NORTHUMBRIAN WATER living water

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Appendix 4.3

DATA TABLE SUBMISSION COMMENTARY

MARCH 2019

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

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INTRODUCTION

The Appendix contains commentary appropriate to the April 2019 data table resubmission and is in accordance with the data table guidance. The commentary is presented in the following sections:

- Appointee data tables
- Water tables
- Wastewater tables
- Dummy control tables
- Retail tables
- Models

We use the following short references throughout this document:

- Northumbrian Water: NW
- Essex & Suffolk Water: ESW
- Northumbrian Water Limited (NW and ESW): NWL

Amendments to 'early submission' data

Through the Ofwat queries process the need to resubmit certain pieces of 'early submission' data was identified. Amendments were made to App5, App9, R9, Residential retail PR14 reconciliation model, and the RCV adjustments feeder model.

Amendments to main submission data following the Initial Assessment of Plans (IAP)

Following the IAP on 31 January 2019, the required data tables and commentaries have been updated. Where changes were not required, data has been copied across from previous tables.

The table below shows which of our data table commentaries have been revised and when.

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APPOINTEE DATA TABLES

The following Appointee data tables are commented upon:

Data table	Contents	Additional commentary provided?	Revised?
App1	Performance commitments (PCs) and outcome delivery incentives (ODIs)	Yes	Following IAP
App2	Leakage additional information and old definition reporting	Yes	
App3	Abstraction Incentive Mechanism (AIM) - surface and ground water abstractions under the AIM threshold	Yes	Following IAP
App4	Customer metrics	Yes	Following IAP
App5	PR14 reconciliation ~ PCs	Originally submitted July 2018	September 2018 And following IAP
App6	PR14 reconciliation ~ sub-measures	N/A	
App7	Proposed price limits and average bills	Yes	Following IAP
App8	Appointee financing	Yes	Following IAP
App9	Adjustments to RCV from disposals of interest in land	Originally submitted July 2018	Following IAP
App10	Financial ratios	Yes	Following IAP
App11	Income statement based on the actual company structure	Yes	
App11a	Income statement based on a notional company structure	Yes	
App12	Balance sheet based on the actual company structure	Yes	Following IAP
App12a	Balance sheet based on a notional company structure	Yes	Following IAP
App13	Trade receivables	Yes	Following IAP
App14	Trade and other payables	Yes	Following IAP
App15	Cashflow based on the actual company structure	Yes	
App15a	Cashflow based on a notional company structure	Yes	
App16	Tangible fixed assets	Yes	Following IAP
App17	Appointee revenue summary	Yes	
App18	Share capital and dividends	Yes	Following IAP
App19	Debt and interest costs	Yes	
App20	Cost of debt / analysis of debt	Yes	
App21	Direct procurement for customers	Yes	
App22	Pensions	Yes	
App23	Inflation measures	Submitted July 2018	
App24	Input proportions	Yes	

App24a	Real price effects (RPEs) and efficiency gains	Yes	
App25	PR14 reconciliation adjustments summary	Submitted July 2018	Following IAP
App26	RORE scenarios	Yes	Following IAP
App27	PR14 reconciliation - financial ODIs summary	Submitted July 2018	Following IAP
App28	Developer services (wholesale)	Yes	Following IAP
App29	Wholesale tax	Yes	Following IAP
App30	Void properties	Yes	
App31	Past performance	Submitted July 2018	
App32	Weighted average cost of capital for the Appointee	Yes also Bio6, Wr5, Wn5 and WWn7	Following IAP
App33	Wholesale operating leases reclassified under IFRS16	Yes	

TABLE APP1 – PERFORMANCE COMMITMENTS (PCS) AND OUTCOME DELIVERY INCENTIVES (ODIS)

This table summarises all of our proposed PCs, their definitions, targets, incentive rates derived from customer research and potential range of rewards and penalties.

New and removed PCs

Since our initial submission in September 2018, we have made the following changes to our Performance Commitments:

- Awareness of additional support: This measure has been split into two, with the first measuring the awareness of non-financial additional support (BES02) and the second relating to financial support (BES02a). These measures are reputational.
- Satisfaction of customers who receive additional support: Again this measure has been split into two, with the first measuring non-financial support (BES01) and the second financial support (BES01a). These measures are reputational.
- Priority Services Register – Reach (COM16): This measure has been added in response to Ofwat's initial assessment of business plans. This measure is reputational.
- Priority Services Register – Review (COM17): This measure has been added in response to Ofwat's initial assessment of business plans. This measure is reputational.
- British Standards Institution Award for Inclusive Services (BES23): This measure has been added to complement the above priority services measures. This measure is reputational.
- NWL Independent value for money survey. This measure is a continuation of PR14 and we have returned this measure to App1 in light of Ofwat's IAP feedback (BES30).

General guidance on App1

We have provided a separate paper, entitled Bespoke Definition Re-submission (appendix 4.1), which details the definitions for each of our measures (column 6) in greater detail.

Within this note there is no reference to how we have calculated our PCs. This is detailed within a separate paper, entitled "PC Evaluation methodology." (Appendix 4.2).

For standard underperformance and outperformance incentive rates in columns 97 and 101 the values are £m 2017-18 CPIH deflated. Our proposed incentives are per unit (and maybe calculated

pro-rata where decimal places dictate) and we propose to set one standard incentive rate (not including enhanced); as such we have not completed standard underperformance and outperformance columns for payment 2 and 3. Where we propose enhanced penalties and rewards are set the values in columns 100 and 104 are again set to £m 2017-18 CPIH deflated.

Columns 132 and 138 contain the P10 and P90 incentives for all financially incentivised PCs, again in £m 2017-18 CPIH deflated. Further details are provided per measure below.

Guidance on the completion of customer priorities by measure within App1

Within this Appendix we make a brief note as to how our customers prioritise each measure – high, medium or low. We have a large bank of evidence with regard to our measures and we have a detailed compendium of customer research report summaries within Appendix 2.2.

Guidance on the setting of ODIs on PC measures

Within section 4 of our business plan we set out how we developed our ODIs, the criteria we utilised to determine where a PC was a non-financial incentive, outperformance and underperformance or underperformance only.

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Guidance on the calculation of incentive rates

Outperformance and underperformance incentive rates have, where possible, used the formulas outlined by Ofwat's methodology. There have been exceptions to this methodology in some circumstances. For example where costs of undertaking the activity has caused the penalty formula to create a positive value. In circumstances such as these we have used symmetrical rewards and penalties. The methodology to calculate incentives has been detailed by measure later in this document. The following table gives a summary of how we used the ODI formulas.

Measure	Common / Bespoke	ODI Approach
Water quality compliance	Common	Ofwat Technical Appendix Rate
Interruptions to supply greater than three hours	Common	Ofwat Technical Appendix Rate
Leakage - NW	Common	Ofwat Technical Appendix Rate
Leakage - ESW	Common	Ofwat Technical Appendix Rate
Per capita consumption (PCC)	Common	Ofwat Technical Appendix Rate
Internal sewer flooding	Common	Ofwat Technical Appendix Rate
Pollution incidents	Common	Ofwat Technical Appendix Rate
Mains bursts	Common	Ofwat Technical Appendix Rate
Sewer collapses	Common	Ofwat Technical Appendix Rate
Treatment works compliance	Common	Ofwat Technical Appendix Rate
Discoloured water contacts	Bespoke	Ofwat incentive formula for reward, symmetric penalty rate
Greenhouse gas emissions	Bespoke	Ofwat incentive formula for reward, symmetric penalty rate
Taste and smell contacts	Bespoke	Ofwat incentive formula for reward, symmetric penalty rate
Interruptions to supply greater than 12 hours	Bespoke	Ofwat incentive formula for reward, symmetric penalty rate
Sewer blockages	Bespoke	Ofwat incentive formula
External sewer flooding	Bespoke	Ofwat Technical Appendix Rate
Bathing water compliance	Bespoke	Ofwat incentive formula for reward, symmetric penalty rate
Abstraction incentive mechanism (AIM)	Bespoke	Cost-based (Ofwat's third AIM approach)
Sewer flooding risk reduction	Bespoke	Ofwat incentive formula for reward, symmetric penalty rate
Percentage of void household properties	Bespoke	Ofwat incentive formula
Repeat sewer flooding	Bespoke	Ofwat incentive formula for reward, symmetric penalty rate
Water environment improvements	Bespoke	Ofwat incentive formula
Visible leak repair time	Bespoke	Ofwat incentive formula
Interruptions to supply between one and three hours	Bespoke	Ofwat incentive formula for reward, symmetric penalty rate
Event Risk Index (ERI)	Bespoke	Cost-based penalty rate

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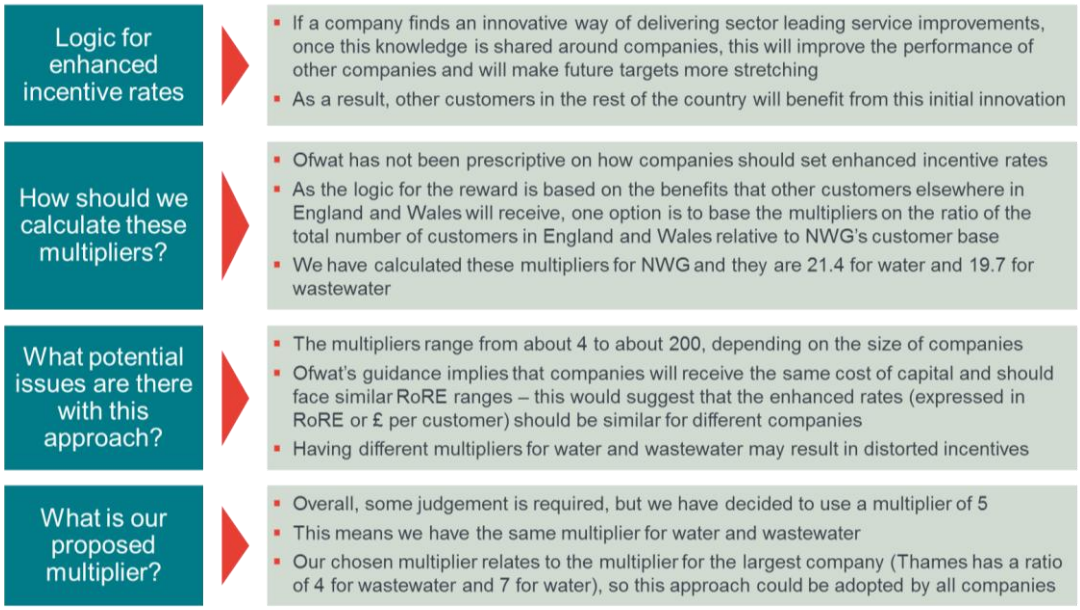
Guidance on the calculation of enhanced incentive rates

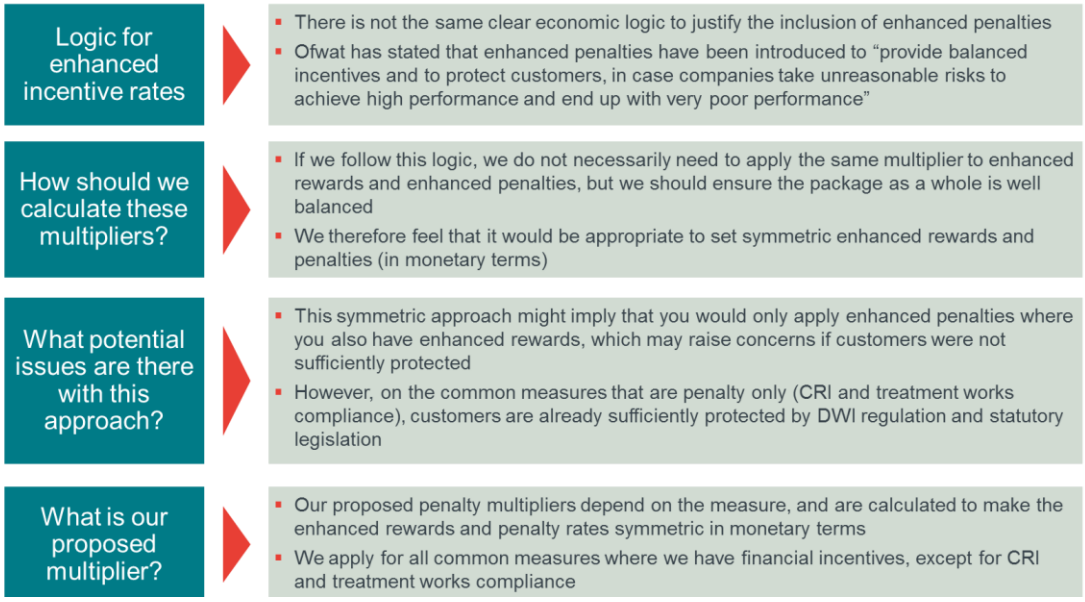
Action response NES.OC.A4 details Northumbrian Water's response regarding the level of enhanced incentives within our submitted App1 table.

Below is additional information which is commented on in NES.OC.A4.

We worked with Frontier Economics to create a multiplier for enhanced rewards based on the proportion of the total customers in England and Wales, relative to one company's customers. The methodology we used is outlined by the following charts produced by Frontier Economics.



To set our enhanced penalties we have based these on the logic of ensuring they are symmetrical with our reward rates.



Within the commentary below we use the reward multiplier of five for rewards where applicable and indicate the multiplier for penalties that make rewards and penalties symmetrical.

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Guidance on how PC ODI units are set

We have provided financial reward and penalty rates within App1 columns 97-104. These rates have been set by a specific number of units, such as leakage, the incentives rates attached to this measure are shown per Ml/d. However when calculating rewards and penalties we will pro-rata these units as indicated by the number of decimal places. For example incentives related to Leakage (NWL) will be set by one decimal place. Outperforming our PC by 0.1 Ml/d will achieve an outperformance payment of the Ml/d payment divided by 10.

Ref	PC name	PC Unit	Decimal Places	Notes re ODI calculations
COM01	Customer measure of experience (C-MeX)	score	1	n/a
COM02	Developer services measure of experience (D-MeX)	score	1	n/a
COM03	Water quality compliance (CRI)	nr	2	Financial penalty is quoted in App1 as per 1 point change. However to calculate rewards and penalties this will be pro-rata to 2 decimal places.
COM04	Interruptions to supply greater than three hours	time	hours: mins: secs	Financial incentives quoted per minute in App1. However to calculate rewards and penalties this will be pro-rata to per second.
COM05	Leakage (NW)	nr	1	Financial incentives quoted in App1 as per Mld. However to calculate rewards and penalties this will be pro-rata to 1 decimal place.
COM06	Leakage (ESW)	nr	1	Financial incentives quoted in App1 as per Mld. However to calculate rewards and penalties this will be pro-rata to 1 decimal place.
COM07	Per capita consumption (PCC)	%	1	Financial incentives quoted in App1 as per 1% change in PCC. However to calculate rewards and penalties this will be pro-rata to 1 decimal place.
COM08	Internal sewer flooding	nr	2	Financial incentives per property per 10,000 connections to the wastewater network – to 2 decimal places
COM09	Pollution incidents	nr	2	Financial incentives quoted in App1 as per pollution per 10,000kms of wastewater network. However to calculate rewards and penalties this will be pro-rata to 2 decimal places.
COM10	Risk of severe restrictions in a drought	%	2	n/a
COM11	Risk of sewer flooding in a storm	%	2	n/a
COM12	Mains bursts	nr	2	Financial incentives quoted in App1 as per mains burst per 1,000km of water network. However to calculate rewards and penalties this will be pro-rata to 2 decimal places.
COM13	Unplanned outage	%	2	Calculated to 2 decimal places.

COM14	Sewer collapses	nr	2	Financial incentives quoted in App1 as per sewer collapse per 1,000km of wastewater network. However to calculate rewards and penalties this will be pro-rata to 2 decimal places.
COM15	Treatment works compliance	%	1	Financial incentives quoted in App1 as per 1% change. However to calculate rewards and penalties this will be pro-rata to 1 decimal place.
BES01	Satisfaction of customers who receive additional non-financial support	nr	1	n/a
BES02	Awareness of additional non-financial support	%	1	n/a
BES03	Response time to written complaints	nr	2	n/a
BES04	Visible leak repair time	nr	1	Financial incentives quoted in App1 as per day. However to calculate rewards and penalties this will be pro-rata to 1 decimal place.
BES05	Customers' perception of trust	nr	1	n/a
BES06	Percentage of customers in water poverty	%	2	n/a
BES07	Gap sites	%	1	n/a
BES08	Voids	%	2	Financial incentive quoted in App1 per 1% change in the void rate. However to calculate rewards and penalties this will be pro-rata to 2 decimal places.
BES09	Interruptions to supply greater than 12 hours	nr	0	Financial incentives quoted in App1 as per property
BES10	Sewer flooding risk reduction	nr	0	Financial incentives are quoted in App1 per property and are whole numbers.
BES11	Discoloured water contacts	nr	2	Financial incentive quoted in App1 per contact per 10,000 people supplied. However to calculate rewards and penalties this will be pro-rata to 2 decimal places.
BES12	Taste and smell contacts	nr	2	Financial incentive quoted in App1 per contact per 10,000 people supplied. However to calculate rewards and penalties this will be pro-rata to 2 decimal places.
BES13	Event Risk Index	nr	2	Financial incentive quoted in App1 per ERI point. However to calculate rewards and penalties this will be pro-rata to 2 decimal places.
BES14	Interruptions to supply between one and three hours	time	hours: mins: secs	Financial incentives quoted per minute in App1. However to calculate rewards and penalties this will be pro-rata to per second.
BES15	Sewer blockages	nr	0	Financial incentives quoted in App1 as per blockage.

BES16	External sewer flooding	nr	0	Financial incentives quoted in App1 as per property
BES17	Repeat sewer flooding	nr	0	
BES18	Abstraction incentive mechanism (AIM)	nr	1	Financial incentives are calculated per Ml/d x the number of days active. To calculate rewards and penalties we will pro-rata based on 1 decimal place.
BES19	Bathing water compliance	%	2	Financial incentive quoted in App1 per 1% change in the bathing water quality. To calculate rewards and penalties we pro-rata this to 2 decimal places.
BES20	Water environment improvements	nr	1	Financial incentive quoted in App1 per Km. To calculate rewards and penalties will be pro-rata to 1 decimal place.
BES21	Greenhouse gas emissions	nr	0	Financial incentives quoted in App1 per Tonne of Greenhouse gas emissions.
BES22	Bioresources	%	1	n/a
BES01a	Satisfaction of customers who receive additional financial support	nr	1	n/a
BES02a	Awareness of additional financial support	%	1	n/a
COM16	Priority Services Register - Reach	Nr	1	n/a
COM17	Priority Services Register - Review	%	0	n/a
BES23	British Standards Institution Award for Inclusive Services	Achieve		n/a
BES24	Delivery of water resilience enhanced programme	nr	0	See individual business case for assessment of penalties associated with late / failure to fulfil.
BES25	Delivery of lead enhancement programme	nr	0	See individual business case for assessment of penalties associated with late / failure to fulfil.
BES26	Delivery of smart water metering enhancement programme	nr	0	See individual business case for assessment of penalties associated with late / failure to fulfil.
BES27	Delivery wastewater resilience enhancement programme	nr	0	See individual business case for assessment of penalties associated with late / failure to fulfil.
BES28	Delivery of cyber resilience enhancement programme	nr	0	See individual business case for assessment of penalties associated with late / failure to fulfil.
BES29	Delivery of Howdon STW enhancement	nr	0	See individual business case for assessment of penalties associated with late / failure to fulfil.
BES30	NWL Independent value for money survey	nr	0	n/a

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Guidance on the calculation of MBs and MCs

MBs

Section 2 in our business plan outlines the customer research and engagement we undertook to provide us with an understanding of how customers valued us being the best company in England and Wales for measures of service. We used triangulated values across our customer valuation research.

Further guidance is available in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1which relates to responses to Ofwat's IAP.

MCs

In all cases, we have carried out the following steps to calculate the MCs.

MCs are only used in the penalties, which means that the costs and the associated service levels should ideally reflect the scale of change between our current performance and the PC. This should then ensure (in theory) that the penalties reflect the costs that we would avoid if it did not meet its targets.

We have used cost estimates for various service levels to calculate our penalties. As part of this, we converted the capital costs (capex) into annualised costs, as ODIs are annual incentive rates. We then added those annualised capex figures to the opex figures to get total annual costs for service improvements.

To get the MCs (i.e. per unit cost data) from this annual cost data, we divided the total costs by a given scale of service improvement (i.e. the difference between a base level and an improved service level). In some cases, we used information on the service level improvements that are consistent with the costs that were provided. In most cases however, we do not have this information and have made assumptions around what the associated service level improvement should be. In these cases, we used the following approach:

In cases where the base levels (ie the starting point) for the costs were not available, we used current performance as the base level. We used different years of data to represent the current PCs, depending on data availability. We mostly use 2017/18 data, but in other cases we used performance from 2016/17, or forecasts of performance at the start of the AMP.

In cases where the improved service level was not available, we used the 2024/25 target.

In cases where we had incremental costs to reach step changes in service levels, we selected the costs and improved service levels that most closely align with the 2024/25 PC.

Further guidance is available in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1 which relates to responses to Ofwat's IAP.

Valuations by £ per unit per household, 2017-18 CPIH deflated

To complete the App1 table we reviewed the marginal valuation and marginal cost data to calculated these by £ per unit per household, 2017-18 CPIH deflated. We were able to undertake this task for the marginal valuations and set these to six decimal places. However we did not split the marginal costs between households and non-households, this is due to the way the costs are calculated for services. We are unable to exclude non-household customers from any changes we make therefore they remain as part of the total costs and therefore MCs. Valuations by £ per unit per household, 2017-18 CPIH deflated.

To complete the App1 table we reviewed the MB and MC data to calculated these by £ per unit per household, 2017-18 CPIH deflated. We were able to undertake this task for the marginal valuations

and set these to six decimal places. However we did not split the MCs between households and non-households, this is due to the way the costs are calculated for services. We are unable to exclude non-household customers from any changes we make therefore they remain as part of the total costs and therefore MCs.

Further detail on this methodology is supplied within Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1 – which covers the building of marginal valuations and costs in greater detail, providing data tables for measures through each step.

However, it must be noted that although marginal valuations were calculated based on our customer evidence, we were required to override these valuations with Ofwat acceptable ranges to ensure we had incentives rates that were within the defined ranges. In these cases the marginal valuations we defined were no longer used in the calculation of incentives rates,

Should you wish to view the detail of the calculation of the Marginal Valuations and Costs from the original September submission they are available within the original submission of appendix 4.2.

Methodologies used in the creation of App1 / 1a and 1b

We have applied a number of methodologies to update the data within App1. These include:

- Applying Ofwat's methodology of using property counts, network lengths etc. to calculate incentive rates. This causes a small change to our incentives rates using the new multipliers.
- Applied the rules within Ofwat's Technical Appendix 1: Delivering outcomes for customers. Guidance within this review includes moving incentives to within the Ofwat acceptable boundaries, considering caps and collars where total incentives account for over 10% in the relevant waste or water section of the business plan and implemented new PC targets and deadbands etc.

We have produced Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1 to detail our response to actions related to valuations, costs, performance commitment changes, caps and collars etc. Therefore this data table commentary does not cover the detail within the Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1.

New Data Tables:

Ofwat have included two additional data tables relating to App1 that require completion for the submission in April 2019. These tables are:

App1a, which details the calculation of incentives rates and the methodologies we have applied. Further detail below.

App1b, which requires relevant measures to be converted into units so that measures maybe compared across those in the industry creating particular bespoke measures. We have a completed the relevant measures to NWL and ESW where necessary in this table.

App1a:

App1a required us to submit all the details of the calculations we have used to obtain our incentives rates for each measure. We therefore only point to the theory we have used to calculate the incentive rates in this data commentary. We do provide extra triangulation and commentary related to the calculation of incentive rates by measure in response to Ofwat's IAP in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1. By each section:

Triangulated WTP / Marginal Benefits estimate: We have populated this column with the data from our Marginal valuations shown in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1. Where our incentive rates have been outside the Ofwat acceptable range, we have moved them to the

nearest point in their range. We have not subsequently back calculated these to obtain marginal valuations.

Marginal Costs: The detail of the calculation of marginal costs is within Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1. This includes data tables and calculations to show how they are derived and the 2017-18 CPIH calculations.

Number of households: We have indicated the number of households either for NWL or ESW across our water or wastewater measures. For example for CRI we have provided the number of water properties across NWL and ESW as a total.

Totex sharing rate: As per Ofwat guidance we have set this to 50%.

Type of ODI rate formula / Reason for using the alternative formula / alternative formula: Within our original submission we considered the Ofwat incentive formulas as the default position for calculating all under and outperformance payments. However within the re-submission we have not always been able to apply these formulas. Where we have taken a point in Ofwat's acceptable range for a measure, then the Ofwat formula no longer applies as the marginal valuations and costs are no longer relevant to the calculation. In other cases where some information was not available, for example the marginal valuation for CRI, we aimed to use a methodology in the nearest way we could to the Ofwat formulas. For example:

- The use of cost only ODIs – Underperformance penalty = Marginal Cost x P (50%)
- The use of symmetrical rewards and penalties. Where costs may outweigh the benefit achieved we applied symmetrical incentives.

Chosen underperformance penalty incentive rate: These are the incentive rates we have used within our calculations and are also reflected in APP1. These are not always the same as the rates calculated used the Ofwat's formulas shown in the blue column, column 22. We provide the reason why the incentive rated used may not show the same as column 22 in columns 23 and 24. The main reasons for applying a different rate to column 22 relate to our incentive rates being outside the Ofwat acceptable range and therefore in this instance we have reflected a rate that is acceptable to Ofwat. These changes are detail in appendix Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1. It is important to note that where we have used a rate within Ofwat's acceptable range we have not then worked backwards to calculate marginal valuations etc.

We apply the same methodology for columns 25 onwards where we discuss rewards in App1a as we did for penalties.

App1b:

App1b required companies to provide further data on measures where App1 commitments were not presented in the format of App1b guidance. After reviewing this guidance we were required to re-present two measures in this table.

Taste and Smell (BES12) – Within App1 we presented our Performance Commitment as per 10,000 population. App1b required this measure to be shown per 1,000 population. We have therefore divided our PCs, P10s, P90s and incentive rates in table App1 by 10 to reduce this to 1,000 population.

External Flooding (BES16) – Within App1 we presented our Performance Commitment as per incident. App1b required this measure to be shown in the format of per incident per 10,000 wastewater connections. We have converted this measure using the following:

(No of external flooding incidents / No of wastewater connections) x 10,000 connections

We have applied this each year of the five years required and used the number of connections for each year. This also applied for the P10 and P90 values. We have then adjusted our incentive rate to ensure this was presented in the same format as performance.

By PC

In this section we discuss how the data in App1/1a/1b was derived for each PC.

Water Quality Compliance (CRI) – COM03

This is a common PC derived by Ofwat as the DWI's compliance risk index. The measure uses data from water treatment works (WTW), networks and customer tap samples. An index is calculated by scoring and multiplying the type of sample failure, the company response and the location (the volume/output of the asset or supply zone population). For each failure at WTWs, the score is then divided by the total WTW supply volume, the same is performed for networks and supply zone failures. This creates an index value for each failure. The sum of all failures within a calendar year is the CRI. By working in this way the DWI can compare water quality risk between asset groups and water companies.

In our initial submission on the 3 May 2018 we indicated this PC was attached to the water network plus price control and as such we now indicate it is 100% allocated to this control.

The target is zero, as set out in the PR19 methodology, as these are statutory standards. This is equivalent to no failures of any standard within the entire water supply system. As there is no ability to outperform we have set the ODI to an underperformance penalty only. This PC will be reviewed each year and a penalty where required applied.

Customer priority: High. Our customers expect a safe, wholesome and reliable supply of water.

As indicated our PC target is zero. However data provided from the DWI has shown volatility in this measure, partly as it is new, and partly as a small number of failures can have a significant impact on performance. Only two years' worth of official DWI data is available and it has shown that company's performance can vary significantly between years. Due to this volatility we are proposing a penalty deadband (i.e. no penalty would be payable until performance deteriorated beyond this level). This is structured to drive performance to the current upper quartile (UQ) industry performance by 2024/25 (2.27).

Our incentive penalty rate was set through calculating the total costs of a package of activities to achieve our target. Due to limited data we used our current performance (based on the 2016 official DWI figure) as the base level and the 2024/25 target as the improved service level. We started with understanding our annualised totex from the opex and capex. We then divided this by the number of units we needed to improve to achieve our target.

$$\frac{\text{Total annual opex + annualised capex = annualised totex}}{\text{Number of units to improve}}$$

To ensure we set incentive rates in line with the methodology, 2017-18 CPIH deflated we adjusted the above incentive rate by multiplying up by the Retail Price Index (RPI) (3%) through and including 2019-20 and then dividing by CPIH (2%). This ensured our rates were in the required format.

To obtain our final penalty incentive rate we applied the Ofwat underperformance formula without the incremental benefit, therefore making this a cost based penalty.

ODI underperformance = incremental benefit – (incremental cost x p)

In relation to CRI there is no enhanced penalty so we are unable to provide data on the maximum standard and enhanced rewards / penalties.

We have calculated the P10 position which we have entered into App1. This is calculated through using the formula:

(P10 performance – deadband underperformance level) x penalty rate

As Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1 indicates, we propose to set a collar on penalties at the P10 performance.

Interruptions to supply greater than three hours – COM04

Interruptions of three hours or more is the common industry measure of how well water companies are doing at maintaining uninterrupted water supplies.

The PR19 methodology sets a firm expectation that companies will aim for a forecast of the industry UQ in each year of the 2020-25 period.

This measure is a water network plus price control – 100%.

Interruptions performance can fluctuate significantly from year to year and one single interruption event can add several minutes to performance. In 2017/18 some significant interruption events pushed our performance upward for the first time in several years. The biggest interruption event we have seen over the past ten years added more than six minutes to our overall performance. We therefore see our PC levels as very stretching, especially as there will no longer be a penalty dead-band for this measure. We also think there is a natural "floor" to the industry UQ for this measure – as ultimately the need to protect the health and safety of crews responding to and repairing bursts has to be balanced against the need to restore supplies for customers as quickly as possible.

Customer priority: High. Our customers have indicated that they would like us to go further at reducing interruptions. We also have feedback from a previous Water Forum meeting suggesting that we need to consider how to demonstrate continued leadership in this area. In response we are proposing a new interruptions measure looking at shorter, i.e. less than 3 hours, interruptions.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment. We have also set an enhanced reward and penalty rate against this measure with the reward commencing at the current leading company, whilst the enhanced penalty starts at the lower quartile (LQ) performance.
Setting our reward rate:

This PC was included in the core PR19 customer research. We calculated the customer valuation from the results of the ODI part of the core PR19 customer research. We used the following approach to get the unit valuation for this PC. We adopted the same / broadly the same approach for all PCs that were included in the core PR19 customer research.

The calculation of marginal valuations and costs are featured in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1. However these figures have been overridden by the use of the Ofwat Acceptable range in their Technical Appendix1.

We have applied enhanced incentive rates. To apply these we have multiplied the reward rate by the multiplier to obtain the enhanced reward rate. The enhanced reward and penalty have then been applied symmetrically. Our response to our proposed enhanced rate multiplier is contained within action .

Caps and collars

We provide our response to caps and collars within the required action and by measure within Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Leakage (NW and ESW) – COM05/06

We measure leakage in mega-litres (millions of litres) of treated water lost each day from our water network and also from customer supply pipes. The amount of treated water lost each day varies and during winter it tends to be higher because of higher burst rates. Each year we report the average amount of water lost per day and our measure at PR19 is leakage in mega-litres per day using a three year average.

Historic leakage targets have been set in reference to the sustainable economic level of leakage (SELL) – the level where the value of the lost water was balanced with the cost of improving further. This has served the industry well but has now led to a plateau in performance, with the current economics of leakage constraining future ambition – instead of future ambition driving improvements in the economics of leakage reduction.

The PR19 methodology requires that we justify our leakage proposals against both the industry UQ, and also a 15% reduction from current levels.

We measure leakage separately in our two operating areas, because there has always been a different economic case for leakage reduction in ESW due to the region being designated 'water stressed', which has been reflected in our SELL calculations.

We are committed to reducing leakage by 15% in NW by 2025. This will mean that by 2025 leakage in NW will reduce to 121.9 Ml/d three year average. In ESW we are committed to improving our performance by 17.5%. This will lead to a reduction to 53.8 Ml/d three year average in 2025.

Customer priority: High. The overall level of leakage comes as quite a shock to many of our customers and the majority respond by expressing a strong expectation of improvement.

Incentives:

The setting of incentives from marginal valuations and costs is outlined in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1 which is our response to the queries raised by Ofwat in their initial assessment of plans. Although we originally calculated our incentives based on our customer valuations, our incentive rates for leakage NW and ESW have been overridden with values from the acceptable range that Ofwat have calculated. This is detailed in the above appendix.

We have applied enhanced incentive rates. To apply these we have multiplied the reward rate by the multiplier to obtain the enhanced reward rate. The enhanced reward and penalty have then been applied symmetrically. Our response to our proposed enhanced rate multiplier is contained within action NES.OC.A4.

Per Capita Consumption – COM07

This measure related to water efficiency in terms of the amount of water used by our customers in their homes.

Customer priority: High. Our customers have told us that they would like us to do more to help them use water wisely.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

The setting of incentives from marginal valuations and costs is outlined in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1 which is our response to the queries raised by Ofwat in their initial assessment of plans. Although we originally calculated our incentives based on our customer valuations, our incentive rates for leakage NW and ESW have been overridden with values from the acceptable range that Ofwat have calculated. This is detailed in the above appendix.

Caps and Collars:

We continue the position of not adding any caps or collars to this measure.

Internal sewer flooding – COM08

This measure counts the number of incidents of properties suffering internal flooding. This includes flooding caused by assets which transferred into water company ownership in October 2011, and also includes severe weather events.

Customer priority: High. Our customer views in this area are straightforward: They tell us that internal sewer flooding is the worst service failure that they can experience.

This is another of the three measures where the PR19 methodology sets a firm expectation that companies will aim for a forecast of the industry UQ in each year of the 2020-2025 period.

We have an extremely challenging PC of 1.34 per 10,000 connections, with a rapid reduction before 2020 if we are to achieve our PC.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

The setting of incentives from marginal valuations and costs is outlined in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1 which is our response to the queries raised by Ofwat in their initial assessment of plans. Although we originally calculated our incentives based on our customer valuations, our incentive rates for leakage NW and ESW have been overridden with values from the acceptable range that Ofwat have calculated. This is detailed in the above appendix.

Caps and Collars:

Detailed in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1.

Pollution incidents – COM09

This measure is a count of Category 1 – 3 pollution incidents arising from our sewerage operations.

Customer priority: High. Customers have indicated that pollution is a high priority for improvement. Our customers tell us that they expect us to care for the environment.

The PR19 methodology sets a firm expectation that companies will aim for a forecast of the industry UQ in each year of the 2020-2025 period.

