Affinity Water: PR19 - 3 September 2018 Submission - Table Commentaries v2

Appointed business tables

App1 – Performance commitments (PCs) and outcome delivery incentives (ODIs)

General

Our PCs and ODIs are summarised as follows:

No.	Performance Commitment for 2020 to 2025	ODI Type	ODI Form	ODI Timing	Cap / Collar	Dead Band
1	Leakage (Ml/d)	£ + / (-) unit based	Revenue	In period	Cap & collar	No
2	Per capita consumption (l/p/d)	£ + / (-) unit based	Revenue	In period	Cap & collar	No
3	Risk of severe restrictions in a drought (% popn. 1:200)	Non-financial	n/a	n/a	n/a	n/a
4	Supply interruptions greater than 3 hours (avg. min lost per prop)	£ + / (-) unit based	Revenue	In period	Collar & deadband	Yes
5	Unplanned outage (Ml flow rate)	£ (-) unit based	Revenue	In period	Collar	No
6	Number of burst mains (per 1,000km)	£ (-) unit based	Revenue	In period	Collar	No
7	Compliance Risk Index (CRI)	£ (-) unit based	Revenue	In period	Collar & deadband	Yes
8	Customer measure of Experience (C-MeX)	£ + / (-) unit based	Revenue	In period	Cap & collar	No
9	Developer measure of Experience (D-MeX)	£ + / (-) unit based	Revenue	In period	Cap & collar	No
10	Properties experiencing longer or repeated instances of low pressure	£ + / (-) unit based	Revenue	In period	Collar	No
11	Customers in vulnerable circumstances satisfied with our service (%)	Non-financial	n/a	n/a	n/a	n/a
12	Customers in vulnerable circumstances who found us easy to deal with (score)	Non-financial	n/a	n/a	n/a	n/a
13	Environmental Innovation – delivery of community projects	£ + / (-) unit based	Revenue	In period	No	No
14	Number of properties wrongly classified as unoccupied (False voids)	£ + / (-) unit based	Revenue	In period	No	No
15	Number of occupied properties not billed (Gap sites)	£ + unit based	Revenue	In period	No	No
16	River restoration	£ + / (-) unit based	Revenue	In period	No	No
17	Abstraction reduction	£ + / (-) unit based	Revenue	In period	No	No
18	Number of sources operating under the Abstraction Incentive Mechanism	£ + unit based	Revenue	In period	No	No
19	Mean Zonal Compliance (MZC)	Non-financial	n/a	n/a	n/a	n/a

Columns D-G: Outcome, PC History, PC ref and PC name

We have included the following common PCs as required by Ofwat:

- Supply interruptions greater than 3 hours
- Leakage
- Per capita consumption
- Risk of severe restrictions in a drought
- Unplanned outage
- Number of burst mains
- Compliance Risk Index (CRI)
- Customer measure of experience (C-MeX)
- Developer measure of experience (D-MeX)

Our bespoke PCs were set based on customer and stakeholder engagement and are as follows:

- Properties experiencing longer or repeated instances of low pressure
- Customers in vulnerable circumstances satisfied with our service
- Customers in vulnerable circumstances who found us easy to deal with
- Environmental innovation – delivery of community projects
- Number of properties wrongly classified as unoccupied (False voids)
- River restoration
- Abstraction reduction
- Number of sources operating under the Abstraction Incentive Mechanism
- Mean Zonal Compliance (MZC)
- Number of occupied properties not billed (Gap sites)

In addition, some of these PCs meet the Ofwat requirement for Asset Health and Resilience PCs, as follows:

Asset Health (p.27 of Annex 2 of Ofwat PR19 methodology)

- Number of burst mains
- Unplanned outage
- Properties experiencing longer or repeated instances of low pressure

Resilience (p.46 of Ofwat PR19 methodology for common PC list)

- Leakage
- Per capita consumption
- Risk of severe restrictions in a drought
- Environmental innovation – delivery of community projects
- Abstraction reduction
- Number of sources operating under the Abstraction Incentive Mechanism

Columns I-Q: Price control allocation (%)

We have adhered to the Ofwat guidance and not split any of the ODIs over multiple price controls.

Columns R-T: ODI type, form and timing

All financial ODIs are revenue-based and in-period.

The following ODIs are "Out & Under":

- Supply interruptions greater than 3 hours
- Leakage
- Per capita consumption
- Customer measure of experience (C-MeX)
- Developer measure of experience (D-MeX)
- Properties experiencing longer or repeated instances of low pressure
- Environmental innovation – delivery of community projects
- Number of properties wrongly classified as unoccupied (False voids)
- Number of occupied properties not billed (Gap sites)
- River restoration
- Abstraction reduction

The following ODIs are "Under" only:

- Unplanned outage
  This is "Under" because our objective is to maintain the AMP6 target, which is the position that best serves intergenerational equity.

- Number of burst mains
  This is "Under" because our objective is to maintain the AMP6 target, which is the position that best serves intergenerational equity.

- Water Quality Compliance, Compliance Risk Index (CRI)
  This is "Under" because we are targeting a score of zero, and therefore we cannot exceed the target.

The following ODI is "Over" only:

- Number of sources operating under the Abstraction Incentive Mechanism
  We do not think it appropriate to set a penalty for AIM, and the target is set at zero. This is because activation of the scoring mechanism, and therefore the activity and costs, are contingent on exogenous factors (a "dry-year" trigger). A target rate of higher than zero could lead to a penalty being paid simply because of wet weather.

The following ODIs are reputational/non-financial:

- Risk of severe restrictions in a drought
  We have decided not to assign a financial ODI to this Common PC. This is because any improved performance in this PC will be through investment in other PCs. For example, by reducing our PCC and leakage levels and implementing the sustainability reductions (through new network connections), we will improve our drought resilience. This will lead to reward multiples if we outperform on these contingent PCs, and if we underperform, we would be exposed to double-jeopardy (or doubled rewards).

- Customers in vulnerable circumstances satisfied with our service
  We have not set a penalty or reward for this ODI as we believe it would be inappropriate for this performance commitment to have a financial incentive. We do not think a water company should receive a reward for providing good service to customers in vulnerable circumstances. We do not need a financial incentive to get this right as this is a matter of corporate pride.

- Customers in vulnerable circumstances who found us easy to deal with
  We have not set a penalty or reward for this ODI as we believe it would be inappropriate for this performance commitment to have a financial incentive. We do not think a water company should receive a reward for providing good service to customers in vulnerable circumstances. We do not need a financial incentive to get this right as this is a matter of corporate pride.

- Mean Zonal Compliance (MZC)
  We have retained this PC to provide clear reporting to customers retaining continuity with existing reporting; however, if we set a financial ODI on this it would risk double-jeopardy with the CRI ODI, which is financial.

Columns U-Y: Primary category, PC Unit, PC Unit description, Decimal places and Direction of improving performance

We have assigned the PCs to the relevant "primary" categories from the drop-down selection list.

We have provided the units, unit description and direction of improving performance of all PCs except C-MeX and D-MeX, where we are waiting for confirmation of the PC methodologies from Ofwat.

We have set the decimal places we regard as appropriate, where applicable.

Column Z: Common performance commitment

We have included the following WoC common PCs as required by Ofwat:

- Supply interruptions greater than 3 hours
- Leakage
- Per capita consumption
- Risk of severe restrictions in a drought
- Unplanned outage
- Number of burst mains
- Compliance Risk Index (CRI)
- Customer measure of experience (C-MeX)
- Developer measure of experience (D-MeX)

Columns AA-AE: Special cost factor, Scheme specific factor, Asset health, NEP and AIM

We have no PCs related to:

- Special cost factor
- Scheme specific factor

The following are Asset Health PCs (p.27 of Annex 2 of Ofwat PR19 methodology):

- Number of burst mains
- Unplanned outage
- Properties experiencing longer or repeated instances of low pressure

The following PCs are part of the NEP:

- River restoration
- Abstraction reduction

We have one PC related to AIM.

Column AF: Customers' relative priority/importance

We consider that our benefit valuations and outperformance rates reflect customer priority, in three clear categories:

Category one – very important

- Compliance Risk Index (CRI)
- Per capita consumption
- Unplanned outage
- Leakage
- Supply interruptions greater than 3 hours
- Customer measure of experience (C-MeX)
- Developer measure of experience (D-MeX)
- Number of properties wrongly classified as unoccupied (False voids)
- Number of occupied properties not billed (Gap sites)

Category two – important

- Abstraction reduction
- River restoration
- Number of burst mains
- Properties experiencing longer or repeated instances of low pressure

Category three – lower value / non-financial

- Environmental innovation – delivery of community projects
- Number of sources operating under the Abstraction Incentive Mechanism
- Mean Zonal Compliance (MZC)
- Customers in vulnerable circumstances satisfied with our service
- Customers in vulnerable circumstances who found us easy to deal with

Columns AG-AP: Past performance levels (where available)

We have provided historic performance where data is available and comparable to our proposed AMP7 PCs.

PC	Comment
Supply interruptions greater than 3 hours	We have provided historic data for this measure.

Leakage	We have provided three-year average data for 2018/19 and 2019/20 using the new methodology. These are therefore different from the numbers provided in Appendix 4 of our Business Plan, which were expressed as percentage reductions. We have not provided earlier data as this would require recalculation of our leakage performance for every two years before the year in question, in order to get a consistent three-year average. This would be a significant undertaking.
Per capita consumption	We have provided three-year average data using the new PCC methodology for the years 2018/19 and 2019/20. These are therefore different from the numbers provided in Appendix 4 of our Business Plan, which were not three-year averages calculated under the same measure. We have not provided earlier data as this would require recalculation of our PCC performance for every two years before the year in question, in order to get a consistent three-year average. This would be a significant undertaking.
Risk of severe restrictions in a drought	We have provided data for the years 2018/19 and 2019/20 in line with the Ofwat methodology for this measure (please note these have been recalculated and so are different from the numbers provided on page 22 of Appendix 4 of our Business Plan).
Unplanned outage	We have provided historic data for this measure, and have forecast a performance of 3.5 for 2018/19 and 2019/20.
Number of burst mains	We have provided historic data for this measure. For 2018/19 and 2019/20 we are forecasting we meet our AMP7 target.
Compliance Risk Index (CRI)	We have provided historic data for this measure (as per page 44 of Appendix 4 of our Business Plan).
Customer measure of experience (C-MeX)	This is a new measure for AMP7, so we do not have pre-AMP7 figures for it.
Developer measure of experience (D-MeX)	This is a new measure for AMP7, so we do not have pre-AMP7 figures for it.
Properties experiencing longer or repeated instances of low pressure	Our measure of low pressure is difficult to forecast with any accuracy for the last two years of AMP6. The reason for this is that we are in the process of installing a lot of new remoted detection loggers on to our network that will provide us with a large quantity of new data about water pressures. The forecast for 2020/21 has been produced by extrapolating data from the parts of our network that have DG2 loggers installed. However, it should be noted that this constitutes a small percentage of our total network and is not typical in the sense that the loggers were installed in parts of the network that were thought to be vulnerable to low pressure. Extrapolation of this data is therefore likely to be unreliable. We expect this situation to improve over the next twelve months as more data becomes available, but we think it is unwise to provide estimates for 2018/19 and 2019/20 that we know will be soon superseded by superior information.
Customers in vulnerable circumstances satisfied with our service	This is a new measure for AMP7, so we do not have pre-AMP7 figures for it (as per page 57 of Appendix 4 of our Business Plan).

