see **Section 3**). In addition, we consider the allowance for specific enhancement costs in more detail and answer the questions raised by the CMA, supporting the case for some of the additional finding in the SoC (see **Section 4**).

610. In selecting the central point of the potential range of costs, the CMA has not fully taken into account the preferences of customers for price and the balance of risk to their service indicated through Willingness to Pay. Our customer research shows that customers strongly rejected a potential plan that included reductions in bills at the cost of reductions in maintenance.

611. We believe that consideration of the analysis presented, customer preferences and an appropriate level of service risk should lead the CMA to a point estimate nearer the top of the range than the centre.

5.1.3 Structure of the section

612. In this section we set out:

- our views on the comparison of base expenditure (see **Section 5.2**);
- our views on the inclusion of enhancement (see **Section 5.3**); and
- other considerations (see **Section 5.4**).

5.2 Overall estimate of base expenditure

5.2.1 Introduction

613. In the provisional findings, the estimated central point from the econometric modelling of £346m was in the centre of the range identified from the business plan assessment.

614. We have set out in **Section 2** above that we consider the econometric assessment did not take sufficient account of special cost factors. In **Section 3** above we set out additional reasons why, based on actual cost requirements, the PFs includes a totex allowance that will not enable delivery of the service that our customers want. We therefore consider that both approaches have resulted in an estimate of base costs that is too low.

615. In this Section we compare aspects of the econometric analysis and business analysis with wider industry data for:

- operating costs (see **Section 5.2.2**);
- infrastructure maintenance (see **Section 5.2.3**);
- non-infrastructure maintenance (see **Section 5.2.4**); and
- base totex overall (see **Section 5.2.5**).

5.2.2 Operating costs

616. In **Section 2.4** we discuss our views on special cost factors. Table 21 below sets out the special cost factors relating to operating costs.

Table 21 - Summary of Special Cost Factor Adjustments Opex

Description	CMA Provisional View (£m)	Bristol Water Conservative View (£m)	Potential higher estimate (£m)
Canal and River Trust Payments	8.1	8.1	8.1
Treatment Complexity	0.0	5.5	6.0
Additional costs at Purton and Littleton	0.0	8.35	14.7
Congestion in Bristol	0.0	3.65	6.2
Total opex special cost factors	**8.1**	**25.6**	**35.0**

Source: CMA Provisional Findings/Bristol Water

617. At PR09 Ofwat allowed special cost factors for operating costs of £30.3m.[350] This was also accepted by the CC in CC10.[351] At PR04 Ofwat allowed a £33.1m special cost factor for operating costs.[352] In both cases the additional costs allowed were greater than the special cost factor of £25.6m relating to operating costs we have set out in the table above.

618. Moreover, the first three of these special cost factors relate to additional costs for water treatment of £22m. In **Section 2.4.3.2.2** we show that Bristol Water has additional costs over five years of £25.7m for resources and treatment operating costs compared to an average company on a volumetric basis. This shows that the special factors we have set out do not explain all of the difference between our costs and the costs of an average company for treatment.

619. Given the regulatory precedent and the comparative data on resource and treatment costs we consider that the special costs factors we have included for operating costs are conservative and credible. In contrast, we do not believe that the special cost factors of £8.1m included by the CMA reflect the cost requirement of Bristol Water.

---

350 See 2010 SoC (SOC128), para 1161, calculated as £5.172m per annum updated from 2007/08 prices to £6.07m in 2012/13 prices.

351 CC Determination 2010 (SOC011).

352 Ofwat, Final Determination: Future Water Charges 2005-10 Supplementary Report for Bristol Water (RPF048), Table C.2.1a. Calculated as £4.8m pa in 2002/03 prices adjusted to £6.6m in 2012/13 prices.

620. In **Section 3** we set out that, compared to the actual costs we incur, we believe the reductions in operating costs the CMA has made from our SoC to £215m are inappropriate:

- the use of an adjusted average AMP5 spend as a base ignores underlying drivers that we have shown lead to higher cost in the future. We believe the overall level of adjustments made are selective and go further than the narrative describes;
- we set out additional analysis of the impact of AMP5 capital expenditure that clearly demonstrates that it will lead to higher costs in the future. The adjustment is not consistent with the CC10 findings; and
- in its calculation of opex build up the CMA appears to have included an efficiency challenge for 2014/15 despite using average AMP5 costs (including 2014/15) as its base costs. We do not consider this is appropriate and estimate that adjusting the CMA calculation for this would increase opex by £4.4m due to the related impact on the efficiency challenge for AMP6.

621. We believe the CMA should take comfort in Oxera's disaggregated modelling, which shows our cost projections are below an upper quartile benchmark (with the amended regional wage adjustment) and reverse the adjustments made.[353]

622. We consider that taking into account the representations we have made in **Section 2** for special cost factors and **Section 3** for operating costs results in a consistent and credible picture.

5.2.3 Infrastructure Maintenance

623. Table 22 below sets out our view on the special cost factors relating to IRE from **Section 2**.

Table 22 - Summary of IRE Special Cost Factor Adjustments

Description	CMA Provisional View (£m)	Bristol Water Conservative View (£m)	Potential higher estimate (£m)
Mains Renewal Programme	10.6	15.0	26.4
Upstream Infrastructure Maintenance	N/A	12.1	12.1
Total special cost factors	**10.6**	**27.1**	**38.5**

Source: CMA Provisional Findings/Bristol Water

624. We present evidence in **Section 2.4.7** that the average expenditure on upstream assets for a company of Bristol Water's size is £3.9m, compared to the £16.0m. The evidence also shows that those companies with a higher proportion of upstream assets have higher costs in this area than those without. The CMA's models do not include an explanatory factor for this area of expenditure and therefore it needs to be treated as a special cost factor.

625. The CMA has estimated a special cost factor for additional mains replacement based on misleading comparative information from Aqua. We show in **Section 3.5.3.2** that a more balanced benchmarking approach based on comparable evidence for all companies shows that the costs we have included in our plan for infrastructure maintenance, excluding upstream, at £259 per metre are low compared to the industry average of £412 per metre. Applying this higher mains replacement cost to the CMA estimate of special cost factor results in the estimated cost increasing to £26.6m. We consider that an estimate in the

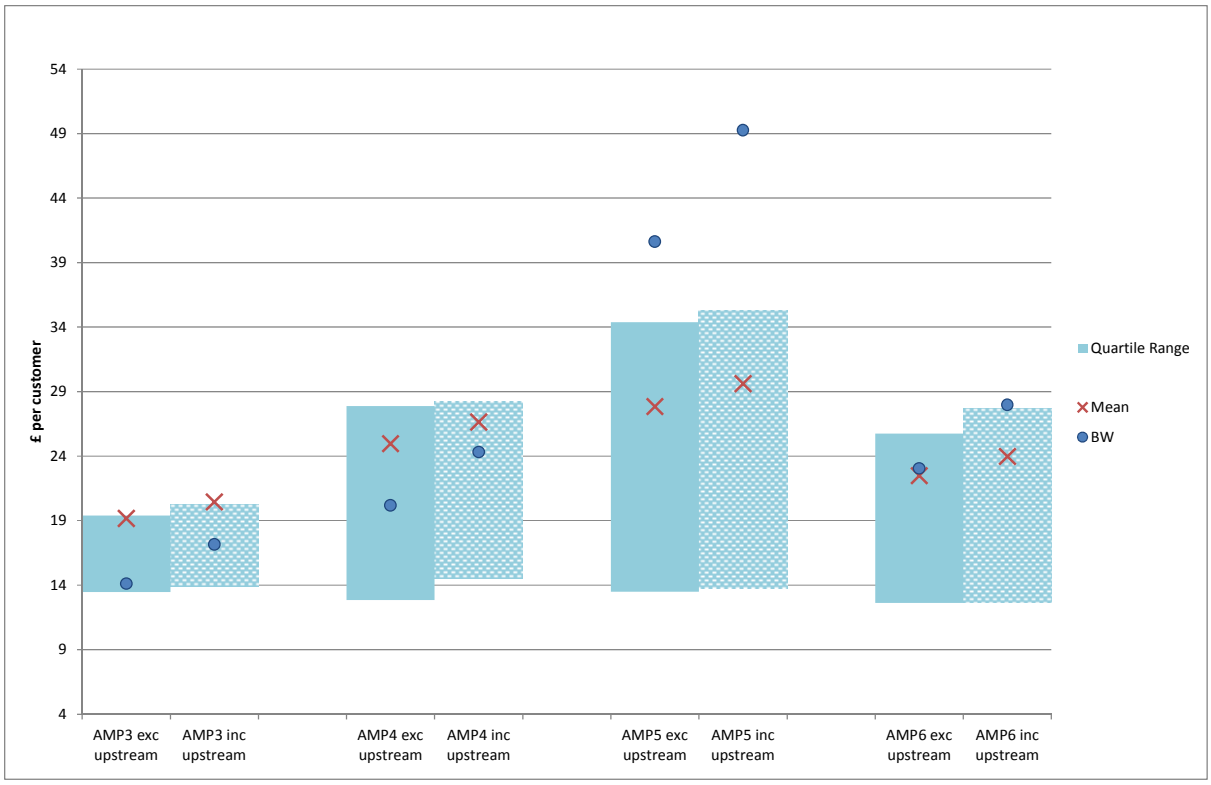
[353] SoC, Table 72, p.309.

centre of the CMA's modelling estimates for the costs of additional mains of £15m is more appropriate.

626. We welcome the CMA's acceptance of Bristol Water's proposed mains replacement programme of 233km. However, we do not accept the CMA's concerns that our strategic modelling is not aligned with our approach to actual delivery, as these are based on Aqua's misunderstanding of our mains modelling. Both our modelling and our selection of pipes to replace are based primarily on historic burst rates. We do not agree with the CMA's assumption that we are able to deliver further efficiency savings over and above the 10% programme efficiency we have already assumed.

627. Moreover, as demonstrated by Figure 7 below, a comparison of our proposed expenditure with that allowed for other companies shows that, excluding upstream maintenance costs, our proposed costs per customer are in line with the industry average. Given the higher level of proposed mains replacement, this demonstrates that our costs in this area are efficient.

Figure 16 - Industry Expenditure on Infrastructure Maintenance



Source: June Returns/Ofwat PR14 data/Bristol Water/Bristol Water analysis

628. In addition disaggregated benchmarking evidence demonstrates that the costs we have included in our plan are within a reasonable range:

- Bristol Water's disaggregated modelling indicated that the expected level of infrastructure maintenance costs for Bristol Water was £107.8m;[354] and
- Oxera's non-SFA disaggregated modelling indicated a range for upper quartile efficient costs of £80m-£85m.[355]

[354] SoC, para. 1040

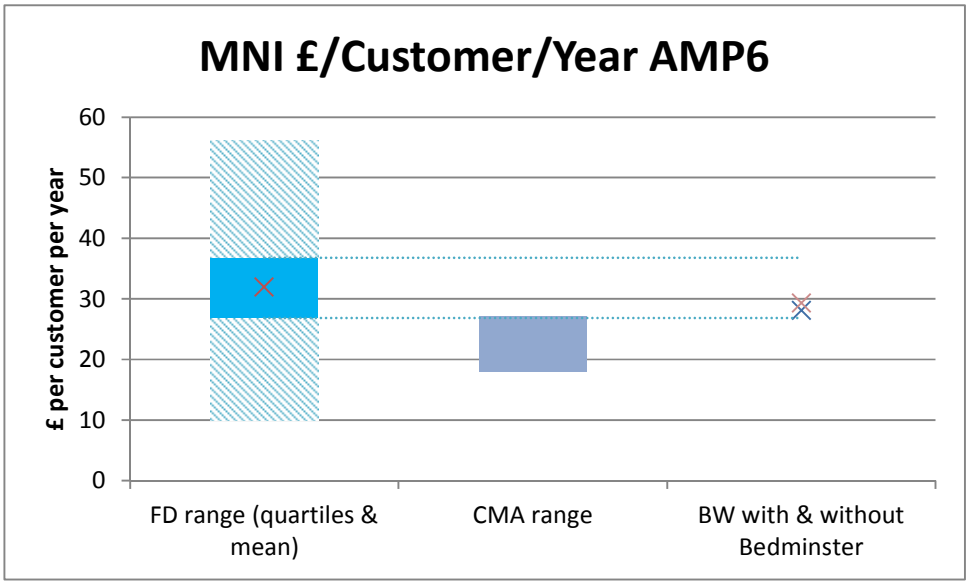
629. Both of these disaggregated estimates are greater than the costs included in our plan of £76m and should give the CMA confidence that the costs we have included are efficient.

5.2.4 Non-infrastructure Maintenance

630. In **Section 2** we did not identify any special cost factors relating to non-infrastructure maintenance other than Bedminster Reservoir.

631. In **Section 3** we show that the range of costs for MNI assumed in the provisional findings is below an appropriate level. This is illustrated in Figure 14 below which compares the range of costs included in the FD14 for MNI with the range included in the provisional findings and the amounts included within our plan.

Figure 17 - Comparison of ranges for MNI



Source: Ofwat FDs/Bristol Water analysis

632. The figure shows that the top of the range assumed by the CMA in the preliminary findings is below the lower quartile range of companies' allowed spend. In addition, it shows that the cost included in our plan (excluding Bedminster Reservoir) is in line with the industry lower quartile.

633. Maintenance expenditure on treatment works for companies with higher levels of treatment complexity is likely to be higher because of the greater number and complexity of treatment processes that will require maintenance. Bristol Water has a comparatively high level of treatment complexity, and therefore would be expected to have higher maintenance costs than an average company in this area. Typically, maintenance expenditure on treatment works across the industry represents around 35% of non-infrastructure maintenance, with a range of 16% to 55%.[356]

634. In addition, Bristol Water would be expected to incur higher maintenance costs on its pumping plant as a result of greater pumping plant capacity because of the higher than

[355] SoC, Table 72, p.309.

[356] Based on industry expenditure between 2009 and 2011.

average pumping head. Taken together with the impact from treatment works, it should be expected that our costs would be above average. Bristol Water's proposed overall level of infrastructure maintenance is below the industry average despite these factors that should lead to higher cost. We consider that this should give the CMA confidence that the costs included in our plan for non-infrastructure maintenance are efficient.

635. In addition disaggregated benchmarking evidence demonstrates that the costs we have included in our plan are within a reasonable range:

- Bristol Water's disaggregated modelling indicated that the expected level of infrastructure maintenance costs for Bristol Water was £89m;[357] and
- Oxera's non-SFA disaggregated modelling indicated a range for upper quartile efficient costs of £81m-£83m.[358]

636. Both of these disaggregated estimates are greater than the costs included in our plan, excluding Bedminster Reservoir, of £74m and should give the CMA confidence that the costs we have included are efficient.

637. We have set out our response on Bedminster Reservoir in **Section 3.6.2**. We continue to believe the case for Bedminster is clear and that it is the best option for our customers, particularly taking into account their views as expressed through our customer engagement. For instance, Bedminster Reservoir is required for resilience, rather than storage. Our customers ranked 'making sure water is always on tap' as their equal top priority for service in our customer priorities research.

638. We consider that expenditure on this reservoir is atypical. This is supported by Ofwat's analysis that suggests that the implicit allowance for replacing service reservoirs for Bristol Water is £1m.[359] We therefore consider that if included in the Final Determination, a special cost factor of £5.1m should be included for Bedminster reservoir (based on £6.1m cost less £1m implicit allowance).

5.2.5 Base totex overall

639. The table below sets out a number of comparisons between our plan and econometric modelling. The special factors in the Oxera disaggregated view exclude treatment complexity for operating costs as this is included in the model. They also exclude the mains replacement special factor as this is also included in the model. The regional wage adjustment has been added to Oxera's analysis.

Table 23 – Comparison of Modelling approaches to adjusted SoC

Description	CMA Modelling BW Cost Factors (£m)	CMA Provisional View (£m)	Oxera Disaggregated view (exc SFA) (£m)	Bristol Water adjusted SoC (£m)
Disaggregated Modelling				
Opex			161	198.5
IRE			83	76
MNI (excluding Bedminster)			82	74

[357] SoC, para. 1048.

[358] SoC, Table 72.

[359] PFs, para. 5.111.

Description	CMA Modelling BW Cost Factors (£m)	CMA Provisional View (£m)	Oxera Disaggregated view (exc SFA) (£m)	Bristol Water adjusted SoC (£m)
Total			326	348.5
Overall Modelling				
Total	307.4	307.4		
Policy Items	29.5	29.5	29.5	29.5
Opex special factors (inc wages)	37.0	14.8	31.5[360]	N/A
IRE special factors	27.1	10.6	N/a	N/A
Total modelling allowance	401.0	346.4	387	378[361]

Source: CMA Provisional Findings/Bristol Water

640. The PFs set out a range for base expenditure of £324m to £366m.[362] If the CMA's provisional view of £346m is adjusted for the special factors set out in **Section 2**, the total modelling allowance would be close to £400m, above the £378m in our SoC and the upper range set out in the PFs.

641. As the CMA has questioned the use of SFA modelling,[363] the table only presents the average of the OLS and RE methods. The table shows that taking into account special factors, the costs included in our plan are efficient based on Oxera's modelling and highlights that disaggregated modelling would likely lead to a more reflective cost allowance.

642. We consider that given the strength of the evidence we have provided for the special factor cases, this confirms the base costs included in the SoC are reasonable.

5.3 Overall assessment of enhancement expenditure

643. The CMA has considered Bristol Water's enhancements requirements by undertaking a bottom-up assessment of our business plan proposals. We agree that this is the most appropriate way to determine enhancement expenditure. Our views of the assessment of enhancement expenditure are set out in **Section 4**.

644. The CMA has excluded costs in relation to Cheddar Reservoir Two, Cheddar WTW and the service reservoir component of the Southern Resilience Scheme and made further amendments resulting in an allowance of £83m.

645. The consensus view is that Cheddar Reservoir Two does need to be built at some point in the near future, in line with our WRMP. Given the CMA's position in the PFs, we believe it should consider a solution that preserves the optimal delivery timeframe and is consistent with the spirit and intention of the WRMP.

646. Whilst we consider the CMA's approach of an uncertainty mechanism for Cheddar WTW is a reasonable alternative, it would require policy clarifications and counters the LEF view that delaying action would not be in the best interest of customers.

647. In **Section 4**, we provide additional analysis and reasoning to explain the need for the service reservoir that is included in the Southern Resilience Scheme. Our ongoing design process

[360] Based on Bristol Water analysis.

[361] Excludes Bedminster Reservoir, therefore the table shows a different total to Table 72, SoC.

[362] Range includes the operating cost sensitivity analysis included in Table 9, Appendix A5 of PFs.

[363] PFs, para 4.84.

has highlighted that a service reservoir at Hutton will provide the local resilience required and meet growth demands.

5.4 Other considerations

648. The CMA has chosen the mid-point of its range for costs both in respect of its modelling and its business plan assessments.

649. We consider that the selection of a point within a range should reflect the following issues:

- customers preferences for service and bills (see **Section 5.3.1**); and
- balancing customer service risk (see **Section 5.3.2**).

5.4.1 Evidence of Customer Preferences

650. Bristol Water undertook a wide range of customer research to help it understand the views of customer and allow their views to shape our plan.

651. This research showed that customers strongly rejected a potential plan that included reductions in bills at the cost of reductions in maintenance. Section 6.5.7 of the SoC sets out the results of the acceptability research, which included a 'purple' plan which included bill reductions and a reduction in maintenance. This purple plan was unanimously rejected by respondents in the qualitative research and preferred by only 12% of respondents in the quantitative research.

652. In addition, the overall shape of our plan, and prioritisation of elements within it, has reflected the balance of customers' differing willingness to pay for improvements in separate elements of customer service. The adjustments made in the provisional findings make no allowance for these preferences.

653. In its provisional findings, the CMA appears to have substituted its view of customer preferences from that used to derive our plan and which was based on detailed customer research and challenge by the LEF. In doing so, we consider that that the CMA has not reflected customer preferences for the balance of service and price.[364] As a result the provisional findings are not necessarily consistent with customer preferences.

5.4.2 Balancing customer service risk

654. In preparing our Business Plan, we have paid particular attention to our internal approach to risk and how this has informed our investment choices, based on the views of customers.

655. We recognise that some aspects of our plan reflect the evidence-based view of the level of risk that customers are willing to accept. For example, much of our proposed capital programme focuses on providing a resilient supply, such that we are able to cope with extreme events, or to ensure that our water continues to meet high quality standards and is good to drink, despite new challenges. In certain instances our plan has been informed by the appetite for risk indicated by the specialist regulators, such as in relation to management of water quality risk (see, for example, **Section 4.4**).

---

[364] LEF Letter to the CMA July 2015 (RPF069).

656. The provisional findings challenge the scope of our capital programme and whether the level of risk in service provision in our Business Plan is too low. This view is particularly notable for specific enhancement schemes where uncertainty is material, as well as in respect of the overall amount of expenditure envisaged for maintenance within the overall totex allowance.

657. The CMA indicates that we suggested it should *"err on the side of a wholesale expenditure allowance that was too high".*[365] That is not our position. We simply noted the risks of setting an allowance below an appropriate level.[366] In the preparation of our Business Plan and in subsequent submissions, we have continued to target a central estimate of costs, less a challenging efficiency assumption.

658. Ultimately, the CMA must decide on the level of risk it believes is appropriate and therefore which schemes form part of the totex allowance and what level of funding is made available for maintenance.

5.5 Conclusions on overall wholesale cost allowance

659. A comparison of the CMA model, together with an appropriate but conservative approach to special cost factors, results in a base cost allowance that is similar to the base costs we have included in our plan. We consider that this should give the CMA confidence that the base costs in our plan are efficient and appropriate.

660. We consider that the provisional findings have resulted in a base cost allowance that is too low. One reason for this is that the CMA has not included an appropriate level of special cost factors to adjust its modelled range.

661. In addition, where there is a range of outcomes, careful consideration needs to be given to where in the range is most appropriate. Taking into account the evidence presented and customer preferences, such consideration is likely to result in an estimate nearer the top of the range than the centre.

662. Finally, the CMA must decide on a scope of investment that reflects the level of risk it believes is appropriate, and ensure that the funding it allows is adequate.

---

[365] PFs, para 4.198.

[366] Bristol Water's response to the CMA Working Paper on Overarching approach to cost assessment of 13 May 2015, Section 2.2.1.1.

6 Reconciling 2010-2015 performance

6.1 Executive Summary

6.1.1 Introduction

663. This section provides our response to the CMA's provisional findings on RCV adjustments in respect of 2010-15 performance, as set out in Section 8 of the PFs.

6.1.2 Key themes

Serviceability penalty

664. The CMA has retained the £4.1m reduction to RCV imposed by Ofwat in respect of its infrastructure serviceability assessment. This penalty is disproportionate to the impact on customers of performance against this measure, and is counter to the regulatory framework for assessment set out at FD09. We maintain that this penalty should not be imposed.

665. To the extent, however, that the CMA believes a penalty is justified, we believe that a penalty of £4.1m is disproportionate and should be reduced. The penalty of £4.1m relates to four specific incidents which caused performance on the unplanned interruptions greater than 12 hours sub-indicator to be exceeded. At approximately £1m per incident, we do not consider that the scale of the penalty is proportionate in the context of these incidents, all of which were impacted by circumstances beyond the control of Bristol Water that meant we could not restore supplies within the 12 hour timeframe. Customers were compensated under the GSS scheme for the events affecting the distribution mains.[367]

666. We demonstrate that Ofwat did not apply its stated methodology, as set out at PR09, including not providing an annual serviceability assessment in 2011/12 and 2012/13, and not carrying out the 2013/14 assessment consistent with the example provided in its 2010 serviceability workshop.[368] This means that the only year to which a serviceability penalty could potentially be applied is 2014/15, which through Ofwat's calculation limits the maximum penalty to £1.6m.[369]

667. In its assessment of whether the specific incidents were outside of the control of Bristol Water, the CMA has not considered the extent to which Bristol Water could have been expected to reduce the duration of the interruptions or the numbers of customers affected. For each incident we have proven, and been supported by CH2M Hill's analysis, that external factors meant that it was not possible to restore supplies within 12 hours. Again, this supports a conclusion that either a penalty should not be applied or, if it is, it should be proportionate to the underlying circumstances.

---

367 SoC, paras. 1866 and 1876.

368 Ofwat serviceability 2010 Workshop (SOC270) and Ofwat serviceability 2010 Workshop part 2 (SOC271).

369 Calculated by removing 2011/12 and 2013/14 shortfall values from cells AR13 and AT13 of Ofwat's shortfall feeder model (RPF068).

RCV capping

668. The CMA has not made an adjustment to our RCV in relation to Ofwat's 2009-10 RCV capping. This capping was based on a COPI series which was later found to be inaccurate and discontinued. Our expenditure decisions in 2009/10 were based on the best available forecast of COPI at that time, and the RCV capping is not a fair reflection of the available data on which investment decisions were made. The CMA's finding creates a retrospective adjustment given what Bristol Water understood was the cap when it made its capital expenditure decisions.

669. We maintain that the capping should be reversed, with a positive adjustment made of £4.8m to our RCV.

CIS adjustment

670. The CMA has chosen not to intervene in Ofwat's process for correction of indexation issues in the CIS, against the background of Ofwat's pending industry consultation to address the issue. We consider this approach to be appropriate.

6.1.3 Structure of the Response

671. Our response to the CMA's provisional findings in this Section is structured as follows:

- the approach to serviceability (see **Section 6.2**);
- the approach to 2009-10 RCV capping (see **Section 6.3**);
- the approach to CIS indexation methodology (see **Section 6.4**); and
- conclusions on 2010-15 adjustments (see **Section 6.5**).

6.2 Serviceability

672. Ofwat introduces serviceability in its document PR09/38 by stating that "*All companies must maintain their asset systems so that they remain fit for purpose over the long term.*" This is consistent with our view of the purpose of the serviceability assessment process, that it is intended to ensure that companies deliver the investment required of them at price reviews, and that the investment is effective in delivering a satisfactory level of service to customers.