In their Water Industry Strategic Environmental Requirements (WISER) document, the Environment Agency (EA) have set out an expectation that companies will reduce their 2016 (2016/17 reporting year) pollution levels by 40% by 2024/25.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment. This is a measure for NW only.

Setting our reward rate:

The setting of incentives from marginal valuations and costs is outlined in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1 which is our response to the queries raised by Ofwat in their initial assessment of plans. Although we originally calculated our incentives based on our customer valuations, our incentive rates for pollutions have been overridden with values from the acceptable range that Ofwat have calculated. This is detailed in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1.

We have proposed enhanced incentive rates. To apply these we have multiplied the reward rate by the multiplier to obtain the enhanced reward rate. The enhanced reward and penalty have then been applied symmetrically. Our response to our proposed enhanced rate multiplier is contained within action.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x penalty rate

P90 = (PC target – P90 performance) x reward rate

Risk of severe restrictions in a drought – COM10

One of the two new resilience metrics and examines the percentage of the customer population at risk of experiencing severe restrictions for example, standpipes or rota cuts as part of Emergency Drought Orders in a 1-in-200 year drought.

An area of population is considered to be ‘at risk’ if the supply demand balance calculation in each water resource zone (as used for water resource planning) for a 1-in-200 year drought results in a shortfall.

Our supply demand balance, however, is in a surplus position. Our modelling conducted for our Water Resource Management Plan (WRMP) shows that no customers are at risk during a 1 in 200 year drought.

We are hence proposing a PC of 0% for this measure.

Our model does not currently include the Berwick resource zone. Investigations are being undertaken now, a model will be constructed and any risks identified will be added to this measure when modelling is completed. This is forecast to be by 2022. The Berwick resource zone is small and makes up 0.6% of our customer population.

Customer priority: Low. Our customers understand that we cannot remove all risks, and this is an area of low risk.

ODI is set to reputational. Our PC is set at perfect performance and as we cannot outperform there is no opportunity for rewards. Also, we are in a strong water resource position in both our operating areas, a financial penalty was not considered necessary to protect customers against drought resilience underperformance. As such have not completed the sections of App1 that relate to financial incentives. We also did not test customer valuations for this PC and again there are no marginal benefits or costs included within App1.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Risk of sewer flooding in a storm – COM11

The Water Act 2014 introduced a new primary duty on Ofwat to "secure the long-term resilience of sewerage systems as regards to environmental pressures, population growth and changes in consumers' behaviours". As such Ofwat has adopted the following definition of resilience; "Resilience is the ability to cope with, and recover from, disruption, and anticipated trends and variability in order to maintain services for people and protect the natural environment, now and in the future".

This is a new resilience metric and looks at the potential for sewers to flood due to extreme rainfall - it does not mean that sewers will flood or that properties will be impacted. Population is used as a measure of stress in the system, and does not necessarily mean that properties will be flooded should an extreme rainfall event occur.

Reducing the risk of sewage escaping from our network and causing flooding into homes and gardens is important to our customers, and there is general support for us to invest in decreasing this risk.

Customer priority: High. We recognise that sewer flooding is the worst service failure our customers can experience.

ODI is set to reputational.

Mains Bursts – COM12

The number of burst mains which occur on our water network each year is measured as an indicator of asset health. We measure the number of mains bursts which have occurred each year by taking the total number of mains repairs completed in that year – this includes "reactive" bursts which are visible and occur un-expectedly, along with "pro-active" bursts which are less visible and are identified as part of our leakage management programme.

Customer priority: High. Customers want to see an improving trend to bursts performance. Dissatisfaction is more often related to the time taken to repair bursts than the number of bursts which occur although all bursts can be seen as evidence of a lack of maintenance. Our customers support a reduction in leakage and interruptions, and both are linked to mains bursts. This is important to customers because repeat bursts and interruptions cause dissatisfaction and undermine confidence in us as our customers' water provider. Replacing failing mains earlier will also reduce disruption to traffic from carrying out works in the roadway and contribute towards building our local economies.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

Setting our reward rate:

The setting of incentives from marginal valuations and costs is outlined in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1which is our response to the queries raised by Ofwat in their initial assessment of plans. Although we originally calculated our incentives based on our customer valuations, our incentive rates for pollutions have been overridden with values from the acceptable range that Ofwat have calculated. This is detailed in Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1.

The above appendix also outlines the caps and collars we have applied for this measure.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x incentive rate

P90 = (PC target – P90 performance) x incentive rate

Unplanned Outage – COM13

Unplanned outage is a new Ofwat common measure to be introduced in 2020.

The measure is to be used as a means of assessing asset health (primarily for above ground assets), for water abstraction and water treatment activities. The expectation is that we will maintain enough water production capacity to meet the level of demand we would experience in a peak weak (ie a period of high demand). This measure reports the extent to which companies fall below this expectation due to any unplanned occurrences such as asset failures

This measure is proportionate to both the frequency of any asset failures as well as the criticality and the scale of the assets that are causing the outage.

This is a new measure based upon a recently defined methodology. The proposal is to build an appropriate data set in the 2018/19 and 2019/20 years to establish a base understanding of performance - 2019/20 performance will then be used as the base year and target for year one of the next period.

Customer priority: Medium. Our customers have told us that dealing with interruptions to supply is a top service priority.

This is a new measure and we anticipate that understanding of this measure will improve and reporting will become more robust over time. We also did not test customer valuations for this PC and again there are no MBs or MCs included within App1.

As per Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1 we have applied a penalty to protect customers against underperformance. As we did not test this with customers we have used the Ofwat acceptable rate indicated within their Technical Appendix 1.

Sewer Collapses – COM14

This measure counts the number of sewer collapse that have occurred in the year and is a measure of asset health. Customers have little direct interest in collapses, but the potential consequences in terms of pollution and sewer flooding are of high importance.

Customer priority: High. Our customers expect us to invest in sewer networks.

Incentives:

This measure has been set to a penalty only ODI. There are no deadbands applicable, therefore a penalty commence immediately either side of our commitment.

Setting our penalty:

As per Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1 the rate applied to sewer collapses was below that of the Ofwat acceptable range therefore we have moved our rate to the lower boundary of acceptable.

ODI (underperformance) = Ofwat Technical Appendix 1 Upper Quartile (Lower Bound) x Wastewater properties in NW (2022/23)

We do not propose enhanced penalties on this measure.

We have calculated the P10 position which is entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x penalty rate

Treatment Works Compliance – COM15

The EA sets permit standards for the quantity and quality of treated effluent which is discharged into rivers, estuaries and the sea. These standards are set individually for each of our WTWs and Sewage Treatment Works (STWs) taking into account the level of treatment required in order to protect receiving waters. Our ultimate objective is to achieve 100% compliance for all our licences and permits.

This is a common measure of asset health and indicates overall compliance with environmental permits, as reported in the EPA. It now includes performance of discharges from both STWs and WTWs.

We know from our engagement activities that rivers and coastal waters are important to our customers. We understand from our tracking surveys that our customers trust us to be responsible users of the environment, and to comply with all relevant regulations in this area.

We are proposing a PC level 100% compliance, with a penalty occurring for below 99% compliance.

This is stretching because we know that future permits will tighten as legislation changes (ie WINEP) and are also aware that the pressures of increasing population, new housing, industrial developments and climate change will challenge our performance. Our aim is to continue to lead in this area, despite the increasing numbers of more complex permits and tighter consents that we will need to adhere to from 2020.

Customer priority: High. Our customers tell us that they expect us to care for the environment.

Setting our incentive rates

As per Appendix NES.OC.A1-74 – Additional Evidence – Appendix 1 the rate applied to sewer collapses was well above that of the minimum value Ofwat deemed acceptable. Therefore to be in line with the rest of the industry we have moved the rate to this value.

We have proposed a deadband on underperformance against this measure, 99%, below which we will be penalised.

We have not proposed caps and collars within our plan and due to this we cannot provide data on a number of the fields related to standard and enhanced rewards and penalties. In relation to treatment works compliance there is no enhanced penalty so we are unable to provide data on the standard and enhanced penalties.

We have calculated the P10 position which we have entered into App1. This is calculated through using the formula:

P10 = (P10 performance - PC Deadband performance) x incentive rate

Priority Services Register – Reach (COM16)

As per Ofwat's methodology we have included this measure within App1. We have set this measure to reputational only, therefore no financial incentives apply.

Priority Services Register – Review (COM17)

As per Ofwat's methodology we have included this measure within App1. We have set this measure to reputational only, therefore no financial incentives apply.

BESPOKE PCs

Satisfaction of customers who receive additional financial (BES01a) and non-financial (BES01) support

This will be measured via a telephone survey where customers who are on our priority services register and/or signed up to our support plus tariff are asked to rate their overall satisfaction with the service we provide. Customers score their satisfaction with our performance between one and ten, the greater the score, the greater the level of satisfaction. 1,000 customers are surveyed throughout the year to provide an annual score/result.

Our aim is to achieve equal levels of customer satisfaction between customers who need extra help and those who do not as a minimum.

Our PC is to achieve 8.8 out of 10 for overall satisfaction levels for customers who receive additional support by 2023/24 and to maintain this level.

Customer priority: Our customers who need extra help, whether financial or otherwise, tell us they would like to enjoy the same services as everyone else - rather than being singled out or labelled as 'vulnerable', they want to feel included.

ODI is set to reputational. We do not propose a financial ODI on these measures as we felt it would be unethical to set incentives related to helping those who need additional help and support. As such have not completed the sections of App1 that relate to financial incentives. We also did not test customer valuations for this PC and again there are no MBs or MCs included within App1.

Awareness of additional financial (BES02a) and non-financial (BES02) support

These measures assesses customer awareness of the additional support the company offers (financial and non-financial).

Research demonstrates that awareness of the additional services we offer to vulnerable customers is low.

Any of our customers could potentially become vulnerable due to a change in circumstances. Our research shows that most of our customers are likely to experience a circumstance which would make them vulnerable at some point in their lives.

Customers tell us they want to be better informed about our priority services register and customers who have accessed Support PLUS have rated it very highly.

To ensure customers are receiving the right services and charges it is important that they are aware of the additional support services available to them.

This measure will be based on the results of our independent domestic tracking customer survey which as of March 2018 incorporates a question on awareness of the additional support that we offer. The research consists of 500 completed interviews carried out quarterly (2,000 annually) in line with

the Market Research Society code of conduct (internationally recognised as best practice). Customers score their awareness with a yes/no answer and this will be presented as a percentage.

Customer priority: High. Our customers who need extra help, whether financial or otherwise, tell us they would like to enjoy the same services as everyone else - rather than being singled out or labelled as 'vulnerable', they want to feel included.

ODI is set to reputational. We do not propose a financial ODI on these measures as we felt it would be unethical to set incentives related to helping those who need additional help and support. As such have not completed the sections of App1 that relate to financial incentives. We also did not test customer valuations for this PC and again there are no MBs or MCs included within App1.

Response time to written complaints – BES03

As part of our ambition to deliver an unrivalled customer experience, we are aiming to deliver a substantial reduction in written complaints. Complaints are a lagging indicator of service failure, it is important for us to drive improvements not only to improve customer satisfaction but also efficiency.

Our PC is to reduce written complaints is to position us within the UQ of the industry.

This stretching target will drive innovation in resolving the root causes of complaints.

Customer priority: Medium. Our customers' expectations are rising and more than ever before customers' judge the companies they use by their approach to service.

ODI is set to reputational. We do not propose a financial ODI on this measure as we agree with the PR19 methodology that incentives could discourage customer engagement and participation. As such have not completed the sections of App1 that relate to financial incentives. We also did not test customer valuations for this PC and again there are no MBs or MCs included within App1.

Visible leak repair time – BES04

This is a bespoke service measure which responds to customer and water forum feedback.

Leaks running over pavements or roads are perceived by customers to be a waste of a precious resource. They become quickly annoyed and frustrated with us for not acting more quickly to repair these and save the water.

This measure recognises the customer desire to work more quickly in this areas. The measure will be the average number of days within a year to find and fix all customer reported visible leaks.

The primary concern of customers is not wasting water, hence the clock will stop when the leak is fixed, as opposed to when the excavation is filled and the road surface reinstated.

Customer priority: High. Our customers suggested that we measure how quickly leaks were resolved.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

Setting our reward rate:

Responding to visible leaks incidents was included in the core PR19 customer research, so we used the same approach to calculate per unit valuations (per incident) as for supply interruptions. This

response to leaks was only tested with customers in our ESW operating area and as such we use the valuation from this area in our valuation calculations.

We took the average household and non-household valuations from the ODI part of the core PR19 customer research, and in particular from the unconstrained results, where the customers saw the unconstrained research first.

We applied these values across both NW and ESW.

We divided these average valuations by the service level change. This service level change was calculated as the difference between the base level and the "ODI level" that was used in the PR19 customer research. This gave us the average unit valuations (i.e. per unit valuations for households, and per unit valuations for non-households).

	Household valuation per unit (Marginal benefit)	Non-household valuation per unit
NW / ESW	=(Value in average bill / service level units)	=(Value in average bill / service level units)

We then calculated the total per unit valuations. For NW, we multiplied the per unit household valuation by the number of households in NW, and multiplied the per unit non-household valuation by the number of non-households in the NW. We applied the same methodology for ESW.

	Total MV
NWL	= (marginal benefit x number of properties) for each of NW and ESW household and non-household
Total NWL adjusted by CPIH	To have values in the format of 2017/18 CPIH deflated we adjusted by RPI over 2018/19 and 2019/20 and the reduced by CPIH.

We then used our MV (referred to as marginal benefit) within the Ofwat formula to calculate our ODI rate for outperformance. This formula is set as:

ODI (outperformance) = incremental benefit x (1 – p) where p = 0.5.

Setting our penalty rates:

We were able to cost a step change in performance to calculate our marginal costs.

	Annualised totex per unit of improvement
NWL	= (annualised totex / Service level units)
Total NWL adjusted by CPIH	To have values in the format of 2017/18 CPIH deflated we adjusted by RPI over 2018/19 and 2019/20 and the reduced by CPIH.

We then used our MC (referred to as incremental cost) along with our incremental benefit value within the Ofwat formula to calculate our ODI rate for underperformance. This formula is set as:

ODI (underperformance) = incremental benefit - (Incremental cost x p) where p = 0.5.

Caps and collars

We do not propose any caps and collars within our plan and as such the data relating to this in App1 is blank.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x penalty rate

P90 = (PC target – P90 performance) x reward rate

Customers' perception of trust – BES05

It is important for us that our customers have trust and confidence in us and the services we deliver. In our Outcomes review 'we are a company that customers can trust' was ranked as one of the highest priorities by customers. There is a consistent link between high general satisfaction and trust.

This measure is based on a telephone survey, part of which asks customers how much they would agree that NW/ESW is a company that they can trust. Customers score their satisfaction with our performance between one and ten, the greater the score, the greater the level of satisfaction.

Our PC is to achieve 8.8 out of 10 between 2020 and 2024/25.

Customer priority: High. Our customer tell us that being able to trust us is important to them.

ODI is set to reputational. We do not propose a financial ODI on this measure as we felt it would be unethical to set incentives related to the level of trust our customers have in us. As such have not completed the sections of App1 that relate to financial incentives. We also did not test customer valuations for this PC and again there are no MBs or MCs included within App1.

Percentage of customers in water poverty – BES06

Our ambition is to eradicate water poverty by 2030, to ensure bills are affordable for all of our customers. We estimate that in our NW and ESW areas around 400,000* households will benefit from this.

The definition of water poverty is 'households spending more than 3% of their disposable income on their water charges, after housing costs', using the qualifying threshold (sources: Ofwat Debt and Affordability 2014-15 / Call Credit analysis) for child tax credit as an income cap

There is strong evidence that a stable and affordable bill is highly important to customers.

This measure is to demonstrate where we will be on this journey by 2025. We recognise that this is a significant aspiration, and that there are many areas out of our direct control that will influence progress. We are taking an innovative approach to inclusivity, and continually looking at initiatives that will provide extra help and support to our customers.

Our proposed PC is to reduce water poverty from current levels of 18.38% of our customers to 6.32% by 2025.

Customer priority: High. Our customers support out ambition for zero water poverty.

ODI is set to reputational. We do not propose a financial ODI on this measure as we felt it would be unethical to set incentives related to helping those in water poverty. We felt it was inappropriate to gain a reward for eradicating water poverty as this would in turn lead to an increase in bills. As such

have not completed the sections of App1 that relate to financial incentives. We also did not test customer valuations for this PC and again there are no MBs or MCs included within App1.

Gap sites – BES07

By definition the number of gap sites is an unknown and unmeasurable number. Our proposed measure is hence an indirect one which seeks to decrease the risk of gap sites existing.

For gap sites we have chosen to focus on non-household properties, and will measure the extent to which we have matched our property database with that of the Valuation Office (which sets rateable values in order to set business rates).

There will always be a number of properties that are recorded on our database such as churches and farms which are not on the valuation office list, similarly there will be some on the valuation office list which all relate to one water service connection but are separately rated for example some holiday lets.

We believe that 76.5% of properties are currently matched, and that 95% is a reasonable proportion that will be fully match-able and therefore propose to set our PC at 84.4% in 2020/21 tightening to 95% in 2024/25.

This has not been tested with customers but is important from a financial / bill impact perspective.

ODI is set to reputational. The majority of our measures relate to Outcomes that will be delivered for customers. However this measure is an activity based rather than an Outcome. It is unclear how far this will benefit customers so we felt it inappropriate to attach a financial incentive to this measure. As such have not completed the sections of App1 that relate to financial incentives. We also did not test customer valuations for this PC and again there are no MBs or MCs included within App1.

Voids – BES08

For voids we have chosen to focus on our household properties, as we believe the onus for tackling this for non-household (i.e. business properties) lies with the corresponding retailers.

It is important for us to reduce the number of void properties as in so doing we can bill a higher number of properties and hence reduce average bills for all customers.

There is an underlying level of empty properties in our area, which based on Local Authority statistics is estimated to be 2.69% of properties. Our current void numbers are 4.85% and consist of the above genuinely empty properties but also a number which we predict are occupied but unbilled.

Our PC is to reduce our level of voids so that is as close as possible to the underlying level. We are proposing to set our PC at 4.21% by 2024/25.

Customer priority: Medium. This has not been tested with customers but is important from a financial / bill impact perspective.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

Setting our reward rate:

We calculated the extra revenue that we would receive if our household void rate fell by 0.54%. From this we calculated the amount of extra revenue that we would receive from a 1% change in the households voids rate. We used this as the total valuation for NWL, as this "saving" would be shared across all customers and can be used as a proxy for the customer valuation.

Extra bill value associated with a 1% improvement in the void rate

To ensure we set incentive rates in line with the methodology, 2017/18 CPIH deflated we adjusted the above incentive rate by multiplying up by RPI (3%) through and including 2019/20 and then dividing by CPIH (2%). This ensured our rates were in the required format.

Marginal valuation (£) after RPI / CPIH adjustment

We then used our MV (referred to as MB) within the Ofwat formula to calculate our ODI rate for outperformance. This formula is set as:

ODI (outperformance) = incremental benefit x (1 – p) where p = 0.5.

Setting our penalty rate:

We were able to calculate operating costs to achieve a 0.54% reduction in voids. This was converted to a unit cost to achieve a 1% reduction in voids.

Marginal costs (£) after RPI / CPIH adjustment

We then used our MB and MC values within the Ofwat penalty formula to derive our ODI rate for underperformance. The formula is set as:

ODI (underperformance) = MB – (MC x p) where p = 0.5

As per the PR19 methodology we do not propose enhanced rewards and penalties on this measure.

We have not proposed Caps and collars within our plan and due to this we cannot provide data on a number of the fields related to standard maximum rewards and penalties.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x penalty rate

P90 = (PC target – P90 performance) x reward rate

Interruptions to supply greater than 12 hours – BES09

This bespoke measure assessed the resilience of our water supply system covering resource management, the maintenance of our asset base and our ability to respond and recover from unforeseen events.

It measures the number of properties experiencing an interruption of more than 12 hours.

Performance has varied considerably, one significant interruption can have a substantial impact on performance.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

We intend to reduce our recent 3 year average performance over the course of 2020 to 2025, resulting in a final PC for the period of 400 properties.

This compares favourably to the UQ, which based on most recent available information is 555.

Customer priority: Medium. Our customers have told us that dealing with interruptions to supply is a top service priority.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

Setting our reward rate:

This PC was included in the bespoke ODI research, so we applied the same approach as we did for mains bursts. We took the average household and non-household valuations from the bespoke measure ODI customer research.

We divided these average valuations by the service level change. This service level change was calculated as the difference between the base level and our P90 level. This gave us the average unit valuations (i.e. per unit valuations for households).

NW Household valuation per unit (Marginal benefit)	ESW Household valuation per unit
=(Value in average bill / service level units)	=(Value in average bill / service level units)

We then calculated the total per unit valuations. For ESW, we multiplied the per unit household valuation by the number of households and then the same for NW. Then we summed up the ESW households and NW households to get the total per unit valuation for NWL.

	Total MV
NW	= (MB x number of properties) for each of NW household and non-household
ESW	= (MB x number of properties) for each of ESW household and non-household
Total NWL	=NW MB + ESW MB
Total NWL adjusted by CPIH	To have values in the format of 2017-18 CPIH deflated we adjusted by RPI over 2018-19 and 2019-20 and the reduced by CPIH.

We then used our MV (referred to as marginal benefit) within the Ofwat formula to calculate our ODI rate for outperformance. This formula is set as:

ODI (outperformance) = incremental benefit x (1 – p) where p = 0.5.

As per the PR19 methodology we do not propose enhanced rewards and penalties on this measure.

Setting our penalty rate:

As no data was available on costs for reducing interruptions to supply (ITS) 12 hours, we were not able to calculate a marginal cost. This meant that the penalty rate for ITS 12 hours was set symmetric to the reward rate.

ODI (underperformance) = ODI (outperformance)

As per the PR19 methodology we do not propose enhanced rewards and penalties on this measure.

We have not proposed caps and collars within our plan and due to this we cannot provide data on a number of the fields related to maximum standard rewards and penalties.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x penalty rate

P90 = (PC target – P90 performance) x reward rate

Sewer flooding risk reduction – BES10

This measure will provide future resilience for our customer, and reduce the risk of flooding before there is an impact on our customers or the environment. The approach will develop our integrated hydraulic modelling capability and will enhance our understanding of risk to the capacity of our network from all sources (surface water and fluvial for example).

The approach to proactive flood management will build on current and future flood risk initiatives and strategic partnerships (RainWise, Northumbria Integrated Drainage Partnership (NIDP)) and provide resilience to our customers, communities and businesses across the region, supporting economic development and environmental improvements.

This measure is designed to complement the common measure which relates to flooding risk, and incorporates a wider range of risk reduction activity, which will in turn driver a wider range of improvements.

Customer priority: Medium. We recognise that sewer flooding is the worst service failure our customers can experience.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

This PC is for NW only.

Setting our reward rate:

This PC was included in the bespoke ODI research, so we applied the same approach as we did for mains bursts. We took the average household and non-household valuations from the bespoke measure ODI customer research.

We divided these average valuations by the service level change. This service level change was calculated as the difference between the base level and our P90 level. This gave us the average unit valuations (i.e. per unit valuations for households).

	Household valuation per unit (Marginal benefit)	Non-household valuation per unit
NW	=(Value in average bill / service level units)	=(Value in average bill / service level units)

We then calculated the total per unit valuations. For NW, we multiplied the per unit household valuation by the number of households in NW.

	Total MV
NW	= (MB x number of properties) for each of NW household and non-household
Total NWL adjusted by CPIH	To have values in the format of 2017/18 CPIH deflated we adjusted by RPI over 2018/19 and 2019/20 and the reduced by CPIH.

We then used our MV (referred to as MB) within the Ofwat formula to calculate our ODI rate for outperformance. This formula is set as:

ODI (outperformance) = incremental benefit x (1 – p) where p = 0.5.

As per the PR19 methodology we do not propose enhanced rewards and penalties on this measure.

Setting our penalty rate:

Total costs to reach a specified service level were available. We used a current base performance level for the costs as zero. Using this approach resulted in a negative penalty as the cost figures appeared to be relatively high. As a result, the penalty rate was set to be symmetric to the reward rate.

ODI (underperformance) = ODI (outperformance)

We have not proposed caps and collars within our plan and due to this we cannot provide data on a number of the fields related to standard maximum rewards and penalties.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (P10 performance - PC target) x penalty rate
P90 = (P90 performance - PC target) x reward rate

Discoloured Water Contacts – BES11

One of our current measures for 2015 to 2020 is discoloured water contacts received from customers.

This continues to be an area of focus for us in order to improve the quality of water we deliver to customers. Inclusion of this measure for 2020 to 2025 also demonstrates to the Drinking Water Inspectorate (DWI) that we continue to be focused on this area.

Finally, with the headline drinking water quality measure changing to CRI, inclusion of this measure provides a degree of continuity, enabling customers and stakeholders to hold us to account for improving our water quality performance over the long term.

Customer Priority: High. Our customers judge water quality through the appearance, taste and smell of the product we deliver to their homes.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

Setting our reward rate:

Discoloured water contacts was included in the core PR19 customer research, so we used the same approach to calculate per unit valuations as for supply interruptions.

We took the average household and non-household valuations from the ODI part of the core PR19 customer research, and in particular from the unconstrained results, where the customers saw the unconstrained research first.

We divided these average valuations by the service level change. This service level change was calculated as the difference between the base level and the "ODI level" that was used in the PR19 customer research. This gave us the average unit valuations (ie per unit valuations for households, and per unit valuations for non-households).

	Household valuation per unit (Marginal benefit)	Non-household valuation per unit
NW	=(Value in average bill / service level units)	=(Value in average bill / service level units)
ESW	=(Value in average bill / service level units)	=(Value in average bill / service level units)

We then calculated the total per unit valuations. For ESW, we multiplied the per unit household valuation by the number of households in ESW, and multiplied the per unit non-household valuation by the number of non-households in the ESW. We did the same for NW. Then we summed up the ESW households, ESW non-households, NW households, and NW non-households to get the total per unit valuation for NWL.

	Total MV
NW	= (MB x number of properties) for each of NW household and non-household
ESW	= (MB x number of properties) for each of ESW household and non-household
Total NWL	=NW MV + ESW MV
NWL per contact per 10,000 people supplied	Total Marginal Valuation (contact per 10,000 people supplied) = Per discolouration contact x (number of people supplied / 10,000)
Total NWL adjusted by CPIH	To have values in the format of 2017/18 CPIH deflated we adjusted by RPI over 2018/19 and 2019/20 and the reduced by CPIH.

We then used our MV (referred to as marginal benefit) within the Ofwat formula to calculate our ODI rate for outperformance. This formula is set as:

ODI (outperformance) = Incremental benefit x (1 – p) where p = 0.5.

We do not propose enhanced rewards and penalties on this measure.

Setting our penalty rate:

Costs to reach a particular improved level from a 2017/18 performance was available. We used this as the base to calculate a marginal cost. Using this approach resulted in a disproportionately low penalty relative to the reward as the cost figures appeared to be relatively high. As a result, the penalty rate was set to be symmetric to the reward rate.

ODI (underperformance) = ODI (outperformance)

We have not proposed caps and collars within our plan and due to this we cannot provide data on a number of the fields related to standard and enhanced rewards and penalties. In relation to discoloured water there is no enhanced penalty so we are unable to provide data on the maximum standard and enhanced penalties.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x Penalty rate

P90 = (PC target – P90 performance) x Reward rate

Taste and smell contacts – BES12

This is another of our 2015 to 2020 measures which we are proposing to continue. It measures the number of contacts we have received from customers regarding unsatisfactory taste or smell of drinking water.

When surveyed around one in five customers had experienced an issue with either the taste or the smell of their drinking water. Customer Priority: High. Our customers judge water quality through the appearance, taste and smell of the product we deliver to their homes.

Including this measure demonstrates our commitment to continued improvement in this area.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

Setting our reward rate:

This PC was not included in the PR19 core customer research, but was included in the PR14 customer research. The customer valuation from PR14 appeared relatively high compared to other companies' valuations (i.e. as per the comparison in Accent's report). We therefore used the following approach to infer some customer valuations for taste and odour, based on our PR19 estimates for discoloured water.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

We collected the average valuations for ESW households, ESW non-households, NW households, and NW non-households for discoloured water from PR19.

We applied a ratio to each of these valuations to reflect the difference of importance between discoloured water and taste and odour, as viewed by customers. We used the ratio between the average valuations for discolouration and taste and odour from PR14 to do this. For example, the ratio between PR14 valuations for discolouration and taste and odour for households in the North was around 90%, so we applied this ratio to the PR19 average valuation (NW households) for discoloured water to imply a PR19 valuation for taste and odour for NW households. We did this for each of the four customer groups.

Ratio between discolouration and taste & smell valuations at PR14:

	NW - HH	NW – Non-HH	ESW - HH	ESW- Non-HH
PR14 £ valuation for base to +1 discolouration	£2.28	£11.43	£3.01	£6.02
PR14 £ valuation for base to +1 taste and odour	£2.13	£10.40	£1.83	£1.83
Ratio	0.93	0.91	0.61	0.30

Adjusting the discolouration PR19 valuation for taste and odour:

	NW - HH	NW – Non-HH	ESW - HH	ESW- Non-HH
Raw PR19 discolouration valuations	£3.81	£17.94	£3.21	£5.10
Adjusted PR19 discolouration valuations = taste & smell valuations	£3.56	£16.33	£1.95	£1.55

We then calculated per unit valuations for each of the four customer groups by assuming the change in service levels for taste and odour is the same as that which was shown in the PR19 research for discoloured water. We then summed these four values up to get a total per unit valuation for taste and odour for NWL.

	Household valuation per unit (Marginal benefit)	Non-household valuation per unit
NW	=(Value in average bill / service level units)	=(Value in average bill / service level units)
ESW	=(Value in average bill / service level units)	=(Value in average bill / service level units)

We then calculated the total per unit valuations. For ESW, we multiplied the per unit household valuation by the number of households in ESW, and multiplied the per unit non-household valuation by the number of non-households in the ESW. We did the same for NW. Then we summed up values to get the total per unit valuation for NWL.

	Total Marginal Valuation
NW	= (marginal benefit x number of properties) for each of NW household and non-household
ESW	= (marginal benefit x number of properties) for each of ESW household and non-household
Total NWL	=NW Marginal Valuation + ESW Marginal Valuation
NWL per contact per 10,000 people supplied	Total Marginal Valuation (contact per 10,000 people supplied) = Per discolouration contact x (number of people supplied / 10,000)
Total NWL adjusted by CPIH	To have values in the format of 2017/18 CPIH deflated we adjusted by RPI over 2018/19 and 2019/20 and the reduced by CPIH.

We then used our marginal valuation (referred to as marginal benefit) within the Ofwat formula to calculate our ODI rate for outperformance. This formula is set as:

ODI (outperformance) = Incremental benefit x (1 – p) where p = 0.5.

Setting our penalty rate:

Costs to reach the 2024/25 PC were available. We calculated marginal costs using our assumption that the 2024/25 PC was a 12% improvement from a base level in 2016/17. This approach resulted in a negative penalty, as the cost figures appeared to be relatively high. As a result, the penalty rate was set to be symmetric to the reward rate.

ODI (underperformance) = ODI (outperformance)

We have not proposed caps and collars within our plan and due to this we cannot provide data on a number of the fields related to standard and enhanced rewards and penalties. In relation to taste & smell there is no enhanced penalty so we are unable to provide data on the maximum standard and enhanced rewards / penalties.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x Penalty rate

P90 = (PC target – P90 performance) x Reward rate

Event Risk Index – BES13

The DWI event risk index (ERI) is a new index and there is limited comparative data published at the time of evaluating PC levels.

The 2017 ERI data published by DWI in July 2018 indicates an UQ value of 10.8. Our PC is to improve from current performance to UQ by 2024/25.

Incentives:

This measure is penalty only and we did not test this with customers to achieve a marginal valuation.

Setting our penalty:

To obtain a marginal cost per ERI point we valued all our costs related to ERI between 2015 and 2017. We then totalled the costs across all three years and divided the value by the total number of ERI score points during the same period. This provided an average cost per ERI point over the three years.

To ensure we set incentive rates in line with the methodology, 2017-18 CPIH deflated we adjusted the marginal cost.

As we did not have a marginal benefit rate we were unable to use the full Ofwat penalty formula. As such we utilised a cost based penalty.

NWL ODI (underperformance) = (MC x p)

We have calculated the P10 position which we have entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x Incentive rate

Interruptions to supply between one and three hours – BES14

Our customers have indicated that they would like us to go further at reducing interruptions. We also have feedback from a previous Water Forum meeting suggesting that we need to consider how to demonstrate continued leadership in this area.

In response we are proposing a new interruptions measure focussed on shorter interruptions between one and three hours.

We are doing this because we recognise that all interruptions cause inconvenience to customers and one or two hours is a long time to go without water for some. A series of repeated short interruptions can also cause much greater dissatisfaction than a single long interruption but at present this would have no impact on performance against the current measure of interruptions.

In all other aspects, apart from the duration, this measure will be reported as per the common measure. We have deliberately aligned it in this manner in order that it can more easily be adopted by the whole industry in future using a well-established reporting methodology.

As this is a new measure we currently have an incomplete data set for shorter interruptions lasting 60 minutes or more and are therefore committing to a percentage reduction in performance by 2024/25. We will collect data from April 2018 to March 2021 and take a three year average of performance as our starting point to then improve performance by 10% by 2024/25.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

Setting our reward rate:

We scaled our valuation of interruptions over three hours to achieve a marginal valuation for interruptions one to three hours. With assistance from Frontier Economics we used a scale factor of 75%, therefore the value of an interruption between one to three hours was 75% of the value over three hours.

Total MV	
Interruptions to supply over three hours	
NW	= (marginal benefit x number of properties) for each of NW household and non-household
ESW	= (marginal benefit x number of properties) for each of ESW household and non-household
Total NWL	=NW Marginal Valuation + ESW Marginal Valuation
Total NWL adjusted by CPIH	To have values in the format of 2017-18 CPIH deflated we adjusted by RPI over 2018-19 and 2019-20 and the reduced by CPIH.
Interruptions to supply between one and three hours	
Total NWL adjusted by CPIH	Adjusting for Interruptions to supply between one and three hours using the scaling factor of 75%

We then used our marginal valuation (referred to as marginal benefit) within the Ofwat formula to calculate our ODI rate for outperformance. This formula is set as:

ODI (outperformance) = Incremental benefit x (1 – p) where p = 0.5.

Setting our penalty rate:

Following the same approach as for discoloured water, the penalty rate was set symmetric to the reward rate.

ODI (underperformance) = ODI (outperformance)

As per the PR19 methodology we do not propose enhanced rewards and penalties on this measure.

We have not proposed caps and collars within our plan and due to this we cannot provide data on a number of the fields related to maximum standard rewards and penalties.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x Penalty rate

P90 = (PC target – P90 performance) x Reward rate

Sewer blockages – BES15

In addition to being a measure of the health of our sewerage network, the number of blockages strongly influences our sewer flooding performance.

A key part of our wastewater strategy is to deliver a reduction in blockages via customer education, as a significant number of blockages are caused by inappropriate items wither being flushed down the toilet, for example wipes, or sink, for example fats oils and greases.