Customers in vulnerable circumstances who found us easy to deal with	This is a new measure for AMP7, so we do not have pre-AMP7 figures for it (as per page 61 of Appendix 4 of our Business Plan).
Environmental innovation - delivery of community projects	This is a new measure for AMP7, so we do not have pre-AMP7 figures for it (as per page 65 of Appendix 4 of our Business Plan).
Number of properties wrongly classified as unoccupied (False voids)	We have provided historic data for this measure. For 2018/19 and 2019/20 we are forecasting a rate of 2.62 for both years.
River restoration	This is a new measure for AMP7, so we do not have pre-AMP7 figures for it (as per page 78 of Appendix 4 of our Business Plan).
Abstraction reduction	We have provided historic data for this measure.
Number of sources operating under the Abstraction Incentive Mechanism	We have listed our historic performance for 2016/17 and 2017/18, and have forecast a score of zero for 2018/19 and 2019/20 as we do not know how often the AIM mechanism will be triggered and what our score will be.
Mean Zonal Compliance (MZC)	We have provided historic data for this measure.
Number of occupied properties not billed (Gap sites)	We are forecasting a performance of 50 for 2018/19 and 2019/20.

Columns AQ-AU: 2020-25 performance commitment levels

We have set out our PC targets for AMP7, except C-MeX and D-MeX, where we are waiting for confirmation of the PC methodologies and targets from Ofwat.

Columns AV-BK: Longer term projections

PC	Long term projection basis
Supply interruptions greater than 3 hours	We are forecasting a long-term reduction in supply interruptions to an average of 2 minutes by 2035.
Leakage	In our dWRMP we are including a 50% reduction from 2015 to 2050. We have applied this reduction linearly between 2025 to 2050. Total reductions shown in this line are cumulative from 2019/20, the last year of AMP6.
Per capita consumption	In response to stakeholder feedback and support of our customers for achieving reductions in consumption, we have set an ambitious target for PCC of 110 by 2040. Reductions from 2025 are linear per year to achieve that goal.
Risk of severe restrictions in a drought	In response to feedback from our stakeholders, we have brought forward more ambitious demand management measures for our dWRMP and brought forward development of a regional reservoir to improve resilience to extreme drought. We have assumed the reservoir will be fully operational from 2040 and that we will meet our target drought resilience at that date. Thereafter we will hold this measure stable and this will be a continuous challenge in face of growth.

Unplanned outage	Our forecast is unchanged as this reflects stable serviceability of our assets and achievement of an efficient working level using a risk based approach focusing on critical assets with low unplanned failure.
Number of burst mains	Our forecast is unchanged as this reflects stable serviceability of our assets.
Compliance Risk Index (CRI)	We are forecasting that we continue to target a score of zero.
Customer measure of experience (C-MeX)	We are awaiting the Ofwat methodology on this measure, so presently we are unable forecast a target.
Developer measure of experience (D-MeX)	We are awaiting the Ofwat methodology on this measure, so presently we are unable to forecast a target.
Properties experiencing longer or repeated instances of low pressure	We are forecasting a progressive improvement in the number of customers affected by low pressure, reflecting the rate of improvement we are planning to achieve in AMP6.
Customers in vulnerable circumstances satisfied with our service	We are forecasting a progressive improvement in this performance commitment.
Customers in vulnerable circumstances who found us easy to deal with	We forecast that we will continue to improve our service provision, so target score decreases as our service becomes easier to use (1 = easy to use).
Environmental innovation – delivery of community projects	We are forecasting zero projects for AMP8, as the continuation of this PC will depend on the success of this PC during AMP7.
Number of properties wrongly classified as unoccupied (False voids)	We are forecasting a further reduction of 0.32% over AMP8 (equivalent to our reduction over AMP7) and then a small rate of improvement thereafter.
River restoration	This depends on Brexit, the future of WFD and when good status is reached in all rivers. Currently, the EA is targeting completion by 2027 so our current vision is continuing with projects for 2 years into AMP8 having achieved good status by 2027 and flat after that.
Abstraction reduction	Our forecast here assumes we will complete all reductions necessary to achieve good status by 2027 under the WFD. Currently, the EA is targeting completion by 2024 of all WINEP3 green and amber SR's to measure improvement by 2027 so we expect to complete all SR's in AMP7 and good status by 2027 and flat after AMP7. We have no 'red' WINEP3 requirements

Number of sources operating under the Abstraction Incentive Mechanism	We are forecasting a continuing target of zero as everything above zero is a positive environmental benefit.
Mean Zonal Compliance (MZC)	We are forecasting that we continue to target a score of 99.95%.
Number of occupied properties not billed (Gap sites)	We are forecasting that we will keep Gap Sites to the AMP7 target over AMP8 and beyond, targeting 50 properties per year.

Table 2: Long term PC projections

Columns BL-BP: Financial ODI may accrue or apply

Financial ODIs apply each year for all our PCs except the non-financial PCs:

- Risk of severe restrictions in a drought
- Customers in vulnerable circumstances satisfied with our service
- Customers in vulnerable circumstances who found us easy to deal with
- Mean Zonal Compliance

Columns BQ-BU: Enhanced underperformance penalty collar

We have no enhanced ODIs.

Columns BV-BZ: Standard underperformance penalty collar

We have followed the Ofwat guidance in not setting caps, collars and deadbands for the majority of our ODIs. We have set a standard under performance penalty collar for the following:

- Supply interruptions greater than 3 hours: we have set a collar on the basis that under our P10 scenario, our underperformance penalty would far exceed 3% of RoRE, exposing us to significant risk. We have set the collar at 5:0 minutes above our target in each year so that in any individual year the maximum underperformance penalty is £1.63m.

- Leakage: we have set a collar on the basis that under our P10 scenario our underperformance penalty would far exceed 3% of RoRE, exposing us to significant risk. We have set the collar at 5.846ML/d below the target in each year so that in any individual year the maximum underperformance penalty is £2.954m.

- PCC: we have set a collar on the basis that under our P10 scenario our underperformance penalty would far exceed 3% of RoRE, exposing us to significant risk. We have set the collar at 5 Ml/d above the target in each year so that in any individual year the maximum underperformance penalty is £2.59m.

- Unplanned outage: we have set a collar at the P10 level of 4.3%.

- Number of burst mains: we have set a collar at the P10 level of 200 bursts per 1,000km per year

- Compliance Risk Index (CRI): we have set a collar of 4 for every year of AMP7 recognising that this is a new measure and there is a risk of measurement changes during AMP7 potentially leading to significant score variability.

- Properties experiencing longer or repeated instances of low pressure: we have set a collar at the P10 level of 4 hours above the target in each year.

Columns CA-CE: Underperformance penalty deadband

We have followed the Ofwat guidance in not setting caps, collars and dead bands for the majority of our ODIs. We have set an underperformance deadband for the following:

- Supply interruptions greater than 3 hours: we have introduced a deadband for supply interruptions. This is because we are starting AMP7 with a significant change in measurement as our AMP6 target is "properties subject to an unplanned interruption over 12 hours". We have therefore set deadbands to reflect a period of transition towards the new PC definition and the significant improvements required to achieve the target that is beyond any level that we have historically achieved. We have set a deadband for 3.0-5.0 minutes in year 1, 3.0-4.5 minutes for year 2, 3.0-4.0 minutes for year 3, 3.0-3.5 minutes for year 4 and no deadband in year 5. The deadband shrinks each year in line with our ambition to reach 3 minutes.

- Compliance Risk Index (CRI): Our CRI score target is zero, however due to this being a new measure and the risk of measurement changes during AMP7 leading to significant score variability, we have set a deadband at 2.8 below the industry average score for 2017. This means any score between 0 and 2.8 will not incur an underperformance payment.

For the other PCs where we have implemented a collar we have included the target performance level so that the calculation in the spreadsheet is able to calculate the maximum underperformance penalty in light of the penalty collar.

Columns CF-CJ: Outperformance payment deadband

We have followed the Ofwat guidance in not setting caps, collars and deadbands for the majority of our ODIs. We have set an outperformance deadband for the following:

- Supply interruptions greater than 3 hours: the outperformance deadband has been set at 3 minutes so that any outperformance payment can only be achieved by performance better than 3 minutes

- Compliance Risk Index (CRI): we have included an outperformance deadband of zero, reflecting our target. We are therefore not able to outperform this PC and achieve an outperformance payment but have included this for completeness.

For the other PCs where we have implemented a collar, we have included the target performance level so that the calculation in the spreadsheet is able to calculate the maximum outperformance payment in light of the payment cap.

Columns CK-CO: Standard outperformance payment cap

We have followed the Ofwat guidance in not setting caps, collars and deadbands for the majority of our ODIs. We have set outperformance payment caps for the following:

- Per capita consumption: we have set an outperformance payment cap just above our P90 performance, effectively capping any outperformance should we, in the unlikely event, do better than projected in the P90 scenario. The cap is set at 1 l/h/d better than P90.

- Leakage: we have set an outperformance payment cap just above our P90 performance, effectively capping any outperformance should we, in the unlikely event, do better than projected in the P90 scenario. The cap is set at 0.162 ML/d better than the P90.

Columns CP-CT: Enhanced outperformance cap

We have no enhanced ODIs or outperformance payment caps.

Columns CU-DB: Underperformance penalty and Outperformance payment incentive rates

We have used the standard Ofwat ODI formulae (Delivering Water 2020: Our final methodology for the 2019 price review, Ofwat, December 2017, Appendix 2 (page 91)) to calculate all our ODI rates:

- ODI underperformance (penalty) = Incremental benefit – (incremental cost x p)
- ODI outperformance (reward) = Incremental benefit x (1–p)
- The "p" value is the sharing rate, which we have set at 50% for all of our financial ODIs.

Columns DC-DE: Standard ODI calculation, Standard ODI operandi and Standard ODI operandi note

We have only selected "No" for supply interruptions and manually entered the calculation in columns DL to DP due to the format of the information being presented in a time format.

Columns DF-EC: Maximum enhanced underperformance penalties, Maximum standard underperformance penalties, Maximum standard outperformance payments and Maximum enhanced outperformance payments

All these cells (coloured blue) are automatic calculations based on data entries earlier in the spreadsheet. The only exception is row 7 "Supply interruptions greater than 3 hours" columns DL to DP which have been manually entered due to the form of the information being presented in a time format.