673. In its serviceability assessment the CMA should also take into account that our infrastructure maintenance expenditure of £128.1m during AMP5 was £19.7m greater than the £108.4m allowed at CC10.[370] This expenditure was used to deliver the key outputs required at that determination, including 296km of mains replacement, and a 10% reduction in leakage. We do not consider that delivery of these outputs is consistent with a position of under-investment in asset systems that a serviceability shortfall penalty implies.

674. The CMA has concluded in the provisional findings that it is appropriate to maintain the £4.1m reduction to RCV imposed in FD14 in relation to the infrastructure serviceability assessment.

675. In reaching that conclusion, the CMA has set out three key questions to determine whether a shortfall penalty should be applied.[371] We consider that these questions are appropriate to

[370] Figures presented in 12/13 prices.

[371] PFs, para. 8.5.

address, but should be placed in a wider context of what the targets were and whether the assessment has been correctly applied. An additional question should be whether, if the CMA finds that a penalty should be applied, the resulting penalty is proportionate to the impact on customers and the circumstances leading to the penalty being incurred.

676. We suggest a more appropriate framework for the CMA's assessment of this issue could be as follows:

- should the methodology be followed as set out at FD09, or that which Ofwat has retroactively used for assessment at FD14 (see **Section 6.2.1**.);
- what is the correct application of this assessment methodology (see **Section 6.2.1.4**);
- is the result of the serviceability assessment proportionate to the impact on customers (see **Section 6.2.3**);and
- is the result of the serviceability assessment consistent with the mischief that the process is intended to guard against (see **Section 6.2.4**)?

677. We set out our response to each of these points below.

6.2.1 Should the methodology be followed as set out at FD09, or that which Ofwat has retroactively used for its assessment at FD14? [372]

678. We consider that it is only appropriate for the methodology applied to be as it was set out at FD09, and reinforced by the 2010 serviceability workshop.[373] This set out the six indicators applicable to infrastructure serviceability, with bursts as the lead indicator and five others, including unplanned interruptions greater than 12 hours as sub-indicators.[374] This means that all indicators should not be treated equally in the assessment or calculation of any penalties.

679. To the extent that Ofwat has retroactively sought to revise this methodology, as it appears to have done at FD14, these revisions should only supersede the existing guidance where it was explicitly stated that they did so and due process had been followed in terms of an appropriate level of consultation, etc. We are not aware of any such statement. The support for our position is developed further in the following sections.

6.2.1.1 Consistency with workshop example

680. Ofwat has informed the CMA that the workshop example from April 2010 is not an appropriate comparison with Bristol Water's performance and should be discounted. The CMA appears to accept Ofwat's recommendation.[375] We have not had sight of the evidence Ofwat provided to the CMA to justify this conclusion, but in any case we assert that the example is clearly relevant. Whilst the extent by which we exceeded the DG3 Unplanned Interruptions greater than 12 hours (**DG3UI>12**) target is larger than in the example, the key principle which the example shows is that the assessment is made against infrastructure serviceability in the round, rather than on each sub-indicator separately. This assessment

---

[372] The CMA at para 8.21 states " *we provisionally consider it inappropriate to intervene in this area retroactively*". By endorsing Ofwat's change of methodology from that explained at the Ofwat 2010 Serviceability workshop the CMA has, however, supported a retroactive change. The CMA then goes on to set out a logical inconsistency by saying at para 8.23 that: "*We would expect any guidance in AMP5 to supersede the previous documents*".

[373] Ofwat serviceability 2010 Workshop (SOC270) and Ofwat serviceability 2010 Workshop part 2 (SOC271).

[374] RD15/06 serviceability (SOC146).

[375] PFs, para. 8.22.

methodology clearly shows the hierarchy of lead and sub-indicators, as bursts is the lead indicator, with DG3UI>12 as a sub-indicator, and therefore a stable performance on bursts should over-ride a marginal performance on a sub-indicator.

6.2.1.2 Communication of revision to assessment methodology

681. Ofwat's retroactive revision to its serviceability assessment methodology, to treat all indicators as equal, was not expressed through this example or any publication it has made, including PR09/38. Whilst PR09/38 stated that Ofwat's starting point will be a shortfall in output, it did not make it clear that this represented a change from the previous assessment process. Companies could therefore have reasonably assumed that some account would be taken as to whether the indicator in question was the lead indicator or a sub-indicator, as had been the case in previous assessments.[376]

682. We do not agree with the CMA's comment, therefore, that there was sufficient guidance to expect us to be aware of this. Ofwat's failures to properly communicate and implement its revisions to its serviceability assessment process have significantly impacted its assessment of our performance.

6.2.1.3 Volatility of DG3>UI12 measure

683. The CMA states that it is unlikely that it was the natural volatility of DG3 UI>12 that drove the breaches of the control limit.[377] This conclusion, in response to our comments expressed in the SoC,[378] may be based on a different context of 'volatility'. In our submissions, we were not referring to the variation in reported numbers of properties affected between years, but to the impact that one particular event can have on reported performance. This is particularly evident in our reported data for 2013/14 and 2014/15, where any one incident could cause a breach of the control limit.

684. These incidents are also then subject to the arbitrary threshold of 12 hours, meaning that a company could have a number of major incidents restored in just under 12 hours and remain stable, but with one incident of just over 12 hours would be classified as marginal. Use of the number of bursts as a lead indicator is useful to overcome this volatility, as each burst is treated as an equal indicator of the condition of the network, regardless of the subsequent time for restoration of supplies, which may be impacted by a wide range of factors not connected to network condition.

6.2.1.4 Consistency with regulatory precedent and good regulatory practice

685. Ofwat's reduction of the RCV through a retroactive adjustment to its assessment bears some similarities with the adjustment to the Total Regulatory Value (**TRV**)[379] made by the Northern Ireland Authority for Utility Regulation to Phoenix Natural Gas Ltd (**PNGL**), in a case that was referred to the CC in 2012.[380] PNGL said that UR's proposals were retrospective and had implications for regulatory uncertainty, and undermined investors' confidence in the

---

[376] See comments from other water companies on this same point at: Southern Water DDR (POS003), South East Water DDR (POS002), and Thames Water DDR (POS004).

[377] PFs, para.8.21.

[378] SoC, paras. 1835 – 1841.

[379] The TRV in the gas distribution industry is essentially the same as the RCV in the water industry.

[380] Although we note that the scale of the adjustment and circumstances of its application are somewhat different.

regulatory environment.[381] In this case the CC found that where adjustments to the TRV increased regulatory uncertainty there could be an increased risk of a downgrade to credit ratings and an increase in the cost of equity.[382]

686. The CC provided its view on the adjustment to the TRV, that "*In line with normal regulatory practice, our view is that any revision of previous regulatory determinations should be: well reasoned, properly signalled, subject to fair and effective consultation, clear and understood, and, normally, forward-looking. We consider that some changes are more serious than others, and that to reduce ex post and without clear signalling the opening value of a RAB is a step that should not normally be taken without very good justification, and only then after an appropriate period of consultation on the proposals.*"[383]

687. The CC concluded that "*A reduction in the TRV, with its consequent effect on the expectations of both PNGL and its investors, can have an impact on the perception of regulatory stability and can damage investor confidence in the regulatory framework. While the circumstances of this decision are specific to the special situation of PNGL (for example, the significant revenue under-recoveries and the move to RAB-based regulation), investors may perceive that there could in future be further compromise on principles of good regulation*."[384]

688. Ofwat's adjustment to RCV through a serviceability penalty was not properly signalled, subject to fair and effective consultation, clear and understood or forward looking, and therefore can be concluded to increase regulatory uncertainty. We believe that it would be consistent with the CC's decision in the PGNL case to therefore reject the serviceability penalty on these grounds.

6.2.2 What is the correct application of this assessment methodology?

689. The assessment methodology for unplanned interruptions greater than 12 hours requires an assessment of whether these interruptions were beyond reasonable management control. The methodology also requires an annual assessment of serviceability to be made by Ofwat and communicated to companies. We discuss these factors in the following section.

6.2.2.1 Assessment process

690. The PFs recognise the weaknesses in the assessment process, through Ofwat's own admission that the workshop in April 2010 could be misleading,[385] and that there was limited signposting of an update to the methodology.[386]

691. A further weakness and non-compliance with the stated assessment methodology is included within Ofwat's document PR09/38, whereby Ofwat states that companies:

> *"should exhibit a stable (as a minimum) or improving trend year on year and demonstrate this in June returns (or equivalent)"* [387]

---

[381] CC – Phoenix Natural Gas Ltd Price Determination 2012 (RPF070), para. 8.80.

[382] CC – Phoenix Natural Gas Ltd Price Determination 2012 (RPF070), paras. 8.92 and 8.94.

[383] CC – Phoenix Natural Gas Ltd Price Determination 2012 (RPF070), para. 32.

[384] CC – Phoenix Natural Gas Ltd Price Determination 2012 (RPF070), para. 9.116.

[385] PFs, para. 8.18.

[386] PFs, para. 8.23.

and

> *"A company should assume it is at risk of a shortfall adjustment at the next price review if we assess serviceability as less than stable in any year from the 2012 June return (or equivalent) onwards"* [388]

692. Ofwat ceased collection of annual June Returns from 2012 onwards, and instead requested companies to provide a limited set of KPIs, including serviceability assessments. To meet this requirement, Bristol Water provided an annual regulatory performance report for each year,[389] which provided the overall serviceability assessments, and detailed information against each sub-measure. Ofwat therefore had ample opportunity to make an annual assessment of our serviceability performance, and to advise where it considered its assessment was marginal. Ofwat's failure to undertake such an assessment was contrary to its stated process in PR09/38, and meant that we were not advised of the annual assessment and therefore given the opportunity to respond to this assessment.

693. We made an annual assessment of serviceability, based on the methodology set out by Ofwat. This assessment was provided annually to Ofwat through the June Return 2011 and KPI reports 2012 – 2014.

694. Ofwat did not carry out its own annual assessment of serviceability, contrary to its stated methodology, and chose instead to make an assessment at DD14, which was published in August 2014, four months into the final year of the AMP (and after the incidents had occurred, with the exception of the Fisher Road incident in September 2014). Given there were just 8 months remaining in the AMP by the time we received Ofwat's assessment this materially impacted our ability to respond to this assessment.

695. Ofwat's application of penalties for serviceability shortfalls in multiple years is therefore clearly inappropriate in light of its stated methodology, as we were offered no opportunity to respond to those assessments during the period.

6.2.2.2 Management Control

696. The CMA states that the definition of 'management control' used by Bristol Water and CH2M Hill is narrow, and contrary to the aims of an outcomes-based framework.[390] We do not consider that this is the case. Given the serviceability penalty has been levied in respect of FD09, the CMA must consider what was a reasonable interpretation of management control for companies to take at that time, i.e. in the context of what was set at FD09.[391]

697. The serviceability assessment framework for AMP5 was set before the introduction of outcome regulation for PR14, and so the regulatory framework for AMP5 was more focussed on the delivery of specific outputs. We do not believe it is appropriate to retroactively apply the principles of the PR14 methodology onto the decisions made at FD09 that using an outcomes based approach would imply.

---

387 PR09/38 - Serviceability outputs 2009 (SOC123).

388 PR09/38 - Serviceability outputs 2009 (SOC123).

389 Bristol Water 2012 Annual Return, Board Overview (RPF064); Regulatory Performance Report 2012/13 (RPF063); Regulatory Performance Report 2013/14 (SOC052).

390 PFs, paras. 8.9 and 8.10.

391 See more detail on this issue in our Reply to Ofwat at section 5.3.

698. The CMA suggests that a wider definition is more appropriate, whereby wider controls such as risk management, real time controls and back-up solutions are considered.[392] This conclusion appears to be particularly based on Ofwat's comments in its response to our SoC.[393] Whilst we agree that these factors are important in mitigating the impact of interruptions on customers, all of these are in place and should not be expected to fully mitigate the impact of every event. The particular suggestions made by Ofwat of overland bypasses and use of tankers were not appropriate to the incidents in question, but as we explained in our Reply, these options are available to us to use when feasible.[394] Therefore, Ofwat's assertion as made in its Response, and implicitly supported by the CMA in its PFs, that the events were not "*beyond the wider management control that Bristol Water could and should have placed on these incidents*" [395] is not substantiated by analysis of the details of these events and our response to them.

6.2.2.3 Risk management

699. The CMA suggests a different approach to risk management could have avoided breach of the DG3UI>12 target. We believe our approach to risk management is appropriate and in line with our peers. The implication of the CMA's statement is that we should take a more risk averse approach.

700. Our principal strategy for reducing the level of interruptions to customers is mains replacement. We carried out replacement of 296km of mains during AMP5, consistent with the level of expenditure allowed at CC10. As that level was set as a regulatory allowance at the previous price control, we do not consider it consistent for that to now be adjudged to be insufficient. The model we used to target that mains replacement was considered by the CC 's expert adviser Halcrow to be appropriate.[396]

701. We also try to ensure resilience within our supply network through development of greater interconnectivity between key assets. To this end, we have delivered the Northern Strategic Support Scheme in AMP4, the Durdham Down (Bristol) Resilience Scheme during AMP5, and will be commencing the Southern Resilience Scheme in AMP6, subject to the CMA's final approval. We have also delivered a number of smaller resilience projects designed to improve the interconnectivity of the network. However, these schemes are designed to mitigate the loss of a key asset such as a treatment works or pumping station. Full interconnectivity of the mains network would require significantly more investment, without this there will remain the possibility that bursts on certain strategic mains will cause interruptions that cannot easily be mitigated.

702. We retain an emergency plan to detail the processes to follow in response to major incidents. This plan was followed for each of the incidents in question. However, as demonstrated in our earlier submissions and as confirmed by CH2M Hill, a confluence of external factors caused each of these interruptions to extend beyond 12 hours.[397] The plan is

---

[392] PFs, para. 8.9.

[393] Ofwat response, para. 506.

[394] Reply, para. 525.

[395] Ofwat Response, para. 505

[396] CH2M Hill CM Review Aug 2014 (SOC096); Halcrow Technical Reports for Competition Commission, Bristol Water Price Determination (ENQ044).

[397] SoC section 13.5; CH2M Hill Report on unplanned interruptions Dec 2014 (SOC334).

reviewed and updated regularly. Lessons learnt in our area and from other industry incidents are incorporated.

6.2.2.4 Real-time controls

703. The CMA suggests that greater use of real-time controls may have reduced the duration of the interruptions.[398] We do not accept this conclusion, and are not aware of the evidence on which it is based. Our operations room operates 24 hours a day, monitoring patterns of network activity and our treatment and pumping operations. This can include re-zoning the supply of water where appropriate, although doing so first requires suitable analysis of the wider effects that might impact the supply to other areas including consideration of water quality. In each incident we face rezoning is one of the immediate options considered. In the four incidents we rezoned where possible but, for example, on the Burnham incident there was limited opportunity to support the affected zone by way of rezoning because of the network structure in that location.

6.2.2.5 Backup solutions

704. The CMA also suggests that backup solutions should be considered.[399] For the Burnham and Kingswood (Fisher Road) incidents in question, backup supplies were made available to customers through supply of bottled water to hub locations within the affected areas. Bottles were distributed to vulnerable customers who were unable to collect water. This supply of bottled water is not incorporated in the calculation of the duration of the interruption.

6.2.2.6 Definition of full/partial management control

705. The CMA has identified CH2M Hill's conclusion that the relevant incidents were partially within management control.[400] However, it appears that CH2M Hill's definition of partial control may not have been interpreted in the manner intended. When commissioning the CH2M Hill report our primary concern was to establish whether the events related to any underlying problems or causes for concern. CH2M Hill was not requested to provide an assessment as to whether the duration of the incidents or the numbers of customers affected could have been reduced.

706. CH2M Hill's definition of "entirely outside of management control" refers to 3rd party actions beyond the control of Bristol Water. "Partial Control" means the jobs were exceptional and out-of-the-ordinary. Examples of these features which turn a standard repair for which we plan and equip our teams into something much more challenging and often require additional specialist materials, plant or resources, are where a third party has laid electricity cables in conjunction with our main in breach of the relevant rules or a third party has built a structure intruding on the "statutory easement" preventing such encroachment so causing extra risks to health and safety and of third party damage when carrying out a repair.[401]

---

398 PFs para. 8.9.

399 PFs para. 8.9.

400 PFs para. 8.10.

401 Both occurred on the Wedmore Vale incident.

707. The CMA comments that

> *"Only one of the four events would be reduced to less than 12 hours if the interruption time that CH2M considered was fully outside management control was removed".*[402]

708. This characterisation of the duration of periods of control between partial and no control is too simplistic. It does not recognise that partial loss of control may result in disruption to the otherwise smooth running of activities. In the incidents we believe that we could not have reasonably avoided exceeding the 12 hour interruption threshold because of the impact of matters that are outside our control or of such a nature that they turn a piece of difficult but standard repair work into something more complicated and risky.

709. As such, we do not consider the definition applied by CH2M Hill in its assessment to be unduly narrow, and do not believe that it contradicts our conclusion that all four incidents reviewed should be excluded from the serviceability assessment.

6.2.3 Is the result of the serviceability assessment proportionate to the impact on customers?

710. We do not consider that the proposed shortfall penalty of £4.1m is proportionate to the impact on customers of our performance on DG3UI>12. As set out in our SoC, exceedance of the targets for this measure is attributable to four major incidents, and as such the resulting penalty equates to just over £1m per incident, which as CH2M has demonstrated, the impacts of which were fully or partially outside of the control of Bristol Water.

711. The size of the penalty implies we should have spent up to £4m to avoid these instances exceeding 12 hours. We were not given the choice to make this decision. Spending £1m on each incident to keep it below 12 hours (in one instance by 3 minutes) did not appear appropriate at the time of the incidents and we still question if that is what the CMA intends.

712. We believe the penalty of £4.1m, if applied, would not be proportionate. It does not appear logical to create an implied incentive to spend up to £1m to avoid each single incident, particularly given the level of customer satisfaction with our approach to handling the incidents.[403] An alternative approach is to consider the WTP data we have available. WTP for interruptions of 12-24 hours is £22 greater than WTP for interruptions of 6-12 hours.[404] Applying this difference to the total of 41,108[405] properties interrupted by the three bursts would imply an overall customer detriment of £0.9m. The penalty of £4.1m imposed by Ofwat and upheld by the CMA in the PFs is therefore shown to be disproportionate to the detriment to customers and their willingness to pay for supply interruptions.

713. By adopting the methodology Ofwat and the CMA are adopting a risk averse approach by forcing all incidents to lead to large penalties. This is counter to other decisions in the PFs, such as the approach on Cheddar WTW. Given a 50% share in costs, the penalty is assuming that customers would have paid £2m to reduce incidents by around 2 hours. This is not in line with the willingness to pay research results mentioned in the above paragraph.

---

402 PFs, para. 8.8.

403 SoC paras. 1874 and 1875.

404 SoC Table 40, para. 618.

405 No. of properties affected: Fisher Road: 28,388, Burnham-on-Sea: 12,270, Wedmore Vale 450 – as set out in SoC section 13.5.2

714. The CMA states that there is nothing that suggests it would be proportionate for the CMA to substitute an alternative methodology. We are not proposing that an alternative methodology is applied, only that the methodology set out at FD09 is adhered to. Given that Ofwat failed to make an annual assessment of serviceability in 2011/12 or 2012/13 no penalty should be applied for those years. Performance in 2013/14 was consistent with that provided in the workshop example, with a DG3>UI12 performance above the target level, but all other indicators assessed as stable. Therefore, an overall assessment of stable is applicable for that year. This means that the only year for which a marginal assessment could be applied, notwithstanding the points on management control made above, is 2014/15. Using Ofwat's shortfall feeder model, this means that the maximum shortfall penalty that could be applied to Bristol Water is therefore £1.6m.

6.2.4 Is the result of the serviceability assessment consistent with the mischief that the process is intended to guard against?

715. Given that the serviceability shortfall assessment was intended to re-coup under- or mis-investment by companies, we do not agree that a shortfall penalty should be payable in the circumstances where we have carried out a level of investment on mains rehabilitation greater than that required by CC10, and that this has had the intended result in terms of the level of bursts, and other indicators such as leakage.[406]

6.2.5 Conclusion on serviceability

716. We do not consider that the CMA should uphold Ofwat's retroactive amendment to the serviceability assessment methodology, and as such the £4.1m shortfall penalty should not be applied. As set out above, we consider that the maximum value of the penalty that can be calculated in accordance with Ofwat's methodology is £1.6m.

6.3 RCV Capping

717. The CMA has provisionally found that the £4.8m negative adjustment to RCV that Ofwat has applied in respect of 2009/10 expenditure should be retained.[407] We disagree with this provisional finding, as we do not consider it is a proper reflection of the issue.

718. By requesting the removal of this capping penalty we are not seeking a retroactive adjustment to the CC10 determination, or looking to benefit from subsequent revisions to COPI. The RCV capping penalty has been applied due to the difference between the forecast of COPI available at the time of 2009/10 investment, and subsequent abandonment of that index. Upholding the penalty effectively penalises Bristol Water for not anticipating revisions to the COPI methodology.

719. The provisional COPI was used by Bristol Water to assess how much capex it could spend without breaching the cap. The notion of the cap allowed the company to invest in maintaining and improving services to customers up to that limit. That was exactly what Bristol Water did and its expenditure planned in 09/10 was based on that understanding of that cap. Accordingly with this provisional finding the CMA is making a retrospective adjustment.

---

[406] See Figure 88 in the SoC p.458 for details of burst performance and table 19 p.120 for leakage performance.

[407] PFs, para. 8.35.

720. The regulatory framework allows for all investment to be added to the RCV, to the capped levels. Our 2009/10 investment decisions were therefore based on meeting but not exceeding the cap as identified at that time. This was based on the forecast COPI figures that Ofwat had also used in FD09. As the CMA notes, this COPI series was then revised to a lower level at CC10.[408]

721. The CMA notes that the original intention was to use COPI as a cost inflation measure on the capex cap.[409] We agree, but this cap was intended to inform companies' investment decisions as they were being made, rather than to act as a retrospective limit on the level of expenditure.

722. The CMA places weight on guidance issued by BIS, regarding use of the previous index until Q2010.[410] This guidance document was produced subsequent to the revision of the COPI series in 2011, and therefore could not have impacted Bristol Water's decision making in 2009/10. Reliance on this ex-post guidance to apply a retrospective penalty on levels of expenditure is not consistent with the intention of the capping mechanism, which is to correct for any deliberate overspending of regulatory allowances.

723. Ofwat has been inconsistent in its application of COPI. Analysis of RCV and CIS adjustment feeder models for all companies shows that the 2005 series was used for CIS, whilst the 1995 series was used for RCV. We do not consider this to be consistent with good regulatory practice, and suggest that the 2005 series should have been used for all adjustments.

724. In particular we note:

- our actual expenditure was based on the COPI forecast of 158.7 as used by Ofwat in its FD09, which would result in almost no capping;
- CC10 used a COPI forecast published in Spring 2010 of 149.6 which led to capping of £1.8m; and
- the COPI series was later revised because of errors in the series from 2008/09 onwards, setting an equivalent value of 161.3 for 2009/10.
- Using the 2005 series would remove the capping and result in an increase in RCV of £4.8m in 2015.

725. Ofwat's calculation of RCV midnight adjustments did not take into account previous RCV capping. This means that even if the 1995 series was retained, the -£0.9m that Ofwat has applied to our RCV should be removed.

726. We request the CMA to revisit its provisional finding in respect of the comments above, and to remove the £4.8m adjustment to RCV.

6.4 CIS indexation methodology

727. The issue of CIS indexation arose subsequent to the referral of Bristol Water's FD14 to the CMA, and as such did not form part of our SoC.

---

[408] PFs, para. 8.30.

[409] PFs, para. 8.31.

[410] PFs, appendix 8.1, paras. 27 and 28.

728. Ofwat has subsequently identified that retrospective revisions to RCV may be required for all companies, including Bristol Water.

729. The CMA has provisionally chosen not to make any adjustment to Bristol Water's PR14 price control to take account of this issue, and for any adjustment to be subsequently made by Ofwat in common with its approach to the rest of the industry.[411]

730. We agree that this provisional approach appears appropriate to maintain consistency of the Bristol Water price control with that of other companies.

6.5 Conclusions on 2010-15 adjustments

731. We do not consider that the £4.1m serviceability shortfall penalty is proportionate to the impact on customers or Ofwat's application of its stated assessment methodology. We calculate that the maximum penalty payable by Bristol Water under Ofwat's methodology is £1.6m. We propose that the CMA revisits its provisional finding and removes the penalty in total.

732. We suggest that the CMA should examine the -£0.9m reduction to RCV that Ofwat has applied in respect of 2009/10, which does not appear to take account of previous capping and should be removed.

733. We do not consider that retention of the £4.8m RCV capping penalty is appropriate, given that it does not fairly reflect the information on COPI available at the time of investment decisions in 2009/10. As such, we propose that the CMA revisits its provisional finding and applies the 2005 COPI series, which will have the effect of removing the penalty.

734. We support the CMA's provisional finding to make no intervention on the CIS indexation methodology.

[411] PFs, para. 8.41.

7 Outcome Delivery Incentives

7.1 Executive Summary

7.1.1 Introduction

735. This section provides our comments on the CMA's Provisional Findings in respect of Outcome Delivery Incentives (**ODIs**), as set out in Section 9 of the PFs.

7.1.2 Key themes

736. We welcome the CMA's recognition that the move to outcome regulation, with associated performance commitments and delivery incentives, should deliver real benefits to Bristol Water's customers.

737. We also note the CMA's identification of the inconsistencies in Ofwat's application of the framework to those measures where it has made adjustments to company targets based on its industry benchmarking.