Our customers are increasingly interested in the impacts of sewer misuse, particularly as this can cause sewer flooding.

This PC is for NW only.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

This PC was included in the bespoke ODI research. Within our sewage package we demonstrate a small overlap of blockages becoming internal flooding or external flooding, 14%. As such we have reduced our blockage incentive rate by 14%.

We divided these average valuations by the service level change. This service level change was calculated as the difference between the base level and our P90 level. This gave us the average unit valuations (i.e. per unit valuations for households).

	NW Household valuation per unit (Marginal benefit)
NW	=(Value in average bill / service level units)

We then calculated the total per unit valuations. For NW, we multiplied the per unit household valuation by the number of households in NW.

	Total MV
NWL	= (marginal benefit x number of properties) for each of NW household and non-household
Total NW adjusted by CPIH	To have values in the format of 2017-18 CPIH deflated we adjusted by RPI over 2018-19 and 2019-20 and the reduced by CPIH.

We then used our marginal valuation (referred to as marginal benefit) within the Ofwat formula to calculate our ODI rate for outperformance. This formula is set as:

ODI (outperformance) = Incremental benefit x (1 – p) where p = 0.5.

Setting our penalty rate:

A range of cost options, each associated with given step changes in performance was available. We followed the same approach as for supply interruptions. We used 2017/2018 performance as the base to calculate a marginal cost.

Annualised Totex per unit of improvement	
NW	= (annualised totex / Service level units)
Total NW adjusted by CPIH	To have values in the format of 2017-18 CPIH deflated we adjusted by RPI over 2018-19 and 2019-20 and the reduced by CPIH.

ODI (underperformance) = Marginal Benefit – (Marginal Costs x p) where p = 0.5

As per the PR19 methodology we do not propose enhanced rewards and penalties on this measure.

We have not proposed caps and collars within our plan and due to this we cannot provide data on a number of the fields related to maximum standard rewards and penalties.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x Penalty rate

P90 = (PC target – P90 performance) x Reward rate

External sewer flooding – BES16

Our customers tell us that sewer flooding is the worst service failure that they can experience.

While we will continue to prioritise our efforts to tackle internal sewer flooding, we are also committed to delivering further reductions in external flooding.

Our measure for external sewer flooding will be the number incidents of properties suffering external flooding. This is for flooding from the public and transferred network and includes severe weather events.

Despite recent reductions our external flooding numbers remain higher than industry average.

This measure applies to NW only.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

Setting our incentive rates:

We have applied the lower bound rates of penalty and reward from Ofwat's Technical Appendix 1 to derive our incentive rates. We then factored these rates with our 2022/23 property counts as per Ofwat's methodology. Therefore our incentive rates:

ODI (outperformance) = 0.339 x 2022/23 NW only household count

ODI (underperformance) = -0.567 x 2022/23 NW only household count

(The values of properties used is in App1a, whilst the results of these calculations is in App1).

We have not proposed caps and collars within our plan and due to this we cannot provide data on a number of the fields related to maximum standard rewards and penalties.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x Penalty rate

P90 = (PC target – P90 performance) x Reward rate

Repeat Sewer Flooding – BES17

Customer priority: High. Our customers tell us that internal sewer flooding is the worst service failure that they can experience. In addition to minimising all sewer flooding, it is critical that we continue to focus on repeats.

We currently measure repeat flooding using an old industry reporting definition which is extremely complex for our customers and stakeholders to understand.

For 2020 to 2025 we are proposing to simplify the measure to the number of times per year that properties have suffered from internal flooding where the property has flooded internally at least once in the last 5 years. This is for flooding from the public and transferred network and includes severe weather events.

This is not a comparable industry measure, so no UQ information is available.

This measure relates to NW only.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

Setting our reward rate:

This PC was included in the bespoke ODI research, so we applied the same approach as we did for mains bursts. This approach assumes that the amount households placed on the mats reflects the incremental amount that they value a repeat incident, relative to a one-off incident (i.e. as opposed to them placing down the total valuation for a repeat incident).

We divided these average valuations by the service level change. This service level change was calculated as the difference between the base level and our P90 level. This gave us the average unit valuations (i.e. per unit valuations for households).

	NW Household valuation per unit (Marginal benefit)
NW	=(Value in average bill / service level units)

We then calculated the total per unit valuations. For NW, we multiplied the per unit household valuation by the number of households in NW.

	Total Marginal Valuation
NW	= (marginal benefit x number of properties) for each of NW household and non-household
Total NW adjusted by CPIH	To have values in the format of 2017/18 CPIH deflated we adjusted by RPI over 2018/19 and 2019/20 and the reduced by CPIH.

We then used our marginal valuation (referred to as marginal benefit) within the Ofwat formula to calculate our ODI rate for outperformance. This formula is set as:

ODI (outperformance) = Incremental benefit x (1 – p) where p = 0.5.

Setting our penalty rate:

Following the same approach as for mains bursts, the penalty rate for mains bursts was set symmetric to the reward rate.

ODI (underperformance) = ODI (outperformance)

As per the PR19 methodology we do not propose enhanced rewards and penalties on this measure.

We have not proposed caps and collars within our plan and due to this we cannot provide data on a number of the fields related to maximum standard rewards and penalties.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x Penalty rate

P90 = (PC target – P90 performance) x Reward rate

Abstraction Incentive Mechanism (AIM) – BES18

Where water bodies exhibit ecological stress due to abstraction of raw water this measure promotes the use of alternate raw water sources to prevent harm. This only applies to sites which have been agreed with stakeholders.

This bespoke mandatory measure has been agreed with stakeholder for one site – Ormesby in our Suffolk area.

The AIM methodology (Ofwat, 2016), has been applied and the AIM will be 'switched on' when the water level reaches an agreed trigger level. When active the daily abstraction volume must not exceed 8.59Ml on average. The PC is to not abstract more than this volume therefore the PCL has been set at 0.

This measure is important to demonstrate that we are delivering expectations on environmental safeguards.

The PR19 methodology requires us to include a bespoke measure on AIM.

Data in relation to AIM has originated from App3. We have used the rates in this table to calculate the P10 and P90 positions as shown in App1. **Rates apply to this measure daily.**

Bathing water compliance – BES19

In response to Defra's drive for the water industry to increase its ambition to improve bathing waters, we are proposing to change our current measure which assesses the number of beaches meeting the Sufficient standard, to those which meet the Good or Excellent standard.

There have been a range of views expressed by customers regarding the priority we should attach to further improvements, however a common consensus is that we should not deteriorate from our current position.

We are proposing a PC of 33 out of our 34 beaches meeting the good or excellent standard, which is consistent with our forecast of future UQ for this measure.

Customer priority = High. Our customers have told us that they want us to meet or exceed our regulatory obligations in relation to bathing waters.

This measure relates to NW only.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

Setting our reward rate:

This PC was included in the bespoke ODI research, so we applied the same approach as we did for mains bursts.

We divided these average valuations by the service level change. This service level change was calculated as the difference between the base level and our P90 level. This gave us the average unit valuations (i.e. per unit valuations for households).

	NW Household valuation per unit (Marginal benefit)

NW	=(Value in average bill / service level units)

We then calculated the total per unit valuations. For NW, we multiplied the per unit household valuation by the number of households in NW.

	Total Marginal Valuation
NW	= (marginal benefit x number of properties) for each of NW household and non-household
Total NW adjusted by CPIH	To have values in the format of 2017-18 CPIH deflated we adjusted by RPI over 2018-19 and 2019-20 and the reduced by CPIH.

We then used our marginal valuation (referred to as marginal benefit) within the Ofwat formula to calculate our ODI rate for outperformance. This formula is set as:

ODI (outperformance) = Incremental benefit x (1 – p) where p = 0.5.

Setting our penalty rate:

Following the same approach as for mains bursts, the penalty rate for mains bursts was set symmetric to the reward rate.

ODI (underperformance) = ODI (outperformance)

As per the PR19 methodology we do not propose enhanced rewards and penalties on this measure.

We have not proposed caps and collars within our plan and due to this we cannot provide data on a number of the fields related to maximum standard rewards and penalties.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (P10 performance - PC target) x Penalty rate

P90 = (P90 performance - PC target) x Reward rate

Water environment improvements – BES20

This new and innovative bespoke measure will help us demonstrate progress towards our ambition to work with others to play our part and demonstrate leadership in providing an improved, enhanced and sustainable environment. We will value the natural capital and the ecosystem services the environment provides, and will improve access and recreation, to meet the needs and aspirations of our customers, partners and communities.

Packages of agreed water environment improvements will be delivered in partnership to accessible areas of the water environment (streams, rivers, lakes, reservoirs, wetlands, beaches and coastline). Each of these areas of the water environment has an associated kilometres (km) length of water environment. The length of water environment enhanced as measured under this PC will relate to the cumulative lengths of accessible water environment areas where improvements have been delivered.

These improvements will be above and beyond our regulatory obligations and our business as usual activities, and will be agreed through a partnership approach incorporating customer representation, overseen by governance arrangements. This PC will allow us to work with partners in our regions to target further wider environment improvements above our regulatory minimum for the benefit of our customers and their communities.

Customer Priority: High. Customers have indicated that they would like us to go further on this measure, and we will aim to achieve the customer preferred level in the longer term.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

Setting our reward:

Length of water environment improved was included in the core PR19 customer research, so we used broadly the same approach to calculate per unit valuations as for supply interruptions over three hours.

We took the average household and non-household valuations from the ODI part of the core PR19 customer research, and in particular from the unconstrained results, where the customers saw the unconstrained research first.

We divided these average valuations by the service level change. This service level change was calculated as the difference between the base level and the “ODI level” that was used in the PR19 customer research. This gave us the average unit valuations (ie per unit valuations for households, and per unit valuations for non-households).

	Household valuation per unit (Marginal benefit)	Non-household valuation per unit
NW	=(Value in average bill / service level units)	=(Value in average bill / service level units)
ESW	=(Value in average bill / service level units)	=(Value in average bill / service level units)

We then calculated the total per unit valuations. For ESW, we multiplied the per unit household valuation by the number of households in ESW, and multiplied the per unit non-household valuation by the number of non-households in the ESW. We did the same for NW.

	Total Marginal Valuation
NW	= (marginal benefit x number of properties) for each of NW household and non-household
ESW	= (marginal benefit x number of properties) for each of ESW household and non-household
Total NWL	=NW Marginal Valuation + ESW Marginal Valuation
Total NWL adjusted by CPIH	To have values in the format of 2017/18 CPIH deflated we adjusted by RPI over 2018/19 and 2019/20 and the reduced by CPIH.

We then used our marginal valuation (referred to as marginal benefit) within the Ofwat formula to calculate our ODI rate for outperformance. This formula is set as:

ODI (outperformance) = Incremental benefit x (1 – p) where p = 0.5.

Setting our penalty rates:

We were able to calculate the costs to reach the 2024/25 PC. To calculate a per-unit cost, whilst the base service level is at zero km.

Annualised totex per unit of improvement	
NWL	= (annualised totex / Service level units) To have values in the format of 2017-18 CPIH deflated we adjusted by RPI over 2018-19 and 2019-20 and the reduced by CPIH.

We then used our marginal cost (referred to as incremental cost) along with our incremental benefit value within the Ofwat formula to calculate our ODI rate for underperformance. This formula is set as:

ODI (underperformance) = Incremental benefit - (Incremental cost x p) where p = 0.5.

As per the PR19 methodology we do not propose enhanced rewards and penalties on this measure.

We have not proposed caps and collars within our plan and due to this we cannot provide data on a number of the fields related to maximum standard and enhanced rewards and penalties.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (P10 performance - PC target) x Penalty rate

P90 = (P90 performance - PC target) x Reward rate

Greenhouse gas emissions – BES21

This is a measure of the annual amount of the greenhouse gases we produce. This measure is a continuation of W-F1 from the 2015-20 period. However the measure is now measured in tonnes not kilo tonnes.

Greenhouse Gas (GHG) emissions are a concern to many customers who are aware of the risks posed by Climate Change. The Water Industry is responsible for around 1% of the total UK emissions, largely from the use of grid electricity where the industry uses around 3% of the total UK use.

Having a measure for GHG emissions makes it clear that we are concerned about the environment and signals our determination to contribute to a better future.

This measure will be a fully bespoke one. Our PC profile represents a challenging though achievable pathway towards an ambition to become carbon neutral by the end of 2027/28.

This is a huge stretch for a water company using significant volumes in energy to deliver a heavy product (1tonne/m3) to it's to customers and then dispose of what is returned on a daily basis. It is only remotely achievable because of the fact that our new supplier provides carbon free electricity, and recent changes in the way we can account for the emissions linked to grid electricity use.

The ambition remains stretching even taking this into account. Around a fifth of our emissions are linked to our fleet use. Low carbon vehicle development for vans is some years behind that for cars and we renew our vans typically every eight years. Large freight vehicles lag yet further back in development terms. It will take time to have a fully alternatively fuelled clean fleet. We also have to account for travel undertaken in private vehicles or public transport, something over which we have little control.

A similar proportion is linked to our use of fossil fuels at fixed sites, particularly for space heating, though also for standby/emergency generation needed to ensure a 24/7 service. Making the change to low emissions fuels will take time if it is to be done without significant cost.

We are also responsible for some emissions linked to the treatment processes we undertake, particularly where nitrous oxide and methane are released to atmosphere at many separate sites. Stopping this at source would be hugely expensive. If we were to achieve carbon neutrality by 2027 we would be likely to be seen as industry leading, and one of few such organisations running what is effectively a manufacturing/production business.

Note: The PC levels in App1 are in tonnes, whilst figures in WWS18 and WS18 are in kilo tonnes. Due to this if comparing the three tables then App1 will not equal the sum of the latter two tables due to the numbers in WWS18 and WS18 being rounded to the nearest kilo tonne.

Customer priority: Medium. Our customers tell us that they expect us to care for the environment.

Incentives:

This measure has been set to a reward and penalty ODI. There are no deadbands applicable, therefore rewards and penalties commence immediately either side of our commitment.

Setting our reward rate:

This PC was included in the bespoke ODI research, so we applied the same approach as we did for mains bursts. We took the average household and non-household valuations from the bespoke measure ODI customer research.

We divided these average valuations by the service level change. This service level change was calculated as the difference between the base level and our P90 level. This gave us the average unit valuations (i.e. per unit valuations for households).

NW Household valuation per unit (Marginal benefit)	ESW Household valuation per unit
=(Value in average bill / service level units)	=(Value in average bill / service level units)

We then calculated the total per unit valuations. For ESW, we multiplied the per unit household valuation by the number of households and then the same for NW. Then we summed up the ESW households and NW households to get the total per unit valuation for NWL.

	Total Marginal Valuation
NW	= (marginal benefit x number of properties) for each of NW household and non-household
ESW	= (marginal benefit x number of properties) for each of ESW household and non-household

Total NWL	=NW Marginal Valuation + ESW Marginal Valuation
Total NWL adjusted by CPIH	To have values in the format of 2017-18 CPIH deflated we adjusted by RPI over 2018-19 and 2019-20 and the reduced by CPIH.

We then used our marginal valuation (referred to as marginal benefit) within the Ofwat formula to calculate our ODI rate for outperformance. This formula is set as:

ODI (outperformance) = Incremental benefit x (1 – p) where p = 0.5.

Setting our penalty rate:

As no data was available on costs for reducing greenhouse gas emissions, we were not able to calculate a marginal cost. This meant that the penalty rate for greenhouse gases was set symmetric to the reward rate.

ODI (underperformance) = ODI (outperformance)

As per the PR19 methodology we do not propose enhanced rewards and penalties on this measure.

We have not proposed caps and collars within our plan and due to this we cannot provide data on a number of the fields related to maximum standard rewards and penalties.

We have calculated the P10 and P90 positions which are entered into App1. This is calculated through using the formula:

P10 = (PC target – P10 performance) x Penalty rate

P90 = (PC target – P90 performance) x Reward rate

Bioresources – BES22

The PR19 methodology requires us to have bespoke measures covering all price controls, including bio-resources.

Our ambition is to continue to perform at 100% which is industry leading by a substantial margin. In recognition, however, of the potential for access to land to be constrained by certain events, for example such as the foot and mouth outbreak in 2001, we are setting our PC at 98%.

ODI is set to reputational. Due to the introduction of a competitive market for bioresources we believe this performance against this measure is already financially incentivised. As such have not completed the sections of App1 that relate to financial incentives. We also did not test customer valuations for this PC and again there are no MBs or MCs included within App1.

British Standards Institution Award for Inclusive Services – (BES23)

We believe this measure is complementary with the Ofwat prescribed Priority Services Measures (COM16 & 17). It is our ambition to achieve this award. As per the Priority Services measures this is a reputational only and no financial ODI is set against it.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Delivery of Enhancement Programmes – (BES24-29)

Measures have been created within App1 to provide customer protection on our enhancement packages. Each package contains multiple outputs and as such we have created detailed business cases which include information regarding customer protection etc. These are detailed in NES.CE.A1.5 and NES.CE.A1.6 Appendix 3.2 Enhancement Business Cases and the nature of change forms NES.OC.A59-65, 69-71 and NES.OC.A66-68,72-74.

All enhancement packages contain penalty only incentives for none or late delivery.

NWL Independent value for money survey – (BES30)

We welcome Ofwat's challenge to provide sufficient evidence to justify discontinuing our PR14 Value for Money PCs. It has given us the opportunity to reflect on whether the decision we made to discontinue with them was justified.

In response we propose to reinstate the NWL independent value for money survey as a PC for PR19. This will make sure that we are measuring the satisfaction of all our customers and not only those that receive additional support. This is the more statistically robust measure of the four, and is also conducted more frequently – enabling us to respond more rapidly to any changes.

Our scores in our independent value for money survey have remained consistent over the last four years, surpassing our PC and demonstrating that we have maintained our customers' overall satisfaction with the services we provide since 2015. We hope these will improve further as we deliver significant bill reductions in AMP7.

Our PC for this reputational measure - independent value for money survey PC between 2015-20 is 7.9 out of 10. For the last fouyr years 2015-2018 our performance has been 8.2 out of 10. We will, therefore, set our PC at 8.2 out of ten for the 2020-25 period.

This measure is reputation and as such no financial ODI is attached or shown in APP1.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

TABLE APP2 – LEAKAGE ADDITIONAL INFORMATION AND OLD DEFINITION REPORTING

Lines 2-4 and 9-11: Upper, Central and Lower Point of SELL

The SELL has been rebuilt for the WRMP and the values have been adjusted to represent the forecast values using the new consistent leakage definition. A number of WRMP scenarios were considered and the "most probable" scenario resulted in a reduction of 3.41 Ml/day in ESW and an increase of 1.52 Ml/day in NWL. Future reductions in the central point of SELL have been forecast based on an estimate of the effect on key parameters, e.g. Background Leakage, NRR and AZNP as key projects are delivered. We have also made an assessment for the effects of improving Leakage Survey efficiency. The upper and lower points have been estimated using a variance in the confidence of the NRR element of the calculation, ranging from 5-26%.

Lines 5 and 12: WRMP Leakage Targets

Leakage targets have been calculated for the remaining years of PR14 using the anticipated effect of adopting the WRMP "most probable" scenario to move from the old definition to the new consistent method. This results in a revised PR14 PC of 138.5 Ml/day in NWL and 62.6 Ml/day in ESW. In the period 2020 to 2025, these numbers have been reduced by 17.5% in ESW and 15% in NWL. Each subsequent 5-year period reduces these values by 10% in both areas. In both areas the resulting WRMP Leakage Targets are significantly lower than the central point of the SELL.

Lines 6-7 and 13-14: Leakage/Property/Day and Leakage/Km/day

These represent the WRMP Leakage target normalised to the number of properties and length of mains respectively. The forecast property numbers have been taken from the WRMP submission and the length of mains has been estimated for the next 25 years based on the percentage increase observed between 2017 and 2018.

Lines 30 and 33: Leakage

This represents the volume of water that leaks from the water supply. It includes any uncontrolled losses between the treatment works and the customers' stop tap but does not include internal plumbing losses. Figures for 2015/16 and 2016/17 are as previously reported. Figures for 2018/19 and 2019/20 are the existing PC targets. Figures beyond 2020 are as derived for the WRMP using the proposed 15% savings in NWL and 17.5% savings in ESW.

Lines 31 and 34: Central Point of SELL

The SELL has been rebuilt for the WRMP and this new derived value has been used for the period 2015/16 to 2017/18. Future reductions in the SELL have been forecast based on an estimate of the effect on key parameters, e.g. Background Leakage, NRR and AZNP as key projects are delivered. We have also made an assessment for the effects of improving Leakage Survey efficiency.

Line 41: Per Capita Consumption

PCC (old definition) is the average PCC for measured and unmeasured households for NWL.

Unmeasured consumption uses the PCC from unmeasured household monitors (IHM in ESW and SAM in NW). These monitors are representative of the unmeasured customer base.

Measured consumption is from the measured volumes recorded in the billing database.

Forecasted numbers rely on the micro-component survey and analysis to determine estimated changes in consumption for both unmeasured and measured PCC.

Household population used in the PCC calculation has been commissioned from Edge Analytics. This is in line with the WRPG (Environment Agency, 2017) requirement, NWL has used local authority Plan housing growth evidence from all local authorities and has selected the Plan-based scenario.

PCC is forecast to decrease over the forecast horizon as a result of a combination of behaviour change, increased metering (including the introduction of smart metering) and increased water efficiency activity. In 2017/18 NWL PCC is 148.0 l/h/d this reduces by 13.7 l/h/d to 134.3 l/h/d at the end of AMP 7, 2024/25. NWL forecast a further reduction to 118.0 l/h/d by 2040/41.

Line 42: Interruptions

In line with the guidance provided the 2015/16, 2016/17 and 2017/18 data are PR14 actual PC numbers. 2018/19 and 2019/20 are the PR14 PCs. 2020/21 to 2024/25 is an improving trend based a forecast UQ assessment of 00:04:13.

The UQ was assessed from two years of current definition data and one year of converged definition data. The three year dataset was adjusted to account for the impact of the consistent definition.

Line 43: Sewer flooding (internal)

In line with the guidance provided the 2015/16, 2016/17 and 2017/18 data are PR14 actual PC numbers (Number of properties internally flooded). From 2018/19 to 2024/25 is a forecast based on our PR14 number properties internally flooded PC.

TABLE APP3 – ABSTRACTION INCENTIVE MECHANISM - SURFACE AND GROUND WATER ABSTRACTIONS UNDER THE AIM THRESHOLD

This commentary covers both the calculations for the existing Ormesby Broad AIM scheme (AMP6 2016-2020) and the proposed changes to the Ormesby Broad AIM scheme from March 2020 onwards (AMP7).

Ormesby Broad is an existing AMP6 AIM site because the Review of Consents (RoC) mud pumping solution for the Ormesby Broad abstraction was planned for completion by April 2017, and it thus met the AMP6 qualifying criteria. Even though the mud pumping is now complete, because Ofwat expects that companies will continue with current AIM sites at PR19, and because local interest in the management of water levels remains, Ormesby is being put forward as an AIM site for PR19.

NWL screened all of its Water Industry National Environment Programme 3 (WINEP3) (ESW and NW) schemes against the following criteria, as set out in Ofwat's AIM guidance (Ofwat, February 2016), to establish which of them could be AMP7 AIM schemes:

i. The abstraction causes, at times, a potentially unacceptable impact on the environment if operated at licensed or current rates, r local concerns exist over the impact of the abstraction on the local environment;

ii. There is an existing alternative source of water or bulk supply, or other realistic means of reducing abstraction from the AIM site; and

iii. Additional company filters, e.g. solution will be in place by 2020, or an environmental assessment is pending

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DATA TABLE SUBMISSION COMMENTARY

Following the screening, and subsequent consultation with the Environment Agency and other stakeholders, NWL is proposing to continue, albeit with revised conditions, with a single AIM scheme at Ormesby Broad in Norfolk. This is the only potential scheme which was supported by the Environment Agency.

The current (AMP6) Ormesby AIM scheme was designed based on the abstraction licence and available abstraction and water level data available during 2015. The water level trigger threshold for AMP6 was set at -0.14mAOD, which was the abstraction cessation level in force at that time.

Since the start of AIM in April 2016, the AIM has only been triggered in 2018/19. In previous years Broad water levels remained above the trigger threshold. This is why the relevant columns for 16/17 and 17/18 in Table App3 for AIM performance and normalised AIM performance show 'N/A'. The 2018/19 data was determined in March 2019 and is therefore provisional. However, due to weather patterns and water resources it is not anticipated to change.

Essex & Suffolk Water implemented a programme of mud pumping within the Trinity Broads during 2016-17, which was the agreed solution arising from the Environment Agency's Review of Consents process for the Ormesby Broad abstraction. Following this mud pumping, a new, lower, abstraction cessation level became 'live' on 1st April 2017, stated in the abstraction licence.

Although the Review of Consents mud-pumping solution for the Ormesby Broad abstraction was fully completed during AMP6 (by April 2017), and the site therefore does not satisfy any of Ofwat's three screening criteria, the site is included within AIM for AMP7 due to stakeholder feedback.

Given the changes that have occurred since the original AIM scheme was designed, ESW has therefore taken the opportunity to revisit the parameters of the AIM scheme for AMP7 (from April 2020 onwards). The new licence conditions, extended water level and abstraction dataset and information on Broadshore moisture levels, a key ecological indicator, have been used to update the AIM trigger threshold and the historic abstraction baseline for AMP7.

The water level trigger threshold has been reviewed for AMP7. Through stakeholder consultation the AMP7 water level trigger threshold has been set at -0.19mAOD. This is based on available data on acceptable Broad margin moisture in relation to the needs of the Desmoulin's Whorl Snail. Desmoulin's Whorl Snail, which is present on site, is a protected species under Annex II of the Conservation of Habitats and Species Regs (2017), and is highly dependent on maintenance of existing local hydrological conditions1. The PR19 AIM water level trigger point has therefore been set based on stakeholder feedback and available ecological data, at the point where a reduction in abstraction from the site would be, or is likely to be environmentally beneficial. It is significantly higher than the new abstraction cessation level of -0.44mAOD.

The AIM baseline abstraction value has been reviewed for AMP7. Available rainfall, abstraction and Broad water level data has been reviewed, and average daily abstraction from 2011 will be used as the historical period from which to calculate the AIM baseline abstraction value. Rainfall data show that 2011 had the lowest monthly average rainfall figures within the available record, and can thus be considered as a dry year. Metaldehyde concentrations in the River Bure at Belaugh (the alternative water source) remained below the abstraction management trigger of 0.08µg/l throughout 2011, and therefore would not have constrained AIM. Ormesby Broad water level in 2011 was below the AMP7 AIM trigger of -0.19mAOD for the longest period within the available record.

An additional constraint will be applied during AMP7, as the AIM scheme can only operate if there is "an existing alternative source of water or bulk supply, or other realistic means of reducing abstraction from the AIM site" (Ofwat, 2016). For Ormesby Broad, the alternative source is the River Bure. Therefore the AIM can only be triggered when water quality in the Bure is good enough so as not to compromise the treatment capability of Ormesby WTW or the Company's ability to undertake abstraction management to achieve drinking water compliance for metaldehyde and other parameters, such as nitrates or trihalomethanes (THMs).

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DATA TABLE SUBMISSION COMMENTARY

Given Ofwat's overall objective for AIM is to reduce the environmental impact of abstracting water at environmentally sensitive sites during defined periods of low surface water flows, the projection data for AIM performance for each year from 2020/21 to 2024/25 is based on the assumption that the Company would manage water levels within Ormesby Broad to, where possible, avoid going below the water level trigger threshold. Where this is not operationally possible, for example in a very dry year, then the assumption would be that the scheme would be operated neutrally at the baseline abstraction value of 8.59Ml/d. This would give an AIM performance value of 0Ml for each year from 2020/21 to 2024/25. The longer term projection data for AIM performance for each year from 2025/26 to 2029/30 is based on the same assumption, hence the projected AIM performance value of **0Ml** for each year.

The AIM underperformance penalty rate is calculated using the short run marginal cost to use an alternative source of water, namely the River Bure at Belaugh. This is the third method proposed by Ofwat in Table 6 of their guidance (Ofwat, 20172). Bure water is on average £35.16/Ml more expensive to abstract and treat than Ormesby Broad Water. The underperformance penalty rate for failing to abstract less from Ormesby Broad than the baseline during an AIM period is therefore set at £35.16/Ml, ie equal to the amount saved by not switching abstraction to the Bure.

The AIM outperformance payment rate is calculated using the short run marginal cost to use an alternative source of water, namely the River Bure at Belaugh. This is the third method proposed by Ofwat in Table 6 of their guidance, and uses the example multiple given in that table (Ofwat, 20172). Bure Water is on average **£35.16/Ml** more expensive to abstract and treat than Ormesby Broad Water. The underperformance penalty rate for failing to abstract less from Ormesby Broad than the baseline during an AIM period is therefore set at **£35.16/Ml**, i.e. equal to the amount saved by not switching abstraction to the Bure.

The AIM outperformance payment rate is calculated using a 1.2 multiple of the short run marginal cost to use an alternative source of water, namely the River Bure at Belaugh. This is the third method proposed by Ofwat in Table 6 of their guidance, and uses the example multiple given in that table (Ofwat, 2017). Applying a multiple of 1.2, to the marginal cost difference of £35.16/Ml gives an outperformance payment of **£42.19/Ml** for reducing abstraction from Ormesby Broad to below the AIM baseline, and switching it to the Bure, during an AIM period.

Due to Ofwat's request that the underperformance penalty rate and outperformance payment rates are presented in Table App3 as '£m to four decimal places', the entries in the table say '£0'. However, the actual values are provided in the Comments box at the far right of Table App3.

The underperformance penalty collar is set at **36.3Ml**. This is the maximum daily abstraction allowable under the Ormesby Broad abstraction licence (7/34/09/*S/0054). The underperformance penalty collar is intended to apply to daily AIM performance.

The outperformance payment cap is set at **0Ml**. This would occur if all abstraction from Ormesby Broad during an AIM period is switched to the alternative source.

Given the other variables within the underperformance and outperformance calculations (small abstraction volume, little cost differential between using the Ormesby source compared to using the alternative source), then neither the underperformance penalty exposure nor the potential outperformance payments for the scheme are very big. As an illustration, given the figures above, during an AIM period, our understanding is that we would pay £35.16/Ml at the end of an AIM period for every day during that AIM period that our average abstraction is between 8.59Ml/d (our baseline abstraction) and 36.3Ml/d (our underperformance penalty collar).

So if the AIM period in any given year ran for 20 days and our average abstraction from Ormesby Broad during those 20 days was 9.7Ml/d, then we would have to pay:

(9.7-8.59=1.11) x £35.16 x 20

= £780.55

Given the purpose of this measure, which is to reduce environmental stress on a sensitive ecosystem, during times of low water availability, it is not seen to be appropriate to define an underperformance penalty deadband or outperformance payment deadband. The AIM scheme is designed in such a way that penalties or payments are incurred instantaneously when the AIM water level trigger threshold is breached.

The Trinity Broads Technical Group, which includes technical representatives from the Environment Agency, Natural England, the Broads Authority, the Water Level Management Association and Norfolk Wildlife Trust, challenged the justification for the proposed AMP7 water level trigger threshold. As a result of this, NWL undertook further work to investigate the amount of variation around average Broad level and to analyse available data on Broad margin moisture levels, in order to confirm -0.19m AOD as a suitable water level trigger threshold.

Further ecological survey work on Broad margin moisture levels will be carried out in 2018 and 2019 to extend the available dataset. Therefore the proposed AMP7 AIM water level trigger threshold will be reviewed, based on this extended dataset, and a final AMP7 AIM water level trigger threshold will be agreed with the Trinity Broads Technical Group, ahead of the start of AMP7.

Technical and Hydrology leads for the Environment Agency in the Anglia area have provided feedback in support of the proposed AMP7 scheme in principal for two main reasons:

1. Holding water levels higher in Ormesby Broad (than required by the licensed pumping cessation level) has environmental benefits.
2. By conserving storage capacity in Ormesby Broad, it extends the supply of water during prolonged drought.

1 http://jncc.defra.gov.uk/ProtectedSites/SACselection/species.asp?FeatureIntCode=s1016 Site accessed: 22/02/18

2 Ofwat (2017) Delivering Water 2020: Our methodology for the 2019 price review. Appendix 2: Delivering outcomes for customers.

TABLE APP4 – CUSTOMER METRICS

Block A – Affordability, Lines 1-21

Lines 1-2: Real bill profile tested with customers from 2020-2021 to 2024-2025 & Real bill profile tested with customers beyond 2025

We have set out the Northumbrian Water combined service bill profile as consulted on with customers. The key change points are a 10% bill reduction in 2020/21 and a 3% bill increase in 2025/26, both of which were shared with customers in our business plan engagement. Whilst the Essex & Suffolk Water bills start at a different level, the profile consulted on was the same.

Lines 4-8: Customers who find the level of their bill acceptable (lines 4 & 7 only for WASCs)

Historical data is from the CCWater - Water Matters report. Future targets are based on our affordability measures improving acceptability. However, even at the point where we achieve zero water poverty, we would expect some level of customer response indicating that they feel their bills are too high.

Lines 9-12 - Social Tariffs

The table shows the discount and impact of our company funded tariff only for 2017/18. This tariff is not funded through increases in the cross subsidy. From 2018/19 these lines include both our

company funded scheme, which we intend to extend, and the addition of a customer funded scheme which expands the eligibility of our existing SupportPLUS reduced bill. The costs shown in lines 9-10 relate purely to the bill and write-off impacts, and exclude the operational costs of administering the schemes. We have added zero for 2013/14 and 2014/15 as we did not have a social tariff in place until 2016/17.

Lines 13-15: WaterSure Discount

These lines detail the number of customers receiving a WaterSure discount, and the value of the WaterSure discount that customers on the scheme benefit from. As you are aware, WaterSure is a mandated national scheme. However, WaterSure Plus is a company-specific social tariff provided by a few companies using an additional cross subsidy under the Defra guidance for social tariffs. This is not a scheme that we have had customer approval to support, and as a result we have included no additional costs in this section. We have reported our company specific schemes in lines 9-12, as previously mentioned.

Historically we have not submitted or recorded the unbilled value of WaterSure and we have not been able to source these figures for the periods of 13/14, 14/15, 15/16 and 16/17. On this basis we have added N/A in lines 13 and 14 for these years, as we are unable to provide the total cost and value per customer for the years mentioned.

Lines 16-17: Hardship Fund

We currently offer a small hardship fund for customers who find themselves in a position where they have an element of uninsured loss from a flooding event. The expenditure from this fund is impacted by the number of flooding events we have during the year. In 2017/18 we had very few cases compared to previous years, so the cost of this scheme has been very small. In 2020/21 we hope to launch a customer hardship fund funded from the interest generated from the IRFS tax funding received in PR14. We believe that this fund could support around 3,500 customers in real financial difficulty. We first provided a hardship fund in 2017/18, so we have added zero for previous years.