We have completed the earlier data entry so that these calculations generate the maximum standard underperformance and outperformance payments subject to the collars, caps and deadbands discussed earlier. It is assumed that all remaining PCs which do not have caps, collars and deadbands are only included in the following sections for P10 and P90.

Column ED to EI: P10 underperformance penalties

We have inserted calculated values for the P10 performance without the application of any caps, collars or deadbands assuming that this information will be used to directly compare to the calculated maximum values with caps, collars and deadbands applied.

Column EJ to EO: P90 outperformance payments

We have inserted calculated values for the P90 performance without the application of any caps, collars or deadbands assuming that this information will be used to directly compare to the calculated maximum values with caps, collars and deadbands applied.

Column EP to EZ: Marginal cost, Marginal benefits valuation method 1 and Marginal benefits valuation method 1 (£ per unit per household)

We have used the following approach to calculate our marginal costs. For the purpose of meeting the Ofwat reporting requirement, the figures we have entered in App1 are our "per unit" costs, divided by our number of billed properties (1,425,795).

Components of the individual ODIs

Supply interruptions greater than 3 hours

In order to deliver our reduced supply interruptions target from the current level of 12 minutes average supply interruption greater than three hours per property, to 3 minutes, we will need to make significant OPEX investments.

As this is OPEX-only, we do not assume a level of depreciation.

We treat the reduction delta of 9 minutes as the denominator.

This gives a cost of £544,333.33 per minute per property interrupted.

	CAPEX (£)	OPEX (£)
Risk Mitigation (reducing SI from 12 to 3 mins)	OPEX only used for SI	24,495,000

Table 3: Business plan investment - Supply interruptions

Leakage

To reduce our leakage, we will need to undertake a combination of both OPEX and CAPEX activities. Operational costs involve the labour costs incurred in going out to detect the leaks, and the capital costs include the installation of district meters, pressure reducing valves and purchasing leakage detection equipment.

	CAPEX (£)	OPEX (£)
Leakage	-	48,585,720
Leakage Infrastructure and Maintenance	14,170,000	-
Network Ancillaries	40,000,000	-
Total	54,170,000	48,585,720

Table 4: Business plan investment - Leakage

One year of OPEX is £9,717,144.

We assume that the assets involved in this measure have a lifespan of 60 years on average. This gives a one-year depreciation of £902,833.

The return on capital is calculated as £1,245,910.

Our target is a 15% reduction on our assumed AMP6 end position (three-year average) of 167.4 ML/d. This equates to a 24.5ML/d reduction over AMP7. We use this as the denominator.

Category	Value
Depreciation (1 year)	£902,833
Return on Capital	£1,245,910
OPEX (1 year)	£9,717,144
Total	£11,865,887
Denominator	24.5

Unit cost	£484,321

Table 5: Leakage cost calculations

The unit cost is £484,321 per percentage point.

Per capita consumption

A significant amount of our investment in reducing consumption will be in installing boundary boxes and meters. There are a number of other investments that will be required as well, which are CAPEX-heavy.

	CAPEX (£)	OPEX (£)
Fast data	12,300,000	0
Water Efficiency Schemes	14,140,000	0
Water Reuse Schemes	28,040,000	0
National water efficiency campaign	3,000,000	0
Unmeasured non-household meters	7,530,000	0
Baseline Water Saving	69,350,000	5,865,000
Total	134,360,000	5,865,000

Table 6: Business plan investment - PCC

We assume that on average, these assets have a lifespan of 30 years. This gives a one-year depreciation of £4,478,667.

One year of OPEX is £1,173,000.

The return on capital is calculated as £2,955,920.

Our target is a (three-year average) reduction to 133 l/h/d by end of AMP7, and our starting position at the beginning of AMP7 is forecast to be 149 l/h/d. This equates to a reduction of 17 l/h/d over the period.

Category	Value
Depreciation (1 year)	£4,478,667
Return on Capital	£2,955,920
OPEX (1 year)	£1,173,000
Total	£8,607,587
Denominator	17
Unit cost	£506,328

Table 7: Business plan investment – PCC cost calculations

This gives a unit cost of £506,328 per l/h/d reduction.

Unplanned outage

We plan to spend £11,000,000 on CAPEX per annum in AMP7 to maintain our unplanned outage level of 3.5% (lost capacity as % of total company maximum production capacity). This equates to a total cost over AMP7 of £55,000,000.

These investments include repairing and replacing long-life non-infrastructure assets such as reservoirs and pumping stations, but mainly involve shorter-lived M&E work. We therefore assume an average asset lifespan of 30 years. This gives a one-year depreciation of £1,833,333.

The return on capital is calculated as £1,210,000.

We assume that if we did not make the CAPEX investment, our unplanned outage level of 3.5% would increase by an additional 25% over AMP7. This would translate to an additional 0.875 percentage points. We therefore use 0.875 as the denominator.

Category	Value
Depreciation (1 year)	£1,833,333
Return on Capital	£1,210,000
OPEX (1 year)	£0
Total	£3,043,333
Denominator	0.875
Unit cost	£3,478,095

Table 8: Unplanned outage cost calculations

This gives a cost of £3,478,095 per percentage point of lost capacity as % of total company maximum production capacity.

Number of burst mains

To proactively prevent bursts, we need to renew the network of mains that supply our customers.

	CAPEX (£)	OPEX (£)
Distribution Mains Renewals	38,000,000	-
Total	38,000,000	-

Table 9: Business plan investment - Mains bursts

Mains are long-life assets with an assumed average lifespan of 100 years. This gives a one-year depreciation of £380,000.

The return on capital is calculated as £889,200.

We are proposing that our target is to maintain the AMP6 level of 186 burst mains per 1,000 km of pipe (per year). However, we do not think it is plausible that, without investment, our number of mains bursts would increase so sharply over the AMP, so we instead use our Pioneer model to assess the real effect of not making this investment.

The Pioneer model output shows that without this investment, we would see a rise in absolute mains bursts of 118 over the AMP. Normalised by 1,000km of mains (16.68), this gives a figure of 7.074. We use 7.074 as the delta for the cost figure.

Category	Value
Depreciation (1 year)	£380,000
Return on Capital	£889,200
OPEX (1 year)	£0
Total	£1,269,200
Denominator	7.074
Unit cost	£179,418

Table 10: Mains bursts cost calculations

This gives a cost of £179,418 per mains burst per prevented per 1,000km of main.

Compliance Risk Index (CRI)

There are numerous activities which a water company undertakes in order to preserve water quality, which are fundamental to maintaining a CRI score of zero.

	CAPEX (£)	OPEX (£)
Nitrates Management	9,955,677	-
Other Pollutants - Disinfections Compliance	889,385	-
Egham aluminium management	640,200	1,950,000
Disinfection in Dour	3,000,000	-
GAC	7,151,531	-
Iver aluminium management	2,324,400	1,950,000
North Mymms Turbidity	3,849,000	-
Egham Chertsey Walton Ozone	1,898,000	-
Iver Ozone	4,798,000	-
Disinfection at Denge	286,877	-
Total	**34,793,070**	**3,900,000**

Table 11: Business plan investment - CRI

One year of OPEX is £780,000.

We assume that the assets involved in this measure have a lifespan of 30 years on average. This gives a one-year depreciation of £1,159,769.

The return on capital is calculated as £765,448.

We are targeting a CRI score of zero, however given that this is a new measure and there is a possibility of scoring and measurement errors, we are proposing a deadband set at the level of the current shadow reporting average of 2.8. We use this as the denominator.

Category	Value
Depreciation (1 year)	£1,159,769
Return on Capital	£765,448
OPEX (1 year)	£780,000
Total	£2,705,217
Denominator	2.8
Unit cost	£966,149

Table 12: CRI cost calculations

This gives a cost of £966,149 per point of CRI.

Properties experiencing longer or repeated instances of low pressure

The general activities to tackle low water pressure involve installing booster pumps, laying reinforcements, new district meters and installing pressure control valves.

	CAPEX (£)	OPEX (£)
Low Pressure	2,500,000	-

Table 13: Business plan investment - Resolving persistent low pressure

These are all CAPEX-heavy assets with an overall assumed average lifespan of 60 years. This gives a one-year depreciation of £41,667.

The return on capital is calculated as £57,500.

Meeting our target of 8.6 hours per property of persistent low pressure will mean a decrease of 4.3 hours from our end of AMP6 level of 12 hours. This is the denominator we use to create the "per unit" cost for this PC.

Category	Value
Depreciation (1 year)	£41,667
Return on Capital	£57,500
OPEX (1 year)	£0
Total	£99,167
Denominator	4.3
Unit cost	£23,062

Table 14: Low pressure cost calculations

This gives a cost of £23,062 per hour of persistent low pressure reduced.

Environmental innovation - delivery of community projects

We are planning to implement eight pilot projects over AMP7, all of which are assumed to be CAPEX-only investments.

	CAPEX (£)	OPEX (£)
Resilience and Environment Community Pilot schemes	2,000,000	0

Table 15: Business plan investment - Environmental innovation

We assume that on average, these investments have a lifespan of 60 years. This gives a one-year depreciation of £33,333.

The return on capital is calculated as £46,000.

Given that these projects vary in size and cost, with one project in particular accounting for around half the total budget, we propose that the cost is calculated as 1/14th of the total project cost. This weighting is based on 7 projects being worth half the total project budget, and the other half (7 units) of the budget being assigned to the remaining project. We therefore use 14 as the denominator.

Category	Value
Depreciation (1 year)	£33,333
Return on Capital	£46,000
OPEX (1 year)	£0
Total	£79,333
Denominator	14
Unit cost	£5,667

Table 16: Environmental innovation cost calculations

This gives a cost of £5,667 per unit of project completed.

Number of properties wrongly classified as unoccupied (False voids)

The cost for locating a false void are entirely OPEX based. We have calculated a cost of £28.27 per void detected.

This figure needs to be expressed as "voids as a % of total household billed properties". To do this, we take our total property number (1,425,795) and divide by 100. This gives a 1% of total billed properties figure of 14,258.

We multiply the cost figure of £28.27 by 14,258, giving a "total cost for 1% of void reduction" of £403,001.

Given the value is entirely OPEX-based and within-year, we do not annualise it.

Number of occupied properties not billed (Gap sites)

We do not have a specific cost associated with gap site detection, so we have set costs equal to benefits (calculation of benefits shown below).

River restoration

In order to improve the quality of our rivers, we need to invest in schemes such as rerouting rivers and streams (morphological works).

	CAPEX (£)	OPEX (£)
Ivel river support scheme	500,000	-
Morphological Works	18,536,654	-
Total	19,036,654	-

Table 17: Business plan investment - River quality improvements

We assume these are long-life assets, with a lifespan of 60 years. This gives a one-year depreciation of £317,278.

The return on capital is calculated as £437,843.

Our target is to complete 36 projects, these are the projects designated with a "green" status, opposed to the total of 84 "green" and "amber" projects. We are only using the 36 "green" projects for the purposes of the ODI and so we use this number as the denominator.