738. We believe the CMA has reached a sensible compromise on our Negative Water Quality Contacts measure, by retaining a very challenging target for achievement of a reward incentive, but removing a penalty for delivering the level of service that customers have expressed a willingness to pay for.

739. On Unplanned Customer Minutes Lost (**UCML**), the result of the CMA's amendment to Ofwat's calculation is to produce a target for Bristol Water that we consider to be unachievable. This will inevitably lead to a penalty being payable at PR19. The target suggested by the CMA in the PFs is not achievable under any economic level of service such that it does not provide a realistic incentive to improve performance which is contrary to the intention behind the ODIs. Our analysis of industry data suggests that our performance is already upper quartile against this metric, and therefore the level of improvement required by this target is not consistent with comparative performance of other companies.

740. Accordingly in this section we set out two changes that we believe the CMA should adopt in respect of UCML:

- calculate a reward target based on comparative industry data for unplanned interruptions rather than making an adjustment to data to adjust for the planned and unplanned elements of the total minutes lost; and
- we suggest that the CMA adopts a similar approach for UCML to that it has taken on Negative Water Quality Contacts, by removing a penalty for delivering the level of service that customers supported in our business plan, but applying an upper quartile target for rewards. We provide an updated version of that calculation based on analysis of industry data.

741. On Mean Zonal Compliance, we accept that the proposed 99.95% penalty threshold may be appropriate, despite our concerns over the disproportionate impact of a failure in a small water supply zone in the context of the application of penalties.

7.1.3 Structure of the Response

742. Our response to the CMA's provisional findings in relation to ODIs is structured as follows:

- CMA's approach to ODIs (see **Section 7.2**);
- unplanned customer minutes lost (see **Section 7.3**);
- mean zonal compliance (see **Section 7.4**); and
- negative water quality contacts (see **Section 7.5**).

7.2 CMA's approach to ODIs

743. The CMA has provisionally found that no intervention was appropriate in the overall ODI framework.[412] We support this conclusion. Our ODIs were developed through an extensive period of consultation with customers and stakeholders, taking account of regulatory guidance where relevant. This outcome framework underpinned the development of our business plan, and we consider it is appropriate that it should be retained through the CMA's redetermination.

744. Whilst it supports the overall framework, the CMA has identified some potential inconsistencies in Ofwat's approach to the application of ODIs. We discuss these here.

745. The CMA identifies that Ofwat's framework implies that upper quartile performance should match the economic level of service.[413] We agree with the CMA that this is unlikely to be the case. Our Business Plan targets were proposed to provide the economic level of service, based on customers' willingness to pay. Moving away from the economic level can distort the incentives placed on companies, as sub-optimal expenditure decisions may be made to avoid penalties. We consider it more appropriate that companies should not be subject to penalties for providing service in line with the economic level of service.

746. The CMA identifies that in some cases Ofwat used the ODI framework to revert to output regulation, through ensuring the delivery of specific large schemes.[414] For Bristol Water this included Cheddar Reservoir Two (ODI C3 – not included in FD14) and Cheddar Treatment Works (ODI D2 – included in FD14). These ODIs were not included in our December Plan, but were added for the June Plan following feedback from Ofwat.[415]

747. We agree that such an approach is counter to the stated intention of outcome regulation, which is intended to focus on the impact on customers rather than the specific mode of delivery. However, as these two schemes are principally intended to reduce the level of risk to customers this may be hard to quantify through other performance measures, so we do not object to specific incentive mechanisms being placed on the delivery of large schemes.

748. The PFs identify the ODI associated with our "Resilient Supplies" outcome as being another example of a scheme-specific ODI, as it is dependent on delivery of the Southern Resilience Scheme.[416] Whilst this is the case for AMP6, ensuring that no population of greater than 25,000 is at risk from failure of a single asset was a key aim of our business plans at PR04 and

---

412 PFs, para. 9.17.

413 PFs, para. 9.16 (a).

414 PFs, para. 9.16 (b).

415 Outcomes feedback meeting 5th June 2014.

416 PFs, para. 9.16 (b).

PR09, and will continue to be in future. This may involve the identification of additional schemes and resilience measures. As such, we do not consider that this ODI is a scheme-specific output incentive in the same way as those schemes mentioned in paragraph 746 above.

749. The CMA identifies that use of positive rewards was rejected by CCWater, the LEF and Bristol Water customers.[417] We agree that was the case, and was reflected in the design of our incentive package for our December Plan, prior to the publication of Ofwat's risk and reward guidance in January 2014. However, as the CMA notes, the potential impact of positive incentives is relatively low in the context of the overall determination in comparison to the potential penalties, and removal of them would require re-balancing of the whole risk and reward framework. Given that all other companies are subject to positive and negative incentives on ODIs, this provisional finding adopts a consistent approach with that applied to the rest of the industry. In this context, we support the CMA's provisional finding to retain positive incentives in its redetermination.

750. The CMA encourages Ofwat to take more account of consumers' views on the risk and reward framework in future.[418] We welcome this suggestion, and look forward to working with Ofwat, our customers and other stakeholders to refine the outcome incentive framework for future price reviews.

751. The CMA has provisionally found that the ODIs not disputed by Bristol Water will remain as set at FD14.[419] We support this conclusion, as those outcomes and associated targets were based on the results of our engagement with customers and stakeholders in the development of our business plan.

752. The CMA notes that ODIs related to capital scheme delivery should be revisited based on allowed totex.[420] We agree that such an approach is appropriate. The CMA recognises that such an ODI may be required in relation to the Southern Resilience Scheme. Our Business Plan also included ODIs for construction of Cheddar Reservoir Two and Cheddar Treatment Works, the latter of which was included in FD14 as ODI D2.[421] The ODIs related to these specific schemes should be included or excluded consistent with the CMA's decision on whether to allow funding for the schemes.

7.3 Unplanned customer minutes lost

753. Our outcome for ensuring reliable supply is based on all unplanned interruptions to customers. The CMA notes that Bristol Water was one of only two companies not to use the Ofwat KPI metric of all interruptions greater than three hours.[422] We reiterate a point made in our earlier submissions that we consider the measure we have chosen to be a better reflection of the impact on customers, who suffer significantly more inconvenience from an unplanned interruption as they are not able to prepare alternative arrangements in advance.[423] We believe that an ODI on this measure is more in customers' interests than the

---

417 PFs, para. 9.16(c).

418 PFs, para. 9.19.

419 PFs, para. 9.21.

420 PFs, para. 9.21.

421 FD14 (SOC229), p 143.

422 PFs, para. 9.22.

423 SoC, p.496.

Ofwat KPI, as it incentivises us to improve our performance on an area that has a real impact on the level of service we provide. Adopting a target including planned interruptions could also lead to significantly higher costs, as we explain in paragraph 756 below.

754. The outcome framework was intended to allow companies free choice to propose outcomes and performance measures, with no suggestion that the Ofwat KPI measures should be adopted for AMP6.[424] As outcomes were largely developed in isolation by companies we were not therefore aware that most others had chosen to use the Ofwat measure, and even if we had been, we would have retained the measure developed through customer engagement for the reasons identified above.

755. The CMA states that it considered replacing the Bristol Water metric with the Ofwat KPI, to allow for an easier calculation of an upper quartile target.[425] We support the CMA's decision not to do so. As discussed above, we consider the Ofwat KPI measure to not be as good an indicator of the impact of interruptions on customers. It also creates a distorted incentive on companies through incentivising the level of planned interruptions, which can be an unavoidable by-product of maintenance activity. This particular metric was discussed fully with and supported by the LEF and consequently a change is not considered appropriate.

756. In particular, our performance on the Ofwat KPI has been adversely affected by high numbers of planned interruptions related to the trunk mains relining work. In order to avoid these interruptions we would have had to undertake this work in a very different and considerably more expensive way (e.g. putting new mains in separate trenches rather than relining existing mains, so that service from the existing mains can be continued). We do not consider that these additional costs would have been justified to avoid a small number of planned interruptions and therefore that our approach was in customers' best interests.

757. The CMA has estimated a target for Bristol Water for UCML using the following steps:

- taking upper quartile industry performance for total minutes lost (including planned and unplanned); and
- adjusting it for Bristol Water's specific split of planned and unplanned interruptions.

758. The CMA has recalculated a target for the Bristol Water metric of 6.15 minutes/household/year, based on industry data from 2011/12 to 2013/14. This is 1.05 minutes lower than the target set at FD14 which, as we explained in our SoC, requires an unrealistic improvement in performance during AMP6.[426] Consequently we have significant concerns regarding the more challenging target calculated by the CMA.

759. Bristol Water has had a relatively high proportion of planned interruptions over this period related to the trunk mains relining programme. Making the adjustment in this way has therefore led to the target set by the CMA being unachievable for unplanned interruptions. In order to achieve this target the level of mains replacement activity required would require a level of investment far beyond customers' willingness to pay.

760. We used our cross asset optimiser model to attempt to calculate the level of investment required to deliver the target of 6.15 minutes. We estimate that reducing the level of

---

[424] Ofwat's final methodology and business planning expectations, Chapter 4 (SOC063).

[425] PFs, para. 9.29.

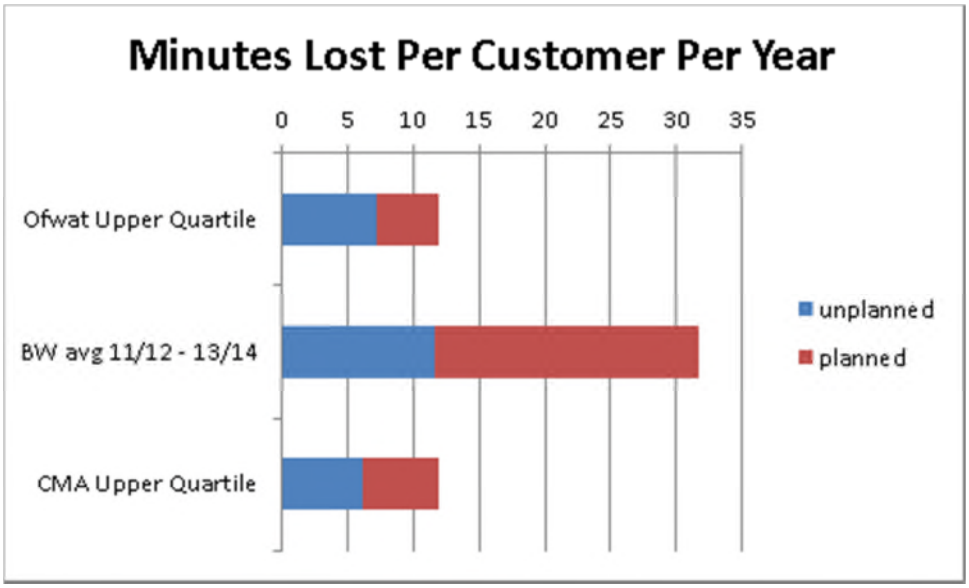
[426] SoC para. 1964, p.493.

unplanned customer minutes lost would require a reduction in the number of bursts of 50% from the current level. Our optimiser calculated that the maximum burst reduction possible is 23.4% over seven years, which would involve the replacement of 924km mains and cost approx. £179m. This would deliver an unplanned customer minutes lost performance of 10.3 minutes, still significantly greater than that calculated by the CMA.

761. In using industry data to calculate an upper quartile benchmark target, it has been necessary for Ofwat and now the CMA to extrapolate the unplanned element of interruptions from data reported on all interruptions, including planned interruptions. The level of planned interruptions for Bristol Water has been higher than average during AMP5 as a result of an increase in the level of maintenance activity carried out. By deriving a target from data that includes planned interruptions, the CMA is effectively penalising Bristol Water for the impact of this maintenance activity.

762. The effect of the CMA and Ofwat's calculation methods, when compared to our actual level of interruptions, is shown in Figure 18 below.

Figure 18 - Breakdown of Minutes Lost



Source: Bristol Water

763. To overcome the issues presented with lack of publically available comparable data for this measure, we have used available industry data on unplanned customer minutes > 3 hours from the 2012/13 datashare[427] and numbers of unplanned interruptions > 3 hours to calculate an average duration of unplanned interruption > 3 hours. This industry average of all companies is 335 minutes, which is close to the Bristol Water figure of 332 minutes.[428] The collated data and supporting calculations are provided as an appendix to this response.[429]

---

427 Industry datashare – Supply interruptions KPI breakdown, (SOC382).

428 These classifications are consistent with the definitions used in the reporting of interruptions for DG3 interruptions, for example in the August 2013 data submission to Ofwat.

429 Industry Datashare – Supply interruptions KPI breakdown (SOC382); Interruptions data supporting document (RPF060)

764. To validate this figure of 335 minutes we have carried out a check against the Bristol Water average from 2004/05 – 2013/14. This average is 364 minutes. However, 2008/09 is a significant outlier with 632 minutes. This was a year with a particularly cold winter, contributing to a significantly greater number of bursts and interruptions of greater than 6 hours.[430] Excluding 2008/09 from the calculated average produces a figure of 335 minutes, in line with the industry average for 2012/13.

765. We also have data from a limited number of other companies 9 to perform the equivalent calculation for 2011/12. This produces an average of 328 minutes, or 329 minutes if Bristol Water is included in that average. Therefore we conclude that this provides reasonable validation to the figure of 335 minutes, or if the average of the two years is taken this does not have a material impact on the proposed upper quartile target set out below.[431]

766. Using this figure of 335 minutes we have been able to extrapolate the unplanned minutes lost per customer for 2010/11 – 2012/13, based on the number of unplanned interruptions > 3 hours reported to Ofwat in June Return 2011 and the August 2013 data.

767. The data shows that the average unplanned minutes lost per customer per year for interruptions greater than 3 hours is 11.8 minutes, and that the upper quartile is 7.7 minutes. We note that on a measure of unplanned customer minutes lost for interruptions greater than three hours Bristol Water's performance of 7.4 minutes is therefore shown to be in the industry upper quartile.

768. To reconcile this data with that required for calculation of a target for all unplanned interruptions requires an estimation of the proportion of all interruptions to those greater than three hours. We set out in our SoC that 55% of Bristol Water interruptions are greater than three hours, using the data series from 2004/05 to 2013/14.[432] To update this calculation we have used the proportion from 2010/11 – 2012/13, consistent with the period of the data used for the calculation. This ratio is 67%.

769. This has allowed us to calculate an updated upper quartile performance level for this measure as shown in Table 24. We provide the calculation based on the longer-time series ratio for comparison:

Table 24 - calculation of upper quartile target for unplanned customer minutes lost

Item	Using 10/11-12/13 ratio	Using 04/05 – 13/14 ratio	Ref
Industry UQ unplanned interruptions > 3 hours	7.7	7.7	a
Proportion of unplanned interruptions > 3 hours to all unplanned interruptions	67%	55%	b
Upper Quartile target for all unplanned interruptions	11.4	14.0	=a/b

Source: Industry Data (RFP060); Bristol Water calculation

770. As shown in Table 24, calculation of an upper quartile target based on using unplanned interruptions data only produces a target of 11.4 minutes. We propose this as a realistic upper quartile target for our measure for AMP6.

---

430 June Return 2009, Board Overview, (RPF019).

431 Using an average duration of interruption of 332 minutes rather than 335 minutes reduces the proposed upper quartile target for unplanned customer minutes lost to 11.3, rather than 11.4.

432 SoC, Table 132, p.500.

771. The proposed target of 11.4 minutes is lower than that of 12.2 minutes included in our Business Plan, which was derived from customer and stakeholder engagement. For consistency with Ofwat's approach, and the CMA's approach on Negative Water Quality Contacts, we suggest that any amendment from Bristol Water's proposed target should only be made to the level of reward incentive. This would avoid penalising Bristol Water for delivering the level of service that customers have stated they require and are willingness to pay for.

772. Further and alternatively, we consider that this principle should apply even if the CMA rejects our arguments above and chooses to retain a target of 6.15 minutes. In this circumstance we consider that the target should only apply to the reward incentive, with the penalty set at the service level proposed in our business plan.

773. The CMA has provisionally determined a two-year glidepath to achieve its proposed target for this measure.[433] Whilst this is welcome to the extent that it recognises that the target levels are not achievable in the short-term, in practice the target levels proposed are likely to lead to a penalty in all years, and so the impact is minimal. If the CMA accepts our analysis as set out above and our proposed targets, the glidepath used should be as proposed in our Business Plan and SoC.[434]

7.4 Mean zonal compliance

774. The CMA has provisionally retained Ofwat's proposed penalty range of 99.94-99.95%, rather than our proposed range of 99.93-99.94%. In the circumstances and given this is consistent with the targets set for the industry we are not seeking to change this aspect of the PFs.

775. The CMA states that it would be very concerned to reduce any incentives around the health and safety of customers.[435] We agree that the safety of drinking water is our primary concern. However, a reduced performance against this measure does not necessarily reflect a reduction in the safety of the water we provide. As we have set out in the SoC, the mean zonal compliance measure is particularly sensitive to a very small number of failures and the size of the supply zone in which they occur.[436] This means that the fluctuations in performance on this measure are unlikely to be indicative of any change in the level of risk to customers. **Appendix 7.1** is a short note addressing some the additional points raised on water quality compliance by the CMA.

7.5 Negative water quality contacts

776. The CMA has provisionally found that the target for this measure should be set at the level proposed in our business plan, but that the reward incentive should be set in line with Ofwat's upper quartile calculation.[437]

777. We support this conclusion as a sensible compromise between the level of performance that customers have expressed a willingness to pay for, and an incentive for further improvements.

---

[433] PFs, para. 9.32.

[434] SoC, Table 128, p492.

[435] PFs, para 9.41.

[436] SoC, para. 2046, p508.

[437] PFs, para. 9.58.

778. The CMA notes that we have not given a reason as to why we should naturally have a higher number of complaints compared to other companies.[438] First, this analysis should be placed into context that our level of water quality contacts is below the industry average. We consider that there are a variety of factors which impact on each company's performance, primarily including the nature of its sources and condition of its network. Network condition is a key driver of discoloured water contacts as it leads to bursts and disturbing of sediment, whilst the nature of sources impacts customers' perception of the taste and odour of supplies. Most contacts about the taste or hardness of our water are received from customers in response to a change in their water. This includes customers who newly move to the area from other parts of the country, and also we have an "open front" between Purton and Barrow which means that supplies to some customers will vary between abstraction and ground water sources. Also, we do not use chloramination, which is an alternative to chlorine treatment and reduces the number of chlorine contacts, but increases the risk of ammonium and nitrate failures, and reduces bacterial quality in the network, as well as being a more costly option.[439] We expect all of these factors serve to increase the level of contacts we receive.

779. The CMA identifies that the target was supported by the LEF but that it would also expect the LEF to provide more of a cross-industry view on behalf of consumers.[440] The Drinking Water Inspectorate (**DWI**) played a full role as part of the LEF, attending several meetings and contributing to discussions on performance measures and targets. This means that the views of the DWI have been incorporated into the views expressed by the LEF. As such, we consider that the LEF were therefore able to provide the cross-industry view suggested in this key area. CCWater receive quarterly performance data from companies, so were also able to base their contribution to the LEF on cross-industry performance information. For this particular measure we provided industry data in the stimulus material, which was reviews by the LEF Customer Survey Sub-Committee, so the members of this group were also aware of our performance relative to the industry.

780. The CMA considers that our proposed targets set relatively low aspirations in comparison with 2013 actual performance.[441] These targets are set to achieve a 14% reduction in contacts compared with the AMP5 average. This equates to less than 0.4% of our customers complaining about their water quality each year, which we consider to be a good level of performance.

781. The CMA observes that Ofwat's intervention may only be achievable through a level of investment beyond the economic level.[442] We agree with this observation, and have set out in our SoC[443] and subsequent papers to the CMA[444] the level of investment required to achieve the targets set out in our business plan.

782. We consider that the CMA's approach of setting a more aspirational target for achievement of rewards, but not penalising delivering the level of investment required by customers, provides appropriate incentive to improve on AMP5 performance.

---

438 PFs, para. 9.53.

439 SoC para. 2025.

440 PFs, para. 9.55.

441 PFs, para. 9.57.

442 PFs, para. 9.57.

443 SoC, p.491.

444 Bristol Water's response to the CMA Working Paper on ODIs of 9 June 2015.

7.6 Conclusions on ODIs

783. We agree with the CMA's provisional decision to set the target for Negative Water Quality Contacts at the level proposed in our Business Plan, but to set an upper quartile target for reward incentives.

784. We consider that the CMA should apply a similar approach to Unplanned Customer Minutes Lost as it has taken for Negative Water Quality Contacts, whereby the targets proposed in our Business Plan are retained, but an upper quartile target is set for reward incentives.

785. The amendments we propose to the ODIs are:

- adjustment of UCML upper quartile target to 11.4 minutes;
- UCML target of 11.4 minutes to apply for positive incentives, business plan targets to be retained for penalties;
- accept adjustment of MZC measure as set out in the PFs; and.
- accept CMA adjustment to incentive framework for NWQC.

8 Cost of capital

8.1 Executive Summary

8.1.1 Introduction

786. This section provides our comments on the CMA's provisional findings in respect of cost of capital, as set out in Section 10 of the PFs.

8.1.2 Key themes

787. We agree with the overall approach to the cost of capital that the CMA has followed in its provisional findings.

788. In addition we are pleased that the CMA has recognised that Bristol Water has a higher cost of debt and equity than a WaSC, and that it has not applied Ofwat's customer benefit test.

789. However, we consider that the approach taken by the CMA has led to an underestimate of the wholesale cost of capital for Bristol Water. We summarise our view below in respect of:

- the cost of debt;
- the cost of equity; and
- the wholesale-appointed adjustment.

Cost of Debt

790. The CMA provisional findings were that the cost of embedded debt was between 2.7% to 3.0%, and the cost of new debt was 1.8% resulting in an overall cost of debt for Bristol Water of 2.48% to 2.70% with a point estimate of 2.59%.

791. We consider that the cost of debt in the provisional findings has been underestimated due to:

- use of too high an inflation rate to convert from a nominal to real cost of debt which has affected estimates of the cost of embedded and new debt;
- underestimation of the actual cost of embedded debt due to inappropriate treatment of artesian debt and other adjustments;
- an estimate of the range of a notional cost of debt that is too low, and for which the lower end is not realistic;
- significant risk of underestimation of the cost of new index-linked debt due to the use of a short time frame for estimating the underlying gilt rate, and using a spread that is too low for Bristol Water in respect of index linked debt; and
- giving undue weight to the cost of new debt compared to old debt in the cost of debt calculation.

Cost of Equity

792. The CMA provisional findings were that the asset beta of Bristol Water was 0.32, resulting in a cost of equity of 5.7%.

793. This estimate of 0.32 for Bristol Water's asset beta is a considerable reduction compared to the estimate in CC10 of 0.37. Such a reduction would imply a very large reduction in systematic risk since 2010. There is no evidence of such a reduction in systematic risk for the listed WaSCs, and such a reduction is not consistent with the views of investors. Consequently, the reduction is not justified by a wider consideration of evidence.

794. We consider that asset beta for Bristol Water has been underestimated due to:

- an estimation of the range for WaSC asset betas that is too wide as a result of including low confidence estimates;
- errors in the calculation of the appropriate uplift required for Bristol Water; and
- use of the centre of the range, rather than considering the appropriate part of the range given the overall balance of risks for customers.

Appointed-Wholesale adjustment

795. The CMA's provisional findings were that the wholesale cost of capital should be reduced by 11 basis points from the appointee cost of capital.

796. We consider that the adjustment for appointed to wholesale has been overestimated due to the incorrect conversion of a nominal return for retail to a real return in wholesale. In addition we believe there are errors in the treatment of tax and changes in risk. We show an alternative calculation based on pre-2015 retail assets within wholesale that shows the maximum adjustment that could be made is 0.03%.

8.1.3 Structure of the Response

797. Our response to the CMA's provisional findings on the cost of capital is structured as follows:

- CMA's overall approach to the cost of capital (see **Section 8.2**);
- cost of debt (see **Section 8.3**);
- cost of equity (see **Section 8.4**);
- provisional findings on appointee cost of capital (see **Section 8.5**);
- wholesale adjustment (see **Section 8.6**); and
- provisional findings on wholesale cost of capital (see **Section 8.7**).

798. Areas of our response are drawn from a report produced for us by KPMG.[445] This report should be read alongside our response in this Section.

8.2 CMA's overall approach to the cost of capital

799. The CMA has adopted an approach to defining the cost of capital that gives weight to:

- current market conditions and projections over the regulatory period;
- actual financing costs incurred by water companies and Bristol Water; and
- relevant precedent from previous regulatory decisions.

800. We agree that these factors are appropriate for estimating the cost of capital.

---

[445] KPMG, Response to CMA Provisional Findings on Bristol Water's cost of capital, July 2015 (RPF028).

801. The cost of capital is a weighted average of the cost of debt and the cost of equity, with the weighting reflecting the assumption made for gearing.

802. In respect of the level of gearing, the CMA provisional findings adopted an assumption of 62.5% in line with the views of Bristol Water and Ofwat. We agree that this assumption is appropriate.

8.3 Cost of debt

803. In this Section we set out:

- our views on the cost of embedded debt (see **Section 8.3.1**);
- our views on the cost of new debt (see **Section 8.3.2**); and
- our views on the overall cost of debt (see **Section 8.3.3**).

8.3.1 Cost of embedded debt

804. The CMA has estimated the cost of embedded debt for Bristol Water on the basis of two reference points:

- a range for the notional cost of embedded debt for WaSCs adjusted to reflect the higher costs of debt for WoCs; and
- a range for the actual cost of Bristol Water's embedded debt.

805. The CMA's point estimate of the cost of embedded debt is chosen from the lower end of the range for the notional cost of debt because the CMA's estimate of Bristol Water's actual costs is below the range for notional cost, and it considered that customers should share some of the benefits of the lower actual cost of debt.