Lines 18-21: Debt Write off Scheme

We have reported the current and forecasted numbers and value of debt written off from our arrears matching scheme. Our experience has been that there is a significant correlation between customers accessing our social tariff schemes who also qualify for our arrears matching scheme. Our forecasts are therefore closely linked, so we expect an increase in the number of customers accessing this scheme as our social tariff numbers rise. We do however expect the average value of the arrears write offs to also fall over time, as customers are able to access help earlier. Our payment matching scheme is not cross subsidised by customers, therefore for line 19 we have added zero.

Block B – Vulnerability, **Lines 22-31**

Line 22: Customers aware of the non-financial customer assistance measures offered

Historical data from the CCWater Water Matters report. Future targets are based on anticipated increased awareness, following planned targeted awareness campaigns internally and externally.

Lines 23-29: Customers on Special Assistance Register (SAR)

We have reported the current and forecasted numbers for customers on our Priority Services Register (PSR), with increases expected due to our campaigns to increase awareness and planned data sharing within the water and energy sector.

Line 30: Customers satisfied that support services are easy to access

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

We have introduced new benchmarking research to source the views of our customers. Respondents were asked to rate how much they agreed with a number of statements regarding our support services, which included how easy they are to access. We have provided the result for 17/18. However, as this is new research we are unable to provide results for 13/14, 14/15, 15/16, 16/17, and have added N/A in these fields.

Line 31: Customers on SAR/PSR contacted over the previous two years

As per suggested common Performance Commitment, please see App1 for our interpretation of this commitment, in particular the concerns we raised about the ability to achieve 90% interaction with customers to validate their details every two years. Our Performance Commitment is to attempt to contact all customers on the PSR at least every two years to ask them to check their details. We have previously not recorded the number of customers where we have reviewed their requirements on PSR prior to 17/18. Therefore, we have added N/A in these fields.

TABLE APP5 - PR14 RECONCILIATION ~ PERFORMANCE COMMITMENTS

This table was submitted as part of our early data submission on 27 July 2018. Through the Ofwat queries process the need to resubmit this table was identified. Data query numbers that identified amendments are *NES-PD-CE-004* and *NES-PD-OC-005*. The resubmitted table amends are as follows:

- A table showing the actual and 3-year average performance for these measures for each of the year AMP (2015-2020) was provided in the query reply.
- App 5 was amended in line with PR14 definitions including any impact on forecast ODI values.
- 2018/19 inconsistency corrected within the PCL met column. The new converged value calculated for App1 was added to App5.

We have reviewed App5 to ensure that this has not been repeated anywhere. Further detail can be found in the Ofwat query replies noted above.

TABLE APP6 - PR14 RECONCILIATION ~ SUB-MEASURES

This table is not applicable, NWL have no sub-measures.

TABLE APP7 - PROPOSED PRICE LIMITS AND AVERAGE BILLS

Blocks A, B, C, D, F and G are all automatic tables with data taken from elsewhere in the PR19 tables.

Block E requires the K factors for Water Resources, Water Network + and Wastewater Network +. It also requires an average revenue per tonne of dry solids for bioresources.

The K factors are taken from the Financial Model Executive Summary. The Bioresources value is taken from Summary Calc F733, which is in turn taken from Table Bio1 line 3.

Block F requires two years of average household bill data, for 2018/19 and 2019/20. The values for 2018/19 are as per Discover Water, with an appropriate weighting between the NW and ESW water bill to derive a single value.

Data source: https://www.discoverwater.co.uk/annual-bill

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

2018-19	North	South	W Average
Water	181	251	213
Sewer	220		220

For 2019/20 projections, we have applied an RPI of 3% and the PR14 K factor of 0.1% to the 2018/19 bills. The PR14 data source for K factor is FD Table A6.2 page 63.

Block H requires a reprofiling discount rate. We have assumed 3.30%, the real CPIH stripped Wholesale cost of capital for PR19, per Table 10.2 of the guidance. The discount rate is used in reprofiling our wholesale revenues in the Financial Model.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

TABLE APP8 - APPOINTEE FINANCING

The majority of the table data is taken automatically from other tables.

Block A - Financial

Line 1: Net Debt

Projection of net debt at 31/3/2020 deflated to CPIH FYE 2017/18 prices.

	£m	Source
Outturn net debt	£2886m	App 12, lines 11,15,22
Deflate to 17/18 CPIH FYE	105.1/109.3	App 23
Net Debt	£2775m	

Line 2: Equity dividends

These are taken from App18 line 8, deflated from outturn to CPIH FYA 2017/18 prices. The dividends are consistent with a 4.52% nominal return on actual regulatory equity.

Line 3: Equity financing

We have assumed zero cash flow from equity financing.

Note, whilst we have assumed a flexible dividend policy when considering stress testing, we have not run any scenarios that require equity financing.

Block B – RCV Year End Balance

Water Resources and Water Network +

Line 4: Provided by Ofwat

Lines 5-12: Outputs from the RCV adjustment feeder model

Lines 15-40: Data from other tables and Ofwat formulas.

Wastewater Network + and Bioresources

Line 41: Provided by Ofwat

Lines 42-48: Outputs from the RCV adjustment feeder model

Lines 49-51: Data from other tables and Ofwat formulas

Line 52: RCV adjustment feeder model

Lines 53-76: Data from other tables and Ofwat formulas.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Blocks C, D and E

These are all driven by data from other tables and Ofwat formulas.

TABLE APP9 - ADJUSTMENTS TO RCV FROM DISPOSALS OF INTEREST IN LAND

This table was submitted as part of our early data submission on 27 July 2018. Through the Ofwat queries process the need to resubmit this table was identified. The data query number that identified amendment is NES-PD-LS-001. The resubmitted table amends are as follows:

- In the 2016-17 APR all of the land sales were reported as water by mistake. £13k should have been allocated to wastewater and the water figure should have been £648k. The PR19 business plan figures for 2016-17 are correct.
- For 2015-16 it is the PR19 business plan that is incorrect. The wastewater figure from 16-17, £13k, was also reported for 15-16 in error. The APR figures for 15-16 are correct, £16k for wastewater and £1694k for water.

TABLE APP10 - FINANCIAL RATIOS

Block A: Data is taken from the F Outputs tab of the financial model, notional gearing

Block B: Data is taken from the F Outputs tab of the financial model, actual gearing

Note – for lines 10 & 32, we have used Return on capital employed (ROCE) (building blocks) as this aligns the calculation of returns to the Cost of Capital.

For the actual capital structure, we have added an additional gearing ratio. that uses the closing March index to calculate closing RCV.

We have used the conventional percentage formatting for the ratios where appropriate, as ‘ratios’ are not always appropriate for values that are typically presented as percentages.

TABLE APP11 - INCOME STATEMENT BASED ON THE ACTUAL COMPANY STRUCTURE

Data is taken from the F Outputs tab of the financial model, actual gearing

We have added amortisation on line 4. This does not seem to connect to the Ofwat financial model, so creates a different P&L from that in the Financial Model. It has no effect on the financial model for bill setting or ratios, so it is essentially illustrative of our actual position.

TABLE APP11A - INCOME STATEMENT BASED ON A NOTIONAL COMPANY STRUCTURE

Data is taken from the F Outputs tab of the financial model, notional gearing.

TABLE APP12 - BALANCE SHEET BASED ON THE ACTUAL COMPANY STRUCTURE

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Data is taken from the F Outputs tab of the financial model, actual gearing

Other notes:

Line 1 Fixed Assets

This is taken from App16. As we note in App16,

Line 9: Trade and other receivables aligns with App 13

Line 13: Trade and other payables aligns with App 14

Lines 11, 15 & 22 Cash and borrowings align with the net debt position as used for financial ratios Lines 15 & 22 match the debt balances in App19

Line 24 Retirement benefit obligations

This line is annually adjusted for the difference between pensions charge and cash from Table App22. The line adds the P&L charge then deducts the cash payments, both ongoing and deficit recovery.

Line 26 Deferred income, G&C

This value should reduce in line with amortisation but the Financial Model does not have a facility for amortisation in fixed assets so we have kept it constant. There is no effect on financial ratios or cash flows.

TABLE APP12A - BALANCE SHEET BASED ON A NOTIONAL COMPANY STRUCTURE

Data is taken from the F Outputs tab of the financial model under notional gearing.

As there is no line for us to include derivative financial instruments, we have included these at a fixed value as part of line 21, trade and other payables.

TABLE APP13 - TRADE RECEIVABLES

Block A: Retail debt is taken from the financial model, residential retail.

Block B: This is a projection of the 2019/20 values and is input to the Financial Model.

We have ensured this table reconciles to the Ofwat financial model and to the Balance Sheet.

Block C: All data is taken from other tables.

Block D: We have set debtor days to be constant across all years. This drives the retail debt in Block A lines 1 & 2..

Block E: We have set the measured income accrual rate to be constant for all years. This drives the measured income accrual in Block A line 6.

TABLE APP14 - TRADE AND OTHER PAYABLES

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DATA TABLE SUBMISSION COMMENTARY

We have ensured this table reconciles to the Ofwat financial model and to the Balance Sheet.

Overall, trade and other payables increase in line with inflation.

Block C: We have kept advanced receipts creditor days constant for all years. This drives the advance receipts creditors on line 8.

TABLE APP15 - CASHFLOW BASED ON THE ACTUAL COMPANY STRUCTURE

Data is taken from the F Outputs tab of the financial model, actual gearing.

TABLE APP15A - CASHFLOW BASED ON A NOTIONAL COMPANY STRUCTURE

Data is taken from the F Outputs tab of the financial model, notional gearing.

TABLE APP16 - TANGIBLE FIXED ASSETS

We have used a projection of our fixed assets at 2019/20 for the financial model, but have then taken the fixed assets additions and balances from the financial model appointee tab.

APP16 represents the company's fixed asset statement.

IAS 16 determines that assets are carried at their cost less accumulated depreciation.

Grants and contributions relating to capital projects should not be netted off the value of any associated asset, but should be held in the balance sheet as deferred income and amortised (or even taken direct to P&L – under IFRS15).

APP16 starts with the historic cost and associated depreciation of fixed assets. However, it then adds a *net* amount for additions (ie cost less any associated grants and contributions). This is incorrect, as IAS 16 states it should be the capital expenditure only which is added, and that the associated contributions should be added to deferred income.

In addition, the depreciation that is then calculated from the model becomes a mix of depreciation and amortisation for the net additions added. (Although the opening balance will still be the true gross figure).

NWL has therefore calculated amortisation outside of the model to enter into APP11, for those grants and contributions held at 31 March 2020 which are not part of the APP 16 opening position. Without this, the amortisation on the opening balance of grants would be missing from APP11 altogether as it doesn't appear to be calculated elsewhere in the model.

All these adjustments have no effect on the revenue requirements or key financial ratios, so we are content that no further adjustments are required. We have made the necessary adjustments to depreciation to reflect the fact that disposals would typically be fully depreciated. The net book values of App16 match those in the financial model.

TABLE APP17 - APPOINTEE REVENUE SUMMARY

This table is entirely populated with data from other tables.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

TABLE APP18 - SHARE CAPITAL AND DIVIDENDS

Block A – Equity Shares

NWL Appointed share capital of £92.05m is consistent across all years and is unchanged from current levels.

Block B – Dividends

Line 8 Ordinary Dividends

For the actual gearing model, we have set these at 4.52% of the previous year's closing regulatory equity. The regulatory equity is taken from the financial model F Outputs tab. As the regulatory equity reflects actual gearing, so do the dividends proposed. Thus, the dividends will increase in the financial model when a notional structure is assumed.

Line 9 Dividend yield

For the notional model, this line is used to set dividends. It is set at 4.52%, as per Ofwat's IAP guidance.

Line 10 Real Dividend Growth

We have not included any real dividend growth to allow for a level of retained earnings across all the controls.

Block C – Preference Shares

We do not have preference shares.

TABLE APP19 - DEBT AND INTEREST COSTS

All debt forecasts and interest rates have been taken from our treasury department forecasts of the opening debt, repayments and interest costs.

Block A

Lines 1-3: Opening debt and lines 7-9: Debt repaid

Opening debt at 1/4/2019 has been taken from our treasury forecasts and aligns with the opening balance sheet at 31/3/2020.

Line 7: For the period to 31 March 2025

NWL has one £350 million Eurobond, dated 6 February 2023 bearing interest rate of 6.875%, which is due to be re-financed. This will provide an opportunity to further review our options and reduce our legacy overall cost of borrowing and help us to maintain our relatively efficient funding model.

We intend to investigate issuing CPIH linked debt in the future, subject to the market continuing to open up. For our plan, we have assumed all index linked debt is financed as RPI linked debt.

Line 6: Index linked debt

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

We have assumed a consistent level of index linked debt is issued over 2020-25 to finance our investments and refinance reductions in embedded debt. We have assumed the £350m Eurobond is financed through a mix of index linked debt and nominal debt.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Line 10: Indexation of Index Linked loans

This is taken from the financial model, Appointee line 110. It is consistent with the interest rates set out in lines 13 and 14.

Block B

Interest rates for new debt, Lines 12, 14 and 20: We have set these in line with the Ofwat assumptions in Appendix 12 of the methodology. Lines 12 and 20 have been set at 3.4%, as per Appendix 12 page 17. Line 14 has been set at 0.38%, at the RPI stripped cost of debt.

Lines 15 and 16 have been set at the weighted average of the mix of embedded and new debt, based on the balances and interest rates set out in the table.

Line 18 has been set by reference to the British Pound Ask Swaps Curve.

Line 21: The 5% interest rate for retail is based on the interest rate we have observed for the non-household retail business.

TABLE APP20 - COST OF DEBT / ANALYSIS OF DEBT

Analysis of the gross debt position as at 31 March 2018, categorised by fixed, floating and index-linked instruments. Column V (Value per balance sheet at 31 March 2018) is as per '1E Net debt analysis as at 31 March 2018' in the Annual Performance Report.

TABLE APP21 - DIRECT PROCUREMENT FOR CUSTOMERS

No projects are identified. We have explored opportunities for potential schemes to be delivered through the direct procurement for customers model and have not identified any projects of sufficient scale to warrant this approach.

TABLE APP22 – PENSIONS

The defined benefit (DB) charge for 2018-2025 is based on the actual 17-18 charge with an assumption that the DB salary roll will reduce by 5% each year, in real terms, to reflect employees leaving the company. The scheme is not open to new starters, as they join the defined contribution scheme.

The DB on-going cash contribution is based on the current schedule of contributions agreed between the Trustees and the company. This will see the company pay in £12.3m per year, commencing January 2018, which will be increased by RPI each year. Note that around 98% of this relates to appointed business employees.

The DB deficit contribution is based on current contribution increasing by RPI each year. There is an additional uplift from 21/22 of £2.6m per year. The contributions made to reflect company N.I. savings from employees paying their contributions through salary sacrifice are assumed to continue.

TABLE APP23 - INFLATION MEASURES

This table was submitted as part of our early data submission on 27 July 2018.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

TABLE APP24 - INPUT PROPORTIONS

Lines 1, 7, 13, 19, 25 & 30: General labour, includes all employment costs direct and general support, also included is operational hired and contracted services eg water and sewerage network field contractors

Lines 2, 8, 14 & 20: Energy, includes direct costs and general & support. Row 20 includes income treat as negative expenditure for sale of energy

Lines 3, 9, 15 & 21: Chemicals all direct costs

Lines 4, 10, 16 & 22: Materials, plant and equipment, includes direct and general & support

Lines 5, 11, 17, 23, 26-28 & 31-33: Other input costs, all other costs including abstraction licences and rates

TABLE APP24A - REAL PRICE EFFECTS (RPES) AND EFFICIENCY GAINS

Key point: All our totex projections in our plan (WS1, WWS1) are net of the adjustments in this table. Hence, any changes made to IPP, RPE or Efficiency targets should take account of the adjustments already made.

Setting our stretching 2020-25 annual efficiency target of 1.5% pa.

We have set ourselves a challenging 1.5% pa efficiency target for base modelled totex.

The target was derived from an assessment of industry performance over 2015-20 and is additional to the stretching catch up targets for Water Resources and Water Network Plus.

NWL has commissioned Economic Insight to assess the level of IPPs and the scope for Efficiency gains. We have used the EI report in setting the IPPs and thus the RPEs.

The efficiency gains are set with consideration of the EI report, but have also been considered and approved by the Board, as these figures set the stretching efficiency targets in the plan. Other evidence such as the KPMG report commissioned by Ofwat was also considered.

We have set a 1% pa efficiency target for other capital expenditure (enhancements), as the evidence from EI suggests lower opportunities for capital efficiencies.

Calculations

The targets are set out in App24a. They combine the Real Price Effects and the Annual Efficiency Target to arrive at the year on year efficiencies we have applied to all base modelled totex.

Table 24a requires data on real price effects (RPE), input price pressures (IPP) and efficiency gains (EG) for each of the five price controls, allocated across five types of expenditure.

In the business plan guidance, Ofwat define RPE as the difference between IPP and CPIH. We have used the formula in the guidance.

Stage 1: Forecast Input Price Inflation (IPI)

For IPI, we have based our forecasts on a report from Economic Insight

	Input Price Inflation		
Service	Opex	Capital Maintenance	Capital Enhancement
	% pa	% pa	% pa
Water Resources	2.22	3.23	3.05
Water Network Plus	2.23	3.23	3.05
Wastewater Network Plus	2.28	3.23	3.05
Bioresources	2.19	3.23	3.05
Retail Household	2.50	-	-

Source: Economic Insight Reports, NES PR19 RPE Tables 1-4, NES PR19 IPP Table 1

Stage 2: Calculate Real Price Effects (RPE)

These are calculated as per the Business plan guidance as:

RPE = (1+IPI)/(1+CPIH)-1

For all years, we have assumed CPIH is 2% pa.

	Real Price Effects		
Service	Opex	Capital Maintenance	Capital Enhancement
	% pa	% pa	% pa
Water Resources	0.22	1.21	1.03
Water Network Plus	0.23	1.21	1.03
Wastewater Network Plus	0.27	1.21	1.03
Bioresources	0.19	1.21	1.03

Note – as per the guidance, the tables do not require a RPE measure for retail services.

Stage 3: Assess Efficiency Targets of 1.5% pa

We noted the KPMG slides on TFP from the Ofwat workshop on 15 March 2018 and we agree with the desire to set stretching frontier efficiency targets. However, in our view, the KPMG approach 'double counts' the 2015-20 efficiencies by adding a totex and outcomes effect on top of the TFP frontier shift.

The KPMG Slide 25 indicates PR14 outperformance from 3% to 11%. At a central estimate, this would be around 7.5% in total or 1.5% pa. This outperformance has been delivered during a period where a totex and outcomes regime has been in place, so any gains from this approach are included in the industry outperformance of that period.

This 1.5% pa efficiency frontier shift experienced over 2015-20 should, in our view, be the basis for an annual frontier efficiency target for 2020-25.

An efficiency target of 1.5% pa is extremely challenging target for a company that is at the UQ or Frontier for all five controls. It is higher than the 0.5% to 1% high case scenarios suggested by our report by Economic Insight.

We have concluded that a stretching target of 1.5% pa across all base modelled totex is an appropriate level of ambition for what we believe is an UQ company.

When this is combined with our stretching water services targets, our overall efficiency targets are extremely challenging. These will only be met through a step change in efficiency due to innovation. We have set out in Section 9.6 case studies of our plans for delivering these efficiencies.

TABLE APP25 - PR14 RECONCILIATION ADJUSTMENTS SUMMARY

All inputs are from the RCV or Revenue adjustment models. All calculated cells align with those two models.

TABLE APP26 - RORE SCENARIOS

1 Summary

We have set below out the RORE ranges based on the scenarios in App26. All data is taken from the Financial Model RORE Calc tab. We have used the Sensi tab Block F in the Financial Model to extract the data from Blocks A to N of App26.

We have applied the scenarios as set out in App26. We have also used these scenarios as additional stress tests and assessed the financial ratios derived from them.

We consider the App26 scenarios sufficient and comprehensive enough to illustrate the balance of risk and return the company faces.

We have used the data post mitigation as the Ofwat's guidance on the table states "*In assessing the effects, companies should consider the full range of financial impacts for each scenario. This includes any direct impacts, but also take account of any efficient management responses to the relevant change in business conditions*."

Risk & Reward analysis

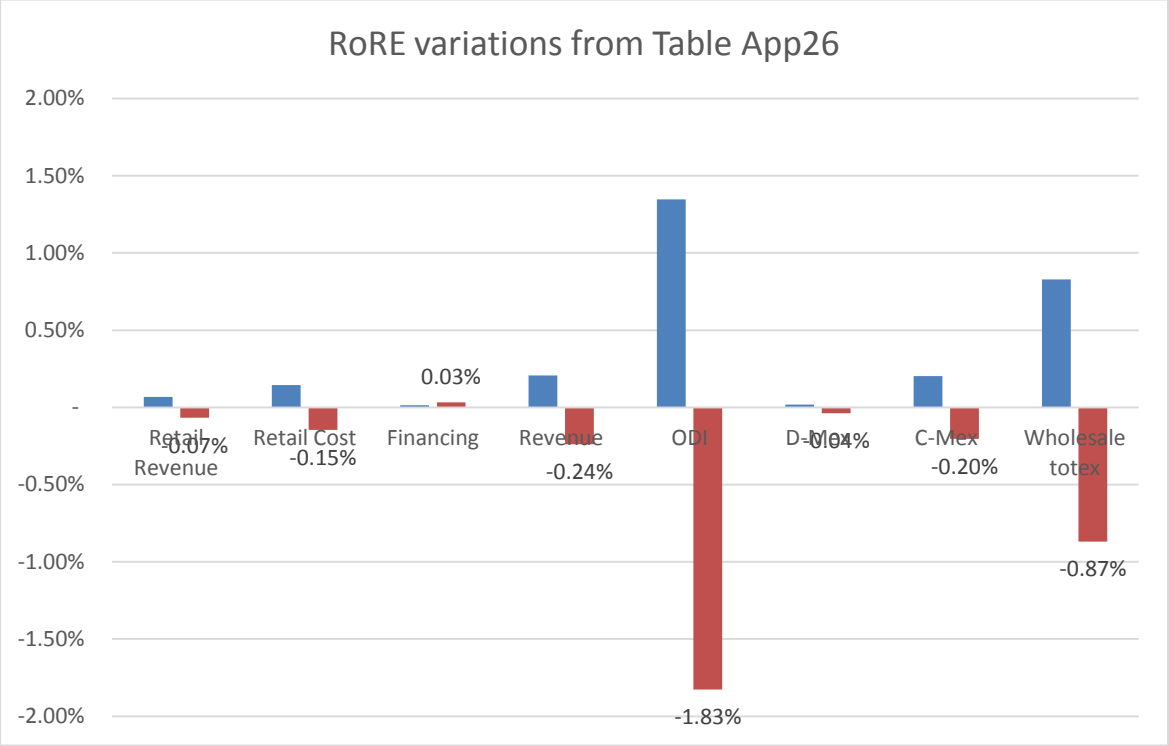
We have shown summary RORE data post mitigation, per App26:

Notional RORE	**Upside**	**Downside**
Base	**4.73%**	**4.73%**
Retail Revenue	0.07%	-0.07%
Retail Cost	0.15%	-0.15%
Financing	0.01%	0.03%
Revenue	0.21%	-0.24%
ODI	1.35%	-1.83%
D-Mex	0.02%	-0.04%
C-Mex	0.20%	-0.20%
Wholesale totex	0.83%	-0.87%
Total	**7.56%**	**1.38%**
Variation from base	2.83%	-3.36%

In presenting these average ranges, we have shown the RORE range that would apply for a P10/P90 event in each year. We have not shown in the table any additional mitigation that could occur in

consequence such an event (ie in subsequent years). This is because using an average 5 year RORE with such mitigation would mask the underlying single year RORE variations due to the event.

The post mitigation RORE ranges are shown as:



Thus, we can see large range for possible ROREs, from 2.8% higher to 3.4% lower. As an illustration, a P10 performance results in returns of below 1%.

2 Revenue variations

Blocks A & B Revenue for High & Low RORE scenarios

Total Revenue impacts, high & low cases – all wholesale controls

Wholesale income, Lines 1,4,7,8,12,15,18,19

To assess the P90 & P10 ranges for revenue variations, we have considered the variability given the self-correcting approach of setting tariffs each year to recover the appropriate wholesale revenue, given knowledge of revenue variations to date. In consideration of this, we have taken into account that the tariffs for a forthcoming regulatory year are set in January and so there is knowledge of:

1 Revenue variations for the 9 months of the preceding year

2 Projections of revenue based on forecast new properties, demand and meter optant take up.

3 WRFIM revenue variations adjusted for with a one year lag.

With this in mind, we would anticipate that revenue variations against the determination values should be temporary, with the majority of corrections made in the immediate or following regulatory year. This is the mitigation we have assumed in our table by assuming a single year variation as a maximum for all 5 years.

As a cross check, we have reviewed the NES PR14 Revenue Correction Mechanism model data. That indicates there was a 3-4% cumulative revenue variation between Final Determination and Actual revenue from 2010-11 to 2014-15. This revenue loss related to the impact of the 2008 recession and low growth on industrial demand and housebuilding. The variation was cumulative to 2015 (there was no opportunity to change tariffs to correct for variations), with annual revenue variations of 0.5% to 1%.

For this reason, with the annual adjustment to tariffs available to the company, the upper bound of variations before tariff correction would be 1%-2% (maximum two years of variations).

We have also reviewed our current level of variations in the WRFIM modelling over 2015-20. The WRFIM model has a 3% threshold that we have not breached to date. To date, for the water service, our maximum variation is 2%, with wastewater only varying by less than 1%.

We have thus set the P10 and P90 variances for these revenue variations at 2% of revenue. As the revenue controls allow for corrections of revenue variations in future years, we have kept the same variations for all years. This +/-2% range is thus an expert judgement based on income data going back to 2010 that we believe represents the P10 and P90 range, with the areas outside this representing variations are technically possible, but we have not encountered in recent history.

For water resources, water network plus and wastewater network plus, variations in revenue from the revenue control will be due to different levels of income than those forecast when tariffs are set in the preceding year.

For bioresources, we have considered the possibility of greater variations due to the revenue control being linked to tonnes of dry solids (tds) rather than a direct revenue control. Our bioresources strategy is mature and stable and have produced a stable level of tds since our move to Advanced Anaerobic Digestion. Our tds forecast does indicate an increase in tds volumes of around 5% over 2020-25, due to general population and property growth. We have thus used a 5% revenue variation to capture the possibility that this growth may not occur or grow twice as fast. Events such as economic growth or recession can have a significant effect on housebuilding and the outcome of the Brexit arrangements may have an impact. We have phased in this impact over the 5 years, starting with 1% in 2020/21 and closing at 5% by 2024/25. The P90/P10 choices are expert judgement and are in line with the assumptions behind the revenue variations experienced during industrial recession over 2010-15.

Lines 10 & 21 Residential Retail

For retail household, the retail household model for 2015-20 indicates variances to date of less than £1m, or 2% of retail household revenue. We have thus used 2% of revenue as our P90 / P10 range.

Water Trading

Lines 2,3,5,6,13,14,16,17

NWL has no need for water imports over 2020-25 for either operating area as we are in resource surplus, with no new schemes planned over the next 25 years. We have instead focussed on the opportunities for exporting water from both our regions.

Whilst we continue to look for opportunities for water trading from our surplus water in the North, the costs of making such transfers appears to be prohibitive. We have had enquiries from our

neighbouring water companies on the costs of abstraction of the water from the Kielder supported system, but the costs of long distance transfers over the rural boundaries that separate NWL from our neighbours have made such transfers unviable. In each case, there are no suitable existing cross border pipelines and systems available for use. This has been confirmed by external studies on building a water grid by the Institute of Civil Engineers for example. We consider it unrealistic to model any such trades in our scenarios. Full details of our discussions are set out in our Northern WRMP Section 1.1.

For ESW, as NWL has already undertaken the largest water trade since privatisation with Thames Water, we have modelled on the revenue upside an increase in the contractual amount supplied under this agreement and take up the water traded alongside the reservation charge. This is an extra 1m income pa in line 5, as the trade is for water resources only. This additional take up request has been made in the past by Thames although it is not in our base case. We cannot envisage any additional water trading revenue beyond this as this additional request would secure the full headroom for our water supply. As such, the P90 value is the same as P100, as the volumes cannot increase further.

Hence, whilst we have shown the additional request as P90, in practice, the probability range is discrete rather than normally distributed.

For line 17, water trading incentives, we have included the water trading incentive revenue that we are claiming for the Thames trade as part of Table WS17. We would not expect a further incentive for increasing the volume supplied as this would not be a new qualifying trade. Again, this seems likely to be binary – the incentive is either awarded or it is not.

We have not modelled any additional trades for ESW as the Thames trade was the maximum level we could provide given the constraints of our long term WRMP.

Dummy and Business Retail

Lines 9,11, 20 & 22

The dummy control does not apply to NWL, we have no proposed DPC schemes.

We have exited the business retail market, so these lines do not apply.

3 Totex variations

Blocks C & D Totex for high & low RORE

For all the totex blocks, in setting the P90 and P10 values, we have relied on expert judgement based on a combination of historical evidence, industry data and input cost forecasts. We have set out the gross impact before the sharing adjustment.

We have summarise our RORE totex ranges as:

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Pre Mitigation:

% of Totex	Water Resources	Water Network	Wastewater Network	Bioresources	Retail HH
High RORE (efficiency) P90	7.5%	7.5%	7.5%	10%	10%
Low RORE (overspend) P10	7.5%	7.5%	7.5%	10%	10%

Starting with pre mitigation, we considered the possible totex variations. A review of industry performance to date against the PR14 FD suggests a range of actual totex performance from 19% below FD to 12% above. The two companies that overspend the determination appear to be temporary outliers. If we exclude these two, the WaSC performance range is from 92% of FD to 81%, **a range of around 10%, or +/- 5%.**

In addition to these variations, we have considered the possibility of input cost variations compared to our plan. Our report by Economic Insight for Table App24a (Real Price Effects) indicated:

Cost Type	**High – Low Range**	**Range**
Labour	2.2% - 3%	2.6%
Energy	2.8% - 3.4%	3.1%
Chemicals	2.8% - 5%	2.2%
Capex	2.2% - 3.7%	1.5%

The weighted average range for this is 2%, so we have **a +/-1% pa variation** around our totex central forecasts.

Extracts from EI Report:

Table 8: Our overall Northumbrian Water labour cost inflation forecasts, 2020-25, 2 digit SOC codes

Price control area	Scenario	2020 / 21	2021 / 22	2022 / 23	2023 / 24	2024 / 25	Avg
Company	High (independent third-party forecasts)	2.69%	3.11%	3.07%	3.07%	3.07%	3.00%
	Central (econometrics based on wages % changes)	1.87%	2.29%	2.25%	2.25%	2.25%	2.18%
	Low (wedge to UK wages)	1.86%	2.28%	2.24%	2.24%	2.24%	2.17%

Table 12: Our overall Northumbrian Water energy cost inflation forecasts, 2020-25

Price control area / year		2020 / 21	2021 / 22	2022 / 23	2023 / 24	2024 / 25	Avg
Company	High (BEIS reference case)	2.16%	3.01%	2.98%	3.63%	5.09%	3.38%
	Central (BEIS low growth)	2.11%	2.92%	2.91%	3.54%	5.04%	3.30%
	Low (BEIS low prices)	1.46%	2.40%	2.25%	3.19%	4.83%	2.83%

Table 15: Our overall Northumbrian Water chemical cost inflation forecasts, 2020-25

		2020 / 21	2021 / 22	2022 / 23	2023 / 24	2024 / 25	Avg
Company	High (trend)	4.99%	4.99%	4.99%	4.99%	4.99%	4.99%
	Central (econometrics)	3.45%	3.54%	3.27%	3.52%	3.52%	3.46%
	Low (independent third-party)	2.76%	2.76%	2.76%	2.76%	2.76%	2.76%

Table 19: Our overall Northumbrian Water capital cost inflation forecasts, 2020-25

		2020 / 21	2021 / 22	2022 / 23	2023 / 24	2024 / 25	Average
Maintenance	High (trend)	3.73%	3.73%	3.73%	3.73%	3.73%	3.73%
	Central (wedge to GDP)	2.43%	2.72%	2.71%	2.71%	2.71%	2.66%
	Low (wedge to CPIH)	2.22%	2.21%	2.21%	2.21%	2.21%	2.21%
Capex	High (trend)	3.55%	3.55%	3.55%	3.55%	3.55%	3.55%
	Central (wedge to GDP)	2.25%	2.54%	2.53%	2.53%	2.53%	2.47%
	Low (wedge to CPIH)	2.02%	2.01%	2.01%	2.01%	2.01%	2.01%

Source: Economic Insight analysis

In effect, this gives us the likelihood of company totex performance variance aggregated with the likelihood of industry cost variations. We consider that aggregation is appropriate as we believe that industry variations against FD over 2015-20 have not been due to variations in input costs, but reflect efficiency and operating performance.

Adding the ranges together, using the expert judgement based on recent history and detailed input cost forecasts, **we arrive at a pre mitigation P10/P90 range of +/- 7.5%** (5% plus 1% extra per year averaged over 5 years). We have used a +/-10% range for bioresources as we believe the baseline is more volatile given the industry move to new technology (AAD) over 2020-25. The published Ofwat efficiency model confirm a wide range of variations in efficiency across the industry and our own bioresources costs have varied more over time than any other control over the last 10 years.

Finally, we apply mitigation to the totex ranges:

Totex mitigations

NWL Efficiency position

As the business plan tables are based on our proposed totex rather than the baseline, we have centred our range at 0%, but we believe that the totex range will change once the business plan totex is replaced by the baseline.

In considering the P10 and P90 range for totex, we have taken into account our views of our relative efficiency for each of the five controls. For the water service (resources and network plus) and for retail household, although we consider we are at the UQ baseline, we recognise that this is due to stretching efficiency targets and so a totex overspend is equally likely as an underspend.

For wastewater, we consider that we are below the baseline for both network plus and bioresources. Under Ofwat's methodology, this should result in a totex allowance that is greater than the projected business plan levels. We consider this makes outperformance of the baseline likely and underperformance unlikely.

Consideration of the likelihood of cost increases by major component

UK Government Charges (Abstraction Charges & Business Rate)

Around 13% of total totex relates to UK Government Charges. These are viewed by Government as taxation and are thus constrained by Government policies.

Abstraction charges have been stable in absolute terms for NWL for at least 10 years, with the Government requirement that they are limited to cost recovery meaning they cannot be varied without justification.

Business Rates for NWL have recently been increased, making a further increase unlikely, as the cost shock has already happened in effect and is in our base totex projections.

For this reason, a more plausible scenario would be a 5% cost increase.

Enhancement totex

Enhancement totex represents 28% of total totex in the NWL plan. It has been costed based on our current cost database. We have adjusted the costs for input price pressures. Our track record on delivering enhancements efficiently is good, with our Whitburn scheme in 2015-20 being delivered efficiently for example.