Category	Value
Depreciation (1 year)	£317,278
Return on Capital	£437,843
OPEX (1 year)	£0
Total	£755,121
Denominator	36
Unit cost	£20,976

Table 18: River quality improvements cost calculations

This gives a cost of £20,976 per project.

Abstraction reduction

In order to reduce our abstractions from groundwater sources, we need to invest in assets that will enable us to source water from alternative surface water supplies. These involve building new treatment works (Sundon) or creating new water connections.

	CAPEX (£)	OPEX (£)
Sundon Reservoir	27,887,000	2,118,000
Sustainability Reduction: Digswell	5,941,592	-
Sustainability Reduction: 33MLD	44,987,424	19,565,509
Sustainability Reduction: St Albans	7,490,208	-
Total	**86,306,224**	**21,683,509**

We assume that on average, these assets have a lifespan of 60 years. This gives a one-year depreciation of £1,438,437.

The return on capital is calculated as £1,985,043.

One year of OPEX is £4,336,702.

Our target is 33 million litres per day reduction (ML/d) in DO over AMP7, so we treat this as the denominator.

Category	Value
Depreciation (1 year)	£1,438,437
Return on Capital	£1,985,043
OPEX (1 year)	£4,336,702
Total	£7,760,182
Denominator	33
Unit cost	£235,157

Table 20: Sustainability reductions cost calculations

This gives a cost of £235,157 per ML/d reduction. Subsequent to this analysis we have been asked to include an additional 2.36 Ml/d of sustainability reductions in our Brett community. We have not included these costs in the above calculation as we estimate that they are broadly allowed for in the costs listed above which have been reduced since we conducted this analysis. We have chosen to keep the original costs estimate and calculations for the purposes of the final incentive rate.

Number of sources operating under the Abstraction Incentive Mechanism

Operating AIM always has a greater cost associated with it than doing nothing. This is because the alternative sources of water available (Grafham or more expensive groundwater sources) are always costlier than using locally sourced groundwater.

We assume an indicative average groundwater cost of £60 per ML. When operating AIM, we instead need to draw water from an alternative source, and for the sake of simplicity we assume that this is Grafham. This has a higher cost of £217 per ML. The delta between these two sources, £157, is assumed to be the marginal cost of operating AIM.

AIM does not have a penalty associated with it, and the target is set at zero. This is because the activation of the scoring mechanism, and therefore the activity and costs, are contingent on exogenous factors (a “dry-year” trigger). We do however use the cost figure to compute the benefit valuation.

Approach to calculating benefits

Views on WTP research and valuing benefits

We have been concerned about the known weaknesses of willingness to pay (WTP) research in developing our business plan and have therefore taken a more innovative and wide-ranging approach to understanding the views and preferences of our customers. In particular, WTP research tends to overestimate the willingness of customers to pay for ‘siloed’ improvements in performance. We think that the right approach to understanding customer preferences is to consider as wide an evidence base as possible. Excessive weight should not be given to

any single view or numerical estimate that has been produced. We have taken account of not only our own research, but also the research of other companies and the research and views of other organisations that represent the views of customers such as Ofwat, CC Water, the EA, and our own CCG.

The one exception was in the case of supply interruptions. We feel that the issue of supply interruptions is the aspect of a water company's service that is most suitable for WTP research. Customers are directly affected by supply interruptions and can therefore easily estimate the true value of the inconvenience that arises. We commissioned an innovative piece of research from Accent that asked customers to choose between an interruption and several different levels of compensation.[1] This allowed us to assess the level of compensation that was required to make the customer positively choose to have the supply interruption (because they think the compensation is greater than the inconvenience).

We also do not wish to reject the use of WTP data altogether. We have therefore used WTP metadata produced by Accent as an input into the calculation of our ODI rates.[2] We feel that this data is more reliable, statistically and methodologically robust than any study that we could have commissioned. We feel that this course of action is both efficient (remembering that half of all such costs are borne by customers), and gives a more nuanced and robust result than we could have obtained by over-relying on WTP research.

How we set the benefit levels

In setting our benefit valuations, we have endeavoured to make sure that they satisfy the Ofwat formulas such that our penalties are always higher than our rewards for the majority of our ODIs. We believe that this condition is necessary for where we are seeking to improve our performance, as it ensures the penalty of not meeting the target will always exceed the reward for beating it, maintaining the concept that our target will always be the minimum standard we seek to reach.

In order for this relationship between rewards and penalties to hold, the Ofwat equation requires that benefits exceed costs. In computing the benefits, we have sought to follow this principle that benefits always exceed the costs. As we have not commissioned WTP research for any of the ODIs except supply interruptions, we have instead calibrated our costs against external benefit valuation approaches, and then set the benefits at such a level that:

1. They cover the costs;
2. They are plausible and within the range of other similar external valuations of benefits.

It should also be noted that there are some instances where we have not been able to obtain appropriate external valuations:

- Unplanned outage
- Mains bursts
- CRI
- Environmental innovation

In these cases, we have simply set the benefits equal to the costs.

For unplanned outage and mains bursts, these are penalty-only ODIs where we are seeking to maintain our performance. This is to preserve intergenerational fairness, as a significant improvement now would be paid for by current customers but future customers would realise more of the benefits. We also believe that attempting to value these benefits is not appropriate

[1] Accent and PJM Economics report for Affinity Water, "*Exploration of Supply Outage Compensation Levels*", June 2018.
[2] Accent and PJM Economics, "*Comparative Review of PR19 WTP Results: Final Report*", June 2018.

as customers cannot place value in exceeding these targets as the outcomes are not transparent to them.

In the case of CRI, we are targeting a score of 0, therefore we cannot outperform on this measure and so it does not make sense to assess the benefits of outperformance.

Our projects for environmental innovation were developed with continued and direct customer input into their scope and goals. Prospective projects were presented as options to customers along with the attendant costs, therefore costs of the final selection represent a true "WTP" value. We have therefore set benefits equal to costs for this measure.

As previously discussed, we have taken a variety of approaches to calibrating the benefit values for our ODIs. We have listed these below.

PC	Source of benefit valuation
Supply interruptions	Accent and PJM Economics report for Affinity Water, "*Exploration of Supply Outage Compensation Levels*", June 2018.
Leakage	Accent and PJM Economics, "*Comparative Review of PR19 WTP Results: Final Report*", June 2018.
PCC	Environment Agency, "*Operational Catchment Economic Appraisal - Final Appraisal Report and Audit Trail: Colne*", February 2018 Environment Agency, "*Operational Catchment Economic Appraisal - Final Appraisal Report and Audit Trail: Upper Lee*", February 2018
Unplanned outage	We have not sought to get a WTP value for this measure, as we are proposing to main current target. Penalty only, so benefits set equal to costs. Penalty only, so benefits set equal to costs.
Mains bursts	We have not sought to get a WTP value for this measure, as we are proposing to main current target. Penalty only, so benefits set equal to costs. Penalty only, so benefits set equal to costs.
CRI	We have not sought to get a WTP value for this measure, as we believe that customers expect us to produce the highest quality possible, and therefore minimise the CRI score. Penalty only, so benefits set equal to costs.
Low water pressure	Accent and PJM Economics, "*Comparative Review of PR19 WTP Results: Final Report*", June 2018.
Environmental innovation	Benefits set equal to costs.
False void	Affinity assessment
Gap	Affinity assessment
River quality improvements	Environment Agency, "*Water pollution natural capital calculator*", April 2018.
Sustainability reductions	Environment Agency, "*Operational Catchment Economic Appraisal - Final Appraisal Report and Audit Trail: Colne*", February 2018 Environment Agency, "*Operational Catchment Economic Appraisal - Final Appraisal Report and Audit Trail: Upper Lee*", February 2018
AIM	Ofwat suggested multiplier

Table 21: List of benefit sources

Components of the individual ODIs

Supply interruptions greater than 3 hours

We commissioned Accent to conduct research with our customers to discover the level at which respondents would prefer "interruption plus compensation" to "no interruption".[3] This effectively gave a willingness-to-pay (WTP) estimate per avoided interruption.

As Figure 1 shows, 70% of customers chose an "interruption plus compensation" level of £25.20 per hour of supply interruption.

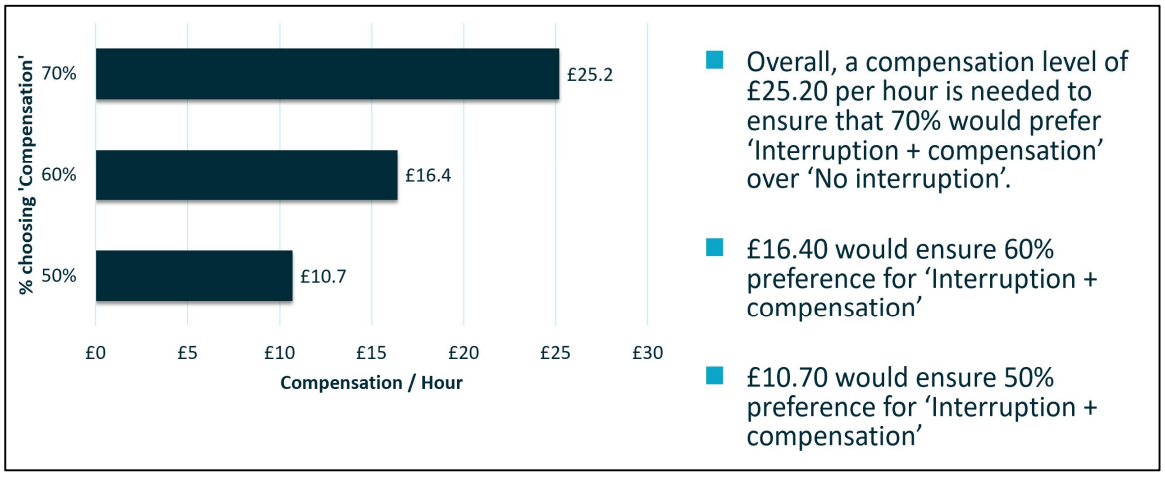


Figure 1: Supply interruptions - AFW results

We also note that, using Accent's industry wide survey results, our WTP figure is in the lower range of the industry figures on WTP for supply interruptions greater than 3 hours, and between 3 to 6 hours.[4] To convert from the "per property" figure to the "per hour" figure, we take the data shown in Table 12, and in the case of interruptions=>3hrs we divide by 3, and for 3-6 hour interruptions we divide by the median of 3-6, which is 4.5. This then gives the results in Table 13.

Study	Unit	Unit value (£/unit/year)		
		HH	NHH	Total
Supply interruptions >3 hours				
Q	1 property affected by a planned supply interruption (> 3 hours)	23		
G	1 property affected by unexpected interruptions to supply lasting 3 hours or longer	132	961	177
Q	1 property affected by an unexpected supply interruption (> 3 hours)	632		
I	1 property affected by planned or unplanned interruptions (<12 hours)	1,312	5,161	1,528
Supply interruptions 3-6 hours				

[3] Accent and PJM Economics report for Affinity Water, "*Exploration of Supply Outage Compensation Levels*", June 2018.
[4] Accent and PJM Economics, "Comparative Review of PR19 WTP Results: Final Report", June 2018.