806. We consider that the estimated cost of embedded debt is too low because:

- the inflation estimate for converting nominal debt costs to real incorrectly includes longer term forecasts (see **Section 8.3.1.1**);
- the lower end of the range in the estimate of the notional debt costs is not credible (see **Section 8.3.1.2**);
- the actual cost of embedded debt has been underestimated because it has incorrectly used the yield at issuance which results in the actual cash costs of debt being underestimated (see **Section 8.3.1.3**);
- the adjustment for shareholder returns is inappropriate, or if it is going to be made, it should be based on the last tranche of debt (see **Section 8.3.1.4**);
- the exclusion of preference share costs is not appropriate (see **Section 8.3.1.5**); and
- overall this results in an underestimate of the cost of embedded debt (see **Section 8.3.1.6**).

8.3.1.1 Appropriate rate of Inflation

807. In the provisional findings, the CMA has used an inflation assumption of 2.6%. This is based on the March OBR forecast of 2.48% and the bank of England implied 10 year rate of 2.74%.

808. We consider that the use of OBR data is appropriate, albeit we note that the latest OBR data has a lower inflation forecast than the March forecast (see **Section 8.3.1.1.1**).

809. However, we consider that the use of 10 year inflation forecast from treasury data is not consistent with the use of an inflation estimate for converting nominal debt costs to real over a five year period (see **Section 8.3.1.1.2**).

810. Overall therefore, we now consider than an inflation estimate of 2.4% should be used consistent with the latest OBR forecast.

8.3.1.1.1 OBR Forecast Inflation

811. The OBR updated its forecast of inflation in July. Table 25 below sets out the Q3 RPI forecasts for the period up to 2020.

Table 25 July OBR forecast for Inflation

	2015/16	2016/17	2017/18	2018/19	2019/20	Average
OBR Forecast of Q3 Inflation	0.7%	2.2%	3.0%	3.1%	3.1%	2.4%

Source: OBR, Economic and Fiscal outlook, July 2015, Table 4.1

812. Table 25 shows that the expected inflation over the period is currently 2.4%.

8.3.1.1.2 Use of 10-year data

813. The CMA's view of likely inflation is partly based upon a 10-year treasury breakeven forecast of inflation.[446]

814. We have two concerns with this approach:

- there are issues about the use of treasury breakeven data for forecasting inflation (see **Section 8.3.1.1.2.1**); and
- the inclusion of a longer term forecast is inappropriate in a regulatory context (see **Section 8.3.1.1.2.2**).

8.3.1.1.2.1 Use of treasury breakeven inflation

815. The CMA has used the BoE spot inflation rate which the BoE clearly states "*is often interpreted as a measure of inflation expectations, although some care is required in doing so*".[447] It further explains that "*Illiquidity in the conventional and index-linked gilt markets could distort this measure, and in practice there will be an 'inflation risk premium' incorporated in the implied inflation rate*." [448]

816. The spot inflation used by the CMA is therefore biased upwards.

817. In FD14 Ofwat has also discounted for this inflation risk premium and notes that "*The difference in yields between nominal and real gilts captures both expected inflation as well as the inflation risk investors bear by not having their cash flows linked to RPI. The average premium on 10 year gilts between 1997 and 2007, as calculated by the Bank of England, was 0.3%.*"[449] The 0.3% was calculated by the BoE in its quarterly bulletin.[450]

---

[446] PFs, Appendix 10.1, para. 11.

[447] (RPF098), p.5.

[448] (RPF098), p.5.

[449] Ofwat, Final price control determination notice: policy chapter A7 – risk and reward (SOC218).

818. This suggests that if the treasury forecast of 2.74% were to be used an adjustment of 0.3% should be made to reflect this inflation risk premium. This is consistent with the OBR forecast of 2.4%.

8.3.1.1.2.2 Inclusion of a longer term forecast

819. The CMA states that its reason for including a longer estimate of inflation is because any fixed rate debt issued would have an implicit RPI estimate priced in by the market, and since most debt is long term, the RPI assumption would be over a longer period.[451]

820. Although we agree that this is correct, we do not consider that it is relevant in respect of converting a nominal debt rate to a real rate in the context of the assessment of the cost of capital of a regulated business such as Bristol Water.

821. This is because the returns obtained by Bristol Water consist of a real return plus inflation of the RCV. In each year the inflationary return will be equal to the actual inflation in that year. To illustrate this point, consider a tranche of debt with a fixed nominal cost of 6.0%. If inflation in a particular year is 3.5%, then the real cost of this debt to the company in that year is 2.5% because the inflationary return obtained by the company that year is 3.5%.[452] If the rate of inflation was 1.5%, then the real cost of the debt in that year is 4.5%. The actual real cost of the debt in each year will reflect the actual inflation of that year. This is true irrespective of the underlying market assumptions about inflation when the debt was issued.

822. To consider the longer term aspects, consider a tranche of debt that was issued based on a forecast inflation of 2.5% for the first five years, and 3.5% for the next five years. Assuming the issuer sought a real return of 2.5%, then the overall cost of this debt would be 5.5% (i.e. 2.5% plus the average inflation over the period of 3.0% (a simplified calculation)). Assuming the inflation forecast was correct, then using the 10 year assumption of inflation in setting a real cost of debt would result in the actual outturn real cost to the company being too high in the first period (3.0% real cost compared to 2.5% actual) and too low in the second period (2.0% compared to 2.5% actual). However, if the cost of capital was set for each period based on the forecast for inflation in that period alone, the real cost of capital would be correct in each period.

823. This demonstrates that it is correct to use a 5-year forecast for inflation even when the debt issuance is over a longer period and takes into account forecast inflation over this longer period.

824. Moreover, we note that if debt was issued previously assuming very low levels of inflation, it would be very unlikely that a regulator would take these into account in adjusting from nominal to real if the forecast inflation for the next period was significantly higher. As a consequence, using a long term basis for estimating inflation can lead to an inconsistent and asymmetric regulatory approach. Basing a forecast purely on the forecast inflation for the five years avoids this risk and ensures that the actual real cost of debt is a close to that actually experienced by the company as possible.

---

450 Bank of England, Quarterly Bulletin 2012 Q3 | Volume 52 No. 3 (RPF015).

451 PFs, Appendix 10.1, para. 10.

452 This and the subsequent example ignores the Fisher relation for simplicity. In addition, the example in the following paragraph ignores the time value of money also for this reason.

825. Given this, we consider that it is not correct to include the 10-year treasury data in the estimate of inflation used for converting nominal debt costs to real. Excluding this estimate would result in an inflation assumption of 2.4%.

8.3.1.2 Notional cost of debt

826. The CMA concludes in the provisional findings that the appropriate range for a notional cost of embedded debt for Bristol Water is 2.7% to 3.3%.

827. It based this decision as a result of the industry range identified by Ofwat for WaSCs uplifted to reflect a small company premium of 0.4%. No allowance was made for cash handling costs.

828. We are concerned that this estimate for the range of the notional cost of debt is too low, particularly at the lower end of the range. We show that:

- the range is below the WoCs own views of their cost of embedded debt (see **Section 8.3.1.2.1**); and
- a calculation based on the observed real gilt rate and WoC spreads suggest that a notional approach would result in a cost of debt at the top of the range identified by the CMA (see **Section 8.3.1.2.2**).

829. We consider that the range has been underestimated because:

- although the 40 basis point difference between WaSC and WoCs is a reasonable estimate of the additional cost of issuing debt for a WoC, it is likely to underestimate the additional costs of embedded debt, particularly at the lower end of the range, because WoCs are more exposed to timing risk as a result of less frequent issuances (see **Section 8.3.1.2.3**);
- issuance costs for WoCs would be higher than those for WaSCs and this would increase the notional range (see **Section 8.3.1.2.4**); and
- It is incorrect to exclude cash handling costs from the notional cost of debt (see **Section 8.3.1.2.5**).

830. We summarise the impact of all these considerations in **Section 8.3.1.2.6**.

8.3.1.2.1 WoCs view of the embedded cost of debt

831. The range for the embedded cost of debt for WoCs is not consistent with the range of embedded debt costs reported by WoCs.

832. Table 7 of Ofwat's risk and reward paper[453] showed that in their December plans the range of embedded debt costs for WoCs was 3.5% to 3.8% with an average of 3.6%. This is considerably greater than the notional range identified by the CMA. In particular, it shows that the lower end of the range identified by the CMA is too low.

8.3.1.2.2 Notional calculation of the cost of debt

833. It is possible to calculate an estimate for the notional cost of debt for Bristol Water based on the assumption that gearing has remained constant at the notional level and the historic

[453] Ofwat Risk and Reward Guidance Jan 2014 (SOC079).

underlying level of index-linked gilts over this period together with a WoC specific spread. Figure 19 below shows the evolution of the assumed debt cost over this period.

834. Undertaking this calculation using data from 2001 and an estimated spread of 2.0% (in line with the spread on issue of our index-linked bond in 2011) results in an estimate of the notional cost of debt for Bristol Water of 3.39% before issuance and cash handling costs. Including issuance and cash handling costs would result in a notional embedded cost of debt for WOCs of 3.6%.

835. This estimate is consistent with the average estimate of the cost of embedded debt that WoCs included in their business plans.

836. The calculation does not make any allowance for higher cost debt that might have been incurred before 2001. This might lead to this estimate being too low. Conversely, it does not allow for any repayment of earlier higher cost debt and substitution by more recent lower cost debt, which would have increased the weighting of more recent debt. This may lead to the estimate being too high, although the risk of this is low as a reasonable assumption for the tenor of the debt would be over 15 years. The balance of these factors would depend upon the assumption for the range of tenors of debt drawn. We have not examined this in detail, but on balance, we consider that the estimate supports a notional cost (including issuance costs) above the upper end of the range identified by the CMA.

8.3.1.2.3 Allowance for the higher costs of WoCs compared to WaSCs.

837. The CMA has made an assumption that the cost of debt on issuance for WoCs is likely to be 40 basis points higher than that of WaSCs. [454]

838. We agree with this conclusion, however, we consider that the difference in terms of the cost of embedded debt could be greater than this because WoCs issue debt less frequently, and are therefore more exposed to timing risk than WaSCs.

839. WoCs have little control over the timing of their infrequent debt issuances as the timing is driven by operational requirements. Moreover, the future path of debt costs is unclear, and therefore it is inappropriate for companies to incur debt ahead of their need, particularly given potentially high carry costs.

840. More specifically, WoCs have raised relatively less debt than WaSCs in the period since the artesian issues and this means that their costs are more heavily weighted to this period which had higher interest rates.

841. We note in passing that the use of a notional approach of debt for WoCs increases their risk. This is an additional factor increasing the cost of equity.

842. We consider that this factor would not impact the upper end of the range identified by the CMA, but would materially increase the bottom end of the range as WoCs will not have had the issuance opportunities available to the WaSCs exhibiting the lowest cost of embedded debt. On balance, we consider that this increases the lower end of the notional range by 0.2%.

[454] PFs, Appendices A 10(1)-7, para. 31.

843. Overall, we consider that after taking account of the higher timing risk, a reasonable notional range for WoCs (pre-issuance costs) would be 2.8% to 3.2%.[455]

8.3.1.2.4 Issuance costs for WoCs compared to WaSCs

844. The CMA has allowed issuance costs in respect of new debt of 0.1%.[456] It has made no allowance for the costs of issuance potentially being higher for WoCs compared to WaSCs.

845. We consider that an allowance for issuance costs of 0.1% on a notional basis is low for a WoC because WoC issuance sizes will tend to be relatively small, whereas a significant element of the issuance costs (such as legal fees) does not tend to be related to the size of issuance. As a result, smaller issuances will have higher costs.

846. The higher costs of raising new debt have been recognised by other regulators. For example, in 2014 the CAA assumed debt issuance costs of 20 bp for Gatwick compared to 15 bp for Heathrow due to its smaller size.[457] Bristol Water is significantly smaller than Gatwick and therefore might be expected to have even greater issuance costs.

847. Overall we consider that the costs of issuance for WoCs in the notional cost of debt should be 0.05%-0.10% greater than that for WaSCs.

848. Taking into account this higher issuance cost, we consider that the notional range of the cost of debt for WoCs should be 2.85% to 3.4% before accounting for cash handling costs.

8.3.1.2.5 Cash handling costs

849. The CMA has not included an allowance for cash handling costs in its notional cost of debt as it assumes that the use of a proportion of short term debt would result in cost savings equal to or greater in magnitude than the cash holding costs. [458]

850. We consider that there are two issues with this assumption:

- firstly, it implicitly assumes that the notional cost of debt does not include any short term debt. Since the range is based on companies actual costs that include an element of short term debt this is not correct; and
- secondly, raising short term debt is not a practical means of reducing the cost of debt for Bristol Water because in order for this to be true a very substantial amount of short-term debt would need to have been raised, and this would have resulted in additional issuance costs that more than offset the benefit of lower yields.

851. This second argument is set out in detail in Section 4.3 of the KPMG report.[459]

852. Overall we consider that the evidence supports cash handling costs for WoCs of 0.15%-0.20% should be included in their notional cost of debt.

---

[455] This is calculated form the CMA range of 2.7% to 3.3% by subtracting issuance costs of 0.1% and adding 0.2% to the bottom of the range.

[456] PFs, para. 10.74.

[457] CAA Estimating the Cost of Capital (SOC512), Fig. 5.1.

[458] PFs, para. 10.99.

[459] KPMG, Response to CMA Provisional Findings on Bristol Water's cost of capital, July 2015 (RPF028).

853. Taking into account the need for allowing cash handling costs to be included in the notional cost of debt, we consider that the notional range of the notional cost of debt for WoCs should be 3.0% to 3.5%.

8.3.1.2.6 Overall conclusions on range for notional cost of debt

854. In **Sections 8.3.1.3.3** to **8.3.1.3.5** we show that taking into account the higher timing risk for WoCs, additional issuance costs, and additional cash-handling costs would result in a range for the embedded cost of debt of 3.0% to 3.5%.

855. This range may be conservative. It is below the average embedded debt cost actually reported by the WoCs of 3.6%, and it is also below a calculation of the embedded cost of debt for WoCs based on historic gilt rates that is also 3.6%.

8.3.1.3 Cash costs of embedded debt

856. The CMA has set out its view that the actual cost of its debt should be based on the yield at issuance rather than the coupon payable.[460] The CMA does not explain why it considers this is so. This results in a reduction in the estimated embedded cost of Bristol Water of 0.22%.

857. We consider that the CMA is incorrect to base the cost of debt on the yield at issuance, on quantitative, theoretical and regulatory precedent grounds. This is because:

- using the yield at issuance is not correct for index linked debt because it incorrectly assumes that the accumulated increase in the debt from indexation has a cost equal to the yield at issue, whereas the cost is clearly equal to the coupon (see **Section 8.3.1.3.1**);
- yield at issue is not theoretically correct to use as premia/costs effectively represent balance sheet movements not an adjustment to the cost of debt (see **Section 8.3.1.3.2**);
- use of yield at issuance results in actual cash interest costs during a period not being correctly calculated. This is not consistent with the other aspects of the cost of capital estimation (see **Section 8.3.1.3.3**); and
- regulatory and CMA precedent clearly state the use of (cash) coupon in calculating the costs of embedded debt. We believe a significant change in methodology such as that being proposed should be set out in detail for comment (see **Section 8.3.1.3.4**).

858. Moreover, we consider that even if the yield to maturity was the appropriate basis for estimating the actual cost of embedded debt, the yield should be adjusted to take into account other costs linked to the issue. This is discussed in **Section 8.3.1.3.5**.

859. As a consequence, we consider that the actual embedded cost of debt should be based on the coupon rate of the debt, and not the yield at issuance.

860. The question of whether to use yield or coupon rates is discussed at length in the KPMG report. It concludes that the approach is not consistent with regulatory CMA precedent and is not theoretically correct.[461]

---

[460] PFs, para. 10.68.

[461] KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 4.2.2

861. We consider that a more practical approach to the treatment of costs and premia is to take account of them through amortisation. This also has the advantage that it is not distorted as a result of an increasing principal in the case of index linked debt. This is discussed in **Section 8.3.1.3.6**.

8.3.1.3.1 Impact of index-linked debt

862. The initial artesian issuance of index linked debt was £91.1m. As at the 31.3.15, the amount outstanding on these loans was £126.5m as a result of the accumulated indexation since issue. As such, 28% of the outstanding index linked artesian debt relates to indexation.

863. The cost of debt of this indexation element is clearly equal to the coupon of this debt. Therefore irrespective of whether using the cost at issuance instead of the coupon is correct for the initial debt, it is clearly incorrect for this indexation element.

8.3.1.3.2 Yield at issue not a theoretically correct cost of debt

864. The premium at issue and subsequent repayments of interest and principal are financially equivalent to issuance of a larger amount of debt. The relevant counterfactual would be if Bristol Water had issued the debt at par value, but raised a higher face value of debt. The only difference between this counterfactual and Bristol's actual debt issuance is the accounting treatment of the interest and principal.

865. The fact that Bristol Water effectively raised a higher quantum of debt by issuing Artesian debt at a premium did not result in Bristol Water's gearing exceeding the average for the WoCs. As such, applying the yield to maturity to the actual quantum of debt raised is effectively equivalent to disallowing costs which have been efficiently incurred.

866. This is considered further in **Section 8.3.1.3.6** below that looks at the amortisation of costs.

8.3.1.3.3 Yield at issuance results in the wrong interest costs being calculated

867. Using the yield at issuance results in an estimate of the cost of debt that is below the actual cash cost of debt the company has efficiently incurred. Consequently, it is not a good estimate of the actual cost of debt during a period.

868. Moreover, the consequence of this is that returns available to equity would be below that assumed and therefore too low. This would not be consistent with the Finance Duty.

8.3.1.3.4 Regulatory precedent

869. The all-in yield approach proposed by the CMA presents a departure from the approach adopted in previous CC determinations. For example, both the CC's NIE and CC10 determinations clearly state the use of (cash) coupon in calculating the cost of embedded debt, and not the all-in yield.

870. In calculating Bristol Water's real historic cost of debt in 2010, the nominal cash interest cost was used across Bristol Water's existing debt. The CC10 determination states: "*the cost of*

debt for index-linked debt is based on the cash interest coupon—this excludes the indexation of the principal".[462]

871. In the context of determining NIE's real cost of debt in light of the potential premium on its yield vs. comparable bond issues within the sector determination, the CC states "*accordingly, it is our view that the cost of the licence holder's existing debt should be assessed based on the actual interest cost of NIE's outstanding bonds*."[463] It is noted that the NIE bonds were issued at a discount.

872. In both cases, the coupon rate was used to calculate the weighted average cost of embedded debt and converted this into a real using the assumed inflation rate. This makes it clear that the CC past approach was to use the coupon rate.

873. The CMA's change in methodology is inconsistent with previous determinations, including CC10 where the coupon rate (cash interest cost) on the same Artesian issuances was used. This is contrary to the approach to estimating the cost of capital that that the CMA set out in para. 10.8(c) of the provisional findings where it would take account of relevant precedent from previous CC/CMA decisions.

874. The CMA does not appear to have set out the basis for this change in approach. We would welcome the opportunity to comment on the rationale used to justify it.

8.3.1.3.5 Correct assessment of yield to maturity

875. If yield to maturity were to be used as the appropriate basis for estimating the cost of embedded debt, then it should be adjusted to take into account the costs associated with the issue.

876. At the time of the Artesian bond issuances, Bristol Water incurred unavoidable and associated costs linked to the issue. These costs (e.g. pension deficit top up) were not remunerated through other elements of the regulatory price control and therefore should be netted off against the premium at issue to reflect the net amount received by Bristol Water for financing operational activities.

877. Table 26 below sets out the premia and costs associated with artesian.

Table 26 Costs and premia relating to Artesian borrowings

	2004 £m	2006 £m
Premium	2.2	6.8
Provisional fees	(1.7)	(0.5)
Gilt lock costs	(1.2)	(0.6)
Total	**(0.7)**	**5.7**

Source: Bristol Water's Reply

878. In addition Bristol Water incurred additional costs of £2.1m as a result of a swap related to a variable rate bank loan that was repaid in May 2003 with the proceeds of the first tranche of Artesian issuances. At the time the loan was repaid, the swap was "out of the money", and given this it was decided to hold it to maturity in 2006 as this was less costly than the break

[462] CC10, Appendix N-56 (SOC553).

[463] CC NIE Final Determination (SOC116) (13-67).

cost. Also a pension deficit of £8.5m had to be paid as a condition of the debt drawdown. This payment was not covered by other elements of the regulatory settlement.

879. The premium from Bristol Water's Artesian issuances totals £9 million but after accounting for the associated costs and the unavoidable pension deficit payment, there was an actual net cost of £3.5 million (i.e. Bristol Water was required to use the entirety of the premium in addition to £3.5 million of the par value to service unavoidable costs). Taking into account the additional cost of the swap leads to net costs of £5.6m.

880. After netting off these costs, the value received by Bristol Water for operational purposes is actually less than par value of the bond issuances, and on this basis, adopting an appropriately adjusted all-in yield approach would actually result in a higher cost of debt compared to the coupon rate as the bonds were effectively issued at a discount net of costs.

881. This identified a significant issue with the use of yield at issue as it requires an element of retrospective regulation. Effectively, decisions have to be made about which costs and benefits should be taken into account when considering a debt issue that occurred several regulatory periods earlier. Moreover, such an approach is likely to lead to inconsistency between assumptions in one regulatory determination and another (as has occurred between CC10 and the CMA's provisional findings).

8.3.1.3.6 Use of amortisation

882. If there is a concern in respect of benefits received from earlier premia at issue, a more reasonable approach is to treat these in the same way as issuance costs by amortising them over the life of the loan. This is also consistent with the accounting approach.

883. The table below sets out a breakdown of Bristol Water's issuance, cash handling and liquidity costs. It also shows the impact of the amortisation of the artesian premia and costs.

Table 27 Breakdown of cash handling and issuance costs

Breakdown of cash handling and issuance costs	Breakdown of issuance and cash handling costs %
Estimation of Costs included in SoC	
Amortisation of IL Bond costs	0.01
Amortisation of bank loan arrangement costs	0.06
Liquidity facility costs[464]	0.08
Cash balance costs[465]	0.20
Total	**0.36**
Artesian loans	
Amortisation of artesian premia	-0.10
Amortisation of artesian costs	0.05
Net premia issuance costs for artesian	**-0.05**
Total cash handling and issuance costs including artesian	**0.30**

Source: CMA/Bristol Water analysis

884. In our SoC we included 0.3% for cash handling and issuance costs. This was reduced from the detailed estimate of 0.36% to be consistent with the assumption made in CC10.

[464] This reflects the cost of the non-utilisation fees of the £70m undrawn debt facility.

[465] SoC, para. 1678.

885. Table 27 above shows that taking the artesian premia and costs into account has only a small impact on the total of issuance and cash handling costs.

886. We consider that amortisation is a superior approach to using the yield at issue of the artesian debt, as it avoids underestimating the costs of the additional artesian debt arising from indexation, it recognises the costs over the period of funding to which they relate (in line with the accounting treatment of these costs), and avoids retrospective assessment of different benefits and costs.

8.3.1.4 Adjustment for Shareholder Return

887. The CMA has excluded elements of Bristol Water's actual embedded debt costs because it considers that some financing was for non-operational purposes. As a result the CMA has reduced the cost of embedded debt by 0.1%.

888. The CMA has reached this decision as a result of the increase in gearing that occurred in the mid/late 2000's. The amount has been calculated by assuming that an element of the more expensive debt should be removed to effectively restore a gearing of 62.5% in line with the notional gearing assumption.

889. We consider that this adjustment is not appropriate and has been made as a result of an unduly narrow perspective on the issue. This is because:

- on a long-term perspective gearing has been stable, being 68% in 1995 when RCV was introduced and 68% in 2014. Variations in gearing and distributions during this period reflect the realities of access to debt markets for water only companies in respect of timing and amounts (see **Section 8.3.1.4.1**);
- the timing of debt issuances reflected availability of long term debt before artesian. An alternative timing that kept gearing constant over the period would have resulted in a higher debt cost (see **Section 8.3.1.4.2**);
- the proceeds of the artesian debt were used for operational purposes (see **Section 8.3.1.4.3**);
- the approach is not consistent with regulatory precedent (see **Section 8.3.1.4.4**); and
- gearing was below the notional level at the start of this period. Therefore if a specific adjustment is to be made it should be made using the most recent tranche of debt (see Section **8.3.1.4.5**).

890. Overall we consider that the CMA has made this adjustment primarily as a result of two misconceptions: firstly that the proceeds of artesian debt were not all used for operational purposes; and secondly the gearing increased above previous levels as a result of the artesian debt. We show below that these views are not correct.

891. This issue is considered in detail in the KPMG report. This concludes that their appears to be no valid justification for the applications made by the CMA to Bristol Water's cost of embedded debt.[466]

892. Given this, we do not consider that a specific adjustment to the cost of debt should be made to adjust for shareholder return.

---

[466] KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 4.2.3

8.3.1.4.1 Long term perspective of gearing

893. Bristol Water's initial gearing when RCV was introduced in 1995 was 68%. Since then the actual level of gearing has fluctuated. However the current level of gearing is no higher than that effectively imposed on Bristol Water when its RCV was first established.

894. Gearing from 1995 until it increased back to its starting level in the mid/late 2000's. This partially reflected the difficulty of obtaining long-term debt before the artesian scheme became available. Gearing dipped after 2010 and has since increased back to slightly above the opening gearing.

895. Over time there has not been an upward change in gearing, and therefore it is not reasonable to assume that there has been excessive shareholder returns. The higher dividends paid in the mid 2000's effectively reflect a catch-up for lower dividends paid during the late 90's when access to long term debt constrained shareholder pay outs. They cannot reasonably be classified as a 'super' dividend.