For this reason, we believe that a 5% cost increase is a more plausible scenario.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Wages and salaries

Around 20% of totex relates to direct wages & salaries. As pay awards are likely to be closely correlated to CPIH, any variation in these aggregate costs would be related to increased employment. As we employ around 3000 people, a 5% increase would mean an extra 150 people employed, enough to cover any activity related workload increase that we have experienced in the past. Our capacity headroom for water resources and treatment and our commended response to the recent 'Beast from the East' thaw confirms that we can handle increased demand on our services without a dramatic increase in our workforce.

For this reason, we believe a 5% increase in costs is a more plausible scenario.

Uncertainty Mechanisms

We have not proposed any uncertainty mechanisms in our plan, so we have not used these lines. We are not proposing any notified items for totex and we do not have any schemes that we consider uncertain.

Post mitigation Totex Ranges

We consider a **post mitigation +/- 5% totex range** to be reasonable for the following reasons:

1. It generates a RORE of +/- 1.7%. This is close to the pre-mitigation range of +/-1.9% for NWL in PR14.
2. It is similar to the NWL stress test, but short of the severe stress test of a 10% totex overspend.

Post Mitigation:

% of Totex	Water Resources	Water Network	Wastewater Network	Bioresources	Retail HH
High RORE (efficiency) P90	5%	5%	5%	5%	5%
Low RORE (overspend) P10	5%	5%	5%	5%	5%

Finally, whilst we have applied the 5% variance in 2020/21, we consider the mitigation that would apply in subsequent years following such a variance. We thus reduce the variance to 2.5% by 2022/23 to reflect this.

Block D, line 45: Water Trading – Water Resources

We have included the costs of actually supplying the water in the Thames trade in this line. To date, the trade has been as a reservation only, but the contract does allow for the supply itself, which would increase NWL totex slightly, but also the revenue.

Block E & F: Retail Costs

Taken from our study by Economic Insight on Input Price Pressures, the variation in retail input price pressures from high to low is around +/- 0.5% pa. The 2015-18 degree of variation in company performance against PR14 FD is around +/-7.5% once outliers have been removed.

Table 1: Summary of forecast gross retail IPP

	2020/21	2021/22	2022/23	2023/24	2024/25	Average
High	2.35%	2.55%	2.53%	2.53%	2.53%	2.50%
Medium	1.84%	2.20%	2.04%	2.08%	2.11%	2.05%
Low	1.64%	2.02%	1.85%	1.89%	1.92%	1.86%

Source: Economic Insight analysis

As an aggregation of the two, we have thus assumed a pre mitigation P90/P10 range of +/-10% for retail. As an example, this could represent a 20% increase in bad debts, which are around half of HH retail costs. That is a plausible P90/P10 variation in our experience of what could happen under for example, a recession (P10) or an improvement in landlord's legislation to allow easier collection of debt from tenants (P90).

We then amend the range to a **post mitigation +/- 5% range** to reflect our efficiency position and the extent to which management action would respond to a retail cost shock.

Blocks G & H Business Retail

These are not applicable for NWL as we have exited the retail market.

4 Outcome Delivery Incentives (ODIs)

Blocks I & J ODI Rewards & Penalties (pre tax adjustment)

Context and introduction

As part of the PR19 business plan process, we need to calculate its RORE range to illustrate the potential upsides and downsides of the regulatory incentives. We have been supported by Frontier Economics in calculating our RORE range for the financial incentives relating to our proposed PR19 outcomes package, ie the ODIs. As Ofwat expects companies to carry out statistical modelling when calculating the RORE range for ODIs, we have used Monte Carlo analysis.

We explain in the rest of this section:

- how RORE range calculations generally work;
- the Monte Carlo approach that we have applied in this case; and
- how our analysis can be used to complete table App26.
- RORE range calculations

The RORE range illustrates the potential upsides and downsides of financial incentives, in this case the ODIs. Typically, the RORE range is calculated as follows:

Assumptions need to be made for the P10 and P90 performance levels. The P10 level should be the performance level at which there is a 10% chance the company performs worse than this, and the P90 level corresponds to the performance level where there is a 10% chance that the company performs better than this. P10 and P90 levels should be set for each of the five years, and companies may assume a glidepath in some cases.

The P10 and P90 financial impacts are then calculated for each PC. For example, in a simple case, the P10 financial impact is calculated as the number of units between the P10 and the PC, and then this number of units is multiplied by the underperformance unit incentive rate. Note that these calculations should take account of: any deadbands; any caps / collars; and enhanced thresholds and enhanced incentive rates.

The P10 and P90 financial impacts should be calculated for each PC, and in each year.

Typically, the P10 financial impacts for each PC are all added up for each year, and the P90 financial impacts for each PC are all added up for each year. A total P10 financial impact (across all PCs and all years) and a total P90 financial impact (across all PCs and all years) can then be calculated.

We have assumed that our performance on each PC is normally distributed. While not all of our PC levels are exactly in between our assumed P10 and P90 levels, most of our PC levels are broadly in between our assumed P10 and P90 levels. The assumption of a normal distribution is therefore a reasonable approximation to make, and there is no material evidence that the distributions are different to this.

We have focused our analysis on the correlations between our performance across PCs, rather than across time, as the correlations across PCs are the more interesting point. To keep our analysis proportionate, we have therefore made the simplifying assumption that the correlations across time are one-for-one.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Monte Carlo approach

The typical RORE approach explained above assumes that there is a one-for-one correlation between a company's performance across time, and across all PCs. Or in other words, that a total P10 scenario amounts to the company performing at P10 on all PCs in all years.

We have used the @risk tool in Microsoft Excel to run Monte Carlo analysis to simulate the total possible financial impacts of our ODI package. These simulations enable us to calculate a distribution of total possible financial impacts, and we can determine from this the total P10 and total P90 financial impacts.

The inputs to this Monte Carlo analysis are as follows:

The calculation of NWL and ESW total financial impact of the ODI package, ie the way that ODIs are calculated, based on the PCs, ODIs and actual performance levels.

An assumption of the distribution of NWL's and ESW's performance on each PC. We have assumed that the distributions are all normal, and therefore that the mean performance level is halfway between the P10 and P90 levels for each PC.

The Monte Carlo analysis also requires us to make assumptions on all pairwise combinations of PCs. We provide further detail on this below.

Assumptions on the correlation between our performance over time:

We have made the simplifying assumption that NWL's and ESW's performance in one year is correlated one-for-one with its performance in other years.

We provide further detail below on the assumptions we have made in relation to the correlation across PCs, and then how the @risk tool runs the Monte Carlo analysis.

Correlations across PCs

As explained above, the standard RORE approach would be to implicitly assume that there is a one-for-one correlation between performance on PCs. In practice, some PCs are likely to be more closely correlated than others. In order to carry out the Monte Carlo analysis, we made the following assumptions:

- We used a one-for-one correlation for each PC with itself (e.g. 3 hour supply interruptions with 3 hour supply interruptions)
- We also grouped some PCs together that appear closely correlated, and applied one-for-one correlations to each pairwise combination within each group (e.g. one for one between 3 hour supply interruptions and 1-3 hour supply interruptions, but not between 3 hour supply interruptions and the sewer flooding measures). The groups are as follows:

  - Supply interruptions: 3 hour interruptions; 1-3 hour interruptions; 12+ hour interruptions
  - Sewer flooding: internal sewer flooding; external sewer flooding; repeat sewer flooding; risk of sewer flooding; sewer collapses; sewer blockages;
  - Leakage: Leakage NW; Leakage ESW; response to leaks
  - Pollution: pollution incidents; bathing water quality; and treatment works compliance

Below we have also provided the Monte Carlo distributions that resulted from the two sensitivities Frontier Economics ran on our behalf.

We then grouped PCs into those which are affected by the weather and those which are not. We assumed a high correlation (e.g. 0.75) between two weather PCs, and a medium correlation (e.g. 0.5) between two non-weather PCs and also between weather/non-weather combinations. We summarise below the PCs we identified as being driven by weather.

All three supply interruption measures, all sewer flooding measures, PCC, mains burst, AIM,

We then considered if performance on any particular PCs are quite separate to performance on other PCs. We felt that CRI performance may be quite separate to performance on other PCs, and applied a low correlation (e.g. 0.25) between CRI and everything else.

We assumed that the minimum level of correlation between performance on different PCs was 0.25, as there is always the common factor of management control. We note that some correlations were inputted as negative, but only in pairwise combinations with the opposite direction of improvement (e.g. where one direction of improvement was up, and the other was done).

@Risk tool

The @risk tool allows many simulations to be run, based on varying the input data. In this case, the tool varies the performance on each PC, taking into account the distribution of possible performance levels on each PC and the correlation in performance across PCs. Under each simulation, the tool calculates the total financial impact (based on the performance on each PC and the incentive rates), and then traces out the distribution of total financial impacts. We then report the P10 and P90 levels of this distribution. We note that these P10 and P90 levels of total financial impact are for the five year period.

Using these P10 and P90 total financial impacts, the RORE range can be calculated by dividing the financial impacts by NWL's regulatory equity for the five year period.

The effect of this statically modelling is to trim down the RORE range, in comparison to the more standard approach explained above.

Results

Frontier Economics worked with us to build the correlation of PCs, grouping them how we described earlier in this paper. We then tested two correlation matrices with these groupings. The first used the sensitivities 0.25 for low, 0.5 for medium, 0.75 for high and some one-for-one correlations, whilst the second used 0.4 for low, 0.6 for medium, 0.8 for high and some one-for-one correlations. The results of which were:

Comparing different sensitivities

	Number of simulations	P10 (£m)	% trim down	P90 (£m)	% trim down
Test (perfect correlations)	100,000	-179.8	N/A	136.0	N/A
Sensitivity 1	100,000	**-149.3**	**17%**	**113.8**	**16%**
Sensitivity 2	100,000	**-156.7**	**13%**	**119.8**	**12%**

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Input for App26

As per the guidance, the outperformance payments/underperformance penalties impact are recorded in the year in they are earned/incurred (rather than when they are paid).

App26 requires that we report the high and low RORE values in terms of £m, per year and price control. The above Monte Carlo analysis provided us with a total AMP RORE analysis.

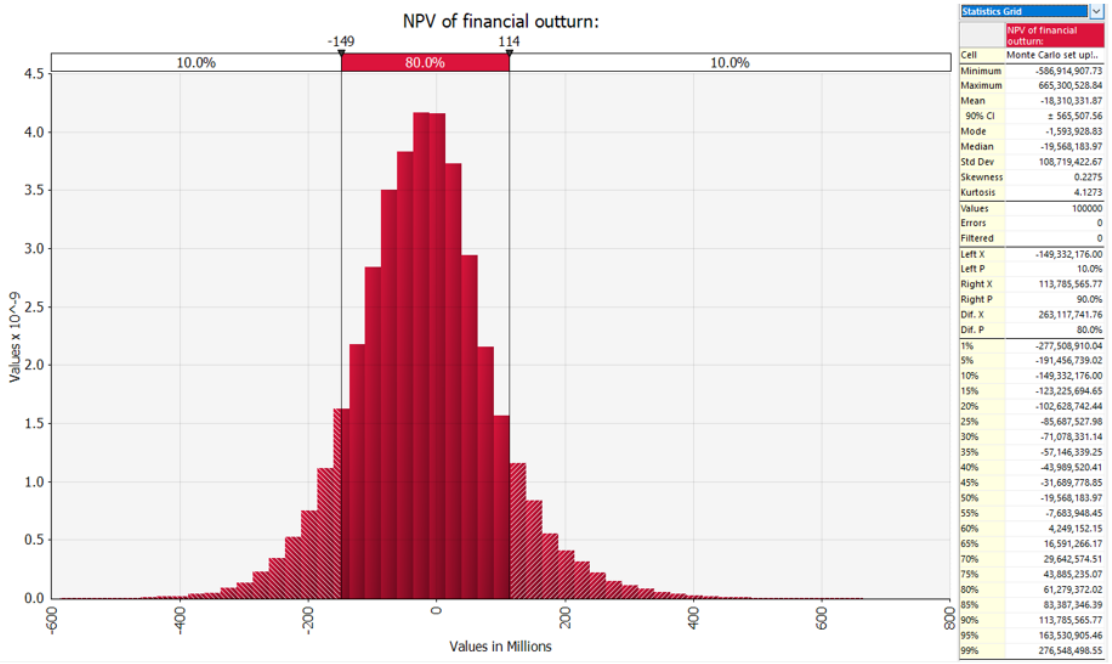
To report the RORE in the required range, we used the App1 P10 and P90 values to total each price control per year. Against these totals we applied the Monte Carlo analysis trim down rate calculated between the summed P10 / P90 and the new Monte Carlo P10 / P90 rates.

We chose to use sensitivity 2 to calculate our scenario based high and low case RORE ranges for App26.

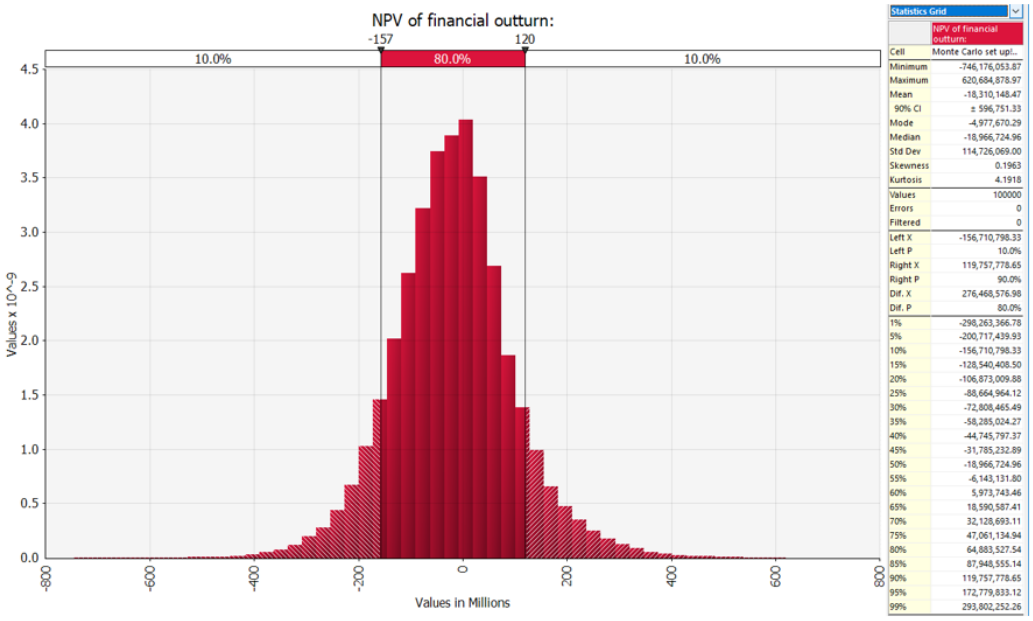
(Note: The total RORE shown above and in App26 is slightly different to that shown in the above slide. This is due to a minor change that occurred in App1 (changing our sum of original P10 / P90s rates) after Frontier Economics ran our @risk tool analysis. However as we had the trim down rates we could apply these in the same way to obtain the required values that were proportionate).

Below we have also provided the Monte Carlo distributions that resulted from the two sensitivities Frontier Economics ran on our behalf.

Sensitivity 1 – 0.25 for low, 0.5 for medium, 0.75 for high and some one-for-one correlations



Sensitivity 2 – 0.4 for low, 0.6 for medium, 0.8 for high and some one-for-one correlations



APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

5 CMEX & DMEX

Blocks K & L CMEX & DMEX rewards & penalties

We calculated CMEX as a percentage of residential retail revenue over 5 years and DMEX as a percentage of developer contributions, as per their methodologies.

We have set out a symmetric range for CMEX of +/1-6%, but an asymmetric DMEX range of +2% to -4%.

	P10 2020-25	P90 2020-25
CMEX	-6.0%	6.0%
DMEX	-4.0%	2.0%

The full range for CMEX is +/- 12% of residential retail revenues. We consider our historical performance under SIM suggests a lower P10 bound of -6%, whilst the extremely challenging cross sector threshold suggest this will be above the P90 range.

The full DMEX range is + 2.5% to -5%. We have thus reflected the asymmetry in our P90/P10 ranges.

6 Debt Financing

Blocks M & N Financing performance

To generate the figures for RORE table M, “Financing performance – cost of new debt for high RORE” the following steps were taken:

A phased decrease in the cost of debt is applied to new debt in each year (ie a decrease of 2% by the end of AMP7).

This results in a decrease in interest expense at the Appointee level (the incremental interest expense), calculated on the basis of the notional financing structure.

This incremental interest expense is then apportioned between the four controls, weighted by the average nominal RCV of each control.

The incremental interest expense incurred by the company is adjusted to reflect the cost of debt indexation mechanism, calculated on a notional basis.

These figures are then deflated to give the 2017-18 CPIH deflated results.

The same approach with an increased cost of debt was applied to generate the figures in RORE table N, “Financing performance – cost of new debt for low RORE”

Note of the cost of debt P10/P90 and the choice of a 2% variation

In the Base Case scenario interest rate for new debt are consistent with the cost of new debt in the Ofwat guidance.

However NWL’s cost of debt allowance is sensitive to movements in interest rates, including exposure to changes in the daily A/BBB iBoxx indices (which include both general interest rate and credit spread risk).

Exposure to changes in the cost of debt include movements in:

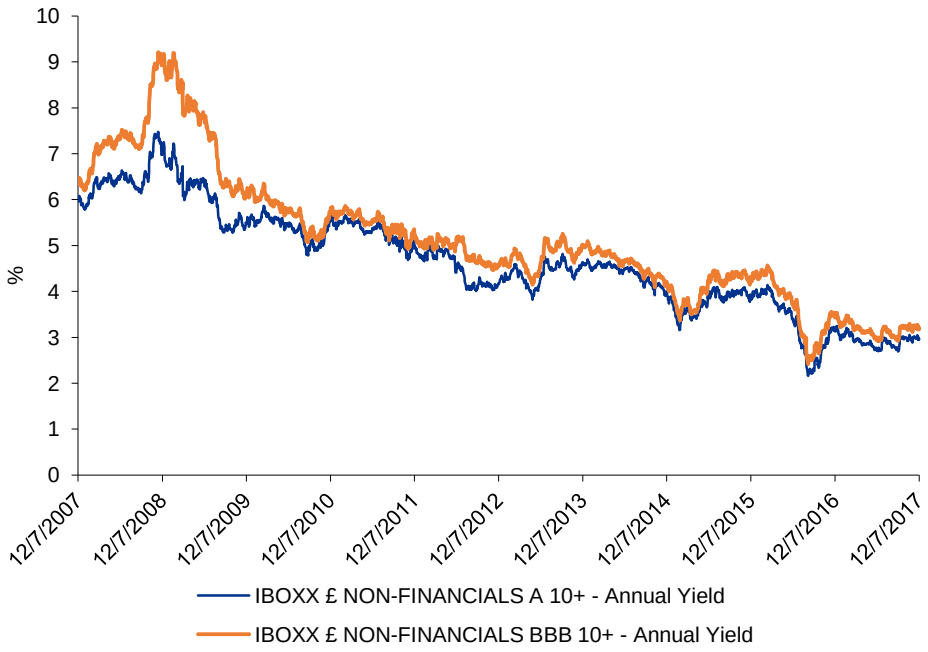
- Gilt yields; and
- LIBOR

The interest rate changes in the economic scenarios impact on the revenue allowance through the iBoxx true-up mechanism, as well as the outturn cost of new debt.

The interest rate scenarios considered are informed by the historical volatility of the relevant iBoxx indices.

A chart setting out the annual yield of A and BBB iBoxx (non financial, 10+) is set out below to illustrate historical interest rate volatility.

iBoxx Annual Yield 2007 - 2017



The A and BBB iBoxx (non-financials) over the last c.10 years suggests that (assuming that NWL issuance is correlated to iBoxx):

(1) Movements in interest rates can be phased (with increases/decreases in interest rates applied gradually over time) or not phased (with an immediate impact on market variables ie, the changes in interest rates are applied from the first year of AMP7 rather than being phased over AMP7). Interest rate movements are predominantly phased over time based on the annual yield of A and BBB iBoxx (set out above)
(2) Movements in interest rates of +/- 2% over a 5 year period are consistent with historical interest rate volatility, however do not represent the P0/P100 movements
(3) Movements in interest rates of 2% are also consistent with the Ofwat financial resilience scenario set out in the April 2018 consultation "Putting the Sector Back into Balance"
(4) P10 and P90s are based on phased + / - 2% relative to base case (4.36% under the notional financing structure)

Comments on the application of the I-Boxx mechanism

The true up assumes high embedded debt in the early years of the AMP, decreasing over time.

As the cost of embedded debt exceeds the cost of new debt, this means that the true up assumes interest costs to be high early in the AMP

This means there is a mismatch in the early years between the ex-ante allowance (which assumes a fixed proportion of new to embedded debt), and the true up adjustment (which assumes a phased increase in new debt)

In consequence there is a significant positive true up value in the early years even in the base case as high embedded debt costs are assumed to exceed the ex-ante allowance (which assumes only 70% embedded debt throughout)

There is also a true up adjustment in the later years where the cost of new debt is assumed to increase relative to base case over AMP7 in high/low interest rate scenarios

By comparison the incremental interest expense (pre true up adjustment) in high/low interest rate scenarios is assumed to apply to new debt only under the notional structure (which assumes the cost of all debt to be based on the weighted average CoD), and does not take into account potential mismatches between the ex-ante allowance (based on a fixed proportion of new to embedded debt) and interest expense.

7 General Mitigation of all RORE Scenarios

Targeted management actions

Our Executive Leadership Team implements the Board's strategies and closely monitors performance. This includes making sure sufficient and suitable resources are applied to scrutinise performance and identify and manage risk. It also makes sure there is appropriate assignment of responsibilities, corporate structures and reporting lines and accountabilities, supported by annual positive assurance on systems and controls. The events as set out in this commentary would be reported on as they occurred and timely action would be taken to mitigate and adjust for these events.

Correlation of macro-economic effects between Company costs and CPIH/RPI

Significant cost shocks to the UK economy would impact both the UK and the Water industry. Macro-economic events that drive increased costs, such as changes in exchange rates or increases in energy prices will increase both company costs and CPIH. In this way, the increase in Revenue and RCV through an increase in CPIH/RPI will offset the impacts on company costs, although there would be a significant P&L timing difference which would arise as increases in allowed revenue would be lagged, whilst higher opex and index-linked debt costs would arise immediately. Additional RCV growth would provide additional debt capacity which would help to cover the increased costs from a cash perspective.

Broad economic trends such as recession or growth tend to have marginal impacts on NWL, however any recessionary impacts which may occur linked to household debt issues, would likely be more pronounced than seen historically given the combined effects of changes to universal credit arrangements and likely higher base rate costs. Demand for water is generally price inelastic and the main impact of recession on the industry has been through the reduction in the cost of debt.

TABLE APP27 - PR14 RECONCILIATION - FINANCIAL OUTCOME DELIVERY INCENTIVES SUMMARY

This table was submitted as part of our early data submission on 27 July 2018 and has been updated for our latest forecasts for 2018/19 and 2019/20.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

TABLE APP28 - DEVELOPER SERVICES (WHOLESALE)

Blocks A and E Lines 1 and 2, 17 and 18

The total number of new residential connections (water and wastewater) increases over the planning period. The growth property figures for each of the forecasted years are provided by Edge Analytics. In line with the WRPG requirement, NWL is using Local Plan housing growth evidence from all local authorities that are either wholly or partially included within the NWL operational boundary.

The annual total number of new business connections (water and wastewater) is expected to remain constant over the planning horizon.

Blocks C and G

The income from connections charges is consistent with WS2 expenditure on connection charges.

The total income from network reinforcement (lines 8 and 24) for the period 2018-2025 is consistent with the total costs (lines 6 and 23) over the same period.

Requisition mains and sewers income is based on 17-18 income which is considered to be a normal year.

TABLE APP29 - WHOLESALE TAX

Section A : lines 1-6
Brought forward capital allowance pool – General 18%

The tax position reflected in the APR at 31 March 2018 has been rolled forward using the company's financial forecasts for the two years ended 31 March 2020. Amounts of capital expenditure have been allocated across the various tax categories to enable the capital allowance general pool balance at 31 March 2020 to be projected. Allocations are estimated but reflect the company's experience in the first three years of AMP6. A writing down allowance rate of 18% has been used for the projection and no notional pool balances (reflecting adjustments for any capital allowance disclaimers) have been used for this exercise.

The final pool balance at 31 March 2020 has been allocated across the four price controls in proportion to RCVs (which is line with Ofwat's suggested approach).

Section B : lines 7-12
Brought forward capital allowance pool – Long life 6%

The approach outlined in section A above has also been used for the long life pool, using a writing down allowance rate of 6% with effect from 1 April 2019 (following a reduction in the rate from 8% included in Finance Act 2019).

Section C : lines 13-18
Brought forward capital allowance pool – Structures and buildings 2%

Finance Act 2019 also introduced a new annual allowance of 2% for certain expenditure relating to structures and buildings (S&B) incurred on or after 29 October 2018. The capital expenditure analyses referred to above include allocations to the S&B pool from which the tax written down value at 31 March 2020 has been projected. Allowances are claimed when assets are brought into use. It has been assumed that no allowances will be claimed in 2018/19 while all costs will qualify annually thereafter.

Section D : lines 19-53
New capital expenditure

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Adjustments for the capex programme give rise to the largest tax adjustments in the company's tax computation. Accordingly, NWL has taken advice on the allocation of the AMP7 wholesale capex programme across the various tax categories. External consultants with a high level of expertise in the industry – ChandlerKBS – were engaged for this purpose. They have provided annual services to NWL for many years to analyse capex for tax purposes so have significant and relevant experience in this field.

In preparing its PR19 Business Plan NWL has continued to apply the methodology that was agreed with HMRC in 2013 in relation to water and sewage treatment works. As a result, brought forward balances of unrelieved expenditure at 1 April 2020 and the allocation of new capex in the 2020-25 period both take the methodology into account.

Section E : lines 54-68
Disallowable expenditure

a) P&L expenditure not allowable as a deduction from taxable trading profits (lines 54 to 58)

Estimates of expenditure not allowable for tax purposes have been made based on a review of the company's recent tax returns. A disallowance has been made in respect of costs such as entertaining, legal fees, fines and penalties, car lease payments etc. The total amount has been allocated across the four price controls by reference to RCVs at the appropriate year end.

b) P&L expenditure relating to renewals not allowable as a deduction from taxable trading profits (lines 59 to 63)

No adjustments have been made for the disallowance of any renewals costs included in the P&L. This reflects the treatment adopted in recent tax computations.

c) Change in general provisions (lines 64 to 68]

At 31 March 2018 NWL had some provisions which are treated as 'general' for tax purposes (for example, obsolete stock, holiday pay and contractual pension entitlements of former employees). Some of those provisions are expected to be utilised by 31 March 2020. Of the remainder, the accounting assumption is that the annual movement will be nil – that is, either the provision balance will remain unchanged or any additional charge in the P&L will be matched by expenditure incurred. Accordingly, there is no impact on taxable profits.

The provision for contractual pension entitlements of former employees is expected to be utilised evenly over several years, giving rise to an annual deduction for tax purposes of £0.165m. The total amount has been allocated across the four price controls by reference to RCVs at the appropriate year end.

Section F : lines 69-78
Allowable expenditure

a) Allowable depreciation on capitalised revenue expenditure – infra & non-infra (lines 69 to 73)

Tax relief for capitalised revenue expenditure is given on a depreciation basis in accordance with HMRC's deferred revenue expenditure principles. Depreciation included in these lines comprises amounts in respect of brought forward capex and new capex in AMP7.

The approach to claiming deductions for brought forward capex has been established since 2015/16 and involves applying appropriate asset lives to expenditure in respect of underground and above ground assets. This approach is embedded in the company's tax returns and has been extended for the 2020-25 period. New capex falling into this category has been identified using the approach in section D above and appropriate asset lives have been used to calculate the deductions due.

The total amount has been allocated across the four price controls by reference to RCVs at the appropriate year end.

b) Finance lease depreciation (lines 74 to 78)

NWL's commercial fleet is held under finance lease arrangements. The vast majority of vehicles are typically depreciated over 5 years. Tax relief is received in the form of depreciation under HMRC's SP3/91.

Depreciation included in these lines comprises amounts in respect of brought forward capex and new capex in AMP7 identified in section C above. Total deductions due under SP3/91 have been allocated across the price controls by reference to RCVs at the appropriate year end.

In addition to the above, an amount of between £0.8m and £1.6m per annum has been included in respect of allowable expenditure relating to items that were previously dealt with as operating leases but are now dealt with as finance leases under IFRS16. This adjustment mainly comprises depreciation deductible under SP3/91 principles but also includes finance charges not allowed for anywhere else in the model.

Section G : lines 79-93
Other taxable income

a) Grants and contributions taxable on receipt (lines 79 to 83)

NWL has no amounts which are taxable on receipt. Diversion and similar income is now subject to a new accounting treatment under IFRS15 with effect from 1 April 2018. However, the company has taken tax advice which confirms the existing tax treatment should not change. Such amounts will be credited to P&L in the company's statutory accounts on receipt, but will not be taxed on that basis. They will continue to be taxed via capital allowances by being netted off the cost of the related assets.

As the Ofwat model nets off grants and contributions (including diversions) against gross capex, the tax treatment described above is broadly achieved, although in reality the majority of receipts will be dealt with via the long life pool. However, a further adjustment is required to ensure P&L income is not taxed (see (c)(iv) below).

b) Amortisation of grants and contributions (lines 84 to 88)

Some grants and contributions (i.e. infrastructure charges) are taxed on an accounts amortisation basis following an agreement made between HMRC and the industry in 2011. The amounts in these lines are estimates of the amortisation for the 2020-25 period and reflect brought forward and new grants and contributions. Total amortisation has been allocated across the relevant price controls by reference to RCVs at the appropriate year end.

c) Other adjustments to taxable profits (lines 89 to 93)

This category includes the following items :

(i) Capitalised pension service costs

App22 (Pensions) includes details of DB and DC pension scheme accounting charges (i.e. service costs) and the percentages of those charges that are capitalised in fixed assets as opposed to being expensed to P&L.

Tax relief for pension costs is on a paid (or cash) basis. No relief is allowed for service costs. Capital allowances are therefore overstated to the extent eligible net capex includes an element related to service costs. An adjustment to effectively reduce capital allowances is included in this category.

(ii) Excess of DC pension cash over service cost

In computing the company's tax liabilities, the Ofwat model includes an adjustment for the excess of DB cash contributions over service cost. However, there is no similar adjustment for any excess in respect of DC cash contributions.

There is an initial presumption that DC cash contributions match service costs but, as explained in (i) above, an element of service cost is capitalised. This means the remaining service cost charged to P&L is less than the cash contributions. An adjustment to make sure tax relief for all DC contributions is received is included in this category.

(iii) Remove 'double taxation' of infrastructure charges

Net capex in the Ofwat model (i.e. gross capex less grants and contributions) is allocated across the various tax categories as explained in section D above. This means infrastructure charges that are included in grants and contributions are effectively being taxed twice – once via (b) above, and again via capital allowances. Accordingly, an adjustment is included in these lines to remove the duplication in capital allowances.

(iv) Remove P&L diversion income not taxed on accounts basis

Diversion income that is dealt with under IFRS15 is reflected in 'non-price control' revenue. As the existing 'capital' tax treatment continues, an adjustment is necessary to remove the P&L credit from taxable income.

The above adjustments are summarised in the table below :

£m	2020-21	2021-22	2022-23	2023-24	2024-25
Reduction in capital allowances relating to capitalised pension service cost	0.384	0.689	0.949	1.168	1.354
Excess of DC pension contributions over service cost	-1.222	-1.258	-1.296	-1.333	-1.373
Remove 'double taxation' of infrastructure charges	-0.239	-0.349	-0.511	-0.666	-0.812
Remove diversion income included in P&L	-2.474	-2.499	-2.522	-2.548	-2.573
Total	**-3.491**	**-3.417**	**-3.380**	**-3.379**	**-3.404**

Section H : lines 94-98
Brought forward losses

The company does not expect to have any brought forward tax losses at 1 April 2020 or for any tax losses to arise during the 2020-25 period.

Section I : line 99
Statutory corporation tax rate

The corporation tax rate for the 2020-25 period is expected to be 17%, based on the rate that was enacted by Finance Act 2016, having effect from 1 April 2020.

TABLE APP30 - VOID PROPERTIES

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

The historic void properties have been populated form the property reports by taking a view of the property database each month through the regulatory year and an average number of voids calculated for the period.

The forecasted void figures have been calculated based on an increase in connected figures for the anticipated number of new connections and a reduction to account for any demolished properties as well as any expected switches between unmeasured to measured services.

While the forecasted properties classified as void do not show a large decrease terms of absolute numbers, the percentage follows a reducing trend when compared to the number of total connected properties due to ongoing void property management projects which will take place between 2019 and 2025.

TABLE APP31 – PAST PERFORMANCE

This table was submitted as part of our early data submission on 27 July 2018.

TABLE APP32 - WEIGHTED AVERAGE COST OF CAPITAL FOR THE APPOINTEE

This commentary also covers the Cost of Capital tables Bio6, Wr5, Wn5, WWn7

We have used the cost of capital that Ofwat set out in the final methodology. This applies for each of our four wholesale price controls, for both existing and post 2020 RCV. We have also assumed the 1% net margin for residential retail.

In line with the methodology, we have assumed long term CPIH inflation of 2% and long term RPI inflation of 3%.

We have used the Cost of Capital data in Table 10.2 of the methodology, adjusting the wholesale cost of equity to remove the 0.1% retail margin deduction, to arrive at the components for a wholesale cost of capital in line with the methodology.

We have assumed a 50:50 mix of the real cost of capital between RPI and CPIH. This means the Real Wholesale WACC is effectively 2.8%.

We have assumed that for tables Bio6, Wr5, Wn5, WWn7 that the ‘gearing used in WACC’ is 60%. This is not our actual level of company gearing, but, as the Financial Model uses the WACC from the wholesale WACC based on the company’s actual structure and that Ofwat expects companies to use the WACC as per the PR19 guidance, we have had to use the same components in Block B as Block A.

To be consistent with Block B of Bio6, Wr5, Wn5, WWn7, we have also set the actual gearing at 60% in Table App32.

The impact of moving to a partial CPIH stripped WACC is entirely offset by the overall reduction in bills passed on to customers in 2020/21. Our choice is driven by customers preferences for stable bills and thus for increases and decreases to be netted off against each other where possible. Our outperformance leading into 2020/21 means that the full transition to a CPIH stripped return can be made in a single year and significant bill reductions still delivered.