L	1 property affected by a planned interruption (3-6 hours)	91	706	120
L	1 property affected by an unplanned interruption (3-6 hours)	136	1,565	203
M	1 property affected by a planned interruption (3-6 hours)	157	1,586	232
M	1 property affected by an unexpected interruption (3-6 hours)	282	4,224	488
E	1 property affected (3-6 hours)	310	701	329
T	1 property affected by unplanned service interruptions (typically lasting around 6 hours)	319	10,840	895
J	1 property affected by a short-term interruption to supply (3-6 hours)	515	2,524	636

Table 22: All-industry WTP on supply interruptions

Study	WTP unit value (£/hr lost) - 2017/18 prices	Position
Q	7.94	Quartile 1
G	27.62	Quartile 1
Q	46.72	Quartile 1
I	53.40	Quartile 2
L	61.11	Quartile 2
M	5.72	Quartile 3
L	112.32	Quartile 3
E	146.38	Quartile 3
M	205.99	Quartile 4
T	218.19	Quartile 4
J	527.53	Quartile 4

Table 23: All-industry WTP for supply interruption (per hour)

Whilst these surveys will have had different methodological approaches to ours, we are nevertheless satisfied that the valuation from our WTP research of £25.20 per hour of supply interruption compares well with these other industry findings. It also meets our requirement of exceeding our costs, so we therefore choose this in preference to the lower valuations given by 60% and 50% of customers.

We convert our WTP figure £25.20 per hour of supply interruption to a per minute value by dividing by 60, and then multiply by the number of Affinity Water's billed customers (1,425,795). This gives a value of £598,833.90 per minute of interruption per property.

Leakage

We have used Accent's WTP report for the whole of the water industry to set our WTP level.[5]

To do this, we have conducted quartile analysis of the WTP data for Leakage (expressed as £/ML/d) shown on page 12 of the report, with the quartiles arranged as lowest WTP = upper quartile. We also adjust the WTP values for inflation to express them in 2017/18 prices (from 2016/17 prices).

As our target is based on % reduction from the AMP6 end position, we need to convert one unit of ML/d into an equivalent percentage. This is simply done by dividing the ML/d reduction by the percentage point reduction, giving a conversion factor of 1.6225ML/d = 1%. We adjust the WTP values by these numbers.

Our leakage cost of £785,820.35 sits in the third quartile, so we use the third to fourth quartile boundary of £1,212,583.18 as our benefit value.

Study	WTP unit value (1 Ml/d of water lost through leakage) (£)	Position	WTP unit value (Converted to 1% reduction) (£)	Position
Q	25,160.94	Quartile 1	40,823.62	Quartile 1
C	132,921.17	Quartile 1	215,664.60	Quartile 1
A	155,027.75	Quartile 1	251,532.52	Quartile 1
D	246,818.09	Quartile 2	400,462.35	Quartile 2
E	304,484.31	Quartile 2	494,025.80	Quartile 2
G	493,644.47	Quartile 3	800,938.15	Quartile 3
P	680,262.95	Quartile 3	1,103,726.64	Quartile 3
U	769,718.77	Quartile 4	1,248,868.70	Quartile 4
I	1,068,379.18	Quartile 4	1,733,445.22	Quartile 4
B	1,174,770.18	Quartile 4	1,906,064.62	Quartile 4
			Quartile 1	£288,764.98
			Quartile 2	£647,481.97
			Quartile 3	£1,212,583.18

Table 24: Leakage WTP metadata in 2017/18 prices

Per capita consumption

We set our benefit level by assuming that a reduction in consumption is equivalent to a reduction in abstraction. We therefore use the Environment Agency's Benefit Cost Ratio for Sustainability Reductions. To do this, we take the average of the BCR in the Upper Lee and Colne area (1.76 and 1.29, so 1.52) and multiply the cost for PCC by this number. This gives a benefit of £729,253.87 per ML/d reduction.

Unplanned outage

We have been unable to ascertain a WTP value for this measure. As this measure is penalty-only, we have set the benefits equal to the costs.

Number of burst mains

We have been unable to ascertain a WTP value for this measure. As this measure is penalty-only, we have set the benefits equal to the costs.

[5] Accent and PJM Economics, "Comparative Review of PR19 WTP Results: Final Report", June 2018.

Compliance Risk Index (CRI)

We have not sought to obtain a WTP value for this measure, as we believe that customers expect us to produce the highest quality possible, and therefore minimise the CRI score. As this measure is penalty-only, we have set the benefits equal to the costs.

Environmental innovation - delivery of community projects

We have developed this measure with continued and direct customer input into its scope and goals. Prospective projects were presented as options to customers, along with the attendant costs, therefore costs of the final selection represent a true "WTP" value. We have therefore set benefits equal to costs for this measure.

Properties experiencing longer or repeated instances of low pressure

We have used Accent's WTP report for the whole of the water industry to set our WTP level.[6]

Given that this measure relates to "persistent low pressure", we take the valuations from studies M and J which specifically relate to "persistent low water pressure". We adjust these figures for inflation and then take the average, as shown in the table below.

Study	Unit	WTP unit value (£/unit) - 2016/17 prices	WTP unit value (£/unit) - 2017/18 prices
M	1 property affected by persistent low water pressure	485	502.00
J	1 property affected by persistent low water pressure	1,110	1,149.66
Average			825.83

Table 25: Low water pressure WTP metadata

We then convert this value from a "per property" unit into a "per hour per property average" unit. To do this, we take the average hours of low pressure experienced by our customers in 2017/18 (3,047,658) and divide this by the number of properties affected by instances of low pressure in 2017/18 (74,185). This gives an "average hours of low pressure per affected property" of 41.

Given we've assumed average asset lives of 60 years for the capital invested in resolving this measure, we also assume that the effect of "avoided low pressure" will last for 60 years, so we multiply 60 by 41 to give a value of 2,464, representing "hours of avoided low pressure per affected property".

Finally, we divide the "per property" WTP value by this "hours of avoided low pressure per affected property" figure. This gives a "WTP per hour avoided low pressure per affected property" value of £0.34. As the PC and ODI rate will be expressed as per total properties, we then multiply the benefit figure by our total billed property number of 1,425,795.

This calculation gives a £ per average hour of low pressure of £477,784.50.

Number of properties wrongly classified as unoccupied (False voids)

We compute the false void benefit using "avoided loss of wholesale revenue". To do this, we take our current average water bill (£175) and net off the cost to serve (retail) component, approximately £20. This gives a "wholesale revenue" water bill of £155. We then take Thames' current sewerage bill (£180) and net off the cost to serve (we assume this is also £20), giving a "wholesale revenue" sewerage bill of £155. We add these two numbers together to get an

[6] Accent and PJM Economics, "Comparative Review of PR19 WTP Results: Final Report", June 2018.

indicative total wholesale revenue bill of £315. This figure represents one year of lost revenue for one false void.

Given that we are aware of voids, and we will eventually detect them, we make the conservative assumption that each false void only equates to one year of lost revenue.

This figure needs to be expressed as "voids as a % of total household billed properties". To do this, we take our total property number (1,425,795) and divide by 100. This gives a 1% of total billed properties figure of 14,258.

We multiply the benefit figure of £315 by 14,258, giving a "benefit for 1% of void reduction" of £4,491,254.

Number of occupied properties not billed (Gap sites)

A gap site may go unnoticed forever, meaning the attendant loss of revenue is potentially infinite. However, to match the five-year price control period, we measure the benefits over five years. This ensures that benefits of additional gap detection achieved in AMP7 are shared with customers in AMP7.

To calculate this figure, we take our current average water bill (£175) and net off the cost to serve (retail) component, approximately £20. This gives a "wholesale revenue" water bill of £155. We then take Thames' current sewerage bill (£180) and net off the cost to serve (we assume this is also £20), giving a "wholesale revenue" sewerage bill of £155. We add these two numbers together to get an indicative total wholesale revenue bill of £315. This figure represents one year of lost revenue for one gap site.

Given that we assume that each gap site represents 5 years of lost revenue, we calculate an NPV over AMP7 (5 years), with a discount rate of 2.4%, on the revenue figure of £315. As shown in Table 26, we compute the NPV of £315 from this year (to account for the fact that by 2020/21 we will already have lost two years of discounted revenue). We take the sum only for the AMP7 period however, as this represents the period for which the ODIs will be calculated.

	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	AMP7 Sum
NPV calculation	£315.00	£307.62	£300.41	£293.37	£286.49	£279.78	£273.22	**£1,433.26**
Discount rate	2.4%							

Table 26: NPV of lost revenue from a gap site (5 years)

This gives a benefit figure, in NPV terms, of £1,433.26 per gap site detected. We do also note that a gap site found after 2020/21 would have a different five-year NPV. However, we have chosen to make the simplifying assumption that when we find a gap site it must have been in existence at least from 2020. The NPV therefore reflects the approximate benefits foregone by there being a gap site in existence.

River restoration

We take the list of rivers covered by the AMP7 "green" morphological projects, alongside the km of the rivers benefitting from the work. These are shown in Table 17. We do not use the Sustainability Reduction effects as these will be covered under the separate PC for that measure.

River	Action Type	2020-21	2021-22	2022-23	2023-24	2024-25	Total (km)
Ver	SR	0	0	0	0	21.430	**21.430**
	Morph	0.763	0.763	0.763	0.763	0	**3.052**
Beane	Morph	0.763	0.763	0.763	0.763	0	**3.052**
Upper Lea	SR	0	0	0	0	10.300	**10.300**
	Morph	0.763	0.763	0.763	0.763	0	**3.052**
Mimram	SR	0	0	0.000	0	10.300	**10.300**
	Morph	0.763	0.763	0.763	0.763	0	**3.052**
Misbourne	SR	0	0	0	0	16.900	**16.900**
	Morph	0.763	0.763	0.763	0.763	0	**3.052**
Gade	Morph	0.763	0.763	0	0.763	0.763	**3.052**
Cam	SR (ND)	0	0	0	0	46.828	**43.828**
Ivel	SR (ND)	0	0	0	0	1.200	**1.200**
Total		**4.578**	**4.578**	**3.815**	**4.578**	**107.721**	**125.270**

Table 27: "Green" river projects for AMP7

We then put these rivers and "km improved" through the EA water pollution natural capital calculator.[7] We assume a "benefit" lifetime of 100 years.

The EA's model computes the cost of a river going from an initial state to a worse state. We take each of our rivers and assess them as going from "good" to their current state. The assumption is that this is equivalent to the benefit of going in the opposite direction.