896. This is confirmed by KPMG's analysis of dividend yield for Bristol Water between 1996 and 2010, which shows that Bristol Water's dividend yield was lower than other WoCs during the period up to 2000 and broadly similar to that of other WoCs in the period 2000-2010.[467]

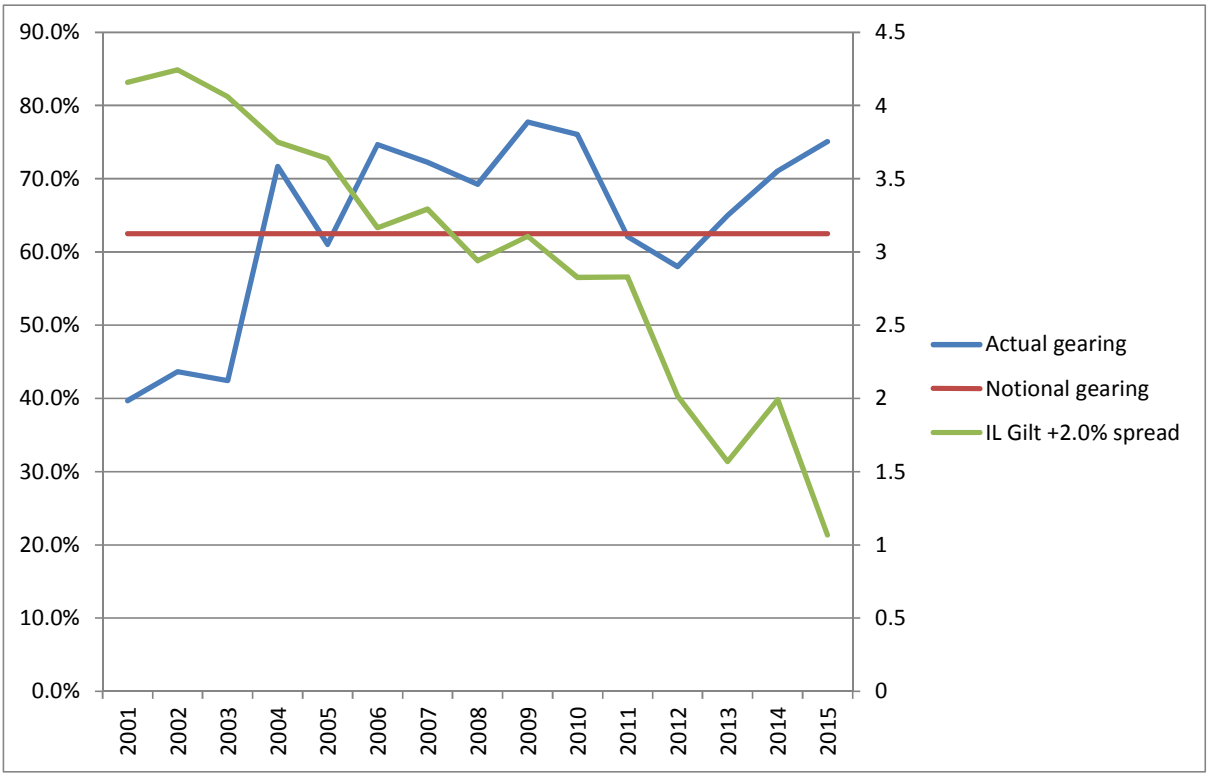
8.3.1.4.2 The timing of debt issuances was not inefficient

897. In **Section 8.3.1.4.1** we show that a longer term perspective does not support the view that some of the artesian debt was incurred for non-operational reasons, but reflected constraints around the availability of long term finance.

898. The actual approach to raising debt has resulted in a cost of debt that is around 0.3% lower than it would have been if instead Bristol Water had maintained a constant gearing over this period. This is because an approach that kept gearing constant would have drawn down more debt earlier in the period when debt rates were higher, and less debt in the last three years when debt rates were lower (see Figure 19 below). If the calculation is adjusted to take into account that our actual approach drew debt down in 2006 that was fixed to 2004 rates, the savings from our approach reduce to 0.1%.

[467] KPMG, Response to CMA Provisional Findings on Bristol Water's cost of capital, July 2015 (RPF028) Tables 4 and 5, p. 11.

Figure 19 - Evolution of gearing and real market debt cost



Source: UK Treasury/Bristol Water analysis

899. This demonstrates that the actual embedded cost of debt is not higher as a result of the different timing of distributions to shareholders. This supports our view that no adjustment should be made to the embedded cost of debt for shareholder returns.

8.3.1.4.3 The proceeds of artesian debt were used for operational purposes

900. We consider that the proceeds of the artesian debt were used for operational purposes.

901. We note that Bristol Water's RCV increased by c£125m from 2000[468] to 2007[469] and that the Artesian debt incorporated the only long-term debt finance issuances during this period, in 2003, 2004 and 2005. Table 28 below sets out the issuances and some associated costs and compares them to the operational debt requirements of the business assuming a constant notional level of gearing.

[468] Bristol Water RCV in 2000 was £136m and gearing at 50%.

[469] RCV at £260m – Reply, Appendix 1, Table 6.

Table 28 Analysis of funding strategy in relation to Artesian debt

	£m
Total Artesian issuance	148.6
Less: debt repayments	(29.8)
Less: pension scheme contribution	(8.0)
Less: funding of Artesian covenant structure	(6.0)
Funding of RCV growth from 2000 to 2007 @ 62.5% gearing	(77.5)
Increase from initial low gearing of 50% to notional in 2000	(17.0)
Residual debt	10.3
% of RCV in 2007	4.0%
Implied gearing	66.5%[470]

Source: Bristol Water analysis

902. Table 29 illustrates that the Artesian debt was in practice largely used to fund the operational requirement of the business. The slight excess in gearing compared to the notional level in 2007 represents an element of pre-funding, which would be expected given that issuances of debt are infrequent for Bristol Water. This is demonstrated by the reduction in gearing to below the notional level after 2010.

903. This confirms that the proceeds of the artesian debt were used for operational purposes.

8.3.1.4.4 Regulatory precedent

904. The issue of whether a proportion of the artesian debt should be disallowed was raised by Ofwat in the CC10 Determination. The CC considered this matter at that time and did not make an adjustment. Consequently, the CMA's approach in 2015 is not consistent with its own precedent, which is contrary to the CMA's stated approach that it would take account of relevant precedent from previous CC/CMA decisions.[471]

905. Moreover, the approach being adopted by the CMA sets a precedent which penalises companies that exhibit gearing above the notional level even when these companies' actual cost of debt is below the notional level. This is contrary to the principle of not intervening in the financing decisions made by management.

8.3.1.4.5 Appropriate adjustment for notional gearing

906. The CMA made an adjustment to the cost of debt to adjust gearing to the nominal level. It considered two approaches:

- scaling down the debt proportionally (which would not affect the overall cost in percentage terms); or
- excluding only the artesian debt raised in 2003-05.

907. We have implicitly used the first of these approaches in our assessment of the cost of debt and consider that this is the preferable approach.

908. However, if an approach that excluded a specific tranche were to be used, we consider that the appropriate tranche of debt to be excluded is that raised since the most recent time gearing has increased above the notional level. Figure 19 above shows that gearing was

[470] Gearing in 2007 was 68%, the difference is largely due to short-term funds - Bristol Water plc Annual Report 2008 (POS009).

[471] PFs, para. 10.8(c).

below the notional level in 2012 and 2013 and only increased above the notional level in 2014. Given this, if a specific tranche of debt is to be excluded then it should be the most recent FFL debt, as it is this debt that has driven gearing above the notional level.

8.3.1.5 Preference Shares

909. The CMA has excluded the cost of preference shares from the calculation of Bristol Water's actual embedded cost of debt. This has reduced the estimated cost of embedded debt by 0.13%.

910. The CMA excluded the costs of preference shares as it considers that they are closer to equity than debt.

911. On balance we consider that the preference shares in their nature are closer to debt than equity. A detailed analysis is set out in Appendix 1 of the KPMG report on the provisional findings.[472] In particular:

- their financial characteristics are more in line with debt than equity including fixed coupons and no upside from available profits;
- trading spreads are closer to debt than comparable risk premiums for the equity market;
- they exhibit very little correlation with broader equity market indices suggesting a systematic risk exposure that is closer to debt than equity; and
- [redacted] consider that the preference shares are closer in nature to debt than equity, and therefore treat them as debt in its assessment of debt and interest.

912. In addition we note that preference shares are included within debt in the regulatory accounts. Treating them differently in the assessment of the cost of capital leads to an inconsistent regulatory approach.

913. Moreover, at the time Bristol Water obtained the preference shares (1992), these were the only long-term finance option available to water only companies. If other forms of long-term debt had been available at this time, then we would have taken advantage of them. The proceeds from the preference shares were used to finance the capital expenditure of the business at that time, in particular the upgrade of Purton WTW. This means that the use of preference shares by the company was debt like in nature. We consider that by not taking into account their costs, the CMA is effectively ignoring historical finance costs associated with the operational requirements of the company.

914. Given that the preference shares are nearer to debt than equity, and that their use was to fund the capital expenditure of the business, we consider that their costs should be included in the estimate of the actual embedded cost of debt.

915. The treatment of preference shares is discussed in detail in the KPMG report, which concludes that preference shares more closely resemble debt than equity in terms of their characteristics and therefore should be treated as debt and that customers have benefitted from the existence of the preference shares.[473] As such they should be included in the calculation of the embedded cost of debt.

---

472 KPMG, Response to CMA Provisional Findings on Bristol Water's cost of capital, July 2015 (RPF028).

473 KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 4.2.1

8.3.1.6 Overall cost of embedded debt

916. The CMA estimated the cost of embedded debt for Bristol Water on the basis of reference points for the notional cost of embedded debt, and the actual cost of embedded debt.

917. The CMA's point estimate of the cost of embedded debt is chosen from the lower end of the range for the notional cost of debt because the CMA's estimate of Bristol Water's actual costs is below the range for notional cost, and it considered that customer should share some of the benefits of the lower actual cost of debt.[474]

918. The KPMG report shows that this approach has perverse incentive effects, and that in order to avoid this, the cost of debt should not be set below the mid-point of the embedded debt range.[475]

919. We have shown in **Section 8.3.1.2** that the range for notional cost of debt identified by the CMA is too low as a result of including an unattainable lower bound, not including cash handling costs and not allowing for WoC notional issuance costs in full. We consider that after adjusting for these factors, a reasonable range of the notional cost of embedded debt is 3.0% to 3.5%.

920. We show in **Sections 8.3.1.3 to 8.3.1.5** that the adjustments the CMA has made to Bristol Water's assessment of its embedded cost of debt are not appropriate. As a result, we still consider that our estimate of the cost of embedded debt of 3.15% is reasonable.

921. Overall, this suggests that out actual embedded debt cost is at the lower end of the notional range we have identified.

8.3.2 Cost of new debt

922. The CMA has provisionally estimated that the cost of new debt for Bristol Water is 1.8%.

923. We consider that the estimate of the cost of new debt has been significantly underestimated. This is because:

- the costs of new fixed debt have been underestimated as a result of using a spread that is too low, an inappropriate inflation rate, and potentially not allowing sufficient allowance for increases in interest rates (see **Section 8.3.2.1**);
- the costs of index linked debt have been underestimated due to use of an inappropriate period for estimating the underlying gilt rate and using a spread that is too low for index liked debt (see **Section 8.3.2.2**);
- issuance and cash handling costs on new debt have not been taken into account (see **Section 8.3.2.3**); and
- that taking these factors into account leads to a higher estimate for the cost of new debt (see **Section 8.3.2.4**).

8.3.2.1 Costs of new fixed debt

924. The CMA has estimated a range for the cost of new fixed debt based on:

---

474 PFs, para. 10.81.

475 KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 4.4

- the average of iBoxx corporate bond yields for A and BBB rated debt;
- adjusting this range for its assumption for inflation;
- making an adjustment of 0.3% to reflect the impact of expected base rate rises; and
- allowing an uplift of 0.11% for the additional costs of raising debt for WoCs.

925. This results in a range for the cost of new fixed debt of 1.8% to 2.1% before issuance costs.

926. We consider that this estimate of the cost of new fixed debt is too low because:

- the adjustment for inflation is too high (see **Section 8.3.2.1.1**);
- the adjustment of 0.3% for future increases in base rate may be too low (see **Section 8.3.2.1.2**); and
- the uplift of 11 basis points for WoCs is not sufficient (see **Section 8.3.2.1.3**); and
- making a correction for these effects will result in a higher cost range (see **Section 8.3.2.1.4**).

927. In addition, the use of a weighted mix of A rated and BBB rated bots may underestimate the cost of debt for Bristol Water, as the A rating debt is not consistent with Bristol Water's credit profile under the provisional findings. It is important that the estimated cost of new debt is consistent with the credit rating targeted (and achievable) for the notional company. This is discussed in more detail in the KPMG report.[476]

8.3.2.1.1 Adjustment for Inflation

928. The CMA used an estimate of inflation of 2.6% to convert from the nominal iBoxx yield to a real cost of new debt.

929. In **Section 8.3.1.1** we show that the inflation estimate should be 2.4% for the period 2015-2020. Using this inflation rate results in a real iBoxx range of 1.6% to 1.9%.

8.3.2.1.2 Adjustment for increases in base rate

930. The CMA considers that an allowance of 0.3% should be made to allow for the expected uplift in base rates.

931. We are concerned that this allowance may not be sufficient. The data presented in Figure 10.1 of the PFs shows that there has been a high level of volatility in rates recently. Given the recent data it would not appear to be unreasonable to assume that gilt rates could quite quickly increase back up to the level of January 14 which is around 0.7% higher than current rates. Indeed rates have increased by around 0.5% since the January estimate we used for the SoC.

932. Moreover, the analysis of base rates presented in Table 10.4 of the PFs does not consider the potential for rises later in the period. It is quite likely that the difference in views on base rates reflects a delay, rather than a fundamental change in view about future levels. In the context of a determination for 2015-2020 only considering up to 2016 may underestimate the effect. An allowance of 0.5% for the five year period would be more compatible with a delayed increase in base rate rises of a year or so than 0.3%.

[476] KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 5.2, pp. 23-24.

933. The KPMG report analyses this issue in detail and shows that the forward looking expected increase in the base rate is currently 0.9%, which is not significantly different from the expectation of 1.0% at the time of Ofwat's determination.[477] This reinforces the case that a reduction of greater than 0.1% from Ofwat's assumption is not justified.

934. In addition, the KPMG report shows that the difference in spot and forward yields on 10-year gilts at the middle of AMP6 is 0.52%.[478] This also supports an assumption that debt costs will increase by 0.5%.

8.3.2.1.3 Additional cost for WoCs

935. The CMA has allowed an additional 0.11% for the higher debt cost for WoCs compared to WaSCs. This is based on PWC evidence that the WoC artesian issuances were 0.11% greater than the real iBoxx at the time of issuance.[479]

936. The costs of WaSC debt were estimated to be 0.15% lower than the real iBoxx average.[480] Given this, the additional costs being allowed by the CMA for new debt are 0.26%. This is lower than the assumption of 0.40% assumed for embedded debt.[481] Using the 0.4% estimate of additional costs would result in a 0.25% increase above the real iBoxx rate. This is 0.14% more than the CMA has allowed.

937. The 0.11% identified by PWC relates to artesian debt. The costs of issuance of this debt were lower because of the benefits of credit wrapping.[482] Since credit wrapping is no longer available, the costs of bond issuance for WoC will be higher than the 0.11% achieved with artesian. This supports a new debt estimate of 0.25% above iBoxx real rates.

8.3.2.1.4 Corrected range for cost of new fixed debt

938. The range for the cost of new fixed debt identified by the CMA was 1.8% to 2.1% (excluding issuance costs). Table 29 below shows how the corrections above modify this range.

Table 29 Adjustments to CMA range for the cost of new debt

	Cost of new fixed debt %
CMA estimate of cost of new debt	1.8 – 2.1
Correction for inflation	0.2
Correction for WoC premium	0.14
Correction for future increase in base rates	0 – 0.2
Final range for new cost of fixed debt	2.1 – 2.65

Source: CMA/Bristol Water analysis

[477] KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 5.2

[478] KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 5.2

[479] PFs, para. 10.53.

[480] PFs, para. 10.53.

[481] PFs, para. 10.55.

[482] The public bonds were issued at a wrapped AAA+ rating, but the borrowers had to pay a higher rating to reflect their greater risk. The deal was attractive to WoCs because the overall cost was lower than accessing the market directly (i.e. the monoline insurers priced the additional credit risk of the WoCs at a lower level than the market). Since monoline wrapping is no longer available (as a result of their mispricing risk) the additional spread for WoC bond issuance now would be higher than for artesian.

939. Overall, Table 29 shows that the estimate for the range of the cost of new fixed debt (before issuance costs) should be 2.1% to 2.65%, with a central estimate of 2.4%.

940. We note that this is higher than the estimate we included in the SoC. However, this reflects the underlying increase in the gilt cost of 0.5% since January 2015 when our cost of debt for the SoC was estimated (e.g. see Figure 10.1 of the provisional findings).

8.3.2.2 Costs of new index-linked debt

941. The CMA has estimated a range for the cost of new index linked debt based on:

- the average estimated 20-year gilt rate between January and May 2015 of -0.74%; and
- an allowance for the expected spread of 1.75%.

942. This results in an estimated cost of new index linked debt of 0.9% to 1.4% (before issuance costs).

943. We consider that this estimate of the cost of new index-linked debt is too low because:

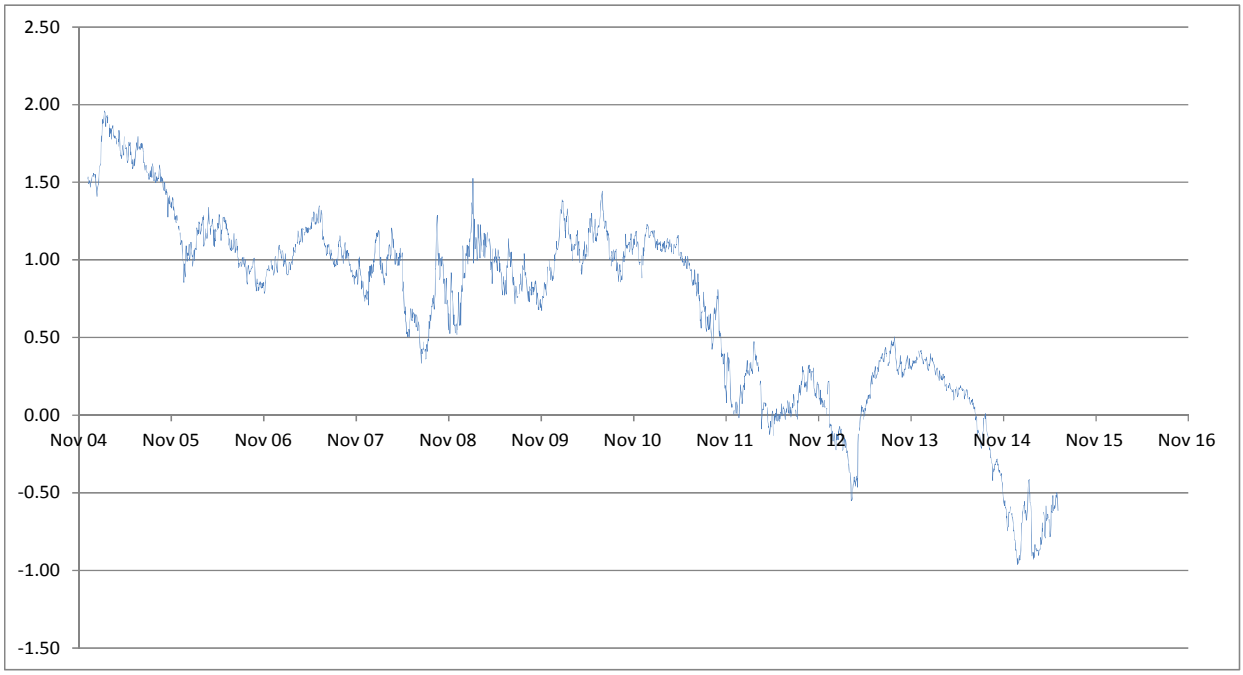
- the estimate of the underlying gilt rate uses too short a period of data resulting in a high risk that it may be too low (see **Section 8.3.2.2.1**);
- the allowed spread is too low for index linked debt (see **Section 8.3.2.2.2**).

8.3.2.2.1 Estimate of the underlying gilt rate

944. The CMA has estimated the underlying index-linked gilt cost on the period January to May 15. We are concerned that using this period as a base for the gilt rate results in an estimate of the cost of debt that is likely to be too low for the period 2015-2020.

945. Figure 20 below shows the estimated 20-year forward gilt rate since January 2005, using the same calculation approach as the CMA.

Figure 20 - Estimated 20 year index linked gilt cost



Source: Bank of England/Bristol Water analysis

946. Figure 20 shows that experience of negative gilt rates is a relatively recent phenomenon, and there has been considerable volatility in the rate during 2015. Given the historical pattern of index-linked gilt costs, it would be reasonable to assume that a return to a level of around 1.0% was within the range of potential outcomes by 2020.

947. Using an estimate based on the last six months only is likely to be associated with a high risk of being an underestimate over the period between 2015 and 2020. We consider that a better estimate of the underlying gilt rate would be to use the average over the last two years (July 2013 to June 2015). This results in an estimate of the underlying gilt rate of -0.1%. A longer period average over the last five years would result in an estimate of 0.25%.

948. A longer term approach would be more consistent with the estimates of asset beta which are based on a longer time series. It would be inconsistent to use a longer time series for cost of capital parameters where this resulted in a lower WACC, and then a short term horizon for different parameters where such an approach also led to a lower WACC.

949. The CC has recognised previously that long-dated index-linked gilt yields have been affected by distortions (associated, for example, with pension fund dynamics) and that these need to be corrected in estimating the RFR applicable to the cost of equity.[483] Whilst we accept that in respect of the cost of debt, we can take advantage of these distortions if they exist when we need to raise debt; changes in the impact of such distortions could lead to rapid and significant changes in the underlying gilt rate. This casts considerable doubt about whether the low underlying gilt rates of the last six months are sustainable to 2020.

[483] For example, the CC's NIE determination (SOC116), in the context of risk free cost rate.

950. This issue is discussed in more detail in the KPMG report.[484]

8.3.2.2.2 The allowed credit spread

951. The spread of 1.75% included in our SoC related to the costs of issuing new fixed debt. Our experience is that the required spread on index linked debt is higher than that for fixed debt.

952. We consider that the likely spread required for new index linked debt would be around 0.2% higher than that for fixed debt, resulting in an estimated spread of 1.95%.

953. The spread on issue of our index linked bond in 2011 was 2.00%.

954. Adjusting the underlying gilt rate to reflect the higher spread required for index linked debt results in an estimate for the cost of new index linked debt of 1.85% (before issuance costs).

8.3.2.3 Issuance and cash handling costs

955. The CMA has allowed issuance costs in respect of new debt of 0.1%. It has made no allowance for cash handling costs associated with new debt.[485]

956. We consider that an allowance for issuance costs of 0.1% is low for a company of Bristol Water's size in respect of 10-year debt (the basis for the iBoxx estimate). This is because our issuance sizes will tend to be relatively small, whereas a significant element of the issuance costs (such as legal fees) does not tend to be related to the size of issuance. We have managed to keep our issuance cost down to around 0.1% mainly as a result of using longer tenor debt. Debt with a longer tenor reduces the effective cost of issuance by allowing the cost to be amortised over a longer period. However, except for rare periods where the yield curve is inverted, longer term debt has a higher underlying cost. Therefore it is not consistent to use a low issuance cost together with a 10 year assumption for debt costs.

957. The higher costs of raising new debt have been recognised by other regulators. For example, in 2014 the CAA assumed debt issuance costs of 15 bp for Heathrow, compared to 20 bp for Gatwick due to its smaller size.[486] Bristol Water is significantly smaller than Gatwick and therefore might be expected to have even greater issuance costs.

958. In addition, we consider that cash handling costs need to be taken into account for the total amount of debt that Bristol Water holds. This was reflected explicitly in the SoC through our calculation of the overall cost of debt (see SoC Table 116). This is because the covenants requiring us to hold positive cash balances that lead to the cash holding costs apply to the total debt, not just the new debt.

959. In the NIE determination the CMA allowed an additional cost of 0.20% for issuance and cash handling costs.[487] NIE is over twice the size of Bristol Water in terms of turnover and RAB and therefore it would be expected to have lower issuance costs. In addition, it does not have the cash holding covenants required by artesian. As such its cash holding costs would also be expected to be less than those of Bristol water. This shows that 0.3% as an allowance for issuance and cash handling costs for Bristol Water is a reasonable estimate.

---

[484] KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 5.3

[485] PFs, para. 10.74.

[486] CAA Estimating the Cost of Capital (SOC512), Fig. 5.1.

[487] CMA, NIE Price determination (SOC116), para. 13.76.

960. If the cash holding costs are not reflected on new debt, then the overall amount allowed for this would be below Bristol Water's actual costs. Therefore, the cost of new debt should also include cash handling costs of 0.20%.

8.3.2.4 Overall cost of new debt

961. The CMA calculated its overall cost of new debt by using a blend of 33% index-linked debt and 67% fixed debt. This resulted in an estimate of 1.8% for the cost of new debt for Bristol Water.[488]

962. We agree that using a blend of 33% index-linked debt and 67% fixed rate debt is an appropriate approach. However, as we have set out above, we consider that the specific estimates of each of these rates are too low.

963. Based on a central estimate of the cost on new nominal debt of 2.4% (excluding issuance and cash handling costs), together with the estimated cost of index linked debt of 1.85%, we estimate the overall cost of new debt to be 2.2%. This is 0.2% higher than the SoC reflecting increases in debt costs since the SoC estimate was made.

964. Including issuance and cash handling costs results in an estimate of 2.5%.

965. We acknowledge that this estimate is significantly higher than the CMA's estimate of 1.8%. The difference of 0.7% has arisen as a result of a number of issues: the use by the CMA of short-term view of interest rates, not taking into account fully the additional cost Bristol Water will incur because of its size, using an estimate of RPI that is too high, and not including a full allowance for issuance and cash handling costs. In combination these factors result in a significant divergence of opinion on the cost of new debt.