Source data:

PR19 Methodology, Pages 172 onwards

https://www.ofwat.gov.uk/publication/delivering-water-2020-final-methodology-2019-price-review/

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Appendix 12: Aligning Risk and Return, Page 16 onwards

https://www.ofwat.gov.uk/publication/delivering-water-2020-final-methodology-2019-price-review-appendix-12-aligning-risk-return/

Customer Evidence – Risk and Reward Evidence, Appendix 10.1

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Table App 32: 2020-25 Data

Description	Block A	Notional Structure	Block B	Actual Structure
	Line	Source	Line	Source
Notional gearing	1	Appendix 12, Table 1	21	**Line 1**
Total Market Return (TMR)	2	Appendix 12, Table 1	22	Appendix 12, Table 1
Risk free rate (RFR)	3	Appendix 12, Table 1	23	Appendix 12, Table 1
Equity Risk Premium (ERP)	4	Formula	24	Formula
Debt beta	5	Appendix 12, Table 1	25	Appendix 12, Table 1
Raw equity beta for listed company comparator	6	Appendix 12,Table 7	26	Appendix 12,Table 7
Actual gearing of listed company comparator	7	Appendix 12,Table 7	27	Appendix 12,Table 7
Asset beta	8	Formula	28	Formula
Re-levered equity beta	9	Formula	29	Formula
Overall cost of equity (used in WACC)	10	Formula	30	Formula
Cost of embedded debt	11	Appendix 12, Table 1	31	Appendix 12, Table 1
Cost of new debt	12	Appendix 12, Table 1	32	Appendix 12, Table 1
Ratio of embedded to new debt	13	Appendix 12, Table 1	33	Appendix 12, Table 1
Issuance and liquidity costs	14	Appendix 12, Table 1	34	Appendix 12, Table 1
Overall cost of debt (used in WACC)	15	Formula	35	Formula
WACC ~ vanilla (pre-tax cost of debt and post-tax cost of equity)	16	Formula	36	Formula
Tax (marginal rate of corporation tax)	17	HMRC	37	HMRC
WACC ~ fully post-tax	18	Formula	38	Formula
Retail margin deduction	19	Appendix 12, Table 1	39	Appendix 12, Table 1
Wholesale WACC	20	Formula	40	Formula

We have used the notional cost of capital to inform our wholesale cost of capital in the price controls and financial model.

Note on roundings. To ensure the values in lines 15 and 20 exactly match the Ofwat 4.36% cost of debt and 5.37% wholesale cost of capital, we have input lines 14 and 19 to four decimal places.

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DATA TABLE SUBMISSION COMMENTARY

Table App 32: 2025-30 Data

Description	Block A	Notional Structure	Block B	Actual Structure
	Line	**Source**	**Line**	**Source**
Notional gearing	1	As per 2020-25	21	As per 2020-25
Total Market Return (TMR)	**2**	**Reversion to longer term trend**	**22**	**Reversion to longer term trend**
Risk free rate (RFR)	**3**	**Increase by 50 bps per Appendix 12, Figure 13**	**23**	**Increase by 50 bps per Appendix 12, Figure 13**
Equity Risk Premium (ERP)	4	Formula	24	Formula
Debt beta	5	As per 2020-25	25	As per 2020-25
Raw equity beta for listed company comparator	6	As per 2020-25	26	As per 2020-25
Actual gearing of listed company comparator	7	As per 2020-25	27	As per 2020-25
Asset beta	8	Formula	28	Formula
Re-levered equity beta	9	Formula	29	Formula
Overall cost of equity (used in WACC)	10	Formula	30	Formula
Cost of embedded debt	**11**	**Reduced as replaced with new debt**	**31**	**Reduced as replaced with new debt**
Cost of new debt	**12**	**Increase by 50 bps per Appendix 12, Figure 13**	**32**	**Increase by 50 bps per Appendix 12, Figure 13**
Ratio of embedded to new debt	13	As per 2020-25	33	As per 2020-25
Issuance and liquidity costs	14	As per 2020-25	34	As per 2020-25
Overall cost of debt (used in WACC)	15	Formula	35	Formula
WACC ~ vanilla (pre-tax cost of debt and post-tax cost of equity)	16	Formula	36	Formula
Tax (marginal rate of corporation tax)	17	As per 2020-25	37	As per 2020-25
WACC ~ fully post-tax	18	Formula	38	Formula
Retail margin deduction	19	As per 2020-25	39	As per 2020-25
Wholesale WACC	20	Formula	40	Formula

Lines 2, 3, 11 and 12 change from 2020-25 levels. We have increased the risk free rate and the cost of new debt (lines 3 and 12) by 50bps, in line with the data in Appendix 12, Figure 13.

We have reduced the cost of embedded debt (line 11) by replacing 30% of it with new debt over 2020-25.

Finally, we have assumed an increase in Line 2 of 50bps in total market returns. This is to reflect a reversion towards as longer term historical trend. We have used the lower end of the evidence provided in the KPMG report (August 2017) to make this uplift.

It should be noted that the net effect of these changes is to increase the wholesale WACC from 5.37% to 5.51%, a relatively modest increase that should not have a major impact on customer bills.

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Whilst it seems likely that the cost of capital will be higher in 2025-30 than for 2020-25, this should be mitigated by:

1. The reduction in embedded debt costs, as 30% of debt is replaced over 2020-25
2. Outperformance – we intend to outperform the totex baseline and other efficiency targets.
3. A customer sensitive approach to price setting from 2025 – there may be a case for a npv neutral incremental approach to avoid large incidence effects in year 1. We have assumed a 0.3% pa reduction in the run off rates for the wholesale controls from 2025 in our plan.

The Cost of Capital for these tables is consistent with the Cost of Capital in App 32.

For all four Wholesale WACC tables, both the 2020-25 and 2025-30 columns:

Line	Description	Source
	Notional Structure	
1	Gearing	App32
2	Total Market Return	Formula
3	Risk Free Rate	Formula
4	Equity risk premium	Formula
5	Debt beta	App32
6	Asset beta	**Adjusted**
7	Re-levered equity beta	Formula
8	Cost of equity ~ water resources	Formula
9	Cost of debt ~ water resources	Formula
10	WACC ~ vanilla (pre-tax cost of debt and post-tax cost of equity)	Formula
	Actual Structure	
11	Gearing (used in WACC) ~ water resources	App32
12	Total Market Return	Formula
13	Risk Free Rate	Formula
14	Equity risk premium	Formula
15	Debt beta	App32
16	Asset beta	**Adjusted**
17	Re-levered equity beta	Formula
18	Cost of equity (used in WACC) ~ water resources	Formula
19	Cost of debt (used in WACC) ~ water resources	Formula
20	WACC ~ vanilla (pre-tax cost of debt and post-tax cost of equity)	Formula

The only new calculations in these tables are in lines 6 and 16, to adjust the asset beta to ensure the wholesale WACC aligns with App32 and the Ofwat guidance.

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APP33 - WHOLESALE OPERATING LEASES RECLASSIFIED UNDER IFRS16

NWL will adopt IFRS 16 in its statutory financial statements with effect from 1 April 2019.

NWL has followed Ofwat guidance in preparing this table and confirms:

- Operating leases existing at 31 March 2018, which will still be in existence at the end of the first reporting period following adoption, have been included in this table;
- Service charges and maintenance contracts have not been included;
- Leases with low, no or peppercorn rentals have not been included as allowed by the standard;
- NWL has a number of very long leases or leases in perpetuity. For discounting purposes these have been taken to a maximum of 250 years;
- Leases have been directly allocated to their price control wherever possible. General leases, such as those for corporate office buildings, have been allocated across price controls by using asset value MEAVs;
- No new leases have been assumed.

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DATA TABLE SUBMISSION COMMENTARY

WATER TABLES

Data table	Contents	Additional commentary provided	Revised?
WS1	Wholesale water operating and capital expenditure by business unit	Yes	Following IAP
WS1a	Wholesale water operating and capital expenditure by business unit including operating leases reclassified under IFRS16	Yes	
WS2	Wholesale water capital and operating enhancement expenditure by purpose	Yes	
WS2a	Wholesale water cumulative capital enhancement expenditure by purpose	Yes	
WS3	Wholesale water properties and population	Yes	
WS4	Wholesale water other (explanatory variables)	Yes	
WS5	Other wholesale water expenditure	Yes	
WS6	Not used		
WS7	Wholesale water local authority rates	Yes	
WS8	Third party costs by business unit for the wholesale water service	Yes	
WS9	Not used		
WS10	Transitional spending in the wholesale water service	Yes	
WS11	Not used		
WS12	RCV allocation in the wholesale water service	Yes	Following IAP
WS12a	Change in RCV allocation in the wholesale water service	Yes with WS12	
WS12b	Not used		
WS13	PR14 wholesale revenue forecast incentive mechanism for the water service	Submitted July 2018	
WS14	Not used		
WS15	PR14 wholesale total expenditure outperformance sharing for the water service	Submitted July 2018	Following IAP
WS16	Not used		
WS17	PR14 water trading incentive reconciliation	Submitted July 2018	Following IAP
WS18	Explaining the 2019 Final Determination for the water service	Yes	
Wr1	Wholesale water resources (explanatory variables)	Yes	
Wr2	Wholesale water resources opex	Yes	
Wr3	Wholesale revenue projections for the water resources price control	Yes	Following IAP
Wr4	Cost recovery for water resources	Yes, also Wn4, WWn6, Bio6	Following IAP
Wr5	Weighted average cost of capital for the water resources control	See App32	
Wr6	Water resources capacity forecasts	Yes	
Wr7	New water resources capacity ~ forecast cost of options beginning in 2020-25	Yes	
Wr8	Wholesale water resources special cost factors	Yes	
Wn1	Wholesale network plus raw water transport and water	Yes	

	treatment (explanatory variables)		
Wn2	Wholesale water network plus water distribution (explanatory variables)	Yes	
Wn3	Wholesale revenue projections for the water network plus price control	See Wr3	
Wn4	Cost recovery for water network plus	See Wr4	
Wn5	Weighted average cost of capital for the water network plus control	See App32	
Wn6	Wholesale water network plus special cost factors	Yes	

TABLE WS1 - WHOLESALE WATER OPERATING AND CAPITAL EXPENDITURE BY BUSINESS UNIT

This table covers all totex, both base and enhancement. We have included the opex from Table WS2 in line 7 of WS1. For Ofwat to carry out a base totex efficiency analysis, the enhancement opex from Table Ws2 will have to be deducted from line 7.

Line 8 Water rates matches the totals in Table WS8.

Line 10 Third party costs matched Table WS8.

Lines 14, 15 & 16 reconcile to the enhancement capex set out in Table WS2.

TABLE WS1A - WHOLESALE WATER OPERATING AND CAPITAL EXPENDITURE BY BUSINESS UNIT INCLUDING OPERATING LEASES RECLASSIFIED UNDER IFRS16

WS1 has been restated and completed on the basis that IFRS16 had not been implemented.

TABLE WS2 - WHOLESALE WATER CAPITAL AND OPERATING ENHANCEMENT EXPENDITURE BY PURPOSE

Line 39 of WS2 agrees to the sum of lines 14 to 16 in WS1.

WS2 lines 24 and 25 have been populated with Traffic management act and Infrastructure network reinforcement values to ensure the reconciliation is transparent.

TABLE WS2A - WHOLESALE WATER CUMULATIVE CAPITAL ENHANCEMENT EXPENDITURE BY PURPOSE

Regard for maintaining consistency with corresponding lines in previous data submissions when using these lines was taken into account.

TABLE WS3 - WHOLESALE WATER PROPERTIES AND POPULATION

Lines 1 – 8: The number of properties reported in rows 1 to 8 up to and including 31/03/18 represents the annual average number of properties, which is calculated as the average numbers as reported on the 1st of each month, from April to April (13 months).

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The property numbers post 31/03/18 are derived from the WRMP including the forecast assumptions for void properties, and are produced in accordance with the table WS3 guidance.

Lines 9 and 10: Number of meters renewed

We continue to carry out planned meter replacements and replace meters as they fail. We completed 18,196 meter replacements in 2017-18; 17,626 household meters and 570 non-household meters.

The planned replacement programme commenced in AMP5 but not until year 3, as system enhancements were required for the programme. Due to the late start of the programme, there was a carryover of meters to be replaced into AMP6.

For the first two years of AMP6 the planned replacement budget was deferred, so we did not start until year 3, although we continued to replace meters as they failed. For the remainder of AMP6 we forecast to replace circa 68,000 each year. For AMP 7 and 8, we forecast to replace circa 309,000 in each AMP. This will be a mixture of household and non-household meters and planned and reactive replacements.

Lines 11 and 12: Number of meters installed

Optant metering is forecast to increase during AMP7 through a targeted metering strategy which includes whole-area metering in Essex, in 2018 which will continue into AMP7. Post AMP7 requests for meters are expected to remain constant. Total NWL forecasted optant metering for AMP7 will be 138,094 meters.

From 2018/19 selective metering will only be employed for large user properties across NWL. The metering strategy for AMP7 includes whole-area metering in the Essex area which will produce the same amount of meter installs as previously would have been done through selective metering.

Lines 13-15: Numbers of new customers

The annual total number of new business connections is expected to remain constant over the planning horizon.

The total number of new residential connections increases over the planning period. The growth property figures for each of the forecasted years are provided by Edge Analytics. In line with the WRPG requirement, NWL is using Local Plan housing growth evidence from all local authorities that are either wholly or partially included within the NWL operational boundary. The following key demographic datasets were used to obtain the population and household forecasting;

- Population estimates, 2001-2015 (ONS)
- Birth, death and migration data, 2001-2015 (ONS)
- Household data and assumptions (DCLG; 2011 Census)
- Fertility, mortality, migration and population growth assumptions from the SNPP (ONS)

Total population served for the 2017/18 and forecasted years has been commissioned from Edge Analytics. In line with the WRPG (Environment Agency, 2017) requirement, NWL has used local authority Plan housing growth evidence from all local authorities and has selected the Plan-based scenario.

Line 18 Company area:

Correct Northern Licensed area used. Past submissions have used combined water and sewerage licensed area. Licenced area is not subject to change, and therefore will remain the same throughout.**TABLE WS4 – WHOLESALE WATER OTHER (EXPLANATORY VARIABLES)**

Lines 2 and 3: Supply side enhancements

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No supply schemes were promoted in WRMP14.

Lines 4 and 5: Total demand side enhancements to the supply demand balance

Line 4: Dry year critical / peak conditions are not applicable to NWL therefore the dry year annual average figures (Line 5) have been substituted for Line 4. Line 5 has been calculated by adding the total water savings from water efficiency together with the optant and selective metered consumption.

The 2017/18 figure has increased compared to previous years. Previous years did not include North and Suffolk area optant consumption which has been corrected for 2017/18 onwards.

The larger increase in 2020/21 of the forecasted figures is due to the increase in water efficiency activity and optants planned for the AMP.

Line 9: Mean zonal compliance

This measure is the percentage of results for 39 parameters, taken at customers' taps, which complied with the prescribed concentration value (PCV) - the mean zonal compliance is the average of the zonal percentage compliances in every one of the company's zones.

We are forecasting to achieve our PC.

Line 10: Compliance Risk Index

Compliance risk index is the new DWI measure of water quality introduced in 2016. The forecast data in line 10 is equivalent to average performance improving year on year from 2019 to 2024. The objective is to be UQ with this measure by 2024/25, from the limited data available the 2024/25 value represents the assessed UQ. The UQ value will be reforecast as more data becomes available.

Line 11: Event Risk Index

Event risk index is the new DWI measure of water quality events, for 2016 the data available is limited to our company regional performance and the industry average.

The forecast provided in line 11 is to be better than industry average using 2016 data as provided by DWI.

Line 12: Volume of Leakage above SELL

This represents the differences between reported and forecasted values of Leakage and the derived SELL, both using the new definition.

TABLE WS5 - OTHER WHOLESALE WATER EXPENDITURE

The headcount figures in this table have been assumed to remain the same as 17-18. While they would be expected to change for efficiencies, enhancement requirements and insourcing / outsourcing of activities, the exact mix of the changes is unknown.

TABLE WS7 - WHOLESALE WATER LOCAL AUTHORITY RATES

Water cumulo rates has an increase during 18/19 with full year impact 19/20

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The Valuation Office Agency (VOA) have confirmed that the rating assessment for NW will increase to £85,000,000 (up from the current £76,350,000) which equates to an annual increase of £4.264m in 18-19 prices. This increase is as a result of the VOA applying strict definitions within their valuation model and current rating law.

Formal notification is being produced by the VOA, but had not been received by the date of submission of the business plan. This will have a part year impact in 18-19 and a full year impact from 19-20 onwards. Future year charges are assumed to increase by CPIH. Please see the supporting letters/schedules from the VOA and Turner Morum in the appendices of Section 7 for further information.

TABLE WS8 - THIRD PARTY COSTS BY BUSINESS UNIT FOR THE WHOLESALE WATER SERVICE

The table has been populated in accordance with the guidance and line definitions. Block B lines 7 – 13 have been completed to summarise other third party services not included in lines 5 & 6.

TABLE WS10 - TRANSITIONAL SPENDING IN THE WHOLESALE WATER SERVICE

Line 14: Resilience

Transitional spending is required for resilience only, the table has been compiled accordingly.

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TABLE WS12 - RCV ALLOCATION IN THE WHOLESALE WATER SERVICE AND TABLE WS12A - CHANGE IN RCV ALLOCATION IN THE WHOLESALE WATER SERVICE

Overview

We have completed Tables Ws12 and Ws12a. We have made the following changes from our January submission:

1. We have removed the IFRS adjustment on line 7, other adjustments.
2. We have updated Table Ws12 for a revised capital programme from 2017 to 2020.
3. We have updated both Tables for inflation to 2017-18 prices.

1 Assurance report by Economic Insight (EI)

We commissioned EI to review our approach to the water resources RCV allocation in the light of the Ofwat feedback. We have included the report in our submission – Appendix 8.1.

EI made the following findings, which we have commented on:

4. Conclusions and recommendations

Overall, we find that Northumbrian's approach to RCV allocation is broadly consistent with Ofwat's guidance, but that there is room for improvement in several key respects. This final section sets out our advice as to how Northumbrian can proceed to further ensure the robustness of its RCV allocation. To facilitate this, we have developed a series of recommendations as to how Northumbrian can ensure robustness and consistency with Ofwat's guidelines. We first summarise each recommendation, before providing further discussion below.

• *Recommendation 1: Northumbrian should remove the adjustment to historical net MEAV, based on IFRS treatment.*

NWL response – agreed, adjustment removed

• *Recommendation 2: Northumbrian should develop additional analysis that: i) sets out why it considers the net MEAV approach to be the most appropriate for allocating its RCV; ii) makes use of potential alternative measures as a cross-check.*

NWL response –agreed – GMEAV cross check added

• *Recommendation 3: Reflecting Ofwat's revisions to its guidance, Northumbrian should develop more detailed analysis of potential bill impacts – and this should apply to all areas that relate to the creation of a separate price control for water resources. It should cover: i) identification of potential bill impacts from RCV allocation and other aspects relating to water resources/wholesale water separation; ii) Northumbrian's approach to mitigation for any adversely affected customers.*

NWL response – agreed – assessment of impact on non potable customers added.

• *Recommendation 4: Northumbrian should provide some additional analysis to underpin the consistency of analysis with the company's WRMP. This should include extracts from the company's WRMP, and discussion of Northumbrian's water resources situation beyond 2025.*

NWL response – agreed – analysis of WRMP section added

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2 Review of Ofwat report: Initial proposals on water resource RCV allocations – feedback to companies

Our review of this report does highlight three specific Ofwat comments over Northumbrian Water's approach.

Extracts from Table 1.2

1 There is no evidence that the companies have considered any of the other potential approaches to allocation or cross checked these against their chosen allocation methods.

We expect companies to consider other potential allocation approaches that use existing data and contrast the proposed allocation against them in their business plan. They should also include a proper justification for selecting their chosen approach in their business plans.

NWL: We have added a cross check against a GMEAV approach as well as consideration of economic value.

2 Northumbrian Water adjusted its net MEAV to recognise additional depreciation prior to 2015 in respect of the current International Financial Reporting Standards (IFRS) treatment. This is inconsistent with our guidance.

We expect companies to use applicable accounting rules in making adjustments to roll forward the reported 2015 net MEAV. We do not expect companies to retrospectively seek to apply changes in accounting standards.

NWL: Agreed, we have removed this adjustment. The removal reduces the % allocation from 17.2% to 15.0%.

3 Customers with minimal use of network plus assets could be unduly impacted by the RCV allocation, as any changes in the water resource element of their water bill will not be offset by changes in the network plus element.

NWL: We do have a small number of large customers receiving a non potable water supply. We have added a note on these customers.

3 GMEAV cross check

We have extracted the GMEAV of our assets at 31/3/15 and compared this with the Net MEAV at the same point:

At 31/3/15	Water resources	Water network plus	Total wholesale Water
GMEAV £m	1456.9	9153.2	10610.1
	13.7%	86.3%	
NMEAV £m	1336.000	7552.083	8888.083
	15.0%	85.0%	

There is not a material difference in the overall weightings. Overall, we feel that Net MEAV remains the most appropriate approach for allocating the Water RCV for the following reasons:

The Regulatory Capital Value is calculated after the deduction of depreciation. It is thus more akin to a Net Book Value than a Gross Book Value. To apply Gross Book Value proportions to a value calculated on a Net Book basis does not seem to us to be consistent.

The Bioresources RCV is assessed on a net book value basis. It seems inconsistent to us to take different allocation approaches unless this is necessary.

Economic Value

Finally, as the approach for water resources is unfocussed, the RCV allocation will not be able to reflect the economic value of the water resources assets (the MEAV). We have set out the RCV discounts below:

Value at 31/3/20	Water resources	Water network plus	Total wholesale Water
NMEAV	1463.771	8314.467	9778.238
RCV allocation	301.561	1712.934	2014.495
Discount	79.4%	79.4%	79.4%

4 Consideration of Non Potable Customers

In our response to an Ofwat query, we confirmed we do not anticipate non potable customers being impacted by the Water Resource RCV allocation.

Our non potable customers receive their supply on a dedicated network, with a bespoke tariff relating to the value ascribed when the network was transferred into the appointed business.

As such, our non potable tariff is calculated in relation to our overall potable water tariffs, with a broadly consistent discount. We apply the same K factors and inflation adjustments to keep the tariffs running in parallel.

As our water bills are forecast to reduce by at least 10% in 2020/21, non potable customers can thus expect a similar reduction.

5 Water Resources Management Plan

We have extracted evidence from our Draft Water Resources Management Plans that confirm that there are no new resource supply schemes planned up to 2060 for any of our Water Resource Zones.

Thus, there are no measures of Average Incremental Costs and no future expenditure to provide a cross check for water resources RCV allocation.

https://www.nwl.co.uk/_assets/documents/NW_PR19_WRMP_Report_-_V4.pdf

https://www.eswater.co.uk/_assets/documents/ESW_PR19_WRMP_Report_Template_-_V3.pdf

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Extracts from DWRMPs:

Table 8.1 Kielder WRZ Supply Surplus

Kielder WRZ	End of AMP6	End of AMP7	End of AMP8	End of AMP9	End of AMP10	End of Planning Horizon	End of 40 Year Planning Horizon
Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45	2059/60
Balance of Supply (excluding headroom)	111.47	102.25	101.04	96.69	89.23	81.80	57.91
Balance of Supply (including headroom)	65.64	49.90	52.08	51.77	47.89	42.55	24.39

Given the supply surplus, no supply schemes will be required.

Table 8.2 Berwick and Fowberry Supply Surplus.

Berwick and Fowberry WRZ	End of AMP6	End of AMP7	End of AMP8	End of AMP9	End of AMP10	End of Planning Horizon	End of 40 Year Planning Horizon
Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45	2059/60
Balance of Supply (excluding headroom)	4.86	4.81	4.77	4.71	4.62	4.55	4.29
Balance of Supply (including headroom)	2.63	2.58	2.88	3.12	3.27	3.33	3.55

Given the supply surplus, no supply schemes will be required.

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Table 8.1: Essex WRZ balance of supply

Essex WRZ	End of AMP6	End of AMP7	End of AMP8	End of AMP9	End of AMP10	End of Planning Horizon	End of 40 Year Planning Horizon
Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45	2059/60
Balance of Supply (excluding headroom)	50.51	48.07	48.56	47.01	61.84	55.68	31.16
Balance of Supply (including headroom)	16.68	14.39	18.54	19.81	36.43	32.25	12.04

The balance of supply with target headroom ranges from 16.68Ml/d at the end of AMP6 to 32.25Ml/d at the end of the statutory 25 year planning period (2045). This increase is due to a bulk raw water export agreement with Thames Water ending. Balance of supply then reduces to 12.04Ml/d by 2060 due to an increase in customer demand.

Given the supply surplus, no supply schemes will be required. ESW has offered other water companies a temporary trade of 5Ml/d until 2035 and then up to 25Ml/d from 2045 to 2060. This is discussed further in section 10 of this report (Final Water Resources Planning Strategy).

Table 8.2: Suffolk Blyth WRZ balance of supply

Blyth WRZ	End of AMP6	End of AMP7	End of AMP8	End of AMP9	End of AMP10	End of Planning Horizon	End of 40 Year Planning Horizon
Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45	2059/60
Balance of Supply (exc. headroom)	3.86	3.75	3.79	3.80	3.75	3.69	3.35
Balance of Supply (inc. headroom)	2.55	2.45	2.69	2.79	2.81	2.81	2.60

The balance of supply with target headroom ranges from 2.55Ml/d at the end of AMP6 to 2.81Ml/d at the end of the 25 year planning horizon and 2.60Ml/d at the end of the 40 year planning horizon.

Given the supply surplus, no supply or demand schemes will be required.

Figure 8.3: Suffolk Hartismere WRZ baseline supply demand balance

WAFU remains constant over the planning horizon while DI increases slightly over the planning horizon. The balance of supply in Ml/d is illustrated in Table 8.3 below and can be summarised as follows:

Hartismere WRZ	End of AMP6	End of AMP7	End of AMP8	End of AMP9	End of AMP10	End of Planning Horizon	End of 40 Year Planning Horizon
Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45	2059/60
Balance of Supply (excluding headroom)	2.01	1.89	1.85	1.80	1.72	1.63	1.30
Balance of Supply (including headroom)	1.19	1.07	1.11	1.14	1.10	1.06	0.81

Table 8.3: Suffolk Hartismere balance of supply

Northern Central WRZ	End of AMP6	End of AMP7	End of AMP8	End of AMP9	End of AMP10	End of Planning Horizon	End of 40 Year Planning Horizon
Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45	2059/60
Balance of Supply (excluding headroom)	14.63	14.21	13.59	12.77	11.67	10.53	7.27
Balance of Supply (including headroom)	10.42	9.52	9.32	8.79	7.86	6.91	4.10

Table 8.4: Suffolk Northern Central balance of supply

The balance of supply with target headroom ranges from 10.42Ml/d at the end of AMP6 to 6.91Ml/d at the end of the 25 year planning horizon and 4.10Ml/d at the end of the 40year planning horizon.

Given the supply surplus, no supply or demand schemes will be required.

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6 WS12 - RCV allocation in the wholesale water service – Table Commentary

Section A – Water Resources Net MEAV

Net MEAV for water resource and other water assets is as published in company 2014-15 regulatory accounts for 31 March 2015.

Disposals are assumed to have a zero NBV.

Reclassifications - 2014-15 Regulatory accounts were produced in line with the RAG 4 guidelines issued on 27th April, 2017, resulting in no reclassifications required

Impact on net MEAV of Inflation. This line is the difference between 1 April 2015 and 31 March 2018 prices for line 1. RPI indices used at March 15 and March 18, as published by the Office for National Statistics.

Additions – Additions between 1 April 15 and 31 March 18, from the same data sources used in the Regulatory Accounts for table 4D line 14. Additions for year 15/16, 16/17 have been uplifted by inflation. RPI indices used at March 16 and March 18, as published by the Office for National Statistics. Additions for 17/18 have not been uplifted.

Depreciation – March 15 regulatory tables were prepared under UK Gaap. Infrastructure Assets have not been depreciated.

Non Infrastructure depreciation charge for 14/15 per table 25 as submitted for regulatory accounts.

Total water services depreciation for 15/16 and 16/17 per table 4G - Wholesale current cost financial performance.

Non Infrastructure deprecation = previous year's annual charge plus current years additions divided by a weighted average life for the service. Balancing figure is adjusted onto the Treated Water Service charge to reconcile back to the charge reported in Table 4G - Wholesale current cost financial performance.

Section B – Roll Forward

Additions and Depreciation all at 31st March 18 prices.

Additions per capital plan as at 31st March 2018, provided by Capital Planning Team.

Each project has been assigned a weighted average life and we have assumed a full year depreciation charge in the year.

Overhead Projects are allocated on a pro rata basis, and the vehicles projects have been allocated based on the percentage allocations used in preparing tables 4.D Wholesale totex analysis – water.

No Other Adjustments forecast.

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DATA TABLE SUBMISSION COMMENTARY

7 WS12 - RCV allocation in the wholesale water service – Table Commentary

Section A – Proposed RCV allocation at January 2018

Line 1 is taken from our January 2018 submission.

Section B – Explanation of Change

There are three reasons for changes from the January 2018 submission:

Line 5: Inflation – calculated as the indexation impact on the January 2018 submission

Line 6: We assess the impact of the revised expenditure in Table WS12. As this is an allocation adjustment, it adds to zero effect on the total RCV.

Line 9: Removal of the IFRS adjustment – We ran the January 2018 submission without the IFRS adjustment and indexed the change to arrive at this value. As this is an allocation adjustment, it adds to zero effect on the total RCV.

There are no unexplained differences.

TABLE WS13 - PR14 WHOLESALE REVENUE FORECAST INCENTIVE MECHANISM FOR THE WATER SERVICE

This table was submitted as part of our early data submission on 27 July 2018.

TABLE WS15 - PR14 WHOLESALE TOTAL EXPENDITURE OUTPERFORMANCE SHARING FOR THE WATER SERVICE

This table was submitted as part of our early data submission on 27 July 2018 and has been updated for the latest 2018/19 and 2019/20 forecasts.

TABLE WS17 - PR14 WATER TRADING INCENTIVE RECONCILIATION

This table was submitted as part of our early data submission on 27 July 2018. We have set out a full report on the water trading incentive in our plan.

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DATA TABLE SUBMISSION COMMENTARY

TABLE WS18 - EXPLAINING THE 2019 FINAL DETERMINATION FOR THE WATER SERVICE

Line 1: Residential customers metered and Line 6: the volume of water traded

Residential customers (metered) is the percentage meter penetration for NWL. It is forecast to increase in line with the metering strategy for AMP7, largely as a result of the continual increase in meter optants.

The volume of water traded is forecast to slightly increase over AMP7 due to an increase of water traded to Barking Riverside as this site continues to develop. There is an export to Thames of 25Ml/d until 2019/20 then 20Ml/d from 2020 to 2035 then zero onwards, all other water traded volumes for other agreements are not changing during AMP7.

Line 2: Number of contacts about drinking water (taste, odour and discolouration)

Taste, odour and discolouration are measures based on customer perception, and calculated based on the number of customer contacts received. During AMP 6, taste and odour contacts have improved from 1225 at end of 2015 to 978 for 2017. The ambition is to drive contacts down to 957 per annum by 2024.

During AMP 6, discoloured water contacts have improved from 2923 at end of 2015 to 2532 for 2017. The ambition is to drive contacts down to 2000 per annum by 2024.

Line 3: Number of catchment management schemes

NWL have nine lines in the current National Environment Programme relating to catchment management, five for ESW and four for NW, all under the Drinking Water Protected Area (DrWPA) No Deterioration driver. For PR19, under the new Water Industry National Environment Programme (WINEP), NWL have 11 lines relating to catchment management, nine under the Drinking Water Protected Area (DrWPA) No Deterioration driver (five ESW and four NW), one under the DrWPA Investigation driver (NW) and one under the NERC Biodiversity Priority Improvement driver (NW). The WINEP is a statutory programme of work which we must undertake so our catchment schemes are a direct reflection of these lines.

Line 7: Length of rivers improved as a result of WINEP Water Resource schemes

This commentary covers Line 7 of Block E in Table WS18, which requires the length of river (km) improved as a result of WINEP Water Resource schemes to be entered for each year of the current (2015-2020) and next (2020-2025) AMPS.

Information on water resource schemes and the improved river lengths attributable to each scheme originates from the Environment Agency's National Environment Programme 5 spreadsheets (2015-2020) and Water Industry National Environment Programme 3 spreadsheets (2020-2025).

Relevant data for the NW and ESW operating areas is collated in a standalone spreadsheet "2018 05 01 - WS18 Block E Line 7 River lengths - Data collation.xlsx".

Several assumptions are made before the calculation of river length is completed:

- Only NEP / WINEP lines that have water resources or drinking water protected area (DrWPA) drivers are included, ie water resources and catchment schemes.
- Of those lines, only NEP / WINEP lines that have improved river lengths attributed to them in the Environment Agency's NEP 5 / WINEP 3 spreadsheets are included within the calculation. Any lines with Water Resource and Drinking Water Protected Area drivers that do not have an improved river length attributed to them are not included.

- Of these remaining lines, only NEP / WINEP implementation schemes are included in the calculation, investigations are excluded, as they would not result in any improvement.

For some reason the AMP6 Catchment Schemes (with the DrWPA driver) all have completion dates beyond the end of the current AMP, ie they have completion dates of Dec 2020, rather than March 2020. They have all therefore been reported under the 20/21 year (first year of AMP7).

In line with the parallel table for wastewater improvements, the river lengths improved have been recorded under the year of actual or planned completion for each line, even though actual improvements to river water quality, ecology and / or morphology may accrue earlier or later than the actual scheme completion date.

Similarly if the same section of river is listed twice for the same parameter under two different drivers (e.g. No deterioration and Improvement), the river length is only counted once. The river length is included twice if the improvement is for a different parameter.

Line 8: Greenhouse gas emissions from water operations

The figures here are reported actual estimated emissions through to 2017-18 and projections thereafter. Our emissions projections include the use of a 'market based' emissions factor for electricity. We use REGO certified grid electricity from our supplier Orsted, which means our Scope 2 emissions for electricity generation, and our Scope 3 emissions linked to losses in electricity transmission and distribution are effectively zero. Residual emissions fall under five main categories; direct emissions from fossil fuel; process and fugitive emissions; fleet transport; public transport; and outsourced activities. Process and fugitive emissions make up 45% of the total, are more challenging to reduce than other areas, and mostly related to wastewater activity. As a result the wastewater emissions form the larger part of the Company-wide total.

TABLE WS18 - EXPLAINING THE 2019 FINAL DETERMINATION FOR THE WATER SERVICE AND WWS18 - EXPLAINING THE 2019 FINAL DETERMINATION FOR THE WASTEWATER SERVICE

WS18 Line 9 and WS18 Line 11, Change in the average residential customer water bill over the period

This is calculated using the average water and wastewater bill data in App7, Block F, lines 29 and 30. We calculate the percentage increase from 2014/15 to 2024/25.

The 2014/15 bills are deflated to 17/18 prices to do this.

Water: Table WS18 Block G

Block G only requires data for 2015-16 and 2016-17, the rest are formulas

Line 10: Amount of planned water investment improving services, maintaining the network and protecting the environment

We have used the equivalent of line 31 of WS1 from our cost assessment datashare for these years.

Line 11: Total number of residential and business customers who receive a water bill

We have used the equivalent of line 1-5 of WS3 from our cost assessment datashare for the

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Wastewater: Table WWS18 Block G

Block G only requires data for 2015-16 and 2016-17, the rest are formulas

Line 12: Amount of planned water investment improving services, maintaining the network and protecting the environment

We have used the equivalent of line 31 of WWS1 from our cost assessment datashare for these years.