[7] Environment Agency, "*Water pollution natural capital calculator*", April 2018. https://www.gov.uk/government/publications/water-pollution-natural-capital-calculator

Table 28: EA model output - Ver

Water pollution natural capital calculator

Catchment		Colne
Waterbody		Ver
Length of impact		
	distance to next tributary	3.052 km
Duration of impact to:		
	Fish	100 years
	Invertebrates	100 years
	Plants	100 years
Condition before incident		
	Fish	Good or better
	Invertebrates	Good or better
	Plants	Good or better
Condition after incident		
	Fish	Moderate
	Invertebrates	Moderate
	Plants	Moderate
	Scaling factor (1=default)	1.0

Results 2016£	Central	High
Total	1,664,000	1,961,000

Table 29: EA model output - Beane

Water pollution natural capital calculator

Catchment		Upper Lee
Waterbody		Beane
Length of impact		
	distance to next tributary	3.052 km
Duration of impact to:		
	Fish	100 years
	Invertebrates	100 years
	Plants	100 years
Condition before incident		
	Fish	Good or better
	Invertebrates	Good or better
	Plants	Good or better
Condition after incident		
	Fish	Poor
	Invertebrates	Poor
	Plants	Poor
	Scaling factor (1=default)	1.0

Results 2016£	Central	High
Total	2,445,000	2,881,000

Table 30: EA model output - Upper Lea

Water pollution natural capital calculator

Catchment		Upper Lee
Waterbody		Upper Lea
Length of impact		
	distance to next tributary	3.052 km
Duration of impact to:		
	Fish	100 years
	Invertebrates	100 years
	Plants	100 years
Condition before incident		
	Fish	Good or better
	Invertebrates	Good or better
	Plants	Good or better
Condition after incident		
	Fish	Bad
	Invertebrates	Bad
	Plants	Bad
	Scaling factor (1=default)	1.0

Results 2016£	Central	High
Total	3,388,000	3,992,000

Table 31: EA model output - Mimram

Water pollution natural capital calculator

Catchment		Upper Lee
Waterbody		Mimram
Length of impact		
	distance to next tributary	3.052 km
Duration of impact to:		
	Fish	100 years
	Invertebrates	100 years
	Plants	100 years
Condition before incident		
	Fish	Good or better
	Invertebrates	Good or better
	Plants	Good or better
Condition after incident		
	Fish	Moderate
	Invertebrates	Moderate
	Plants	Moderate
	Scaling factor (1=default)	1.0

Results 2016£	Central	High
Total	1,327,000	1,563,000

Table 32: EA model output - Misbourne

Water pollution natural capital calculator

Catchment		Colne	
Waterbody		Misbourne	
Length of impact			
	distance to next tributary	3.052	km
Duration of impact to:			
	Fish	100	years
	Invertebrates	100	years
	Plants	100	years
Condition before incident			
	Fish	Good or better	
	Invertebrates	Good or better	
	Plants	Good or better	
Condition after incident			
	Fish	Moderate	
	Invertebrates	Moderate	
	Plants	Moderate	
	Scaling factor (1=default)	1.0	

Results	2016£	
	Central	High
Total	1,664,000	1,961,000

Table 33: EA model output - Gade

Water pollution natural capital calculator

Catchment		Colne	
		Gade	
Length of impact			
	distance to next tributary	3.052	km
Duration of impact to:			
	Fish	100	years
	Invertebrates	100	years
	Plants	100	years
Condition before incident			
	Fish	Good or better	
	Invertebrates	Good or better	
	Plants	Good or better	
Condition after incident			
	Fish	Bad	
	Invertebrates	Bad	
	Plants	Bad	
	Scaling factor (1=default)	1.0	

Results	2016£	
	Central	High
Total	4,236,000	4,992,000

The sum of these values is then divided by the total number of projects (36) to give a benefit per project.

This gives a per project benefit of £431,150.87.

Abstraction reduction

We calculate the benefit for reducing the water we take from the environment by using the Environment Agency's Benefit Cost Ratio for Sustainability Reductions. To do this, we take the average of the BCR in the Upper Lee and Colne area (1.76 and 1.29, so 1.52) and multiply the cost for Sustainability Reductions by this number. This gives a benefit of £358,614.47 per ML/d reduction.

Number of sources operating under the Abstraction Incentive Mechanism

We have attempted to compute a benefit valuation for AIM using an average value per river catchment affected in AMP7. Each catchment's NWEBS value per kilometre per day was multiplied by the potential length of river that may benefit through the operation of AIM. These figures were then averaged to give a weighted average, accounting for the fact that one catchment may be of a higher natural capital value than another or in some catchments a particularly long length of river could benefit. This gave a benefit per ML of £1,489.63.

However, we felt that given our high performance in AMP6 for AIM, this benefit valuation could lead to extremely high rewards. We have instead used Ofwat's suggested "AIM multiplier" of 1.2 times the marginal cost.[8] This gives a benefit of £188.40 per ML..

App2 – Leakage additional information and old definition reporting

[8] Delivering Water 2020: Our final methodology for the 2019 price review, Ofwat, December 2017, Appendix 2, p.37

Line 2 - Upper limit of sustainable economic level of leakage (SELL) & Line 4 - Lower limit of sustainable economic level of leakage (SELL)

The upper and lower limits of the- sustainable economic level of leakage (SELL) are taken from our revised Water Resources Management Plan (rWRMP19) SELL outputs. These bandings are a +4.3% upper limit and a -4.8% lower limit. RPS, the consultants who have generated the SELL for us, have noted that these percentage limits have not changed between draft WRMP SELL and the revised SELL.

Line 3 - Central point of sustainable economic level of leakage (SELL)

The central point of the SELL is 203.5 Ml/d. This figure is representative of the 2016/17 base year used elsewhere in our revised WRMP19, and takes into account the new leakage consistency methodology. The PR19 SELL is also based on a glide path efficiency to maintain consistency with business plan overall cost efficiencies.

Line 5 - WRMP leakage targets

The WRMP leakage targets come from our revised WRMP19 final plan outputs. These outputs are based on the most up-to-date WRMP19 modelling taking into account a 15% AMP7 reduction in leakage. The pre-AMP7 figures relate to actuals for 2016/17 and 2017/18; but for 2018/19 and 2019/20 the figures are representative of our AMP6 ODIs.

Line 6 - Leakage/property/day

The data in line 5 (leakage in Ml/d) has been used alongside property numbers consistent with WS3 to generate a litres/property/day figure.

We have not yet updated the demand forecast and leakage figures to reflect the very latest household/population figures and thus occupancy rate data, as these have only been available at a late stage of our plan development and have not yet been audited. We will submit these to audit and amend the tables through the determination process when a convenient opportunity arises. The total leakage saving in AMP7 remains unchanged at 15%.

Line 7 - Leakage/km of main/day

Total km of main in our supply area has been taken from GIS as 17,001.841 km. The cubic metres volume of leakage was calculated using line 5 (leakage in Ml/d). Both of these components are required for the completion of line 7.

Line 30 – Leakage

The old definition leakage for AMP6 reflects our leakage ODI. For AMP7, the leakage values follow a 15% reduction in leakage (24Ml/d reduction) as a uniform annual decline of 4.7Ml/d.

Line 31 - Central point of sustainable economic level of leakage (SELL)

The central point of sustainable economic level of leakage (SELL) using the PR14 measurement of leakage (i.e. old definition reporting) has been included in line 31. This figure comes directly from the PR14 SELL report.

The PR14 SELL is used here as the table requires data from 2015/16 onwards, as well as the fact we have not undertaken a PR19 SELL using the non-convergence methodology for the 2016/17 base year.

Line 41 - Per capita consumption (PCC)

The per capita consumption (PCC) prior to AMP7 relates to actual PCC for 2016/17 and 2017/18, and then AMP6 ODIs for 2018/19 and 2019/20. The AMP7 PCC is then generated from the revised WRMP19 demand forecast taking into account the benefits of demand management measures which aim to reduce household consumption.

Line 42 - W-C1: Unplanned interruptions to supply over 12 hours

This line relates to our old definition of supply interruptions (No. of properties affected by unplanned interruptions to supply over 12 hours).

Performance for this measure has not been forecast past the end of AMP6 as we will be transitioning to the Common Performance Commitment for supply interruptions (Average supply interruption greater than three hours, minutes per property) and will discontinue our current PC measure of properties impacted for a period greater than 12 hours.

We have forecast that we will meet our target of 320 per annum for the last two years of AMP6. Despite our disappointing performance in previous years, we have developed an action plan to improve our performance. This is detailed in the commentary for App5 - PR14 reconciliation ~ performance commitments – line 8 which shows we continue to make significant progress this year

Line 43 - [ID and name of PR14 internal sewer flooding performance commitment]

n/a

App3 – Abstraction Incentive Mechanism - surface and ground water abstractions under the AIM threshold

Short definition

The Abstraction Incentive Mechanism (AIM) has the objective of encouraging water companies to reduce the environmental impact of abstracting water at environmentally sensitive sites in low flow periods (i.e. droughts).

Measurement

A review of the AIM triggers and baseline abstraction is undertaken on a quarterly and annual basis in order to validate the selected values. Once validated, the actual abstraction figures are measured against the AIM baseline abstraction values on an annual basis (1 April to 31 March), for the duration that the catchment triggers were activated in that period. The individual normalised scores for each source/group of sources are then aggregated up to report on the company performance.

Mitigation / exceptions

Where Sustainability Reductions (SRs) have reduced Deployable Output (DO) to zero Ml/d, the AIM will no longer apply to these sources, as the impact of abstraction has been mitigated. Where DO has not been reduced to zero Ml/d, there remains the potential for a residual abstraction influence and so there is a benefit in continuing to assess AIM against a lower AIM baseline. This will be in line with the post-SR licence once the latter is in place. Also, we have applied groupings of sources that are in the same catchment and share the same AIM trigger, which is typically the downstream gauge of both sources in the grouping, such that the benefit of their combined operation can be realised. The reason for the grouping is to allow operational resilience during a low flow period and also allow an accurate AIM score to be calculated when applying the normalisation. For our Slip End source that has a licence condition to reduce abstraction in steps relative to river flows, a stepped AIM baseline will be adopted at the 95%-ile of the licensed volume instead of a fixed AIM baseline abstraction for a fixed trigger.

Any other information relating to the performance commitment

This is an “outperformance” only ODI. We propose a target of zero for the normalised AIM score at the company level, so that the negative score would result in an outperformance payment. As outlined in our 3 May 2018 submission on performance commitments, we do not consider underperformance payments to be appropriate. As every unit volume of groundwater abstraction reduced from the AIM baseline has to be replaced either by more expensive alternative supplies or reductions in use, we have set the outperformance payment at a level that reflects the cost of replacement water.

We have undertaken analysis using the National Water Environmental Benefits Survey (NWEBS) database, which is supplied by the Environment Agency. This analysis suggests that the potential benefit to the environment of operating AIM is high, significantly outweighing the marginal cost of utilising a more expensive source of water. We do not consider that it is appropriate to claim such a benefit as an outperformance payment and instead propose that the communities who use the AIM catchments should benefit from that added value. We have therefore proposed that the outperformance incentive rate should be equal to a 1.2 multiplier of the average marginal cost of replacement water from our Grafham supply at our operating boundary which has been the additional cost incurred in operating AIM through AMP6. The multiplier allows 20% additional recovery related to internal transfer costs.