8.3.3 Overall cost of debt

966. The CMA estimated that the overall cost of debt for Bristol Water was in a range of 2.48% to 2.70% with a point estimate of 2.59%.

967. The CMA obtained this estimate by assuming a weighting of 75% for the cost of embedded debt and 25% for the cost of new debt. It did not follow Bristol Water's proposal of calculating a cost of debt in each year based on the expected draw down of new debt because it considered that it is for companies to determine when they wish to issue debt to meet their circumstances.

968. We consider that the choice of approach should be based on that which gives the most accurate view. There are no incentive advantages in adopting a notional weighting because the actual level of new debt obtained will reflect the operational needs of the company and the amounts of debt retiring during the period.

969. We have two specific concerns in respect of the approach:

- the weighting used is not representative of the weight of new debt that will actually be incurred (see **Section 8.3.3.1**); and
- the CMA's proposed approach may result in inappropriate incentives (see **Section 8.3.3.2**).

---

[488] PFs, para. 10.102.

8.3.3.1 The notional weighting approach may result in an inappropriate cost of debt

970. The downsides of using a notional approach are that in a situation where the cost of new debt is significantly different to the cost of embedded debt, then getting the appropriate weighting wrong will result in an incorrect estimate of the cost of debt. In addition, indexation of existing debt means that some of the additional debt in the period will be incurred at the embedded debt cost rate not the new debt cost rate. Finally, using a notional approach will not take account of changes in the cost of embedded debt as a result of retirements.

971. This latter point is of particular relevance because the retirement of the FFL debt during the period, to be replaced by new debt, would result in an increase in the cost of debt and not a decrease as predicted by the notional model.

972. There is no reason why the specific amounts of debt drawn down would be the same form company to company. Therefore, if a notional weighting is to be used to assess the cost of capital for a specific company, it should reflect the actual likely level of debt draw down for that company.

973. For Bristol Water, the weighting of new debt in the SoC is 20% including the refinancing of the FFL loan. If the refinancing of the FFL loan is excluded then the weighting of new debt is 17%.

974. The level of expenditure in the provisional finding is less than that in the SoC and therefore the amount of new debt required is less. The weighting if new debt in this case is 17% including refinancing the FFL loan, and 14% excluding it.

975. KPMG use an alternative approach based on maintaining the notional gearing that calculates that the weighting given to new debt should be 16%, and that the use of 25% results in Bristol Water's overall cost of debt being underestimated.[489]

976. On balance we consider that this demonstrates that a weighting of 15% for new debt is more appropriate for Bristol Water than the assumption of 25% used in the preliminary findings. Moreover, the approach used in the preliminary findings overestimates the impact of new debt and therefore results in the cost of debt being under-estimated.

8.3.3.2 The incentive properties of a notional weighting approach may be undesirable

977. Given the timing of the FFL debt raised in November 2014 is close to the start of AMP6, it is not unreasonable to consider this as an element of the new debt over the period, rather than embedded debt.

978. In **Section 8.3.3.1** we show that because of the low cost FFL debt being retired during the period, the use of a 25/75 notional weighting is resulting in a forecast cost of debt that is below that Bristol Water can actually achieve.

979. If Bristol Water had not raised this debt until after the CMA hearing, then the embedded cost of debt would have been higher. The potential impact of this on the cost of debt can be

[489] KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 6.2

shown by adjusting the provisional findings to include the FFL loan in new debt rather than embedded debt. Under this approach, the adjusted cost of embedded debt would be 3.4%, which together with the provisional findings cost of new debt and notional weighting would have resulted in an estimate of the overall cost of debt of 3.0%.

980. If the cost of new debt was adjusted to reflect the lower cost of the FFL loan, then the adjusted cost of new debt would be 1.2% (based on assumed new debt of £110m consistent with provisional findings). Using a 25%/75% weighting in this case would result in an overall cost of debt of 2.86%.

981. In both cases, the alternative calculations result in a cost of debt that is significantly higher than that provisionally estimated by the CMA. This demonstrates that the proposed approach of a 75%/25% notional weighting is in effect penalising Bristol Water for having taken out the FFL loan, and action which the CMA agree is efficient.

982. We consider that taking an approach that results in companies being penalised for having taken efficient actions results in an incentive for companies not to take such actions. We do not consider that such incentives are desirable.

983. We consider that this detrimental incentive could be avoided by either:

- estimating the overall cost of debt on an annual basis; or
- using a notional weighting, but adjusting the embedded debt and new debt costs to move the FFL loan from embedded debt to new debt.

8.4 Cost of equity

984. The CMA has estimated Bristol Water's cost of equity based on an estimate of a Bristol Water's specific asset beta, together with estimates of market parameters for the risk free rate and the overall market return. We set out our response as follows:

- views on Bristol Water asset beta (See **Section 8.4.1**);
- views on the market parameters (see **Section 8.4.2**); and
- overall views on the cost of equity (see **Section 8.4.3**).

8.4.1 Asset beta

985. The CMA has estimated Bristol Water's asset beta by:

- using market data to estimate a range for the asset beta of listed WaSCs;
- using information on operational gearing to adjust the WaSC asset beta range to be representative for Bristol Water; and
- selected a point within this range, resulting in a point estimate of 0.32.

986. We agree that the overall approach adopted by the CMA is appropriate. However, we consider that the resulting estimate of asset beta for Bristol Water is too low. This is because we consider that:

- the asset beta range for WaSCs is too low (see **Section 8.4.1.1**);
- that the uplift for Bristol Water is too low (see **Section 8.4.1.2**); and
- point estimate within the range is too low (see **Section 8.4.1.3**).

987. We consider that correcting for these issues would result in an asset beta that is no lower than the estimate of 0.37 made at CC10.

8.4.1.1 Asset Beta of WaSCs

988. The CMA has undertaken its own analysis of the asset beta of WaSCs using a range of sample frequencies and estimation periods. This analysis identifies a range of beta estimates from 0.184 to 0.438. The CMA has adopted a range of 0.26 to 0.31 as this is the range in which the majority of the beta estimates lie.[490]

989. We consider that the evidence of assets betas supports a higher range than the 0.26 to 0.31 range estimated by the CMA. This is because:

- the 5 year monthly data points have very low R-squared estimates and should be excluded from the analysis (see **Section 8.4.1.1.1**);
- there is clear evidence that beta has increased over the period, and therefore the five year estimates should be excluded from the analysis (see **Section 8.4.1.1.2**); and
- there are methodological issues in respect of the CMAs approach to averaging coefficients where the time series on which they are based overlaps (see **Section 8.4.1.1.3**).

990. Discarding the 5-year monthly estimates and the estimates averaged over the last five years to address these concerns results in a range of beta estimates of 0.26 to 0.44. Narrowing the range further to cover the central estimates (five out of nine) result in a range of 0.27 to 0.37. The central (and mean) estimate within this range is an asset beta of 0.32.

991. We consider that this range of 0.27 to 0.37 is a more robust estimate of asset beta for the period 2015 to 2020 than the range identified by the CMA.

8.4.1.1.1 Use of low confidence estimates

992. The choice of beta estimates comprising the CMA's range for WaSCs is not justified based on the relative robustness of different estimates. As a matter of principle, the CMA should exclude or place less weight on beta regressions with very low R-squared figures, since these coefficients are subject to a degree of error that is too high to form the basis of a robust beta estimate.

993. All of the monthly regressions other than for Severn Trent suffer from this issue: in particular, the R-squared values for Pennon and United Utilities are less than 0.1 for the 5-year monthly single-day regression for 1 June 2015. By contrast, the issue is less prevalent for weekly and daily estimates (for which none of the single-day R-squared values fall below 0.2). Therefore, the CMA should exclude the monthly regressions, but retain the weekly and daily regressions.

994. This would narrow the overall range of asset beta to 0.26 to 0.438. Using the central half of the estimates in line with the CMA's approach results in a range for asset beta for WaSCs of 0.27 to 0.34.

---

[490] PFs, para. 10.124.

995. This is discussed in more detail in the KPMG report which concludes that the evidence supports a significantly higher point estimate for the WaSC asset beta compared with CC10.[491]

8.4.1.1.2 Impact of increasing beta

996. There is strong evidence in the data presented by the CMA that asset beta has increased over the last five years. The table below sets out the average beta estimates of the 2-year daily, 2-year weekly, and 5-year weekly estimates.

Table 30 Increase in average beta estimates over time

	Single day	Last Year	Last 2 Years	Last 5 Years
Average beta estimate	0.363	0.311	0.292	0.286

Source: CMA Provisional Findings Table 10.5, Bristol Water analysis

997. The table shows that the closer the period of estimation to the current day, the higher the estimate for asset beta.

998. The recent increase in asset beta can also be seen in the CMA's analysis shown in Figure 4 of Appendix 10.1 of the PFs.

999. This increase in risk observed in the asset beta estimates is consistent with the findings of the Indepen survey of investors views in 2014 carried out on behalf of Water UK. This showed that investors perception was that political and regulatory risk had increased significantly compared to the previous year.[492]

1000. In the provisional findings the CMA states that its approach gives weight to *"current market conditions including projections of financing costs over the regulatory period."*[493]

1001. We consider that such an approach should give more weight to recent estimates of asset beta than older estimates. In a situation where asset beta is changing, giving equal weight to older estimates would likely result in the beta estimate being incorrect.

1002. In addition, we note that there is an inconsistency in using a short period to estimate the cost of new debt and a long period for equity. We consider a similar period should be used for both.

1003. Given this we consider that the 5-year estimates should be excluded from the analysis.

8.4.1.1.3 Methodological Issues

1004. Introducing a broader range of estimates does not always improve the accuracy or robustness of parameter estimates, particularly where the new estimates introduce noise and/or bias into the estimation.

1005. In particular, in the context of equity beta estimation, averaging of coefficients where the time series on which these coefficients are based overlap results in standard errors being

---

[491] KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 3.2, p.7

[492] Indepen, 2014 survey of investors in the water sector, June 2014 (RPF017).

[493] PFs, para. 10.8.

biased downwards.[494] It can potentially also introduce an autocorrelation term which may lead to biased beta coefficients. Therefore, estimates based on averaged betas from raw OLS regressions should be discarded.

1006. Excluding overlapping time series and monthly beta estimates leaves a range from 0.29 to 0.44.

8.4.1.2 Appropriate Uplift for Bristol Water

1007. In the provisional findings, the CMA adopted the position used in CC10 to uplift the WaSC asset beta to reflect the higher operational gearing of Bristol Water.[495] We support this approach as it gives weight to regulatory consistency.

1008. The CMA has calculated that the uplift for Bristol Water is 13% compared to 18% at CC10.[496] We have two observations in respect of the change in relative operational gearing:

- the specific uplift depends upon the PAYG assumed (see **Section 8.4.1.2.1**); and
- the actual measure of operational gearing has actually increased compared to CC10 (see **Section 8.4.1.2.2**).

8.4.1.2.1 Impact of PAYG

1009. The uplift of 13% is consistent with a PAYG for Bristol Water of 55%. In **Section 9** below we show that the PAYG in the provisional findings is too low. Increasing the PAYG to around 60% would result in the differential being calculated to be 18% in line with CC10.

1010. The introduction of PAYG has muddied the comparison between the operational gearing of WaSCs and WoCs as differences in the timing of cash returns are affecting the calculation of differential operational gearing. We consider that the best way to undertake the calculation would be to assess the operational gearing of companies as if their PAYG was set at the natural level. Alternatively, and more practically, the comparison could be done with the cashflows that would result for Bristol Water if its PAYG was set in line with the WaSC average of 61.6%.

1011. Undertaking the calculation in this way would result in the uplift increasing slightly above the level used at CC10. Given this, we consider that making use of the same uplift of 18% is appropriate.

1012. In practical terms, it is difficult to see what changes might have reduced the riskiness of WoCs in comparison to WaSCs since 2010. This observation also supports an approach of keeping the uplift at 18% in line with CC10.

8.4.1.2.2 Higher operational gearing

1013. The estimate of operational gearing used in the provisional findings is that 47% of the revenue for the next five years is not accounted for by opex and tax. This compares with an estimate of 50% at CC10.[497]

---

494 Harri and Brorsen (2009), 'The Overlapping Data Problem', Quantitative and Qualitative Analysis in Social Sciences, Volume 3, Issue 3, 78-115, (RPF018).

495 PFs, para. 10.128.

496 PFs, para. 10.128.

1014. This suggests that operational gearing has increased since 2010. This would be expected to lead to an increase in the asset beta rather than a decrease as in the provisional findings.

1015. This is discussed in the KPMG report, in which they conclude that the available evidence is indicative of an increase in Bristol Water's asset beta since CC10.[498]

8.4.1.3 Overall Estimate

1016. The range for the asset beta for Bristol Water has been set by the CMA at 0.29 to 0.35, [499] and uses a point estimate of 0.32. [500]

1017. We consider that this estimate of the asset beta is significantly below Bristol Water's actual asset beta equity. This is because:

- the range is based on estimates of the asset beta for WaSCs that are too low (see **Section 8.4.1.1** above) and an uplift for the asset beta of Bristol Water that is too low (see **Section 8.4.1.2** above). Adjusting for these factors would result in a higher range for the asset beta (see **Section 8.4.1.3.1**);
- the CMA has chosen a midpoint in its range without consideration of the appropriate part of the range to use taking into account customer welfare (see **Section 8.4.1.3.2**); and
- the estimate implies a reduction systematic risk for Bristol Water compared to 2010 and no justification for this reduction is provided (see **Section 8.4.1.3.2**).

8.4.1.3.1 Corrected cost of Equity Estimate

1018. In **Section 8.4.1.1** we show that a reasonable range for the asset beta of WaSCs for the period 2015 to 2020 is 0.27 to 0.37.

1019. In **Section 8.4.1.2** we show that an appropriate range for the uplift in asset beta for Bristol Water is 15% to 18%.

1020. In combination this results in an appropriate range for Bristol Water asset beta of 0.31 to 0.44. The mid-point of this adjusted range is 0.37, consistent with the CC10 estimate of asset beta for Bristol Water.

8.4.1.3.2 Use of mid-point in the range

1021. There are well-established arguments from the point of view of consumer welfare why regulators normally chose a value from within the top half of the range.

1022. The CC set out these arguments in previous decisions, for example in its decision on the CAA referrals of the price reviews for Heathrow and Gatwick in 2007.[501]

---

497 CC10 Final Determination (SOC011), footnote 1, p. 276

498 KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 3.2

499 PFs, para. 10.129.

500 PFs, para. 10.130.

501 A report on the economic regulation of the London airports companies (Heathrow Airport Ltd and Gatwick Airport Ltd), Competition Commission, September 2007, Appendix F (RPF016), para 150-154, and Annex 5 to the appendix.

1023. In addition, there are numerous precedents where the CC, CMA and regulators set the cost of equity and the WACC well above the mid-point of the range. The confidence intervals around individual parameters and separately around the WACC calculation itself can be large. These are discussed in more detail in the KPMG report.[502]

1024. If the asset beta (and therefore cost of capital) is set too low this leads to two principal risks: under investment, and increased risks of financial distress. Both of these can lead to adverse effects on consumer welfare, as under-investment risks degrading the service level of the company and sub-optimal choices about the balance between service levels and affordability. In addition, customers would bear costs in the event of actual financial distress.

1025. In comparison, the risks of setting the asset beta too high are much less, as investment will actually occur.

1026. Overall the risks from setting the asset beta are asymmetric; the welfare loss is much larger if the WACC is set too low compared to being set too high. The CMA recognised this in its determinations for Gatwick and Heathrow and chose point estimates approximately two standard deviations above the mid-point of the range.[503]

1027. We consider that the CMA should consider the impact on customer welfare in its consideration of the point within the range it identifies for asset beta. This would result in an estimate for asset beta nearer the top of the range than the centre.

8.4.1.3.3 Bristol Water's systematic risk

1028. The provisional findings point estimate of asset beta for Bristol Water of 0.32 is considerably lower than the CC's point estimate of 0.37 in 2010.

1029. Such a reduction is only credible if the CMA believes that there is strong evidence that the systematic risk of Bristol Water has reduced since 2010. The CMA has not provided any analysis to justify why such a reduction is reasonable.

1030. We consider that there is no evidence to support a view that the systematic risk of Bristol Water has reduced:

- the evidence from the asset beta of WaSCs is that systematic risk is likely to have increased rather than reduced over the last five years (see **Section 8.4.1.1.2** above);
- the views of investors are that regulatory and political risks have increased;[504] and
- the operational gearing of Bristol Water has increased since 2010 (see Section **8.4.1.2** above).

1031. In the absence of evidence setting out why Bristol Water's systematic risk has reduced, we do not consider that it is reasonable to select a point estimate for asset beta lower than the estimate of 0.37 at CC10.

1032. The KPMG report notes that the systematic risk profiles of regulated utilities' assets tends to be relatively stable. In this context, the proposed reduction of Bristol Water's asset beta is

---

502 KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 7.4

503 A report on the economic regulation of the London airports companies (Heathrow Airport Ltd and Gatwick Airport Ltd), Competition Commission, September 2007, Appendix F (RPF016), para 154.

504 Indepen, 2014 survey of investors in the water sector, June 2014 (RPF017).

large in comparison with regulatory precedent, which KPMG show has typically resulted in small reductions of asset beta.[505]

1033. As well as not being consistent with the regulatory precedent for water, the estimated asset beta of 0.32 is not consistent with the regulatory precedent for NIE. After adjusting for a debt beta of zero, the asset beta assumed for NIE was 0.37. Evidence from the Indepen investor survey conducted for Water UK shows that investors consider that water companies have higher risk than electricity distribution companies.[506] Given investors views on relative risk, we consider that the NIE determination of asset beta should be considered a relevant lower bound regulatory precedent.

1034. In summary, we consider that the available market evidence, evidence on operational gearing and relevant CC/CMA regulatory precedence does not support an estimate of asset beta for Bristol Water of below 0.37.

8.4.2 Market Parameters

1035. In the provisional findings the CMA assumed a risk free rate of 1.25% and a market risk premium of 5.25%. In combination this results in an overall market return of 6.5%.[507]

1036. These findings are equal to the estimates we included in our statement of case. Consequently we support the CMA estimates of these parameters.

8.4.3 Overall cost of equity

1037. The provisional findings estimate a cost of equity for Bristol Water of 5.7% based on an asset beta of 0.32, a risk free rate of 1.25%, and an equity market return of 6.5%.[508]

1038. We consider that this estimate of the cost of equity for Bristol water is below its actual cost of equity as a result of using an inappropriate estimate of asset beta.

1039. We show above that a more realistic range for the asset beta of Bristol Water is 0.31 to 0.44 (see Paragraph 1020). The centre of this range is 0.37, consistent with the estimate of asset beta for Bristol Water in CC10.

1040. This range of asset beta results in a range for the cost of equity of 5.6% to 7.4%.

8.5 Provisional findings on appointee cost of capital

1041. The CMA provisionally concludes that the appointee cost of capital for Bristol Water is 3.76% based on an estimate cost of equity of 5.7% and an estimated cost of debt of 2.59%.[509]

1042. We consider that this estimate is too low because it is based on:

- a cost of debt that is too low as shown in **Section 8.3** above; and

---

[505] KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Table 3

[506] Indepen, 2014 survey of investors in the water sector, June 2014 (RPF017).

[507] PFs, para. 10.151.

[508] PFs, para. 10.147.

[509] PFs, para. 10.6.

- an asset beta that is too low as shown in **Section 8.4.1** and which results in the cost of equity being underestimated.

1043. In addition to being below Bristol Water's actual cost of capital, this low estimate of WACC is [redacted]

1044. The CMA considers that the evidence on market asset ratios (**MARs**) supports its estimate for Bristol Water's WACC. [510] We consider that the CMA's conclusions in this area are not correct as a result of it not having adjusted for several relevant factors. This is discussed in detail in the KPMG report which concludes that the CMA's analysis has not taken account of a number of factors impacting the MAR. If these were taken into account, the implied cost of capital would be around 4.0% (excluding any opportunity to out-perform on the cost of financing).[511] This demonstrates that the CMS's point estimate is too low.

1045. The CMA's approach to estimating the cost of capital has used mid-point estimates in many case, and in other has used estimate towards the bottom of the range. In addition, many of the parameters have been the subject of downwards adjustments and/or are vulnerable to downwards bias. The overall impact of this approach is an estimate of WACC that is too low. This is discussed in more detail in the KPMG report.[512]

1046. The use of mid-range or lower estimates for the cost of capital is not consistent with regulatory precedent, which recognises that there is uncertainty in the estimation of WACC, and that there is significant asymmetry in the distribution of welfare losses. As a result it is normal practice for regulators to choose point estimates that are above the mid-point of the range for both cost of equity and WACC.

1047. The KPMG report sets out a range of regulatory precedents in this area together with a discussion of the reasons given.[513]

1048. Given the evidence we have presented in this Section, we consider that the CMA's provision estimate of WACC is too low, and that a more reasonable approach would result in a significantly higher estimate of WACC.

8.6 Wholesale adjustment

1049. The CMA's provisional findings were that the wholesale cost of capital should be reduced by 11 basis points from the appointee cost of capital.

1050. The CMA based this conclusion by adjusting Ofwat's approach to take account of the required return on retail assets. In addition, it concluded that the increase in risk arising from loss of indexation was small in the context of the changes being made to the overall risk/reward framework, and that Ofwat's treatment of tax was reasonable.

1051. We consider that the CMA has made a number of errors in its analysis:

---

[510] PFs, para. 10.165.

[511] KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 8

[512] KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 7.2

[513] KPMG, Response to CMA Provisional Findings on BW's Cost of Capital, July 2015 (RPF028), Section 7.4

- it has not properly adjusted the retail return which is nominal to a real return for wholesale. As a consequence it has over-estimated the adjustment (see **Section 8.6.1**);
- its treatment of tax appears to assume that the cost of capital used is a pre-tax estimate when in fact it is a post-tax estimate (see **Section 8.6.2**); and
- it does not appear to have assessed the additional marginal risk arising from loss of indexation in retail correctly (see **Section 8.6.3**).

1052. We show below that adjusting for each of these factors would result in the size of the wholesale-appointed adjustment being reduced.

1053. We understand the CMA's concern to avoid Bristol Water receiving a return on assets both in the wholesale business and the retail business. We show in **Section 8.6.4** that an adjustment of 0.03% can ensure that this possibility is removed.

8.6.1 Incorrect application of a nominal return to a real wholesale cost of capital

1054. The approach taken by the CMA subtracts a nominal retail return from a real appointee cost of capital. This is not correct, and an adjustment needs to be made to the retail return to covert it from nominal to real before the subtraction can be done.

1055. Based on the assumptions in the provisional findings the retail nominal return is 6.46% (calculated as (1+3.76%)*(1+2.6%)-1). Therefore the scaling required to convert from nominal to real is 0.58 (calculated as 3.76/6.46) which results in an adjustment downwards of 0.06%. Using the assumptions in the SoC results in a slightly smaller adjustment of 0.05%.[514]

1056. The impact of this correction is shown in Table 31 below.

Table 31 – Impact of correctly converting nominal retail return to real retail return

		Ofwat FD	CMA PFs	Bristol Water
Nominal pre-tax retail return	% RCV	0.156	0.156	0.156
Nominal post-tax retail return	% RCV	0.14	0.14	0.14
Correction from nominal to real	% RCV	N/A	N/A	0.05
Real post-tax retail return	% RCV	0.14	0.14	0.09
Adjustment for return on retail assets	% RCV	N/A	0.03	0.03
Required adjustment	% RCV	0.14	0.11	0.06

Source: Ofwat/CMA/Bristol Water analysis

1057. This analysis shows that correctly taking into account the difference between a nominal retail return and a real wholesale return based on the SoC assumptions would reduce the wholesale-appointed adjustment to 0.06%.

8.6.2 Treatment of Tax

1058. In paragraph 10.180, the CMA note that splits of tax between retail and wholesale will not impact the overall level of tax, and therefore that adjustments can be equivalently calculated pre or post tax.

[514] Calculated as retail return equal to 6.87% ((1+4.37%)*(1+2.46%)-1), and scaling proportion of 0.637 (4.37%/6.87%).

1059. We agree that the overall level of tax will payable will be the same irrespective of the split between retail and wholesale. Moreover, we agree that this would mean that no different treatment would be appropriate if a pre-tax cost of capital were being adjusted. However, we consider that this is not correct for a post-tax cost of capital.

1060. This is because the overall post-tax return consists of the post-tax return from wholesale plus the post-tax return from retail. The actual post-tax return for retail will be less than the post-tax return assumed using the overall appointee tax rate. Therefore, if the wholesale post tax return has been adjusted downwards to reflect this higher assumed post-tax return from retail, then the overall appointee total post-tax return will be too low. The overall return is in fact too low by the amount by which the post-tax return from retail has been overestimated.

1061. This demonstrates that it is the actual marginal tax-rate on retail that should be used for the calculation, not the overall appointed company tax-rate.

1062. Table 32 below sets out an additional row and column to Table 31 to show the impact of correctly incorporating tax.

Table 32 – Impact of correcting nominal to real and using retail specific tax

		Ofwat FD	CMA PFs	Bristol Water Nominal Real	Bristol Water Nominal Real and Tax
Nominal pre-tax retail return	% RCV	0.156	0.156	0.156	0.156
Assumed tax rate	%	10	10	10	20
Nominal post-tax retail return	% RCV	0.14	0.14	0.14	0.125
Correction from nominal to real	% RCV	N/A	N/A	0.05	0.045
Real post-tax retail return	% RCV	0.14	0.14	0.09	0.08
Adjustment for return on retail assets	% RCV	N/A	0.03	0.03	0.03
Required adjustment	% RCV	0.14	0.11	0.06	0.05

Source: Ofwat/CMA/Bristol Water analysis

1063. Table 32 shows that correctly adjusting for tax reduces the adjustment required by an additional 0.01% compared to the correction for nominal-real only, and results in an overall correction of 0.05%.