Line 13: Total number of residential and business customers who receive a water bill

We have used the equivalent of line 1-5 of WWS3 from our cost assessment datashare for these years.

TABLE WR1 - WHOLESALE WATER RESOURCES (EXPLANATORY VARIABLES)

Lines 1 - 4: The variation in the numbers provided for the planning period compared to that of 2017/18 is due to using the five year average for the planning period to account for varying weather conditions. In dry weather the proportion of distribution input from impounding reservoirs will be lower and the proportion of distribution from rivers in particular will increase.

Lines 5 - 7: NWL does not operate any of these schemes.

Line 8: One scheme, Langford recycling plant. This uses final effluent from a STW, which we further treat and discharge into a river upstream of our raw water abstraction point. We then abstract this for transfers to Hanningfield reservoir. In recent years this has not been used but we do intend to operate it annually for a couple of months going forward, we are budgeting to abstract 1500 ML per year.

Line 9: Increase of 1 as the minimum maintained flow on the River Wear has been increased in 2018/19, the assumption is that due to this increase Tunstall reservoir will be required to regulate the river and hence included as a source going forward.

Lines 10 - 15: No change over the planning period from 2017/18.

Line 16: Increase of 1 due to the increase in line 9.

Lines 17 - 19: No change over the planning period from 2017/18.

Lines 20 - 21: Four of the 105 pumping stations did not have kW values in our Asset Hierarchy. Their kW values have been estimated using the average kW for that type of pumping station.

Line 22: Values are subject to business as usual updates and amendments to water mains. Forecast values: For each line, the percentage change from 2017 - 2018 has been calculated and applied to the lengths up to 2025. Lengths arising from any major schemes have been taken into account and applied in the relevant year.

Lines 24 and 26: No change over the planning period from 2017/18.

Line 25: It has been assumed raw water is imported at the contracted rate of 91Ml/d throughout the AMP.

Line 27: It has been assumed that the exports from Aldeburgh Well and Bungay Well remain constant and the Thames Water export is at the contracted rate of 25Ml/d until 2019/20 and 20Ml/d from 2020/21 onwards. No export took place in 2017/18.

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TABLE WR2 - WHOLESALE WATER RESOURCES OPEX

The table has been populated in accordance with the guidance and line definitions and reflects table 18_1 of the Cost Assessment submission

TABLE WR3 - WHOLESALE REVENUE PROJECTIONS FOR THE WATER RESOURCES PRICE CONTROL

We have set out a single table commentary for all four wholesale price controls as we have taken the same approach for each and the tables are similar. We have noted where there are specific differences.

Our general approach has been to align the Tables to the outputs of the Financial Model. We have checked that these tables are consistent with the Financial Model throughout.

A	Wholesale revenue requirement aggregated by building blocks	Data Source (FM is Financial Model)
1	PAYG ~ wholesale water resources	Ofwat formula: totex * PAYG rate. As we have chosen operating costs to set the PAYG rate this also matches the operating costs in WS1 and WWS1.
2	Pension deficit repair contributions	PDRC as per WS1 and WWS1. Also matches PDRC in the FM Exec Summary
3	Run off on post 2020 investment	FM Summary calc: RCV additions depreciation - real
4	Return on post 2020 investment	FM Summary calc: Return on RCV additions - real
5	Run off on RPI inflated 2020	FM Summary calc: RCV - CPI(H) + RPI wedge bf depreciation - real
6	Return on RPI inflated 2020 RCV	FM Summary calc: Return on RCV - CPI(H) + RPI wedge bf - real
7	Run off on CPIH inflated 2020 RCV	FM Summary calc: RCV - CPI(H) bf depreciation - real
8	Return on CPIH inflated 2020 RCV	FM Summary calc: Return on RCV - CPI(H) bf - real
9	Current tax	FM Exec Summary – building blocks
10	Re-profiling of allowed revenue	FM Exec Summary – building blocks
11	PR14 reconciliation revenue adjustments	FM Exec Summary – building blocks
12	Total wholesale revenue requirement	Total

B	Wholesale ~ other price control income	Data Source
13	Third party revenue	Non potable water income forecasts

C	Wholesale ~ non-price control income (third party services)	Data Source
14	Bulk supplies ~ contract not qualifying for water trading incentives (signed before 1 April 2020)	Water Resources: Includes the income from the bulk supply to Thames Water, signed late 2015.
15	Bulk supplies ~ contract qualifying for water trading incentives (to be signed on or after 1 April 2020	
16	Rechargeable works	
17	Other non-price control third party services	
18	Total non-price control income (third party services)	Total of lines 14-17

D	Wholesale ~ non-price control income (principal services)	Data Source
19	Wholesale non-price control income (principal services)	

E	Wholesale charges	Data Source
20	unmeasured charge ~ residential	Projections from 17-18 proportions with adjustments for increased household metering, per Table WS3. These sum to 100%.
21	unmeasured charge ~ business	
22	measured charge ~ residential	
23	measured charge ~ business	
24	Total wholesale allowed revenue	Formula: Lines 12 less lines 13, 18 and 19

F	Grants and contributions	Data Source
25	grants and contributions (price control)	Align to App28
26	grants and contributions (non-price control)	

We have allocated all grants and contributions to water network plus and wastewater network plus.

Water grants and contributions (price control) align to App28 lines 7-10.

Wastewater grants and contributions (price control) align to App28 lines 24-26

G	Revenue control total ~ wholesale	Data Source
27	Total revenue ~ wholesale control	Total of Lines 12 and 25

TABLE WR4 - COST RECOVERY FOR WATER RESOURCES

Tables WR4, WN4, WWN6, Bio6: Cost recovery for water resources

Overall Principles

For all four wholesale control cost recovery tables, we have chosen the natural run off rate and PAYG rates. We have taken a consistent approach to the calculations across all four controls.

We believe using natural rates is in line with customer preferences for stable bills (see Risk and Reward Appendix: customer evidence) and avoids any intergenerational cross subsidies, for both current and future customers. By using the natural rates, customers pay an appropriate amount for the assets they receive services from.

We have not made any adjustments to address the 2020/21 transition from RPI to CPIH. These have not been necessary given the large scale price reductions in 2020/21. We have not made any changes for financeability.

For this reason, we have assumed the same PAYG rates in 2025-30 as for 2020-25, as we do not foresee any reasons for divergence. Clearly, the rate itself could vary depending upon the level of enhancements, but, as customers would continue to pay as you go for operating expenditure, the amounts paid for annually should remain stable.

We have made a small 0.3% reduction to the run off rates from 2025-30 to offset possible upward pressure on bills in 2025, explained later.

We have assumed a straight line depreciation method for all of the run off rates.

Calculating the natural PAYG rate

Ofwat guidance states that the "natural RCV rate" is a rate which reflects the economic reality of the expenditure which the company is incurring and the long term nature of its investments.

We have interpreted this as:

Water Service Natural rate % = Table WS1 (Line 11 Total Operating Costs) / (Line 21 Net Totex)

Wastewater Service Natural rate % = Table WWS1 (Line 11 Total Operating Costs) / (Line 21 Net Totex)

We believe this is consistent with the approach taken at PR14. We note it uses all the operating costs as expensed in the P and L, including the renewals expensed in the year.

For the PAYG rate, we have calculated an annual percentage based on the expenditure split in the year. Hence, the annual value varies, depending upon the proportion of operating versus capital cos

For bill stability, our preference is to smooth revenues directly in the financial model rather than trying to do so by varying PAYG rates. We believe this is more transparent for customers and Ofwat.

Calculating the run off rates

We have set our RCV run off rates to align to our long term depreciation policy for each of the controls.

We have taken the current cost depreciation charge component of the capital maintenance charges in table 4G of the 2017 APR.

Run Off Rate	Table 4G CCD (inflated)£m	Opening RCV 1/4/2020 £m	Run Off Rate	PR14 Rate
Water Wholesale	98.8	2,015	4.9%	4.8%
Wastewater Wholesale	95.0	1,964	4.8%	4.4%

The run off rates proposed are thus broadly in line with that set in PR14. This ensures that customers are not unduly impacted by the transition.

Cross Checks – impact on customers

Run Off Rate Charge	PR14 FD Run Off 19/20 £m	PR19 20/21 Run Off £m
Water Wholesale	104.4	103.5
Wastewater Wholesale	94.3	99.4

Note, the 2020/21 charge includes depreciation on the additions in 2020/21, so would be expected to increase. The increase in the run off rate charge for wastewater is more than offset by other reductions in costs, resulting in overall bill reductions of 14% in 2020/21.

We have chosen the reducing balance form of depreciation in the model for all controls as this most closely captures the incremental impact on depreciation for the large scale of enhancements later in the 2020-25 period. To use the straight line approach would have meant charging customers for upfront for depreciation on enhancements in 2020/21 for which there had not yet been any expenditure.

Inter-Generational Customer Equity

As both PAYG and run off rates have been set on a long term stable basis, there are no generational cross subsidies and there should be no undue bill impact in 2025-30. In setting these, we have taken into account that customers have expressed a preference for stable bills over the long term (see Risk and Return Appendix). They are fair to customers who only pay for the proportion of the assets used to provide the services to them.

We have not changed PAYG or run off rates to solve financeability constraints or to advance or slow down cash flows.

Breaking down the run off rate by control and index

Having established the overall wholesale run off rates are reasonable, we then break them down into the controls. Rather than apply the same rate for both controls, we set the water resources and bioresources run off rate using asset lives taken from our historical cost accounting APR Table 2D. The Network Plus run off rates are thus the balancing figure to retain the overall wholesale values calculated earlier.

	Opening RCV	Run Off £m	Run Off Rate
Water Resources	300	16.7	5.6%
Water Network Plus	1,715	82.1	4.8%
Water Wholesale	2,015	98.8	4.9%
Bioresources	137	10.8	8.0%
Wastewater Network Plus	1,826	84.0	4.6%
Wastewater Wholesale	1,964	90.7	4.8%

For the investment post 2020 blocks in Water Resources and Bioresources, we have used the gross asset lives rather than remaining lives. These asset lives have been derived from the relevant columns of Table 2D of our 2018 APR, using gross book values rather than net. The run off rates are thus lower as they represent full asset lives rather than remaining.

SUMMARY: Average	2020-25	2020-25	2020-25
	PAYG Rate	Run Off Rate	Run Off Rate
		All/pre 2020	Post 2020
Water Resources	90.5%	5.6%	4.3%
Water Network +	52.2%	4.8%	n/a
Wastewater Network +	35.2%	4.6%	n/a
Bioresources	40.8%	8.0%	3.2%

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Run off rates adjustment from 2025

We have set our PAYG rate using the natural rate over 2020-25, so we do not anticipate upwards pressures on bills from base totex in 2025.

In the financial model, we have included forecasts over 2025-30 in order to consider the possible longer term bill profile.

The main upwards pressures on bills are likely to be from:

- A higher cost of capital (we have assumed an increase in nominal appointee WACC from 5.37% to 5.51%); and
- The remaining switch from RPI to CPIH stripped WACC (an increase of around 0.3% on the real WACC).

The combination of these two factors would be likely to increase bills.

The increase in the WACC would be required for financeability purposes, but it could be possible to use adjustments to the RCV run off rate to address the transition from RPI to CPIH. Whilst this was not necessary for 2020-25 given the reduction in overall bills, this option could be relevant at 2025. In our business plan, we have adjusted the 2025-30 run off rate for all Wholesale controls downwards by 0.3% pa. This has mitigated the modelled bill increase to below 3% in 2025/26.

TABLE WR5 - WEIGHTED AVERAGE COST OF CAPITAL FOR THE WATER RESOURCES CONTROL

We have assumed the same Weighted Average Cost of Capital for all wholesale controls. See the commentary for Table App32 for full details.

TABLE WR6 - WATER RESOURCES CAPACITY FORECASTS

Lines 1 - 6: Capacity ~ company forecasts

The variation in the water resource capacity across the planning horizon is due to the impacts of climate change on the availability of surface water for abstraction.

For the Kielder and Northern Central WRZs climate change reduces the amount of surface water available for abstraction, however for the Essex WRZ climate change increases the surface water available.

This is due to the enlarging of Abberton reservoir which is now a two season reservoir. In the climate change scenarios, summer rainfall/flows are generally lower but winter rainfall/flows are higher. There is now greater capacity available to store these higher winter flows in Abberton, therefore the starting resource position going into the design drought year is more favourable than it would be without the impact of climate change.

TABLE WR7 - NEW WATER RESOURCES CAPACITY ~ FORECAST COST OF OPTIONS BEGINNING IN 2020-25

No water resource schemes are being promoted.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

TABLE WR8 - WHOLESALE WATER RESOURCES SPECIAL COST FACTORS

NWL has not submitted any special cost factors for the water resources control.

TABLE WN1 - WHOLESALE NETWORK PLUS RAW WATER TRANSPORT AND WATER TREATMENT (EXPLANATORY VARIABLES)

Line 38: Number of treatment works requiring remedial action because of raw water deterioration

Forecast is based on expected end date of the current Legal Instrument for Nickel and no known other issues.

Line 39: Zonal population receiving water treated with orthophosphate

An average percentage of population phosphate dosed in each operational area was calculated and applied to the population forecast numbers from the Demand planning team to calculate the forecast numbers.

Lines 41-48: Band disclosure

Two water treatment works have been decommissioned and the total number of WTW is 51.

WN2 WHOLESALE WATER NETWORK PLUS WATER DISTRIBUTION (EXPLANATORY VARIABLES)

Line 1: Values are subject to business as usual updates and amendments to water mains.

Line 2: Total Length of Mains Relined has been forecast as zero in the period 2017-2025. The reason for this is that the practice of relining is no longer in use.

Line 3: Total length of potable mains renewed has been forecast by looking at the renewal meterage from 2011-2018 and then extrapolating the meterage that may be done for the period 2018-2025. We have assumed that there will be no significant budget changes and major changes to the work type.

Line 4: Total length of new potable mains has been forecast by looking at the new mains meterage from 2011-2018 and then extrapolating the meterage that may be done for the period 2018-2025. We have assumed that there will be no significant change in demand from the developers.

Lines 5-10: Forecast values - for each line, the percentage change from 2017-2018 has been calculated and applied to the lengths up to 2025. Lengths arising from any major schemes have been taken into account and applied in the relevant year.

Lines 13 – 20: The variation in the numbers provided for the planning period compared to that of 2017/18 is due to using the five year average for the planning period to account for varying weather conditions. In dry weather the proportion of distribution input from impounding reservoirs will be lower and the proportion of distribution from rivers in particular will increase. Data has been entered as percentage to two decimal places as per cell format, this ensures validation is true and cells sum to 100%.

Lines 14 – 21: Proportion of distribution input

Covered by Water Balance and demand Forecast methodologies.

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Distribution input (DI) is the average amount of potable water entering the distribution system. This includes water delivered to measured and unmeasured households, measured and unmeasured non-households, water taken unbilled (legally unbilled and legally unbilled), operational use and distribution losses. Through AMP7 DI is forecast to decrease as a result of an enhanced leakage reduction and demand management strategy.

Water delivered (non-potable) is not forecast to change over AMP7 as we do not expect that raw water supplied to businesses will change during this period.Water delivered (potable), distribution losses and operation use is removed from distribution input. This is forecast to decrease over AMP7 largely as a result of the demand management strategy.

Water delivered (billed measured residential) is an average volume of measured water delivered to residential properties, this includes supply pipe leakage and meter under-registration. The volume delivered to measured residential over AMP7 is increasing due to forecasted property growth and an increased metering strategy.

Water delivered (billed measured business), is an average volume of water delivered to business properties which are measured, this includes supply pipe leakage and meter under-registration. The volume delivered to measured businesses over AMP 7 is relatively flat, with a gradual increase over time to account for growth of non-household property numbers.

Total leakage is a calculated figure which sums distribution losses and underground supply pipe leakage. Leakage is forecast to decrease due to the enhanced leakage reduction for AMP7.

Distribution losses is potable water which is lost through the company's distribution system, this excludes supply pipe leakage. It is forecast to decrease during AMP7 due to total leakage reduction from the enhanced AMP7 strategy.

Water taken (unbilled) includes both illegal and legal unbilled usage and is expected not to change during AMP7.

Lines 28-35: Due to the differences in percentage on lines for age and diameter we get a difference in the grand total. To align the total lengths, lines reported by diameter have had the difference in the grand total added to the unknown diameter length, which is then distributed between the known diameters.

TABLE WN3 - WHOLESALE REVENUE PROJECTIONS FOR THE WATER NETWORK PLUS PRICE CONTROL

We have taken the same approach for revenue projections for all wholesale price controls. See the commentary to Table Wr3 for full details.

TABLE WN4 - COST RECOVERY FOR WATER NETWORK PLUS

We have taken the same approach for cost recovery for all wholesale price controls. See the commentary to Table Wr4 for full details.

TABLE WN5 - WEIGHTED AVERAGE COST OF CAPITAL FOR THE WATER NETWORK PLUS CONTROL

We have assumed the same Weighted Average Cost of Capital for all wholesale controls. See the commentary for Table App32 for full details.

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TABLE WN6 - WHOLESALE WATER NETWORK PLUS SPECIAL COST FACTORS

NWL has not submitted any special cost factors for the water network plus control.

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WASTEWATER TABLES

Data table	Contents	Additional commentary provided	Revised?
WWS1	Wholesale wastewater operating and capital expenditure by business unit	Yes	
WWS1a	Wholesale wastewater operating and capital expenditure by business unit including operating leases reclassified under IFRS16	Yes	
WWS2	Wholesale wastewater capital and operating expenditure by purpose	Yes	
WWS2a	Wholesale wastewater cumulative capital enhancement expenditure by purpose	Yes	
WWS3	Wholesale wastewater properties and population	Yes	
WWS4	Wholesale wastewater other (explanatory variables)	Yes	
WWS5	Other wholesale wastewater expenditure	Yes	
WWS6	Not used		
WWS7	Wholesale wastewater local authority rates	Yes	
WWS8	Third party costs by business unit for the wholesale wastewater service	Yes	
WWS9	Not used		
WWS10	Transitional spending in the wholesale wastewater service	Yes	
WWS11	Not used		
WWS12	RCV allocation in the wholesale wastewater service	Yes	
WWS12a	Not used		
WWS13	PR14 wholesale revenue forecast incentive mechanism for the wastewater service	Submitted July 2018	
WWS14	Not used		
WWS15	PR14 wholesale total expenditure outperformance sharing for the wastewater service	Supplied July 2018	Following IAP
WWS16	Not used		
WWS17	Not used		
WWS18	Explaining the 2019 Final Determination for the wastewater service	See also WS18	
WWn1	Wholesale wastewater sewage treatment operating expenditure	Yes	
WWn2	Wholesale wastewater large sewage treatment works explanatory variables and operating expenditure	Yes	
WWn3	Wholesale wastewater network (explanatory variables)	Yes	Following IAP
WWn4	Wholesale wastewater sewage treatment (potential explanatory variables)	Yes	Following IAP
WWn5	Wholesale revenue projections for the wastewater network plus price control	See Wn3	
WWn6	Cost recovery for wastewater network plus	See Wr4	
WWn7	Weighted average cost of capital for the wastewater network plus control	See App32	
WWn8	Wholesale wastewater network plus special cost factors	Yes	
Bio1	Wholesale wastewater sludge (explanatory variables)	Yes	
Bio2	Wholesale wastewater sludge treatment process and disposal routes	Yes	

Bio3	Wholesale wastewater sludge opex	Yes	
Bio4	Wholesale revenue projections for the wastewater bioresources price control	See Wr3	
Bio5	Cost recovery for bioresources	See Wr4	
Bio6	Weighted average cost of capital for the bioresources control	See App32	
Bio7	Wholesale wastewater bioresources special cost factors	Yes	

TABLE WWS1 - WHOLESALE WASTEWATER OPERATING AND CAPITAL EXPENDITURE BY BUSINESS UNIT

This table covers all totex, both base and enhancement. We have included the opex from Table WWS2 in line 7 of WWS1. For Ofwat to carry out a base totex efficiency analysis, the enhancement opex from Table WWS2 will have to be deducted from line 7.

Line 8 Water rates matches the totals in Table WWS7.

Line 10 Third party costs matched Table WWS8.

Lines 14, 15 & 16 reconcile to the enhancement capex set out in Table WS2.

TABLE WWS1A - WS1A - WHOLESALE WATER OPERATING AND CAPITAL EXPENDITURE BY BUSINESS UNIT INCLUDING OPERATING LEASES RECLASSIFIED UNDER IFRS16

WWS1 has been restated and completed on the basis that IFRS16 had not been implemented.

TABLE WWS2 - WHOLESALE WASTEWATER CAPITAL AND OPERATING EXPENDITURE BY PURPOSE

Line 47 of WWS2 agrees to the sum of lines 14 to 16 in WWS1.

WWS2 lines 32-35 have been populated with Infrastructure network reinforcement, Traffic management act, lift and shift and RASWA values to ensure the reconciliation is transparent.

TABLE WWS2A - WHOLESALE WASTEWATER CUMULATIVE CAPITAL ENHANCEMENT EXPENDITURE BY PURPOSE

Regard for maintaining consistency with corresponding lines in previous data submissions when using these lines was taken into account.

TABLE WWS3 - WHOLESALE WASTEWATER PROPERTIES AND POPULATION

Lines 1 – 10: The number of properties reported in rows 1 and 2 represents properties not previously connected. The number of properties reported in rows 3 to 10 up to and including 31.3.18 represents the annual average number of properties, which is calculated as the average numbers as reported on the 1st of each month, from April to April (13 months).

The property numbers post 31/03/18 are derived from the WRMP including the forecast assumptions for void properties, and are produced in accordance with the table WWS3 guidance.

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Lines 11 and 12: The annual total number of new business connections is expected to remain constant over the planning horizon.

The total number of new residential connections increases over the planning period. The growth property figures for each of the forecasted years are provided by Edge Analytics. In line with the WRPG requirement, NWL is using Local Plan housing growth evidence from all local authorities that are either wholly or partially included within the NWL operational boundary. The following key demographic datasets were used to obtain the population and household forecasting;

- Population estimates, 2001-2015 (ONS)
- Birth, death and migration data, 2001-2015 (ONS)
- Household data and assumptions (DCLG; 2011 Census)
- Fertility, mortality, migration and population growth assumptions from the SNPP (ONS)

Total population served for the 2017/18 and forecasted years has been commissioned from Edge Analytics. In line with the WRPG (Environment Agency, 2017) requirement, NWL has used local authority plan housing growth evidence from all local authorities and has selected the plan-based scenario.

Resident population connected to sewerage system increases across the planning period. Non-resident population connected to sewerage system remains constant across the planning period as there is no evidence that this would change.

TABLE WWS4 - WHOLESALE WASTEWATER OTHER (EXPLANATORY VARIABLES)

Lines 4-5: Values are subject to business as usual updates and amendments where areas and properties change. Forecast values: For each line, the percentage change from 2017-2018 has been calculated and applied to the lengths up to 2025.

Line 11: In addition to the 5,584m³ of network storage provided to meet CSO spill frequency objectives, a further 1400m³ of storage has been avoided by removing surface water from the combined sewer network or providing SuDS features to attenuate surface water flows prior to them entering the combined sewer network.

TABLE WWS5 - OTHER WHOLESALE WASTEWATER EXPENDITURE

The headcount figures in this table have been assumed to remain the same as 17-18. While they would be expected to change for efficiencies, enhancement requirements and insourcing / outsourcing of activities, the exact mix of the changes is unknown.

TABLE WWS7 - WHOLESALE WASTEWATER LOCAL AUTHORITY RATES

2017/18 figures include the release of a provision for unassessed sites.

The charge before transitional relief has been increased by CPIH each year, no other significant changes are expected.

Business rates reduced in the 2017/18 review. The transitional relief acts as a dampener on the impact of rates changes and will a cost through to 2020/21 and hence has been input as a positive number.

93% of business rates were allocated to wholesale wastewater in 2017/18. This percentage has been applied to the total transitional relief figure.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

TABLE WWS8 - THIRD PARTY COSTS BY BUSINESS UNIT FOR THE WHOLESALE WASTEWATER SERVICE

The table has been populated in accordance with the guidance and line definitions. Block B lines 6 – 7 have been completed to summarise other third party services not included in lines 4 & 5.

TABLE WWS10 - TRANSITIONAL SPENDING IN THE WHOLESALE WASTEWATER SERVICE

Lines 26 - 27: Growth at sewage treatment works (excluding sludge treatment) and Resilience

Transitional spending is required for areas, the table has been compiled accordingly.

TABLE WWS12 - RCV ALLOCATION IN THE WHOLESALE WASTEWATER SERVICE

Overview

Our approach to Table WWs12 is relatively simple. We have started with our RCV allocation of September 2017 and updated it by RPI to March 2018 prices. We have also updated our valuation to include our business plan view of bioresources investment from 2018 to 2020.

We have made no other changes to our allocation, as our approach was based on our assets and processes as they will be in 2020, and this has not changed since our September submission. We have retained our assumption that the Bran Sands gas to grid scheme goes ahead and that this will be part of our process at 2020. We are awaiting Government confirmation on our application for Renewable Heat Incentive tariffs for the scheme and should be able to confirm the outcome of this with Ofwat before the Final Determination.

We have set out some observations on the Ofwat feedback and on the impact on customers later in this commentary.

We have thus completed Table WWs12 and do not propose to re-submit the detailed tables we provided in September 2017.

1 Assurance report by Economic Insight (EI)

We commissioned EI to review our approach to the bioresources RCV allocation in the light of the Ofwat feedback. We have included the report in our submission, see Appendix 5.1.

EI made the following findings:

4.1 Overall consistency of approach with Ofwat's guidance

Based on our review, we find a high level of consistency between the company's approach and Ofwat's requirements. In the subsequent sections we provide more detailed observations on Northumbrian's method, in light of Ofwat's published feedback, and identify areas in which refinements could be made. However, at an overall level, we find the following:

• That the company has adopted an economic value approach to arriving at its proposed bioresources RCV allocation.

• *The company has further clearly set out its approach to economic value within the wider context of its strategy for sludge, to ensure internal consistency.*

• *The company's approach defines the modern equivalent asset in a logical way – and, due to the recentness of its own strategy, assumes existing processes represent a fair measure of the modern equivalent – a point with which we concur.*

• *The company's approach includes values for shared assets.*

• *The company's approach includes land values.*

• *The company's approach includes and separately identifies relevant income.*

• *The company's approach includes a range of cross-checks, consistent with those outlined by Ofwat (although these could be further refined).*

2 Review of Ofwat report: Economic Value of Bioresources Assets – Feedback to companies (Feb 2018)

Our review of this report does not highlight any specific Ofwat concerns over Northumbrian Water's approach. We have reviewed the comparative graphs to consider our relative position in relation to the industry.

Figure 3.1 Headroom

NWL has the lowest headroom of the industry. This is not surprising as our entire sludge strategy is based on relatively recent investments and so we have no oversized or underused assets, unlike companies with legacy assets. We have not excluded capacity in our assessment.

Figure 4.1 Relative Capital Cost

Our relative gross unit costs are at the lower end of industry figures. As noted in Figure 4.2, this seems to be a function of scale rather than process type – our two sludge treatment centres are relatively large in the scale provided.

Figure 4.3 Relative unit other sites compared to bioresources transported

Our position here seems relatively central – our six sludge handling centres appear relatively efficient in comparison to bioresources transported.

Figure 5.1, 5.2, 5.3 Asset life adjustments and asset lives

Our position seems relatively central, as 5.21 notes, we made the same assumption as Welsh on assessing asset lives.

Figure 5.4 Income excluding and including renewable energy incentives

Our relative position moves from average to highest when renewable income is included. This is no surprise, we have the highest renewable income per unit in the industry.

3 Impact on customers

As we noted in our September 2017 submission, in the context of wastewater bills falling by at least 10%, we do not anticipate any customers being adversely affected by our bioresources allocation.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Trade Effluent Customers

Our bioresources component of trade effluent charges will decrease significantly in 2020/21, with a slight rebalancing towards the other trade effluent components. That rebalancing will be more than offset by the wastewater bill reductions of at least 10%.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Customer receiving surface water rebates

The proportion of wastewater costs allocated to bioresources will decrease in 2020/21 as the significant efficiencies made since the investment in AAD are specifically allocated to the bioresources control. This will make the wastewater network plus control proportion increase, thus increasing the proportion of the bill appropriate for a surface water rebate.

In practice, with an overall reduction in wastewater bills of at least 10%, the wastewater network plus bill will also decrease.

4 Table WS12 Bioresources RCV allocation

Section A

Lines 1 – 3

Net MEAV and RCV allocation are as per the submission in September 2017

Section B

Line4 - RPI

Sum of lines 1-3 uplifted by RPI to March 2018.

Line 5 – Changes to the allocation of assets between business units

There are no post Sept 17 adjustments to be made.

Line 6 – Changes to Sludge Assets in Existence

Changes to net assets reflecting additions and disposals as per the capital plan 31st March 2018

Line 7 – Changes to gross cost of hypothetical new assets (Excluding Land)

Changes to Gross assets reflecting additions and disposals as per the capital plan 31st March 2018

Line 8-9 No change

Section C

RCV

Line 18 Net MEAV

Sum of lines 1 plus lines 3-17

Section D

Net MEAV at 31 March 2020 by Asset Type

These are recalculated from the September 2017 submission with the adjustments per Block B applied as appropriate.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Section E

Movement of Gross MEAV to Net MEAV at 31st March 2020

The only adjustment we make are to adjust for the remaining economic life and for the proportional allocation of shared assets.

Background Comments on the bioresources valuation

Bran Sands

NWL carried out an impairment review of Bran Sands Assets, following the commissioning of the AAD plant in 2009. During the construction of the AAD plant, where possible existing assets were utilised. For example the Sludge Tanks. The Asset data for Bran Sands used in this revaluation consisted of both the AAD projects and existing assets, both of which were revalued by uplifting the Historic cost values from the Journal Entry Reserve Report by RPI up to 3st March 2017.

There were several assets which would not have been built in their current state for the AAD Plant, hence a Modern Equivalent Value was used to replace the Historic Cost Values.

1. Phase 1 Building
2. Phase 2 Building
3. MCC

The MEAV asset included was 1 building the quarter of the size of the existing building to house the MCC, which would be replaced.

The date of construction used for the building was the same as the AAD plant for calculating NBV and its residual life.

Interest was excluded in line with RAG guidelines.

Howdon

The AAD plant was commissioned in 2012. . The Asset data for Howdon used in this revaluation consisted of the AAD projects, revalued by uplifting the Historic cost values from the Journal Entry Reserve Report by RPI up to 3st March 2017.

RPI

RPI rates to uplift historic costs to March 2018, were sought from the National Statistics Database for each year.

Weighted Average Life

The Weighted average life and weighted residual life was calculated for all sludge sites and a composite rate for the sludge sites for use in the RCV tables.

Dates in Service were used for Bran Sands and Howdon Assets. For the remaining thickening sites were the revaluation was provided by the estimating team, we confirmed the construction dates.

A Review of sludge assets was undertaken between2006-2009, and following a discussion with the Stressholme Project Manager, 2009 was deemed to be the most accurate date. Stressholme's centrifuge was originally installed in Seaton Carew and moved to its new home in 2009.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Sludge Transport

We identified the vehicles and trailers from a list of sludge vehicles identified in the budget file from management accounts. The historic cost value for the vehicles were uplifted by RPI.

Replacement values were sought from VLS, were the vehicle was being replaced before 2020.

Land

A valuation of £188.5k per hectare for Industrial Land provided by OFWAT from Department for Communities and Local Government (December 2015) – Land Value Estimates for policy appraisal.

The area for both Bran Sands and Howdon was calculated from our GIS system (Elyx) with the assistance of the Estates Technician.

Additions 2017 -2020

Forecast additions from the capital plan were provided by the Capital plan co-ordinator.

The additions were reviewed to remove base spend.

The costs were at 2018 prices.

Management and General

The data source for calculating the M and G asset values was the same data source as regulatory accounts table 2A SEGMENTAL INCOME STATEMENT.

The activity was designated as “Common” where the assets had been allocated to the primary area of business use and recharged to other business activities.

The asset data used was on an historic cost basis uplifted by March RPI of each year to determine the revaluation. An Adjustment was made for accruals from Mar 16 and Mar 17. An assumed life of 10 years was used in the calculation of the NBV of the accruals with the annual depreciation assumed for each year.

The same basis was used to Howdon and Bran Sands to calculate the weighted average life and weighted average remaining life.

TABLE WWS13 - PR14 WHOLESALE REVENUE FORECAST INCENTIVE MECHANISM FOR THE WASTEWATER SERVICE

This table was submitted as part of our early data submission on 27 July 2018.

TABLE WWS15 - PR14 WHOLESALE TOTAL EXPENDITURE OUTPERFORMANCE SHARING FOR THE WASTEWATER SERVICE

This table was submitted as part of our early data submission on 27 July 2018. The data has been updated for the latest 2018/19 and 2019/20 forecasts.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

TABLE WWS18 - EXPLAINING THE 2019 FINAL DETERMINATION FOR THE WASTEWATER SERVICE

Please see commentary located under WS18 for WWS18 Block G.

Line 1: Number of external sewer flooding incidents

In accordance with work undertaken with the rest of the industry to move towards this common definition of external flooding by 2020-21 we shadow reported against this common measure for the first time in 2016-17. Shadow reporting for 2016-17 required an exercise to manually review flooding incidents reported as occurring during that reporting year to assess them for compliance with the common measure.

In the absence of a similar manual exercise to review flooding incidents reported as occurring prior to 2016-17 we have calculated an estimated number for 2015-16 by using the actual PR14 MOS external flooding number for 2015-16 and applying the mean shadow reported common measure/PR14 MOS ratio from 2016-17 and 2017-18.

Therefore 2015-16 is a calculated estimate, 2016-17 and 2017-18 are actual shadow reported numbers for the common measure and 2018-19 to 2024-25 is a forecast based on our PR19 external flooding PC.

Line 7: Length of rivers improved as a result of WINEP water quality schemes

This data is provided by the EA as part of the Water Industry Environment Programme (WINEP), and in accordance with their guidance document 'Completing the WINEP spreadsheet supplementary guidance: Environmental outcomes'. It is a support document to the guidance 'Water Industry Planning: Completing the Water Industry National Environment Programme (WINEP) spreadsheet.

The EA must record environmental outcomes for each improvement and no deterioration measure on the WINEP spreadsheet. This information will be used to report environmental outcomes for the water industry through the WINEP. The EA's guidance document 'Completing the WINEP spreadsheet supplementary guidance: Environmental outcomes', is written in line with their key performance indicator KPI 1311 as far as possible. KPI 1311 is reported by Government as part of the EA's Corporate Scorecard (CSC) as measure 1.3 – 'Rivers, lakes and coastal waters are healthier'. However, whilst actions to prevent deterioration are outside of the scope of the KPI, they are included in WINEP environmental outcomes.

Source data: (non-corporate)

The data is provided by the EA as part of the WINEP3 publication in March 2018. This includes improvement measures and no deterioration measures. Investigations and monitoring measures do not require environmental outcomes. Environmental outcomes need only be calculated for 'green' or 'amber' measures in WINEP3.