Full definition of the performance commitment

The objective of the AIM is to encourage water companies to reduce the environmental impact of abstracting water at environmentally sensitive sites in low flow periods (i.e. droughts). Following the Ofwat methodology on AIM, the AIM triggers and baseline abstraction values have been calculated for each catchment and source. These values have been reviewed by internal and external stakeholders to be robust, whilst an ongoing assessment is undertaken on a quarterly basis. We led the industry by putting forward a total of 23 groundwater sources to be included in AIM in PR14, which were deemed as potentially environmentally sensitive by previous studies. AIM, as a reputational incentive has been in place since 1 April 2016. Seven sources have been subject to sustainability reductions since then, with three of them having reduced their Deployable Output to zero Ml/d (full cessation). These abstractions will be excluded from the AIM list of sources going forward as the abstraction impact is considered to have been mitigated. Additionally, we have agreed with the Environment Agency that reducing abstraction at Chalfont St Giles will not benefit the Misbourne, and so have removed this site from AIM. These updates reduce the number of AIM sources to 19 that will be carried forward into AMP7. We will be using this as a performance commitment to monitor our success in reducing the environmental impact of our abstraction activities from those 19 sources for the remainder of AMP6 and into AMP7 on an annual basis.

We have put in place a regular data exchange with the Environment Agency, which provides us with up-to-date flow information for our AIM trigger points. We pass this information on to our Operations Centre who, where possible, manage abstraction at AIM sites to ensure that it remains below the respective AIM baseline.

App4 – Customer metrics

Line 1 - Customers finding the level of their water bills affordable: (a) for companies who charge for water only (WoCs)

We have submitted responses based on customer surveys conducted by Blue Marble Market Research in the period 2014/15 to 2017/18 (as part of our Value for Money index) using the following question:

Q.52. *How strongly do you agree or disagree with the following statements about your water supply bill? "I worry about being able to afford my water bill"*

The possible question responses were:

Strongly disagree

Tend to disagree

Neither agree nor disagree

Tend to agree

Strongly agree

Don't Know

We have used totals of "strongly disagree" and "tend to disagree" survey responses to generate the scores for water bills being classed as affordable.

The sample sizes were as follows:

2014/15 - 1900 (note – benchmark year over shorter timeframe)

2015/16 - 1941

2016/17 - 1925

2017/18 - 1912

Note that 2014/15 was a benchmark year and the survey was concentrated in October - November 2014, rather than being spread over 4 quarters as has been the case in subsequent years. Also, the survey was not conducted in 2013/14 so we have no data for this year. In the absence of this data we have used 2014/15 results to populate the table for 2013/14. We have projected the 2018/19 to 2024/25 data to be in line with actual survey results for 2017/18.

Line 2 – Customers finding the level of their combined bills affordable: (b) for companies who charge for both water and wastewater (WaSCs)

n/a

Line 3 - Customers finding the level of their combined bills affordable: (c) for companies who charge for water only (WoCs)

We have not historically surveyed customers on affordability of their combined bills. We have replicated the data from line 1 in this line as this is the closest proxy we have available, rather than leave this line blank. This information should therefore be treated with caution for the period as a whole.

Line 4 - Customers finding their water bills acceptable: (a) for companies who charge for water only (WoCs)

We have submitted responses based on customer surveys conducted by Blue Marble Market Research in the period 2014/15 to 2017/18 using the following question:

Q5. *To what extent do you think the water supply to your home provides value for money, where 0 is 'very poor value for money' and 10 is 'excellent value for money'.*

We have treated scores of 7 to 10 as indicating that customers find their water bills acceptable and taken the totals of those responses to calculate relevant percentage scores.

The sample sizes were as follows:

2014/15 - 1900 (note – benchmark year over shorter timeframe)

2015/16 - 1941

2016/17 - 1925

2017/18 - 1912

Note that 2014/15 was a benchmark year and the survey was concentrated in October - November 2014 rather than being spread over 4 quarters as has been the case in subsequent years. Also, the survey was not conducted in 2013/14 so we have no data for this year. In the absence of this data we have used 2014/15 results to populate the table for 2013/14. Again, we have projected results for 2018/19 to 2024/25 in line with actuals for 2017/18.

Line 5 – Customers finding their combined bills acceptable: (b) for companies who charge for both water and wastewater (WaSCs)

n/a

Line 6 - Customers finding their combined bills acceptable: (c) for companies who charge for water only (WoCs).

We have not historically surveyed customers on acceptability of their combined bills. We have, therefore, replicated the data from line 4 in this line as this is the closest proxy we have available, rather than leave this line in the table blank. This information should therefore be treated with caution for the period as a whole.

Line 7 - Benefits of applying affordability assistance measures

We have calculated the benefits of applying affordability assistance measures by multiplying the total number of customers on either our social tariff (LIFT) or the Watersure tariff by the average bill discounted by the collection rate.

Total benefit = *(Customers on LIFT social tariff x average bill) + (Customers on Watersure x average bill) x collection rate.* The collection rate (cash paid by customers) is used to discount the benefit by the same level of cash that is paid by all customers. Therefore, providing the total benefit of the affordability assistance measures.

Line 8 - Costs of applying affordability assistance measures

Costs include both direct and indirect *Advance Care team* costs plus costs associated with *affordability home visits* where either LIFT or Watersure applications are completed. 100% of the *Advance Care team* costs are associated with this activity.

These costs have been provided from our Finance system.

Revenue forgone has not been included in our calculation as the benefit shown in Line 7 reflects 100% cross-subsidy from customers, thus no revenue has been forgone. We did not have a payment matching scheme or Trust Fund during 2017/18.

Note: The Advance Care Team comprises 8.28 FTEs and is dedicated to the administration of our social tariffs.

Line 9 - Customers aware of affordability assistance measures

We have not surveyed customers on this question so have made the following assumption to estimate the levels of customer awareness of our affordability assistance measures:

> We have defined customer awareness as those customers who pay by instalments (the Affinity Water Standard Payment Plan) using one of the following methods:

- Direct Debit
- Cash (using a bank, Post Office and/or PayPoint)

The methodology used is the sum of all customers paying their bill on the Affinity Water Standard Payment Plan, using all different payment methods, excluding customers who pay immediately after billing/full balance, divided by the total number of customer households.

The future trend is calculated by using the projected number of customers using the Affinity Water Standard Payment Plan divided by the projected number of customer households (at each financial year-end).

The projected numbers of customers using the Affinity Water Standard Payment Plan are calculated using our commitment in AMP7 to increase the proportion of customers paying their water bill by direct debit to 65%. This increase is projected using a glide path approach, stepping up 0.5% in year 1 and then an even increase of 1% each year for the rest of AMP7. As the survey was not conducted in 2013/14 we have no data for this year. In the absence of this data we have used the value from 2014/15.

We believe that the table entries reflect a very conservative view since we frequently communicate the existence of our various assistance measures to all customers, e.g. through inserts included with customers' bills.

In the future, we will consider periodic customer surveys in order to test awareness and understanding of our affordability assistance measures.

Line 10 - Customers who are in debt who have a repayment plan

The total number of customers who are in debt (using the definition of customers with debt outstanding for more than 30 days, which is consistent with the RAG 2.07 table 2.6.1 definition of debt management) is not a data point that we have tracked historically. We have established that this data could be generated by interrogating historical backups of customer debt data. However, this would necessitate taking our live billing and customer service systems off-line for considerable periods of time. We have taken the view that this is cost-prohibitive and have therefore estimated the table entries as described below.

We have used the definition of debt to underpin an assumption for volumes of customers in debt for previous years. Our assumption assumes a flat-line trajectory back to 2013/14 based on the current (as at 31 March 2018) volume of customers in debt. We have not reflected increases in volumes of customers overall in years 2013/14 to 2017/18 as this may not be an accurate proxy for the ratio of customers in debt. However, we have used the direct correlation of the increase in customer households in future years and applied this to the current rate of customers in debt. This takes into account the expected growth in our customer in-debt volumes.

We have been capturing the numbers of customers on a debt management repayment plan since 2014/15, when we implemented our debt collections and recoveries system. However, no data is readily available for 2013/14 and we consider it cost-prohibitive to interrogate historical data to generate the required information. Therefore, we have used the value from 2014/15 as a proxy for 2013/14.

We have assumed a future trajectory of growth of numbers of customers on debt management repayment plans of 1,200 for 2018/19 and the next 2 financial years, and increases of 1,350 additional plans in each of the second to fifth years of AMP7. This 'stepped' increase reflects the additional proactive customer contact activity we propose to undertake and the affordability assistance measures as outlined in the Great Customer Service chapter of our Business Plan.

	Actuals					Forecasts						
Year	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Debt Mgt Plans	16,629	16,629	17,886	19,283	21,956	23,156	24,356	25,556	26,906	28,256	29,606	30,956
Vol. increase	-	-	1,257	1,397	2,673	1,200	1,200	1,200	1,350	1,350	1,350	1,350
%age increase	-	-	7.6%	7.8%	13.9%	5.5%	5.2%	4.9%	5.3%	5.0%	4.8%	4.6%
Debt >30 Days	54,867	54,867	54,867	54,867	54,867	55,265	55,805	56,346	56,886	57,426	57,967	58,508
% on Debt plans	30.3%	30.3%	32.6%	35.1%	40.0%	41.9%	43.6%	45.4%	47.3%	49.2%	51.1%	52.9%

Note: volumes quoted in above table are as at the end of each financial year

Line 11- Customers who have a repayment plan and who are continuing to pay

Historically, we have not tracked the data associated with customers who have a repayment plan and continue to pay. We have, therefore, calculated an average from the period 17 December 2017 to 17 May 2018. Over that period, a total of 132,155 separate repayment plans were set for processing and 24,054 of these failed as the customer did not make the required payment. This equates to 81.8% of repayment plans being paid by customers.

As we have not tracked this data point historically, we are assuming that the rate based on the average for 17 December 2017 to 17 May 2018 represents the historic trend, as we have no data to suggest it would have been different. We have also assumed that the average rate from 17 December 2017 to 17 May 2018 is representative of the future trend.

We have calculated the data for line 11 using the denominator of total customers in arrears with their water charges. Please note that we are unable to calculate a value for 2013/14 as no customer repayment plan data for this financial year is held. Therefore, we have estimated the value to be the same as the following financial year 2014/15.

Line 12 – Customers aware of the non-financial vulnerability assistance measured offered

We have used the number of households on our Priority Services Register (PSR) divided by the total number of properties in our supply area.

Line 13 – Customers on Priority Services Register

We have entered the actual volumes of customers on the PSR up to and including 2017/18. For future years we have projected increases of numbers of customers on the PSR as per below.

Based on our research from publicly available data, we have in the region of 500,000 households with at least one ‘need’ where there is someone with a long-term disability which affects their day-to-day life.