8.6.3 Analysis of risk

1064. In the PFs the CMA states that:

- the overall risk from inflation is small in the context of the changes made to the overall risk/reward framework; and
- Ofwat's use of a retail margin of only 1% for calculating its adjustment compared to the retail margin of 2.5% the CMA used would appear to offset any additional risks from loss of indexation.[515]

1065. We agree that the overall risk from inflation is small compared to the changes made to the overall risk/reward framework. However these overall changes should be reflected in the

[515] PFs, para. 10.167.

overall appointed cost of capital[516] and are not relevant to the issue of the correct wholesale-appointee adjustment. In the context of the retail control itself, the risk from loss of indexation reflects a considerable element of the risk of this part of the business. The estimated impact in the SoC of 0.07% of RCV is equivalent to a retail margin of c0.3%. In other words, this additional risk represents around a third of the retail margin. If this is not taken into account in the wholesale-appointed adjustment, then the wholesale return would be underestimated.

1066. The statement by the CMA in respect of the allowed 2.5% margin appears to show a misunderstanding of the approach to retail margins taken by Ofwat. In its retail determinations, Ofwat used a margin of 1% for households and 2.5% for the much smaller number of non-households. The higher allowance for non-household customers was included as a result of the greater risk faced by the non-household business arising from the introduction of competition. Therefore, if the additional (new) risk from the introduction of competition is ignored, the allowed retail margin is 1.0%. Ofwat used only 1.0% for its wholesale-appointed adjustment because it recognised that the additional allowed margin for non-household customers was to compensate for higher risk.[517]

1067. Given that the margin allowed above 1.0% was used to recompense companies for the additional risk arising from competition and market opening, the use of a 1.0% margin does not offset any additional risk from loss of indexation.

1068. Table 33 below sets out an additional row and column to Table 32 to show the impact of correctly incorporating the additional risk due to loss of indexation.

Table 33 – Impact of correcting nominal to real, retail specific tax, and loss of indexation

		Ofwat FD	CMA PFs	Bristol Water Nominal Real	Bristol Water Nominal Real and Tax	Nominal-real, tax and loss of indexation
Nominal pre-tax retail return	% RCV	0.156	0.156	0.156	0.156	0.156
Adjustment for indexation	% RCV	N/A	N/A	N/A	N/A	0.07
Nominal pre-tax return post indexation	%RCV	0.156	0.156	0.156	0.156	0.086
Assumed tax rate	%	10	10	10	20	20
Nominal post-tax retail return	% RCV	0.14	0.14	0.14	0.125	0.069
Correction from nominal to real	% RCV	N/A	N/A	0.05	0.045	0.025
Real post-tax retail return	% RCV	0.14	0.14	0.09	0.08	0.044
Adjustment for return on retail assets	% RCV	N/A	0.03	0.03	0.03	0.03
Required adjustment	% RCV	0.14	0.11	0.06	0.05	0.014

Source: Ofwat/CMA/Bristol Water analysis

1069. The table shows that correcting properly for nominal to real, actual retail tax, and taking into account the additional risk from indexation results in an adjustment of 0.01%, which can be considered trivial.

[516] We note earlier in this Section that there is a contrast between the CMA's view that in reducing the asset beta estimate for Bristol Water from 0.37 to 0.32, the systematic risk of Bristol Water has reduced significantly over the last five years, and wider views of investors that the changes in Ofwat's approach have increased risk.

[517] Ofwat Risk and Reward Guidance Jan 2014 (SOC079).

8.6.4 Potential retail returns in Wholesale

1070. As at April 2015, the wholesale RCV includes the residual amount of investment in retail assets (net of current cost depreciation) that were made prior to this date. In theory, obtaining a reward on these assets in addition to a retail margin might be equivalent to earning a double return on the assets.

1071. Ofwat's accounting separation rules effectively include two types of retail assets: pure retail assets (e.g. a billing system or meter reader van); and a share of general and support assets (e.g. such as a share of head office costs). In the retail price control, the retail business pays a charge for use of the general and support assets which are actually owned by the wholesale company.

1072. Table 34 below sets out the net value of these retail assets for Bristol Water, taking into account future depreciation on these assets. The table shows both types of retail assets separately and in combination.

Table 34 - Current cost valuation of pre-2015 retail assets in wholesale

	2015 £m	2016 £m	2017 £m	2018 £m	2019 £m	2020 £m	Average £m
Pre-2015 pure retail assets in Wholesale	1.2	0.6	0.4	0.2	0.1	0.0	0.4
Pre-2015 share of general and support assets	4.2	3.8	3.4	3.0	2.8	2.6	3.3
Total	5.4	4.4	3.7	3.2	2.9	2.7	3.7

Source: Bristol Water

1073. The table shows that over AMP6, the average (mid-year) value of the pure retail assets within wholesale is £0.4m. Based on an average RCV of c£440m, this represents less than 0.1% of the asset base. If a reduction to the wholesale WACC were to be made to reflect the risk that these assets may earn a double return, then the wholesale WACC would be reduced by 1/(1+0.1%), i.e. by less than 0.01%.

1074. Even if the total assets allocated to retail are considered, they amount to 0.75% of the wholesale asset base. Adjusting for these assets would result in an appointed-wholesale adjustment of 0.03% (based on a WACC of 4.3%).

1075. Any reduction in the wholesale WACC that is greater than this would result in there being insufficient returns for the remainder of the wholesale assets. This demonstrates that the maximum adjustment that should be made to remove double counting is 0.03%.

8.6.5 Summary of issues for appointee-wholesale adjustment

1076. The analysis above shows:

- correcting the CMA analysis for the difference between a nominal retail return and a real wholesale return reduces the calculated adjustment from 0.11% to 0.06%;
- further correcting to use marginal retail tax rates rather than appointed tax rate, and taking into account the additional risk from loss of indexation reduces the adjustment further to 0.01%; and
- an alternative calculation that estimates the maximum potential amount of double counting in wholesale identifies that this would require an adjustment of not more than 0.03%.

1077. We consider that there is no risk of a double return on retail assets occurring if a wholesale adjustment of 0.03% is made. Since an adjustment greater than this would result in wholesale assets receiving a return below the cost of capital, we consider that this is the maximum adjustment that could be applied.

1078. However, the additional risk in retail from indexation means that a lower adjustment can be justified. The calculations above show that a correct treatment of the adjustment results in an adjustment of only 0.01%.

8.7 Conclusions on provisional findings on wholesale cost of capital

1079. The provisional findings concluded that the wholesale cost of capital for Bristol Water was 3.65%.

1080. However, we consider that the approach taken by the CMA has led to an underestimate of the wholesale cost of capital for Bristol Water. We summarise our view below in respect of:

- the cost of debt;
- the cost of equity; and
- the wholesale-appointed adjustment.

1081. We consider that the cost of debt in the provisional findings has been underestimated due to:

- use of too high an inflation rate to convert from a nominal to real cost of debt which has affected estimates of the cost of embedded and new debt;
- underestimation of the actual cost of embedded debt due to inappropriate treatment of artesian debt and other adjustments;
- an estimate of the range of a notional cost of debt that is too low, and for which the lower end is not realistic;
- significant risk of underestimation of the cost of new index-linked debt due to the use of a short time frame for estimating the underlying gilt rate, and using a spread that is too low for Bristol Water in respect of index linked debt; and
- giving undue weight to the cost of new debt compared to old debt in the cost of debt calculation.

1082. We consider that asset beta for Bristol Water has been underestimated due to:

- an estimation of the range for WaSC asset betas that is too wide as a result of including low confidence estimates;
- errors in the calculation of the appropriate uplift required for Bristol Water; and
- use of the centre of the range, rather than considering the appropriate part of the range given the overall balance of risks for customers.

1083. This estimate of 0.32 for Bristol Water's asset beta is a considerable reduction compared to the estimate in CC10 of 0.37. Such a reduction would imply a very large reduction in systematic risk since 2010. There is no evidence of such a reduction in systematic risk for the listed WaSCs, the operational gearing of Bristol Water has not reduced, and the view of investors is that risk in the sector has increased. Consequently, the reduction is not justified by a wider consideration of evidence.

1084. We consider that the adjustment for appointed to wholesale has been overestimated due to the incorrect conversion of a nominal return for retail to a real return in wholesale. In addition we believe there are errors in the treatment of tax and changes in risk. We show an alternative calculation based on pre-2015 retail assets within wholesale that shows the maximum adjustment that could be made is 0.03%.

1085. We consider that the CMA should address the points we have raised in assessing the WACC for the Final Determination. We consider that this will result in a significantly higher estimate of WACC.

9 Total allowed revenue and financeability

9.1 Executive Summary

9.1.1 Introduction

1086. This section considers the CMA's approach to financeability, and assesses whether we are, in fact, financeable, under the CMA's provisional findings. It also addresses whether the total revenue allowance is sufficient.

1087. Having assessed the impact of its provisional findings on the financeability of Bristol Water, the CMA has "*provisionally found that Bristol Water is financeable under our determination*".[518] As such, the CMA considers that, for the purpose of the provisional findings, it has "*fulfilled [its] statutory duty to secure that Bristol Water is able to finance the proper carrying out of its functions*".[519]

1088. However, the CMA has acknowledged that this is its initial view[520] and that it would consider making adjustments to remedy a situation where Bristol Water is not financeable.[521]

1089. As is clear from the rest of our response to the provisional findings, we believe that adjustments are required to the totex and WACC allowed in the provisional findings. This consideration of the CMA's approach to financeability is predicated on the basis that the components of the CMA's provisional findings are taken as given. However, we believe that even with adjustments to totex and to cost of capital, we will still require a higher PAYG ratio [redacted]

9.1.2 Key themes

The CMA's duty to make sure Bristol Water is financeable has not been fully considered in the Provisional Findings

1090. In the PFs, the CMA acknowledges that the Finance Duty[522] requires it to regard whether Bristol Water specifically is financeable, but notes that a full review of credit ratios should take place once each of the revenue allowance components has been determined. The CMA concludes that, given these findings are provisional, it is proportionate to assess financeability of the PFs by reference to Ofwat's estimates of credit ratios at FD14 and the implied effects of the differences between the PFs and FD14.[523]

1091. The CMA has confirmed that its final assessment of financeability will be carried out once the relevant components have all been determined, such as totex, cost of capital and RCV adjustments.[524] The CMA also notes that there are a number of factors that will impact on

---

[518] PFs, para. 63.

[519] PFs, para. 11.36.

[520] PFs, para 11.10.

[521] PFs, para 11.13.

[522] S2(2A)(c) WIA '91.

[523] PFs, para. 11.42.

[524] PFs, para. 11.9.

the financeability assessment, including any notional vs. actual adjustments, the PAYG rate, the RCV run-off rate and depreciation on new RCV additions.[525]

1092. It is essential that the CMA's final assessment of financeability should, therefore, consider the full range of elements in line with its statement above. Further the CMA should, as it has suggested it will,[526] review the credit metrics resulting from the final determination to confirm that it is indeed financeable from the viewpoint of the relevant credit rating agencies for Bristol Water. This is fundamental, as maintaining an investment grade rating is a condition of our licence and a condition of our debt covenants.

1093. However, we are concerned that the CMA's proportionate limited approach at this stage has given it false comfort [redacted]

1094. [redacted]

The revenue in the provisional findings has been set too low compared to relevant benchmarks

1095. The CMA assumed an average household bill of £159 in the PFs. [redacted]

1096. We have compared revenues to other benchmarks, including past price review processes, PAYG allowances of other companies and average bill levels for peer companies. Each method confirms the conclusion of our credit rating metrics assessment:

- targeting a [redacted] credit rating on a notional basis suggests a bill of £171;
- applying an industry average PAYG rate to the PFs implies a bill of £172;
- using PR09/CC10 "fast money" methodology leads to a bill of £176; and
- a review of theoretical cash flows indicates a bill of £175

1097. For the scope of expenditure included in the PFs, the appropriate bill level is shown to be c.£173, which would represent a 12% reduction from Bristol Water's 2014/15 average household bill. Service delivery for current customers would be put at risk if bills are set too low and future customers will likely face higher bills. This appears to be the implication of the bill level in the PFs.

1098. Adjusting the PAYG rate to set bills at the correct level has no detriment to customers

1099. As KPMG notes in its supporting analysis, adjusting the PAYG rate is NPV neutral and therefore is an appropriate mechanism to address financeability.[529]

---

525 PFs, para. 11.18.

526 The CMA acknowledged that this is good regulatory practice in the PFs, para 11.16.

[redacted]

529 KPMG, Response to CMA Provisional Findings on Bristol Water's Financeability, July 2015 (RPF033) para 99.

1100. Adjusting the PAYG to the benchmark range (as shown in Figure 24 below)[530] would still lead to a significant bill reduction compared to Bristol Water's 2014/15 average bill (as shown in Figure 26 and Figure 27 below). In addition, the bill level would be far lower than our immediate neighbours and in line with industry PAYG averages. We received strong support from customers for the bills proposed in our Business Plan, which was significantly higher, albeit for a different scope of expenditure.

1101. We conclude that our customers would be comfortable with a bill level of c.£173 for the PF's scope of expenditure.

1102. Given the uncertainty attached to the CMA's approach to this assessment, [redacted] we would welcome further engagement, not least because the CMA has noted it has not fully developed its thinking in respect of credit metrics. We believe this would not put the CMA's timetable at risk.

9.1.3 Structure of the Response

1103. Our response to the CMA's provisional findings in relation to financeability is structured as follows:

- the Finance Duty (see **Section 9.2**);
- financeability under the provisional findings (see **Section 9.3**);
- what is an appropriate revenue profile? (see **Section 9.4**);
- overall comparison of different revenue profiles (see **Section 9.5**); and
- Impact on customer bills (see **Section 9.6**)

9.2 The Finance Duty

1104. Under the Finance Duty, the CMA has an obligation to secure that:

> *"relevant undertakers are able (in particular, by securing reasonable returns on their capital) to finance the proper carrying out of those functions."*[531]

1105. As this relates to the individual licensee, an assessment should therefore be made on the merits of that licensee's ability to finance its functions, as set out in our SoC.[532]

1106. The CMA acknowledged in the provisional findings that the Finance Duty requires it to regard whether Bristol Water specifically is financeable and that, if it found this was not the case, it would consider making adjustments to remedy this.[533]

1107. The profile of revenues and the distribution of those returns over time are key to the ability of Bristol Water to being able to finance its functions, not just the level of return. Financeability also means a company's ability to access financial markets to finance their

---

530 Assuming the Provisional Findings level of allowance.

531 PFs, para. 11.8 – reflecting the wording of s2(2A)(c) WIA '91.

532 SoC, para 2261.

533 PFs, para 11.13.

functions in a cost effective and sustainable way and to have sufficient liquidity in the meantime to be able to operate its functions.[534]

9.3 Financeability under the provisional findings

9.3.1 Approach requested by Bristol Water

9.3.1.1 Overall approach requested

1108. Financeability should be assessed on a notional gearing basis after reasonable levels for totex, WACC and other revenue building blocks have been determined. Financeability mechanisms, such as PAYG, then allow revenue to be profiled to meet customers' bill preferences and ensure target credit metrics can be met.

1109. In our SoC, we asked the CMA to take the following approach to profiling revenue when assessing financeability:

- in the first instance, determine the natural PAYG rate in line with the redetermination of totex, based on specific cost categories;
- then, adjust the natural PAYG rate to set bills in line with customer preferences and to resolve financeability issues; and
- perform its financeability tests at Bristol Water's target credit rating level of Baa1 (Moody's) [redacted], using the specific calculations of the respective credit rating agency for the actual company at notional gearing, whilst also considering financial resilience.[535]

9.3.1.2 How acceptable is it to adjust the PAYG rate?

1110. Adjusting the PAYG rate will have an impact on customer bills in AMP6. However analysis previously performed by KPMG indicates that moderate PAYG adjustments are NPV neutral to customers. Adjusting PAYG is, therefore, a suitable way of resolving financeability issues.[536]

1111. Ofwat adjusted the PAYG rate of Severn Trent Water, United Utilities and South East Water in order for them to meet target ratios ([redacted] in their June business plans on a notional gearing basis.[537]

1112. [redacted], if AMP6 revenues are too low then this could lead to undesirable inter-generational effects with future customers paying too much for past enhancements that they have not fully benefited from. It is therefore in the interests of customers that the level of revenue allowed in AMP6 is set appropriately.

1113. Consequently we consider it would be acceptable for the CMA to make moderate adjustments to the PAYG rate for Bristol Water [redacted] on a notional gearing basis in its final determination.

---

534 We have provided a more detailed discussion of the interpretation of the Finance Duty in the context of a financeability assessment in our Reply to Ofwat's Response, 13 April 2015, Section 10.1.

535 SoC, para 2439.

536 KPMG, Response to CMA Provisional Findings on Bristol Water's Financeability, July 2015 (RPF033) para 28.

537 Ofwat FD A8 – financeability and affordability (RPF032), p26.

9.3.2 Approach taken by the CMA

1114. In the PFs, the CMA notes that the determination of the financing components will necessarily precede a full review of credit ratios.[538] It also confirms that its final assessment of financeability will be carried out once the relevant components have all been determined, such as totex, cost of capital and RCV adjustments.[539]

1115. Whilst the CMA notes the impact of other factors on the financeability assessment,[540] including PAYG rates, RCV run off rates and depreciation of new RCV additions, in the provisional findings all of these additional elements were left unchanged from Ofwat's FD14.

1116. Instead of following the more detailed approach described in our SoC, the CMA has gained comfort over financeability by performing general checks as follows:

- assessing financeability of the PFs by reference to Ofwat's estimates of credit ratios at FD14, the removal of the totex menu choice penalty and the implied effects of the differences between the PFs and FD14;[541]
- assuming that if the estimate for operational costs (in the form of totex) and financing costs (in the form of WACC) are reasonable *"then Bristol Water should be able to finance its functions, since it will be able to raise finance at our assumed rates and also meet its investment obligations";*[542] and
- performing a comparative analysis of ratios for Bristol Water to those calculated by Ofwat in its FD14 financeability assessment.[543]

1117. These general checks are considered by KPMG in its report and are not deemed to be reliable tests for assessing financeability on their own. [544]

1118. [redacted]

9.3.3 Bristol Water's assessment of financeability on a notional gearing basis under the provisional findings

1119. We have used our financial model to perform our own assessment of financeability under the provisional findings. Starting with our model of FD14,[546] we updated the inputs with revised figures extracted from the provisional findings.

1120. Table 1 below shows the credit ratios calculated in our financial model under the provisional findings, performed on a notional gearing basis for Bristol Water.

---

538 PFs, para. 11.42.

539 PFs, para. 11.9.

540 PFs, para 11.18

541 PFs, para. 11.24.

542 PFs, para. 11.12.

543 Whilst noting our view that FD14 is not financeable, SoC, para 2248.

544 KPMG, Response to CMA Provisional Findings on Bristol Water's Financeability, July 2015 (RPF033), para 22.

[redacted]

546 Developed by KPMG for a number of Water Only Companies.

Table 35 Relevant Credit Rating Agency Metrics under the PFs

Credit metric	Target	FY16	FY17	FY18	FY19	FY20
AICR	>1.4x[547]	**1.03**	1.63	1.62	1.66	1.69
[redacted]	>[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Net Debt/RCV	<75%[549]	62.2%	63.4%	64.1%	64.7%	64.9%
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Source: Bristol Water

1121. [redacted]

1122. Whilst credit rating agencies take a number of different factors into account,[551] the metrics [redacted] already reflect the strong regulatory environment and an expected business risk profile.[552] [redacted]

1123. KPMG noted that target credit ratings are critical elements of a robust financeability test and that they "*summarise the impact of cashflows within the financial projections and the level below which financeability issues will arise*".[553]

1124. [redacted]

[redacted] financeability in the PFs

9.3.4.1 Bristol Water actual financial position (notional gearing)

1125. [redacted][4]

1126. [redacted]

---

547 AICR target is the minimum requirement set by Moody's to maintain Baa1. SoC, para 2285

[redacted]

549 This represents an internal target for Net Debt/RCV, given financial prudence and a notional gearing of 62.5%. The Moody's threshold gearing for Bristol Water is 85%. SoC, para 2285

[redacted]

551 PFs, para 11.17.

552 As previously noted in paragraph 1111, Ofwat has specifically accepted actual credit rating calculations in certain circumstances where financeability was at issue.

553 KPMG, Response to CMA Provisional Findings on Bristol Water's Financeability, July 2015 (RPF033), p.80.

[redacted]

1127.

1128.

T

1129. In the provisional findings and in the scenario presented above, gearing increases during the period. If the CMA believes a notional balance sheet is an appropriate approach, then it should target higher revenues such that gearing remains stable.

9.3.4.2 Notional company approach

1130. To provide appropriate headroom, in the past the CC had targeted a BBB+ rating on a purely notional basis.

1131. , we also requested that the CMA consider financial resilience as part of its review.[557] The totex and WACC allowances in the PFs are significantly below the level we believe is required to deliver the service our customers want. The totex allowance is also materially lower than current levels of expenditure, suggesting much higher business risk and lower financial flexibility than assumed in our Business Plan. Given the aggressive targeting of the PFs, we consider it is more appropriate for the CMA to revert to its typical target of a BBB+ rating.

1132. In this scenario the PAYG rate increased to 63.1%, and the results are shown in Table 3 below.

[557] SoC, para 2439

Table 37 Relevant Credit Rating Agency Metrics with PAYG flex to target BBB+

Scenario B	Target	FY16	FY17	FY18	FY19	FY20
AICR	>1.4x	**1.30**	1.54	1.59	1.68	1.79
FFO/ Net Debt	[redacted]	14.4%	13.0%	12.6%	12.4%	12.3%
Net Debt/RCV	<75%	61.6%	62.4%	62.8%	63.0%	62.8%
Net Debt/EBITDA	[redacted]	4.90	5.00	5.03	5.04	5.06

Source: Bristol Water

1133. The table shows that credit metrics in future periods are met [redacted]. Gearing levels remain more stable in the above scenario.

9.3.5 Conclusion

1134. In this section we have demonstrated that, whilst the CMA has stated it will not perform a complete assessment of financeability until all the components are determined, the approach taken for the provisional findings has not considered actual credit rating metrics which we believe are fundamental to any assessment of financeability.

1135. [redacted]

1136. [redacted].

1137. Following the approach we requested in our SoC, [redacted]. This should not be mis-interpreted as a suggestion that totex and WACC should remain unchanged. For reasons set out in other sections, we believe both should increase.

9.4 What is an appropriate revenue profile?

1138. [redacted]

1139. As the CMA has noted, "*if allowances are reasonable, then Bristol Water should be able to finance its functions, since it will be able to raise finance at our assumed rates and also meet its investment obligations*".[558] The PAYG, or level of "fast" money, is the key part of the allowance that sets a revenue profile and needs to be appropriately considered and set at a reasonable level.

1140. In this section we explore alternative methods (**Sections 9.4.1** and **9.4.2**) to benchmark an appropriate rate for AMP6.

[558] PFs, para 11.12.

9.4.1 Method 1: Cash flows

1141. The revenue allowance for AMP6 represents the cash in to cover our costs. Some costs are expected to be recovered over the life of an asset (such as investments in long-term assets) whilst other costs will be recovered as they are incurred (such as operating costs). The PAYG rate determines the split of AMP6 spend that is recovered in the period (fast money) and that is recovered over the long term (slow money).

1142. In the provisional findings the CMA assessed the PAYG rate to be 55.3%, unchanged on an average basis from FD14. The calculation for this was mainly based on the natural accounting rate resulting from the CMA allowances, averaged with the FD14 allowance for 2015/16.[559]

1143. However the credit metrics upon which our financeability is assessed are largely cash flow based. We suggested the CMA started with an accounting PAYG, but then adjusted to meet credit metrics, effectively addressing cash flow requirements.[560] Consideration of overall cash flow is more important than the accounting rate and so we consider two alternative methods for determining the scope of cash inflow required in AMP6, which are summarised in the table below and explained in more detail in the later sections.

Table 38 Summary of cash flow analysis scenarios

Method of recovering cost from customers	Method 1A Constant Base Totex RCV	Method 1B CC10 approach
Operating costs	Fast money	Fast money
Infrastructure maintenance expenditure (IRE)	Fast money	Fast money
Non-infrastructure maintenance expenditure (MNI)	Fast money	Slow money
Enhancement expenditure	Slow money	Slow money

Source: Bristol Water

1144. In both scenarios, we have calculated the level of cash inflow as the fast element of AMP6 totex (i.e. Totex x PAYG rate), RCV depreciation less other income.

9.4.1.1 Method 1A: Constant Base Totex RCV

1145. In the provisional findings, the CMA implies that it is appropriate for Base Totex RCV to remain roughly constant over the period.[561] Following the CMA's logic, theoretically cash inflow should:

- fully cover operating costs (fast money);
- fully cover maintenance costs (fast money);
- allow for the proportion of asset life in the period for new enhancements (slow money); and
- recover the proportion of asset life from prior period enhancements.

1146. Our analysis of cash flows for this approach is illustrated below:

[559] PFs, footnote 489.

[560] SoC, para 2439.

[561] PFs, para 11.22.

Figure 21 Method 1A: Constant Base Totex RCV

Source: Provisional Findings, Bristol Water analysis[562]

1147. Our SoC allowed £22m of revenue to cover the cost of prior enhancements. Ofwat did not raise an issue with the approach to PAYG in our business plan and credit metrics were met for Bristol Water's actual financial position. Therefore it is reasonable to assume that the resulting cash available for prior enhancements is appropriate.

1148. Ofwat's FD14 allows only £15m of revenue for prior enhancements, using this methodology, and failed key cash flow metrics.