Assumptions:

Water quality improvement measures are calculated to deliver the water company's fair share of the load reduction towards achieving the WFD status target. Therefore, delivery of the water company measure alone may be insufficient to achieve the desired objective without also securing improvements from other sectors. However, for the purpose of these environmental outcomes, the EA have been guided to report the outcome as the status target that they are aiming to achieve by improving all sectors.

For example, if a water body is at poor status for phosphorus and the EA have included a 'fair share' improvement measure on the WINEP to contribute to achieving good status (ie it has a WFD_IMPg driver), the environmental outcome will be recorded as 'X kilometres improved from poor to good status', even if the water company measure is not quite sufficient to get to good status on its own.

APPENDIX 4.3
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If one improvement will deliver two drivers, and delivers two outcomes, then both will be recorded. For example, improvements to phosphorus in a river which will improve both the immediate downstream river water quality plus also an area of SSSI wetland where there are offtakes from the river. The river length enhanced will be recorded in column CD of the WINEP and hectares of wetland improved in column CG. Only the river length will be recorded in Line 7.

Although outcomes are entitled 'Quantitative Km River Length Improved' and 'Quantitative Area (km2) Improved', this will include length/area 'protected' also.

PR19 table WWS18 Line 7 definition states this should include:

The actual and forecast length of rivers improved as a result of WINEP Water Quality schemes. Figures entered in this line should be consistent with those recorded in the Environment Agency's 2020-25 WINEP spreadsheet. "Improved" shall have the same meaning as in the Environment Agency's PR19 environmental guidance.

The EA guidance states that the EA must provide environmental outcomes for all improvement schemes. This includes improvement measures and no deterioration measures.

The length included in Line 7 will only be counted once for each site ie if a site has a no deterioration and a WFD improvement driver for the same measure, the length will only be recorded once.

Investigations and monitoring measures do not require environmental outcomes.

Environmental outcomes are only calculated for 'green' or 'amber' measures in WINEP3. This will be the total included in Line 7.

The EA guidance specifically states:

Do not collate or summarise the environmental outcomes delivered across multiple measures or even by driver. Each measure must be considered on its own basis. Attempts to summarise environmental outcomes data could lead to double counting of improvements and misrepresentation of the outcomes.

The Ofwat line 7 requests a 'total' length of rivers improved (km) which requires the sum of all outcomes – this contradicts the EA guidance, however by only including the length improved once (where multiple WFD drivers) this will limit the risk of double counting benefits.

It is noted that it is unlikely that the environmental improvement will be evident immediately following improvement as the biology can take some time to respond to change.

Line 8: Greenhouse gas emissions from wastewater operations

The figures here are reported actual estimated emissions through to 2017-18 and projections thereafter. Our emissions projections include the use of a 'market based' emissions factor for electricity. We use REGO certified grid electricity from our supplier Orsted, which means our Scope 2 emissions for electricity generation, and our Scope 3 emissions linked to losses in electricity transmission and distribution are effectively zero. Residual emissions fall under five main categories; direct emissions from fossil fuel; process and fugitive emissions; fleet transport; public transport; and outsourced activities. Process and fugitive emissions make up 45% of the total, are more challenging to reduce than other areas, and mostly related to wastewater activity. As a result the wastewater emissions form the larger part of the Company-wide total.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

TABLE WWN1 - WHOLESALE WASTEWATER SEWAGE TREATMENT OPERATING EXPENDITURE

The table has been populated in accordance with the guidance and line definitions and reflects table 10 of the 2017 Cost Assessment submission.

TABLE WWN2 - WHOLESALE WASTEWATER LARGE SEWAGE TREATMENT WORKS EXPLANATORY VARIABLES AND OPERATING EXPENDITURE

Lines 1 – 10: Sewage treatment works ~ Explanatory variables

The number of STW's in the Large category has not changed.

Lines 11 – 15: Sewage treatment works ~ Operating expenditure

The table has been populated in accordance with the guidance and line definitions and reflects table 11 of the 2017 Cost Assessment submission.

TABLE WWN3 - WHOLESALE WASTEWATER NETWORK (EXPLANATORY VARIABLES)

Line 3: Number of network pumping stations

We have made a major restatement of this data. Full details can be found in the Action response NES.CE.A1.1 and the associated report: NES sewage pumping station capacity – revised calculation.

Line 4: Number of network pumping stations

The period October 2011 to October 2016 was the timeframe for the phased adoption of private pumping stations and rising mains. Within the PR14 submission (submitted partway through this time), it was forecast that a further 300 pumping stations would be adopted. This forecast was produced based on the level of adoptions that had occurred up to March 2013; it was expected that this rate of adoption would continue with a wrap up at the end of the period. However, the total number of stations actually adopted over the five year period was 186.

Line 5: Total number of sewer blockages

Values to 2017-18 are actual data, the total number of sewer blockages reported on the public and transferred network. Values to 2024-25 are forecast based on assessment of past performance with a forecasted target that will improve our UQ position.

Lines 6 and 7: Number of sewer collapses

Our current definition for reporting regulatory collapse is a service impact to a customer resulting in full loss of service and no pass forward flow. Under the new definition, a sewer collapse is considered to be where a structural failure has occurred to the pipe and any loss of flow has occurred that results in a service impact to a customer or the environment and where action is taken to replace or restore the pipe to reinstate normal service. The retrospective review of data indicates that we will see a significant increase in the number of sewer repairs classified as a regulatory collapse under the new definition.

For consistency in the data tables for the period 2017/18-2020 we have reported regulatory collapses as an actual number. The numbers are not normalised.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

For the period 2017-2020 we have reported using our current methodology. For the period 2020-2025 we have reported using the new definition.

For the period 2018-2020 we have forecast using our current PC.

For the period 2020-2025 we have retrospectively reviewed 11 months of repair data and applied the new definition. This will include an assessment where there are gaps in the data. As such, a precautionary approach has been taken and if there was any doubt as to whether a repair should be included, then it has been.

Lines 11 and 16 to 22:

Values are subject to business as usual updates and amendments to sewers.

A number of lengths of foul (only) sewers have been reclassified as combined following on-site confirmation. Length of formerly private sewers is still reported as the estimated length with a current mapped value of 978.6 km. Newly mapped transferred assets will feature in the length of sewer age profile (constructed post 2001) due to an unknown date laid which then uses the capture date as a fall back catch all.

Forecast values: For each line, the percentage change from 2017-2018 has been calculated and applied to the lengths up to 2025. However, with a number of foul sewers reclassified as combined, this has skewed the percentage forecast incorrectly for foul and combined. Therefore, the percentage difference has been taken between 2016 and 2017 for foul (only) and combined to apply from 2019 onwards as a more realistic position.

A potential risk to the forecast projection would be the introduction of Section 42 – Floods and water management act 2010. The commencement of Section 42 would introduce mandatory adoption which would lead to an increase to the lengths of public sewers. Until then, private sewers will continue to be built and should Section 42 come to force, a supplementary transfer would need to take place, altering the projection of formerly private sewers.

Line 12: Data from spreadsheets combining CCB and MOSL data.

The forecast numbers are predicted to stay the same up to 2025 because the load trend from traders shows that there would be zero TE load sometime in AMP7 and there is no data showing specific trader load changes that can be publically shared. With this in mind, and with no way to trend or vary the TE load, the future volume was quoted as constant for consistency. There was confusion over what units this figure was to be reported in, we have reported the figure in Ml/yr to align with APR.

Lines 14-15: Future projections of rehabilitation were calculated based on increasing asset health.

TABLE WWN4 - WHOLESALE WASTEWATER SEWAGE TREATMENT (POTENTIAL EXPLANATORY VARIABLES)

This table covers the load received by sewage treatment works operated by NWL and shows changes going forward to the end of AMP7.

We note that Ofwat has overwritten the rising load profile from 2018-2025 with a flat profile. We have submitted a report ‘Forecast BOD load – response to Ofwat’s challenge’ that supports our rising trend. Action response NES.CE.A1.3 has more details.

Assumptions are that 0.06kg BOD is equivalent to one person.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

NWL currently has no plans to transfer/de-commission any of its STW assets. However, once a more detailed investigation of the requirements of meeting new permit values has been carried out, transferring flows may be the most cost effective solution.

NWL currently has seventeen sites with chemical dosing to meet a phosphorus permit. This will increase to twenty three at the end of AMP6 and then again to fifty two by the end of AMP 7.

There has been an allowance made for residential population growth and this has been included in the figures in this table with the predicted load being received year increasing year on year.

This shows the STW's moving size band;

Wooler 2019 sizeband 3 to 4

Carlton in Cleveland 2023 sizeband 1 to 2

Windlestone 2025 sizeband 4 to 5

Other STW's are having tighter permit values imposed and the proposed treatment solution might mean that the treatment type will change, see the table below:

Site Name	2018	2019	2020	2021	2022	2023	2024	2025
ALDIN GRANGE NTH (BEARPARK)	SB	SB	SB	SB	SB	SB	SB	TB2
ALNWICK	SB	SB	SB	TB2	TB2	TB2	TB2	TB2
AYCLIFFE STW	TA2	TA2	TA2	TA2	TA2	TA2	TA2	TA2
BARKERS HAUGH STW	TB2	TB2	TB2	TB2	TB2	TB2	TB2	TB2
BARTON STW	SB	SB	SB	TB2	TB2	TB2	TB2	TB2
BILLINGHAM STW	TA2	TA2	TA2	TA2	TA2	TA2	TA2	TA2
BISHOP MIDDLEHAM STW	SB	SB	SB	SB	SB	SB	SB	TB2
BUTTERKNOWLE STW	SB	SB	TB2	TB2	TB2	TB2	TB2	TB2
CARLTON & REDMARSHALL STW	SB	SB	SB	SB	SB	SB	SB	TB2
CHILTON LANE STW	TB1	TB1	TB1	TB1	TB1	TB1	TB1	TB2
COCKFIELD STW	SB	SB	TB2	TB2	TB2	TB2	TB2	TB2
CROOKHALL	TB1	TB1	TB1	TB1	TB1	TB1	TB1	TB2
DIPTON STW	SB	SB	SB	SB	SB	SB	SB	TB2
ESH WINNING STW	SB	SB	SB	SB	SB	SB	SB	TB2
FISHBURN STW	SB	SB	SB	SB	SB	SB	SB	TB2
GREAT AYTON STW	SB	SB	TB2	TB2	TB2	TB2	TB2	TB2
HUTTON RUDBY STW	SB	SB	SB	TB2	TB2	TB2	TB2	TB2
KIRKLEVINGTON STW	SB	SB	SB	SB	SB	SB	SB	TB2
KNITSLEY STW	SB	SB	SB	SB	SB	SB	SB	TB2
LANCHESTER STW	TB1	TB1	TB1	TB1	TB1	TB1	TB1	TB2
LONGHORSLEY STW	TB1	TB1	TB1	TB1	TB1	TB1	TB1	TB2
LONGNEWTON STW	SB	SB	SB	SB	SB	SB	SB	TB2
NEW MOORS STW	SB	SB	SB	SB	SB	SB	SB	TB2
PITTINGTON STW	SB	SB	SB	SB	SB	SB	SB	TB2
PITY ME STW	SB	SB	SB	SB	SB	SB	SB	TB2

PLAWSWORTH STW	SB	SB	SB	SB	SB	SB	SB	TB2
RAMSHAW STW	SB	SB	TB2	TB2	TB2	TB2	TB2	TB2
SACRISTON STW	TB1	TB1	TB1	TB1	TB1	TB1	TB1	TB2
SEDGEFIELD STW	TB1	TB1	TB1	TB1	TB1	TB1	TB1	TB2
SHERBURN STW	TB1	TB1	TB1	TB1	TB1	TB1	TB1	TB2
SLALEY STW	SB	SB	SB	SB	SB	SB	SB	TB2
STAINDROP STW	SB	SB	SB	TB2	TB2	TB2	TB2	TB2
STOKESLEY STW	SB	SB	TB2	TB2	TB2	TB2	TB2	TB2
TEESSIDE AIRPORT STW (GOOSEBECK)	SB	SB	SB	SB	SB	SB	SB	TB2
TRIMDON STW	TB1	TB1	TB1	TB1	TB1	TB1	TB1	TB2
WOOLER STW	SB	SB	TB2	TB2	TB2	TB2	TB2	TB2

TABLE WWN5 - WHOLESALE REVENUE PROJECTIONS FOR THE WASTEWATER NETWORK PLUS PRICE CONTROL

We have taken the same approach for revenue projections for all wholesale price controls. See the commentary to Table Wr3 for full details.

TABLE WWN6 - COST RECOVERY FOR WASTEWATER NETWORK PLUS

We have taken the same approach for cost recovery for all wholesale price controls. See the commentary to Table Wr4 for full details.

TABLE WWN7 - WEIGHTED AVERAGE COST OF CAPITAL FOR THE WASTEWATER NETWORK PLUS CONTROL

We have assumed the same Weighted Average Cost of Capital for all wholesale controls. See the commentary for Table App32 for full details.

TABLE WWN8 - WHOLESALE WASTEWATER NETWORK PLUS SPECIAL COST FACTORS

NWL has not submitted any special cost factors for the wastewater network plus control.

TABLE BIO1 - WHOLESALE WASTEWATER SLUDGE (EXPLANATORY VARIABLES)

Lines 1-3: Total sewage sludge produced

100% of NWL's sludge has been treated by the Cambi Advanced Anaerobic Digestion since Autumn 2013 when the Howdon system in Newcastle came on line to duplicate the system at Bran Sands in Middlesbrough. The amount of sludge treated fell year on year from 2013_14 (75.5 ttds) to 2016_17 (67.7 ttds) as the sewage treatment works sludge from around the region underwent a phase of optimisation. There was a slight increase for 2017_18 (70.3 ttds) possibly due to an increase in population and also due to an increase in the number of sites where the sludge is produced from a phosphorus removal process using a chemical coagulant. The population increase is predicted to continue over the next few years up to 2030 and the number of phosphorus removal sites will also increase. The amount of sludge from treating trade effluent and commercial waste has so many variables, it is thought to be too difficult to predict; hence it

has been regarded as stable. The current maximum theoretical yield of the two sludge treatment centres is 80 ttds.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Line 4: Total sewage sludge produced from non-appointed liquid waste treatment

The estimate of sludge quantity produced from treating non-appointed tankered waste comes from a total of commercial waste, imported septic and cess and imported biosolids from other water companies. To calculate the sludge generated by treating commercial waste at Bran Sands, which is the only site with a permit to accept it, we apportion sludge dry solids generated according to the COD equivalent from each source which is measured on-site. Bran Sands also accepted sludge from Yorkshire Water last year. Dry solids results are again taken on-site. In addition, we have several sites where companies can discharge septic tank or cesspool waste. The vast majority of this takes place at Howdon and Bran Sands. We only measure suspended solids of septic/cess imports at Bran Sands (Howdon will come online soon for this) so the average solids result from Bran Sands was used and applied across the other sites.

As there are so many variables with how much commercial waste is received, it was decided to use the figure from 2017/18 as a forecast. The septic/cess is fairly stable and expected to stay that way. Commercial tankering fluctuates depending on the economy and the amount of sludge imported from other water companies is dependent on their strategies and requirements.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

Line 5: Percentage of sludge produced and treated at a site of STW and STC co-location

The percentage of sludge produced and treated at a site of STW and STC co-location has increased this year due to a change in the understanding of the definition. In previous years we believed that including the six centrifuge sites (Sludge Handling Centres) would cause double counting as the sludge cake produced is then taken to a Sludge Treatment Centre (STC) for further treatment. We agreed with the new auditors who understood the definition of STC to be a site where sludge is dewatered to >10% dry solids which therefore includes the six centrifuge sites at Morpeth, Hendon, Birtley, Willington, Stressholme and Tudhoe Mill. Hence the increase in this line for 2017/18 from 53.4% to 64.9%.

Line 6-8: Total sewage sludge disposed

The amount of sludge disposed of, by recovery to agricultural fields, is approximately 40% of the sludge treated. The Cambi thermal treatment and subsequent digestion cause destruction of the volatile sludge matter as well as improving dewaterability. The destruction rate is quoted by Cambi as being between 58-65% and the process typically gives 50-65% reduction in cake volume. Although there are fluctuations in the amount of sludge recovered to agriculture, compared with the amount of sludge treated, the fluctuations are within the expected range. The predicted amount up to 2025 has been calculated as a product of the predicted sludge treated.

Line 19: Chemical P sludge as percentage of sludge produced at STWs

The total quantity of sludge which is produced from a phosphorus removal process using a chemical coagulant (ferric sulphate) as a percentage of the total sludge has seen an increase this year. This is due to a change in definition after the auditors' first visit. Previously, we had calculated this amount by basing it on the additional sludge produced as a result of the phosphorus removal process compared with the amount of sludge that would be produced without that extra treatment. This was then expressed as a percentage of the total sludge produced and gave a result of approximately 0.7%. This was the definition provided by our previous auditors.

This year, we agreed with the auditors that a simpler definition was to be used. We compared the total amount of sludge produced due to the phosphorus removal process at 17 sites with the total amount of sludge produced as Line 3 above. Hence the increase for 2017/18. The predicted amount used the predicted population growth as well as the increase in the sites requiring phosphorus removal.

Ofwat APR Queries process (Query number *NES-APR-CE-012)* identified an opportunity for us to reflect upon the methodology used in our previous years submissions, where we calculated the difference in the amount of sludge that is generated by the addition of coagulant to reduce the Chemical P. This query allowed us to offer Ofwat a different method to calculating Chemical P sludge as percentage of sludge produced at STWs. We therefore offer in our commentary this additional method:

- calculation of P load at the Chemical P sites using sample analysis ($P_{influent} - P_{effluent}$) x Flow

This is added to the amount of ferric coagulant used at the Chemical P sites and compared with the amount of sludge produced.

To predict up to 2024/25 it was necessary to include all sites that will be using Chemical P treatment by then. To get predicted P load, the numbers for 2025 P removed were used vs 2018 data to get a total increase and then just incremented it over the years. To get the amount of ferric the total annual flow for the current sites was divided by the amount of ferric used in kg this year – figure for this was coincidentally 13.000. Then we divided the total annual flow for all 2025 sites by 13 to get tonnage of ferric – and then incremented that as well. Finally the total sludge produced figure was used from the previous predictions (using Population Equivalent).

Using this method the figures (to 1 d.p.) the figures would be:

Line description		Item reference	Unit	DPs	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
19	Chemical P sludge as percentage of sludge produced at STWs	MP05616	%	1	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.8%	0.8%

TABLE BIO2 - WHOLESALE WASTEWATER SLUDGE TREATMENT PROCESS AND DISPOSAL ROUTES

Line 4: % Sludge treatment process- advanced AD

100% of sludge is processed through advanced AD to produce enhanced treated Biosolids.

Line 12: % Sludge disposal route - sludge recycled to farmland

100% enhanced treated Biosolids recycled to agricultural land.

TABLE BIO3 - WHOLESALE WASTEWATER SLUDGE OPEX

The table has been populated in accordance with the guidance and line definitions and reflects table 18_3 of the 2017 Cost Assessment submission

TABLE BIO4 - WHOLESALE REVENUE PROJECTIONS FOR THE WASTEWATER BIORESOURCES PRICE CONTROL

We have taken the same approach for revenue projections for all wholesale price controls. See the commentary to Table Wr3 for full details.

TABLE BIO5 - COST RECOVERY FOR BIORESOURCES

We have taken the same approach for cost recovery for all wholesale price controls. See the commentary to Table Wr4 for full details.

TABLE BIO6 - WEIGHTED AVERAGE COST OF CAPITAL FOR THE BIORESOURCES CONTROL

We have assumed the same Weighted Average Cost of Capital for all wholesale controls. See the commentary for Table App32 for full details

TABLE BIO7 - WHOLESALE WASTEWATER BIORESOURCES SPECIAL COST FACTORS

NWL has not submitted any special cost factors for the bioresources control.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

DUMMY CONTROL TABLES

Data table	Contents	Additional commentary provided
Dmmy1	Dummy price control operating and capital expenditure by business unit	Not applicable to NWL
Dmmy2	Dummy price control capital enhancement expenditure by purpose	Not applicable to NWL
Dmmy3	Dummy price control other (explanatory variables)	Not applicable to NWL
Dmmy4	Dummy price control special cost factors	Not applicable to NWL
Dmmy5	Transitional spending in the dummy price control	Not applicable to NWL
Dmmy6	Dummy price control (explanatory variables)	Not applicable to NWL
Dmmy7	Wholesale revenue projections for the dummy price control	Not applicable to NWL
Dmmy8	Cost recovery for the dummy price control	Not applicable to NWL
Dmmy9	Weighted average cost of capital for the dummy price control	Not applicable to NWL
Dmmy10	PR14 wholesale total expenditure outperformance sharing for the dummy price control	Not applicable to NWL

The Dummy price control is for Thames Tideway and not applicable to NWL.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

RETAIL TABLES

Data table	Contents	Additional commentary provided	Revised?
R1	Residential retail	Yes	
R2	Residential retail special cost factors	Yes	
R3	Residential retail ~ further information on bad debt and customer services	Yes	
R4	Business retail ~ Welsh companies	Not applicable	
R5	Business retail ~ non-exited companies operating in England	Not applicable	
R6	Business retail special cost factors	Not applicable	
R7	Revenue and cost recovery for retail	Yes	Following IAP
R8	Net retail margins	Yes	
R9	PR14 reconciliation of household retail revenue	Originally submitted July 2018 revised	September 2018
R10	PR14 Service incentive mechanism	Submitted July 2018	Following IAP

TABLE R1 - RESIDENTIAL RETAIL

There was significant capital expenditure in 2016/17 and 2017/18 due to the implementation of a new customer billing system. The depreciation increases from 2018/19 as a result of this.

We have set ourselves challenging efficiencies from 2020/21 onwards, particularly on bad debt.

Customer numbers are consistent with Table WS3 and WWS3.

When calculating Cost to Serve values, we have excluded depreciation on legacy assets built before 2015 (line 11).

TABLE R2 - RESIDENTIAL RETAIL SPECIAL COST FACTORS

We have not submitted any residential retail special cost factors. In PR14, NWL received an additional allowance for the depreciation costs of a new billing system. This system is now in place and the depreciation costs now form part of our cost to serve calculations.

TABLE R3 - RESIDENTIAL RETAIL ~ FURTHER INFORMATION ON BAD DEBT AND CUSTOMER SERVICES

Lines: 2-15 Bad debt information

Residential debt written off is impacted in the short term by changes to collections strategies. In 2014-15 we introduced a new third placement agency to collect gone away debt which resulted in the value of debts written off reducing in this year. A number of accounts were placed with this third placement agent at the time we would have previously written them off as uncollectable thus delaying write off so a period of time to allow the agent time to collect this debt. This resulted in a slight uplift in 2015-16. In preparation for our billing system migration in 2017-18 we took the decision to write off some additional older debt so that we

wouldn't have to migrate the balances as it was unlikely we would collect this older debt leading to a significant increase in debts written off in the year.

Debt levels continue to grow over the period, however this is mainly concentrated in arrears from customer who abscond without paying and the longer term habitual non payers whose individual debt balances continue to grow as a new year's unpaid charges are added to their debt every year rather than increasing numbers of non-paying customers.

We are observing more customers who are missing payment instalments and resetting payment arrangements and our focus has been on offering support to these customers either by finding ways to reduce their bills, agreeing more flexible payment arrangements or helping them to work with debt advice where their financial situation needs additional support.

Line 16: Forecast assumption, **percentage of revenue collected in the year**

We are forecasting the current level of revenue collected in the year based on current bad debt rates with an improvement based around collections and billing system improvements that we have planned, additional data-sharing and affordability support for those struggling to pay.

Lines 17-21: Customer service metrics

Costs per contact method

We have taken the customer services costs calculated within the retail tables of the annual performance report and broken them down further into the teams that deal with each of the contact methods. General and support overhead costs are then add to these direct costs on a relative headcount basis. The total cost per contact method is then divided by the number of contacts dealt with during the year.

We have included two additional costs, one for IVR/Web self-service and a second for written correspondence which is received by post. These two methods equated to more than 50% of customer contacts in 2017-18.

The web/IVR costs are calculated by taking the maintenance and running cost of the IVR and web and dividing by the number of contacts resulting in a relatively low unit rate. Contacts that are not fully completed on the web and via IVR are excluded from these costs.

We expect call cost to fall between now and 2019-20 as we realise the benefits of our new billing and telephone systems which should help to reduce average handling time in the contact centres. Longer term we expect call costs to rise as more straight forward contact is increasingly dealt with via automated services meaning calls become longer and more involved but lower in number.

Email and written correspondence received by post are fairly similar to deal with however postal correspondence is more expensive due many responses also being sent to customers by post and therefore incurring additional printing, paper, postage and envelop costs compared to email.

Lines 22-26: Customer service metrics

The percentage of contacts by the following methods:

Phone, email, web-chat, Written correspondence (line 25) and IVR/Web self service (line 26).

The total contacts by each method have been extracted from our billing and customer service system (ICIS) which holds all the customer contact records for every contact mode. The percentage for each method has been calculated by dividing the count of contacts by each method by the sum total of all contacts.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

We have included two additional contacts, one for IVR/Web self-service and a second for written correspondence which is received by post. These two methods equated to more than 50% of customer contacts in 2017-18.

Line 28: Contact centre costs (£m)

Contact centre costs are taken from our retail table calculations and include all direct costs of contact centre employees and a headcount based allocation of retail general and support overhead costs.

TABLE R4 - BUSINESS RETAIL ~ WELSH COMPANIES

This table is not applicable to NWL.

TABLE R5 - BUSINESS RETAIL ~ NON-EXITED COMPANIES OPERATING IN ENGLAND

As NWL has exited the non-household retail market, this table is not applicable.

TABLE R6 - BUSINESS RETAIL SPECIAL COST FACTORS

There are no special cost factors, this table is not applicable to NWL.

TABLE R7 - REVENUE AND COST RECOVERY FOR RETAIL

Our general approach has been to align the Tables to the outputs of the Financial Model. We have checked that these tables are consistent with the Financial Model throughout.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

A	Residential retail costs ~ England and Wales	Source (FM – Financial Model)
1	Total cost to serve	FM Residential Retail line 99
2	Net margin (excl tax and interest)	FM Residential Retail line 99 less lines 3 and 4
3	Current tax ~ residential retail	FM Finstat residential line 19
4	Interest	FM Finstat residential line 16
5	EBIT margin	Sum of lines 2-4, also equal to FM Residential retail line 99
6	Retail residential charge ~ total	Line 1 plus line 5

We have not completed Block B as this is for Wales only.

C	Retail revenues	Source: FM Residential Retail inflated
13	Revenue ~ Water ~ residential retail measured	FM Residential Retail line 166 inflated to outturn by CPIH Fin year average: Residential retail line 209
14	Revenue ~ Water ~ residential retail unmeasured	Per above but line 180
15	Revenue ~ Wastewater ~ residential retail measured	Per above but line 167
16	Revenue ~ Wastewater ~ residential retail unmeasured	Per above but line 181
17	Revenue ~ Combined ~ residential retail measured	Per above but line 168
18	Revenue ~ Combined ~ residential retail unmeasured	Per above but line 182
19	Revenue ~ residential retail	Total of lines 13-18.
20	Revenue ~ business retail measured	Zero as NWL exited
21	Revenue ~ business retail unmeasured	Zero as NWL exited
22	Revenue ~ business retail	Zero as NWL exited

Finally, we reconcile line 6 to line 19 as follows:

Line		2020-21	2021-22	2022-23	2023-24	2024-25
6	Retail residential charge ~ total	58.6	59.9	60.6	61.4	62.2
19	Revenue ~ residential retail	60.3	61.6	62.4	63.2	64.0
Difference		1.7	1.7	1.8	1.8	1.8

The difference is our view of the likely SIM reward that NWL will earn in 2020/21. The value is taken from Table R10 line 8. Page 211 of the Ofwat Guidance suggests that this revenue adjustment should be applied entirely to Retail. We have done so, see App 25 line 30. The Financial Model inflates the £8.3m in Table R10 to £8.9m in outturn. We have then spread this reward over the 5 years using the revenue adjustments feeder model.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

TABLE R8 - NET RETAIL MARGINS

For residential customers (line 1), we have assumed a pre-tax retail margin of 1% as per the Ofwat guidance (page 183).

We have not completed line 2 as we have exited the business customer retail market.

Source data: (non-corporate)

PR19 Methodology, Pages 183, top paragraph

https://www.ofwat.gov.uk/publication/delivering-water-2020-final-methodology-2019-price-review/

TABLE R9 - PR14 RECONCILIATION OF HOUSEHOLD RETAIL REVENUE

This table was submitted as part of our early data submission on 27 July 2018. The need to resubmit this table has been identified by NES. This is due to:

The early submissions for R9 were completed immediately prior to the final void ODI being incorporated in to the WRMP. We have therefore updated R9 so that the customer numbers tie in to the WRMP property numbers, which in turn ties in to other tables i.e. R1, WS3 and WWS3 and App 30. The impact of this was an update to the forecast retail revenue for the last two years of the AMP in R9.

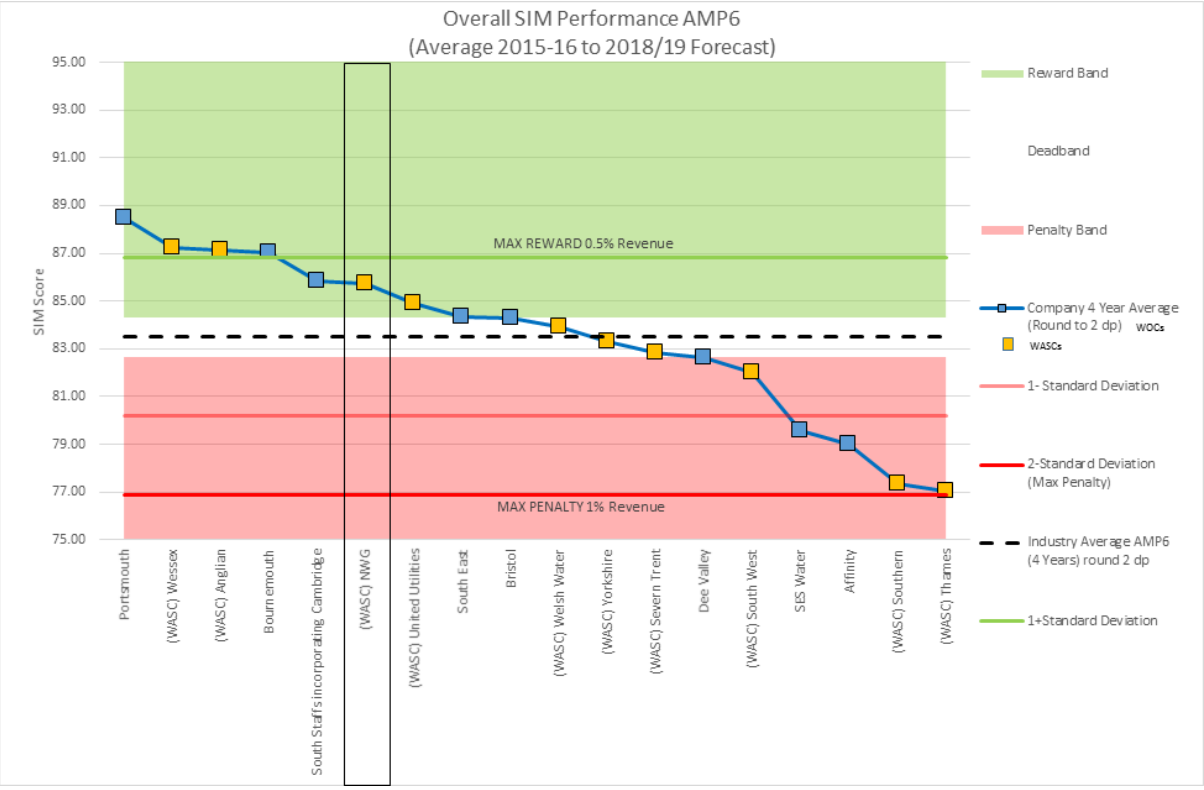
TABLE R10 - PR14 SERVICE INCENTIVE MECHANISM

This table was submitted as part of our early data submission on 27 July 2018. We have updated it as part of Action NES.PD.A, and our recalculation is included:

For Table R10, we have updated the SIM financial reward/penalty calculation as requested with our latest combined SIM forecast, which is 85.44, our four year average is still 85.75.

Therefore in summary based on our current forecasted combined SIM score we would expect to achieve a **0.22%** (circa £8.3m) reward, down from the 0.29% reward estimated in the business plan.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY



APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

MODELS

We have resubmitted all the PR14 feeder models for our April 2019 Plan.

Model Name	Additional commentary provided
NES RCV adjustments feeder model	Originally submitted July 2018 revised September 2018
NES Residential retail PR14 reconciliation	Originally submitted July 2018 revised September 2018
NES Revenue adjustments feeder model	Submitted July 2018
NES Totex menu PR14 Reconciliation	Submitted July 2018
NES Water trading incentive model	Submitted July 2018
NES WRFIM PR14 reconciliation	Submitted July 2018
NES land sales	

NES MODEL – RCV ADJUSTMENTS FEEDER MODEL

This model was submitted as part of our early data submission on 27 July 2018. The need to resubmit this model has been identified by NES. This is due to:

The resubmitted table amends are as follows:

- **Land disposal -** Both these inputs change marginally due to a correction made on 2015/16 disposals in App9. Water ~ NPV effect of 50% of proceeds from disposals of interest in land. Wastewater ~ NPV effect of 50% of proceeds from disposals of interest in land
- **IFRS16 RCV adjustments -** These have now been added to the feeder model, using the data from App8 (taken from App33).
- **Water resources % of total wholesale water RCV ~ 31 March 2020 -** Taken from App8, this has reduced slightly due to changes in Table WS12 – RCV allocation.
- **Bioresources RCV (prior to midnight adjustments) 31 March 2020 -** Taken from App8, this has increased slightly due to changes in Table WWS12 – RCV allocation.

NES MODEL – RESIDENTIAL RETAIL PR14 RECONCILIATION

This model was submitted as part of our early data submission on 27 July 2018. The need to resubmit this model has been identified by NES. This is due to:

The early submissions for the Residential Retail PR14 Reconciliation model were completed immediately prior to the final void ODI being incorporated in to the WRMP. We have therefore updated this model so that the customer numbers tie in to the WRMP property numbers, which in turn ties in to other tables i.e. R1, WS3 and WWS3 and App 30. The impact of this was an update to the forecast retail revenue for the last two years of the AMP in this model.

NES MODEL – REVENUE ADJUSTMENTS FEEDER MODEL

This model was submitted as part of our early data submission on 27 July 2018.

APPENDIX 4.3
DATA TABLE SUBMISSION COMMENTARY

NES MODEL – TOTEX MENU PR14 RECONCILIATION

This model was submitted as part of our early data submission on 27 July 2018.

NES MODEL – WATER TRADING INCENVTIVE MODEL

This model was submitted as part of our early data submission on 27 July 2018.

NES MODEL – WRFIM PR14 RECONCILLIATION

This model was submitted as part of our early data submission on 27 July 2018.