1149. This analysis shows that the CMA provisional findings provide no allowance for the cost of prior enhancements, indicating an even worse cash flow position.

9.4.1.2 Method 1B: CC10 approach to setting revenues – Infrastructure maintenance fully covered by revenues

1150. Previous price determinations allowed revenues to recover the full infrastructure maintenance costs incurred in the period, and this approach was also adopted in CC10. Therefore in this scenario, we would expect revenues to:

- fully cover operating costs (fast money);
- fully cover infrastructure maintenance costs (fast money);
- allow for the proportion of asset life in the period for new enhancements and non-infrastructure maintenance (slow money); and
- recover the proportion of asset life from prior period enhancements *and* non-infrastructure maintenance.

[562] Cheddar Reservoir 2 has been excluded from this analysis as it would not be in use in AMP6.

1151. As this approach was used in previous determinations, opening RCV will reflect enhancement and non-infrastructure maintenance expenditure from previous periods that has not been recovered from customers. A comparison of the AMP6 revenue allocated to recover this past expenditure to the depreciation of opening RCV will indicate if revenues in the period are sufficient.

1152. We show in Figure 22 below the result of applying this approach for PR14.

Figure 22 CC10 approach to setting revenues

Source: Provisional Findings, Bristol Water analysis[563]

1153. The shortfall in the analysis above has been calculated by comparing the amount available for past investment to the allowance for RCV depreciation and run-off rate after deducting the AMP6 elements.[564]

1154. Using this methodology, the SoC revenue allowance shows a small shortfall to provide an appropriate amount for prior enhancements whilst supporting lower customer bills.

1155. Both the FD14 and CMA's PFs have significant shortfalls, with the amount in the PFs being £17m lower than that in FD14. This shows that the cash inflows are significantly lower than previous determinations and do not provide sufficient revenue to cover past investment.

---

563 Cheddar Reservoir Two has been excluded from this analysis as it would not be in use in AMP6.

564 E.g. for the provisional findings, the total allowance for RCV depreciation and run-off rate was £123m. From this we subtracted our estimate of RCV depreciation for AMP6 enhancements and MNI (£12m) and infrastructure maintenance (£6m) based on a 30 year average life.

1156. Our modelling suggests that a PAYG rate of 65.7% would resolve the cash shortfall to the same extent as that assumed in our SoC.[565] This is presented later as scenario C.

9.4.2 Method 2: Benchmarking an appropriate PAYG rate

1157. A number of other approaches to setting a PAYG rate for Bristol Water are considered in the following sub-sections.

9.4.2.1 Industry average rate (from Ofwat final determinations)

1158. The PAYG rate within a business plan will be an inherent part of the plan and, all other things being equal, will be reflective of the balances of expenditures (short term and long term) within that plan. The range of PAYG rates awarded in the Ofwat final determinations varied considerably across the industry, as shown in Figure 3 below.

Table 39 Comparison of industry water-only PAYG rates in FD14

Final Determinations Pay-as-you-Go rates –FD14						
Name	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**Average**
Affinity Water	69.1%	67.4%	74.7%	81.9%	87.7%	76.2%
Portsmouth	82.9%	72.2%	71.3%	74.4%	77.9%	75.7%
Sembcorp Bournemouth	70.1%	72.0%	74.2%	78.1%	80.8%	75.0%
Northumbrian	61.5%	67.6%	66.8%	74.1%	78.7%	69.8%
Dwr Cymru	68.7%	68.9%	69.3%	70.3%	71.0%	69.6%
South Staffordshire	73.9%	68.3%	67.8%	65.7%	65.2%	68.2%
United Utilities	67.2%	65.6%	65.0%	62.1%	70.3%	66.0%
Yorkshire	59.8%	60.2%	64.5%	65.7%	64.8%	63.0%
Severn Trent	67.4%	61.5%	59.1%	59.5%	64.0%	62.3%
Sutton and East Surrey	59.8%	58.4%	56.9%	62.0%	64.4%	60.3%
Anglian	57.5%	50.8%	58.6%	65.9%	68.2%	60.2%
South East	61.6%	58.2%	56.4%	59.7%	64.1%	60.0%
South West	62.4%	57.6%	54.3%	59.4%	62.2%	59.2%
Dee Valley	54.3%	45.5%	50.6%	71.1%	69.5%	58.2%
Thames	54.6%	55.0%	58.4%	59.9%	61.7%	57.9%
Wessex	46.3%	52.6%	55.4%	62.0%	68.8%	57.0%
Bristol (SoC)	**55.7%**	**55.7%**	**55.7%**	**55.7%**	**55.7%**	**55.7%**
Bristol (CMA PFs)						**55.3%**
Bristol (Ofwat FD)	**59.9%**	**54.0%**	**54.1%**	**54.1%**	**54.2%**	**55.3%**
Southern	53.2%	46.3%	47.4%	53.5%	55.5%	51.2%
Average (ex. Bristol)	**63.0%**	**60.5%**	**61.8%**	**66.2%**	**69.1%**	**64.1%**

Source: Ofwat Final Determinations, Bristol Water SoC

1159. The industry average PAYG rate set by Ofwat (calculated excluding Bristol Water) is 64.1%. Whilst the 55.3% rate used in the provisional findings is below this level, we do not think moving to the average rate would be unreasonable and so we include this in our later analysis as scenario D.

9.4.2.2 Industry average rate (applying CC10 methodology to Ofwat determinations)

1160. In previous determinations, including CC10, opex + full IRE (i.e. both the opex and capex elements as considered under IFRS) have been used as a basis for fast money when setting

[565] Leaving £95m available to fund past investments.

revenues. The PR14 period represents a transition to a lower accounting rate under IFRS, however if this approach is adopted for the final determination then the transition will impact fully in one period which we do not consider appropriate.

1161. The PAYG rates from the Ofwat final determinations (and the CMA's PFs for Bristol Water), had they been calculated under this approach, are presented in Table 40 below.

Table 40 Comparison of industry water-only PAYG rates estimated under PR09/CC10 methodology

Final Determinations Pay-as-you-Go rates – Full IRE						
Name	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**Average**
Portsmouth	79.2%	71.9%	73.0%	77.2%	80.8%	76.4%
Sembcorp Bournemouth	72.1%	73.7%	74.9%	76.2%	77.7%	74.9%
Yorkshire	64.1%	66.0%	69.0%	73.8%	79.7%	70.5%
Dwr Cymru	68.7%	68.3%	70.2%	70.4%	71.5%	69.8%
Northumbrian	71.1%	66.8%	64.3%	71.4%	75.5%	69.8%
Sutton and East Surrey	73.2%	68.5%	64.9%	67.8%	67.3%	68.3%
South Staffordshire	67.7%	67.6%	67.7%	67.9%	68.3%	67.9%
Bristol (CMA PFs)						**66.4%**
Affinity Water	57.5%	58.9%	65.8%	71.2%	75.0%	65.7%
Dee Valley	58.8%	49.9%	53.8%	79.7%	82.5%	64.9%
Bristol (Ofwat FD)	**66.5%**	**63.8%**	**59.9%**	**60.4%**	**63.8%**	**62.9%**
Anglian	59.6%	53.3%	61.6%	68.3%	70.5%	62.7%
Southern	60.6%	56.5%	56.7%	58.7%	70.7%	60.6%
South East	61.6%	58.2%	56.4%	59.7%	64.1%	60.0%
Wessex	51.6%	50.8%	56.3%	64.6%	71.8%	59.0%
South West	59.8%	56.7%	53.3%	60.3%	64.1%	58.8%
United Utilities	64.3%	63.1%	56.1%	52.6%	56.6%	58.6%
Thames	54.8%	55.2%	58.6%	60.1%	61.9%	58.1%
Bristol (SoC)	**60.3%**	**57.1%**	**55.9%**	**56.4%**	**54.1%**	**56.7%**
Severn Trent	60.7%	56.9%	54.2%	53.2%	58.1%	56.6%
Average (ex. Bristol)	**63.9%**	**61.3%**	**62.2%**	**66.7%**	**70.4%**	**64.9%**

Source: Ofwat FD financial models, Bristol Water analysis.

1162. The figure for Bristol Water of 66.4%[566] represents an 11.1% increase on the value used in the provisional findings. By comparison, the industry average difference to FD14 is much less pronounced with an increase of just 0.8%,[567] and the difference using the expenditure levels in our SoC is just 1%.[568]

1163. The SoC average above (56.7%) is significantly lower than the equivalent figure for the PFs (66.4%), despite both being calculated using the same methodology. This demonstrates why it is important to review the PAYG rate when adjusting totex allowances.

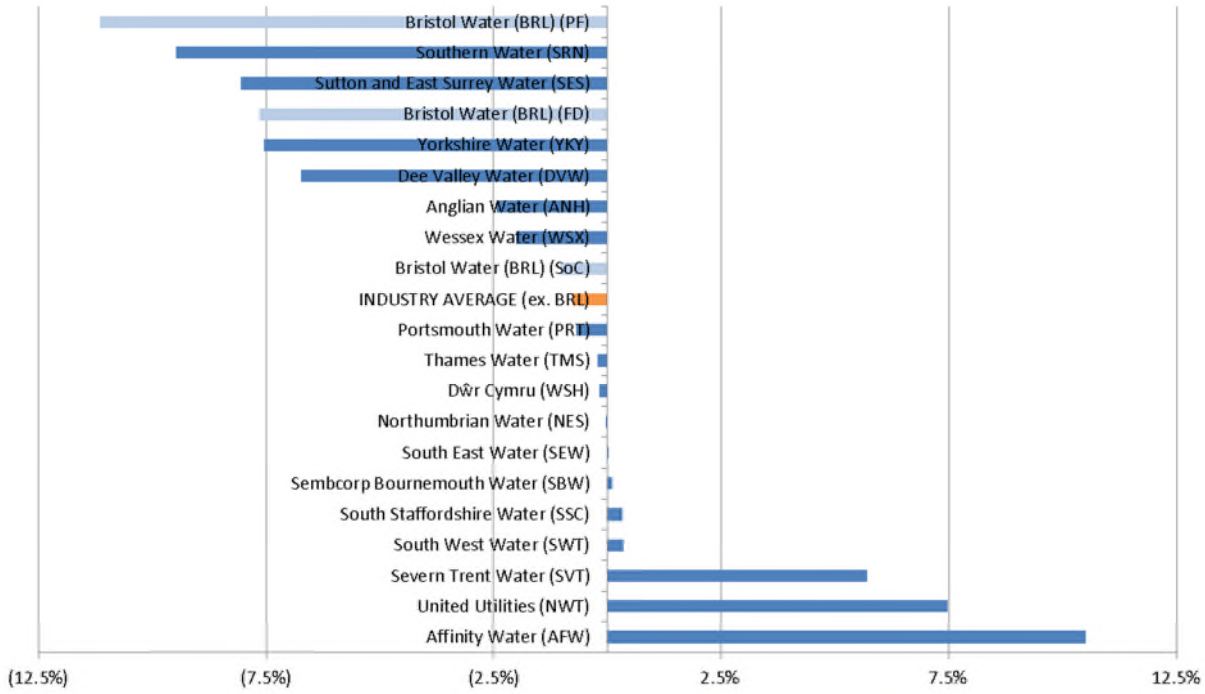
1164. The small change in the industry average rate reflects that for many companies the PAYG rate awarded by Ofwat is much more closely aligned (and sometimes even greater than) a 'natural' rate that allows IRE in full. This is demonstrated further in Figure 23 below.

[566] Calculated as £215m opex and £70m IRE out of a total of £429 totex allowed in the provisional findings.

[567] From 64.1% to 64.9%.

[568] From 55.7% to 56.7%.

Figure 23 Comparison of Ofwat FD PAYG rates and 'Natural' PAYG rates based on full IRE



Source: Ofwat FD financial models, Bristol Water analysis

1165. The chart illustrates that PFs leave Bristol Water with the largest gap to a full IRE 'Natural' rate.

1166. Of the companies with significant deficits, it should be noted that:[569]

- Southern Water and Sutton and East Surrey Water both raised financeability issues with Ofwat;
- Yorkshire Water and Dee Valley Water have significant year on year variations in PAYG rates. Therefore, the above analysis is unlikely to give a full view of the impact of the average gap on financeability;
- Ofwat raised concerns and requested Dee Valley to confirm it was financeable; and
- as WASCs are likely to review financeability for the entire company, there is potential for offsetting effects in the sewerage price controls.

1167. Given the uncertainty of the appropriateness of companies with large deficits, it is more appropriate to consider the 'full IRE' industry average of 64.9% and the Bristol Water figure of 66.4%, which are used in later analysis as scenarios E and F respectively.

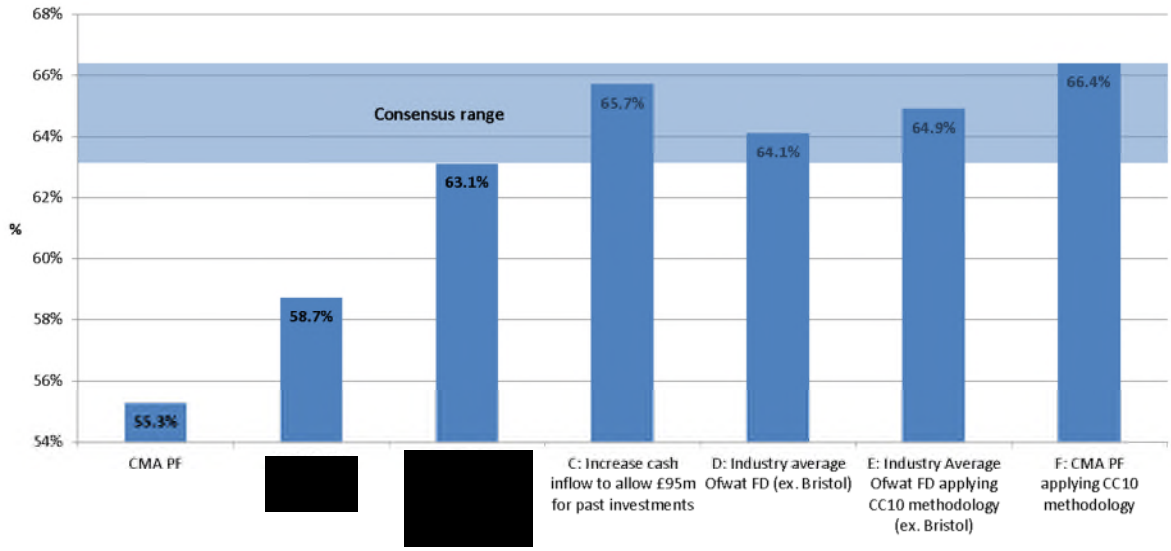
9.5 Overall comparison of different revenue profiles

1168. The scenarios identified in sections 9.3 and 9.4 provide a range of PAYG rates that could be used in the provisional findings (providing all other components remain the same).

1169. They are compared together in Figure 24 below:

[569] Information taken from Final Determination Appendices for each company.

Figure 24 Comparison of potential AMP6 PAYG rates



Source: Bristol Water analysis

1170. This indicates a range of potential PAYG rates for Bristol Water of 63.1% to 66.4%, assuming allowances are in line with the provisional findings. In their report, KPMG conclude that increasing PAYG to 63%-65% "*appears justifiable and well below the maximum PAYG rates used in the industry*".[570]

9.6 Impact on customer bills

1171. Any change to the PAYG rate will have an impact on bill levels so it is important to consider whether the new bill levels would be acceptable to customers.

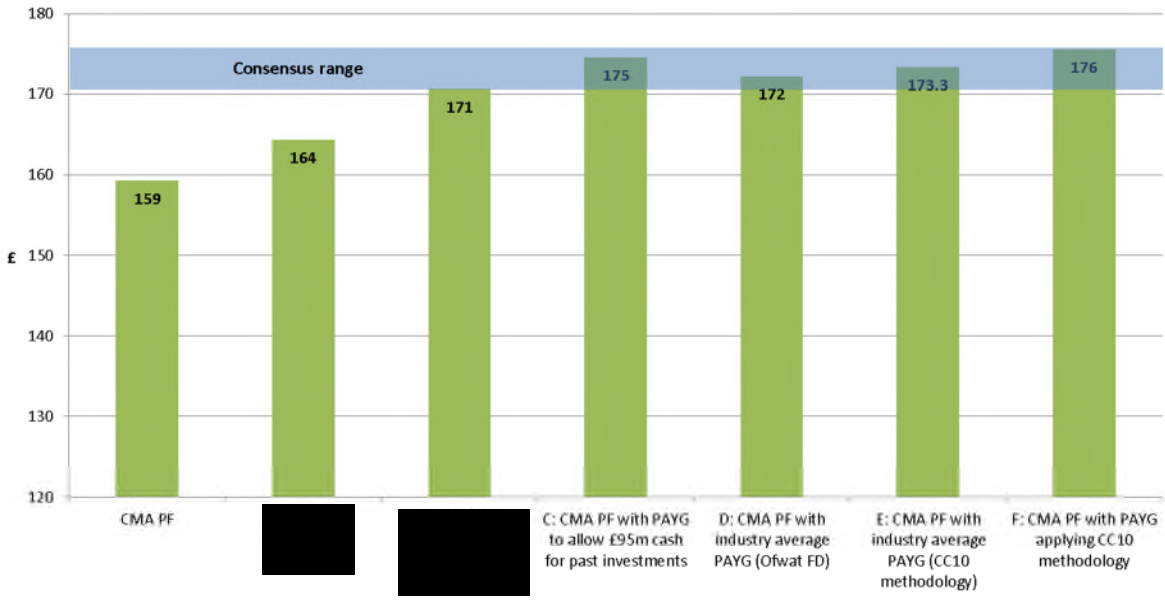
1172. As stated previously, moderate changes to the PAYG rate will not lead to undesirable inter-generational effects and would be NPV neutral to customers.

9.6.1 Potential bill levels for the provisional findings

1173. The figure below compares the bill levels resulting from the scenarios discussed previously.

570 KPMG, Response to CMA Provisional Findings on Bristol Water's Financeability, July 2015 (RPF033) para 44.

Figure 25 Comparison of potential AMP6 bill levels



Source: Bristol Water analysis

1174. The consensus range of bill levels (based on expenditure in the PFs) is in the region of £171 to £176 and therefore a bill of £173 would be appropriate. This is significantly higher than the bill proposed in the PFs and clearly indicates the bill level does not compare to:

- an appropriate cash flow, given the regulatory approach to recovery of costs;
- industry comparisons of PAYG ratios; and
- methodologies used in previous price reviews.

9.6.2 How acceptable would the potential bill levels be for our customers?

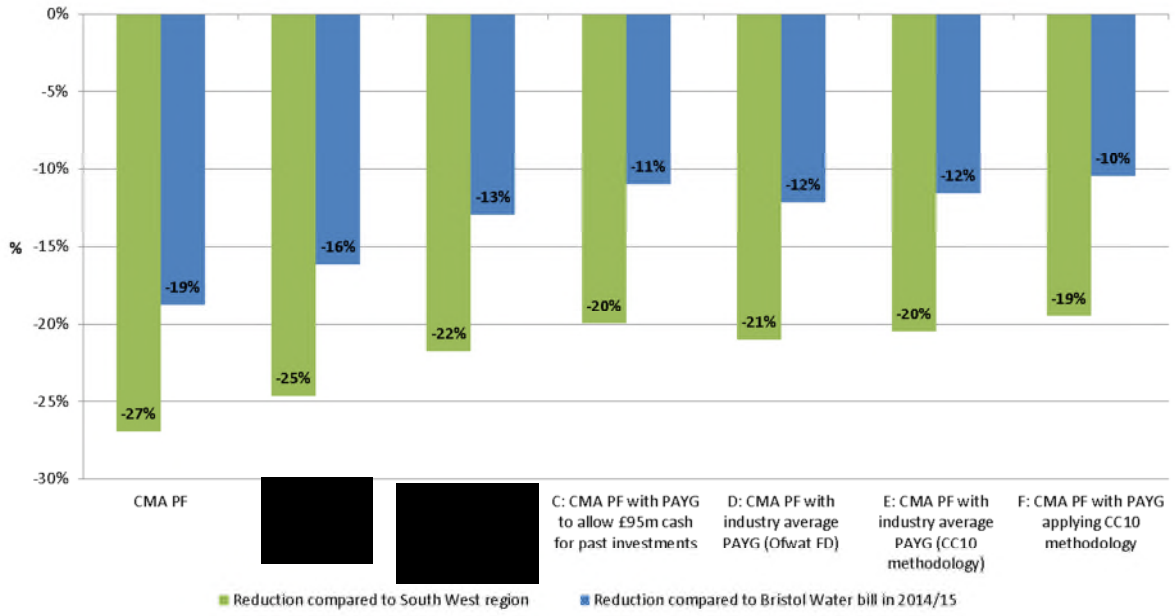
1175. Our SoC proposes average household bills for AMP6 of £187. This represents a slight reduction from the £188 bill level proposed in our final business plan, a level which was supported by the LEF and by customer acceptance testing. All of the potential bills in the consensus range are lower than this level and so would not increase affordability concerns, although customers will receive a different scope of improvement and risk profile in return.

1176. Figure 26 below shows the difference between the resulting bill level in each scenario and two relevant key points of reference: the actual Bristol Water bill for 2014/15[571] and the average AMP6 bill for the South West area.[572]

[571] In their report (RPF033) KPMG quote bill reductions from £191. For this analysis we are using £196. £191 is taken from the Ofwat FD, and is an estimated average bill for 14/15 (calculated before the year end) based on Ofwat's calculation. £196 is an actual average bill for 14/15 (calculated after the year end) based on our calculation. Ofwat acknowledged calculation differences exist in the FD (see note on page 8).

[572] Calculated as the average of Wessex Water (£223) and South West Water (£212) – the other companies serving the South West region

Figure 26 Comparison of scenarios to benchmark bill levels

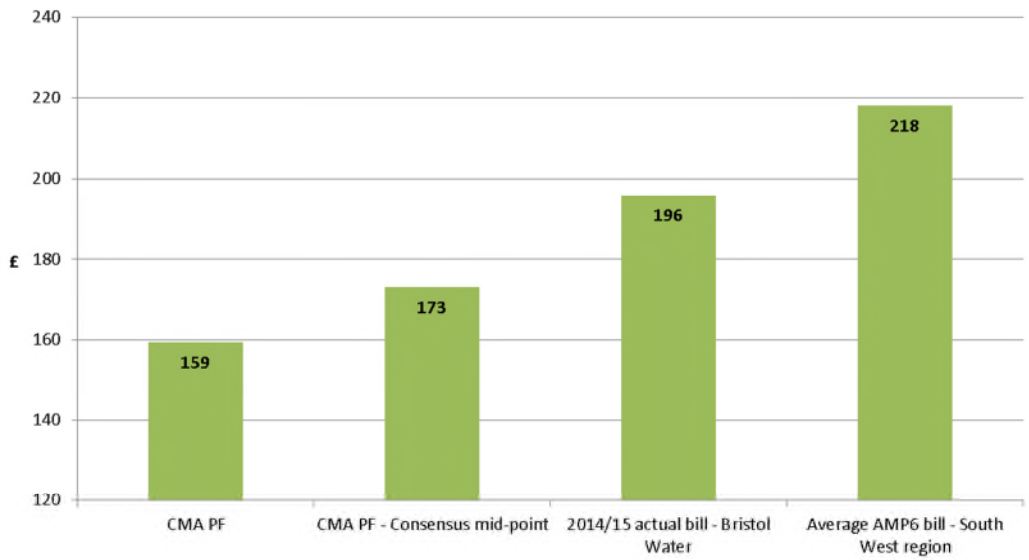


Source: Bristol Water analysis

1177. It is evident that the bill levels in the consensus range are significantly below the water-only average bill for the South West area and Bristol Water's 2014/15 bill.

1178. We therefore believe it is acceptable for the CMA to increase revenue to the level required to ensure financeability and that cash flows are appropriate. For the scope of expenditure included in the PFs, the appropriate level is shown to be c.£173.

Figure 27 CMA PF bill levels compared to relevant benchmarks



Source: CMA PFs, Bristol Water analysis

1179. Figure 9 further illustrates that the suggested bill of c.£173 is appropriate and significantly below South West peer companies.

9.7 Other financeability considerations

1180. A change in totex levels, or in the components of totex, can affect average asset lives and the level of operating costs. We have produced a capital programme to reflect the provisional findings which demonstrates this.

1181. The average asset life, and therefore the depreciation rate for new RCV additions is 30 years in our SoC. The average asset life of new additions implied from the provisional findings is 27 years.

1182. The reduced infrastructure renewals expenditure in the provisional findings has a higher percentage of opex at 28% compared to 25% in our SoC.

9.8 Conclusions

1183. The CMA has acknowledged that the Finance Duty requires it to assess whether Bristol Water specifically is financeable, but has assessed financeability by reference to Ofwat's estimates of credit ratios at FD14 and the implied effects of the differences between the PFs and FD14.[573]

1184. The CMA's final assessment of financeability should review the key metrics of the relevant credit rating agencies for Bristol Water to confirm that it is indeed financeable. We would welcome further engagement, not least because the CMA has noted it has not fully developed its thinking in respect of credit metrics.

1185. [redacted]

1186. Our benchmarking analysis of cash flows and PAYG rates confirms our conclusion that revenues have been set too low in the PFs. The PF's average bill does not compare to past determination approaches or to the rest of the industry, when adjusted for totex levels.

1187. We believe the CMA should assess cash flows and PAYG using the methods we have set out and adjust the PAYG rate to provide an appropriate cash inflow to the business. Adjusting the PAYG rate is NPV neutral [redacted] For the scope of expenditure included in the PFs, the appropriate bill level is shown to be c.£173, which would represent a 12% reduction from Bristol Water's 2014/15 average household bill.

[573] PFs, para. 11.42.

[redacted]

BRISTOL WATER

BRISTOL WATER'S RESPONSE TO PROVISIONAL FINDINGS 27 JULY 2015