We have used this category as the basis for our model as this will encompass many different types of disability which are substantial and for 12 months or more. This includes sensory impairments, progressive impairments, organ specific, developmental, learning disabilities, mental health conditions, mental illnesses and body and brain injuries.

We understand that a major source of the data we receive will be from UKPN as the distribution network operator in our geographical area. We have therefore used UKPN data as a

benchmark and are aiming to grow the number of households supported to 91,957 by 2024/25but we anticipate some households will have more than one need.

We have forecast growth year-on-year as follows:

Regulatory Year	Increase – year on year	Total Households on PSR
2018/19	12%	29,938
2019/20	14%	34,129
2020/21	16%	39,589
2021/22	19%	47,110
2022/23	22%	57,474
2023/24	25%	71,842
2024/25	28%	91,957

We have assumed that growth rates will themselves increase by 3 percentage points annually from 2020, as data sharing with energy retailers is due to commence around that time and we expect this to have a significant impact. We have assumed a 2% growth in annual increases prior to that.

Other activities to promote the priority services register include a dedicated Advance Care Manager whose role is to develop partnership working to promote support available including Priority Services Register.

We also have a programme of training for our front-line teams including Dementia Friends information sessions to raise awareness and to support with identification of customers that may require additional support and to promote the Priority Services Register.

We have also reviewed the England Indices of Deprivation from 2015 with a view to matching the bottom two indices – bottom 20% for Health and Disability, which means we will be able to have a more segmented approach to promote the Priority Services Register through community events, marketing, social media and our partners.

Line 14 - Customers on Priority Services Register (PSR) (percentage of all customers)

Our entries are based on the number of households on the PSR, as entered on line 13, divided by the number of properties as at 31 March each year. For future projections, we have based the growth on insight into the needs within our communities and activities associated with them going forward.

Line 15 – Customers receiving services through the PSR (a) support with communication

Line 16 – Customers receiving services through the PSR (b) support with mobility and access restrictions

Line 17 – Customers receiving services through the PSR (c) support with supply interruption

Line 18 – Customers receiving services through the PSR (d) support with security

Line 19 – Customers receiving services through the PSR (e) support with 'other needs'

Following guidance provided by OFWAT, we have grouped our current categories as follows:

Communication:	Visually Impaired, Braille, Large Print, Hearing, Speech Impediment, Learning Difficulty, Audio Tape
Mobility & Access:	Elderly, Wheelchair user, Mobility problems
Supply Interruption:	Mental Health, Unable to fetch water, Dialysis
Security:	Password

Current Position

As at 31 March 2018, the 26,731 households on our register are classified between the four above groups as follows:

Communication:	4,354	(16.29%)
Mobility & Access:	6,677	(24.98%)
Supply Interruption:	7,292	(27.28%)
Security:	20,961	(78.41%)

The total number of these classifications (39,284) exceeds the number of households on our register as it is possible for a household to have more than one classification, for example support with communication and security.

Method of Calculation

We have assumed that the current percentages of all households on the PSR classified in each of the groups will remain consistent over the remainder of AMP6 and throughout AMP7.

For the category of 'other' we have included the numbers of households for which we expect to hold third-party contact details for an incident. Currently, for approximately 0.9% of all households (12,550) we hold a third-party notification for billing purposes. Our aim is to offer notification to a nominated contact during an incident and we have assumed the same level of support as currently provided for billing purposes.

We have anticipated that for the first two years (2018/19 and 2019/20) the growth in the number of households supported will remain consistent as this is a new proposal which will need to be embedded and from 2020/21 we will see stepped increases.

We believe that this will not have a significant impact on the overall numbers of households on our PSR as the vast majority of these households will already be registered under at least one existing category.

This is a new offering therefore we will be working with our partners and operational teams to deliver and promote it.

On the basis of the above, the profile of entries on our PSR across the four categories we currently use for the remainder of AMP6 and through AMP7 is estimated as follows:

	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
		Year-on-Year percentage increases						
		12%	14%	16%	19%	22%	25%	28%
Total Households on PSR	26,731	29,938	34,129	39,589	47,110	57,474	71,842	91,957
Needs Categories:								
Comms	4,354	4,876	5,559	6,449	7,674	9,362	11,703	14,979
Mobility	6,677	7,478	8,525	9,889	11,768	14,357	17,946	22,970
Supply	7,292	8,167	9,310	10,799	12,851	15,678	19,598	25,085
Security	20,961	23,474	26,760	31,041	36,938	45,065	56,331	72,103

The anticipated profile for the “other needs” category is as follows:

	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Total entries	0	1,000	2,000	3,250	4,750	6,750	9,250	12,550
Annual increase		1,000	1,000	1,250	1,500	2,000	2,500	3,300

Historical Data

The following figures have been reported as part of quarterly requirements to Consumer Council for Water and for account reporting purposes. The figures represent the number of households recorded on the register at the dates noted.

31 March 2014	14,882
31 March 2015	17,159
31 March 2016	16,921
31 March 2017	24,259

Line 20 - Customers satisfied that the services are easy to access

We have submitted responses based on customer surveys conducted by Blue Marble Market Research in the period 2014/15 to 2017/18 (as part of our Value for Money index) using the following question:

Q24. *How easy or difficult was it for you to make contact with Affinity Water?*

Although we have tracked ‘ease of effort’, this is not bespoke to customers in vulnerable circumstances and therefore the information is not a direct correlation but an indicator to the

score. As the survey did not begin until 2014/15 we do not have evidence for 2013/14 and have therefore used 2014/15 result as a baseline.

As the table requires entry of a percentage, the assumption used for the table is based on the Value for Money Survey, the assumption used was a flat profile of the average over 4 years.

In AMP7, we will introduce audits by an independent panel to assess 'ease of effort' as part of an holistic approach to evaluate how we have embedded customer ease into our service. We believe setting a target score of 4.8 will be stretching as the approach to the audit will be robust and tailored to vulnerable circumstances. Scoring is based on Institute of Customer Service scoring whereby 10 represents high effort.

Line 21 - Customers on SAR/PSR contacted over the previous two years to ensure they are still receiving the right support

We have no data available, however during 2018/19 we will be contacting all customers as part of our work for GDPR and therefore 100% of customers on our PSR.

App5 – PR14 reconciliation ~ performance commitments

General

- We confirm that the amounts being claimed for ODIs are the same as the outperformance payments/underperformance penalties determined by expected performance. We have not chosen to voluntarily forgo any amounts due.

- We have considered, in line with reporting methodologies, the effect of weather on actual performance against certain ODIs. Considerations on weather or weather adjustments have been made against actual performance to ensure it is directly comparable to the reported PR14 base year.

- We do not believe that there is any ambiguity in the definitions of the ODIs so have not needed to make any interpretations.

- We confirm that there have been no cases where issues with past reporting of data have resulted in adjustments to ODI claims.

- We confirm that we have not made any material refinements to our methodologies for reporting on any of our performance commitments.

Column 4 - PR19 Price Control Allocation (%)

We have allocated all the performance commitments with financial incentives to each respective price control by considering the segment of the business that is responsible for delivering the performance commitment and the nature of the activities that we are undertaking to fulfil the commitments. Accordingly, the performance commitments for Water Available for Use and Sustainable Abstraction are allocated 100% to water resources. The remaining commitments, apart from SIM which is allocated to residential retail, are allocated 100% to water network plus.

Line 1 – Leakage (Ml/d)

The challenge to reduce leakage by a further 11 Ml/d over the next two years is a significant one and will be delivered using a variety of techniques, summarised below:

- District Metered Area (DMA) Optimisation – Forensic investigation into the reasons why long term high leakage DMAs do not respond to normal Active Leakage Control (ALC) activity. This will involve but is not restricted to, step testing, meter verifications, portable acoustic logging and high-volume water use logging

- ALC Controlling Natural Rate of Rise (NRR) – Each year we expect to see the NRR equate to 160 Ml/d and this will be managed by using a combination of fixed and portable acoustic logging alongside traditional leakage detection techniques

- ALC Reducing Leakage – Reducing the duration of a leak will be central to ALC contributing to the reduction of background leakage. Our work with external consultants has shown that most of the duration of a leak occurs before we are aware of it. There is a period of time to detect leaks before the repair can be initiated. We will reduce the leak duration by changing our approach to targeting from a predominantly flow based process at a DMA level to a leak noise based approach highlighting points of interest for investigation

- Pressure Management – During 2018/19, we will complete the delivery of our programme of pressure management schemes across our area. In addition, we will continue to optimise existing schemes to ensure we strike the right balance between network performance and leakage

Line 2 – Average water use (l/p/d)

Average Water Use is a weighted average water consumption measure for all domestic (household) customers across our supply area. This measurement includes both measured and unmeasured customers. It is measured in litres per person per day and refers to normal year conditions. The ODI measure is based on the 'Normal Year' PCC forecast, therefore this value must be adjusted based on the weather experienced in the reporting year. To do this, we have worked with the Met Office to develop a weather model which can be used to identify how far from the base year 2012 (considered a 'normal year') the reporting year is and the appropriate adjustment factor.

Based on our latest demand forecast completed for our draft WRMP19, and the performance of the last financial year 2017/18, we expect to meet our ODI targets for the remaining years of AMP6.

Line 3 – Water available for use (Ml/d)

We measure the water that is readily available to us by subtracting actual outage and sustainability reduction volumes from our total deployable output. In order to monitor progress against this target, consideration is given to our drought conditions. Within our drought management plan, upon reaching drought trigger zone 3, we commit to rescheduling planned maintenance and responding to unplanned outage events more quickly. It is at this point water levels could impact abstraction and so W-A3 will be reported against the Dry Year Annual Average (DYAA) Deployable Output (DO). Under less severe drought conditions the Normal Year Annual Average (NYAA) DO will be used to monitor the ODI. We have consistently achieved our W-A3 targets in the last three years and we are therefore confident that the W-A3 ODI will be met in the remaining years of AMP6.

Line 4 – Sustainable abstraction reductions (Ml/d)

Our AMP6 sustainability reduction commitment involved changes in deployable output at seven sources (Bow Bridge, Fulling Mill, Whitehall, Hughenden, Amersham, Piccotts End and Marlowes) in six river catchments. These reductions are being made either by changing or revoking the abstraction licence or entering into a Water Resources Management Agreement with the Environment Agency under Section 20 of the Water Resources Act.

As of 31 March 2018, we have delivered 32.69Ml/d of reduction (average deployable output), of which 18.6Ml/d was implemented 12 months earlier than the PR14 WRMP target date. We are on target to deliver the remaining 9.4Ml/d reduction in average deployable output in the 2018/19 reporting year. This will conclude our AMP6 sustainability reduction programme.

Summary of cumulative reductions by source, implemented on 1 April each year.

Source	**1/4/15**	**1/4/16**	**1/4/17**	**1/4/18**	**1/4/19**
FULL	3.49	3.49	9.09	9.09	9.09
WHIH	3.18	3.18	16.18	16.18	16.18
BOWB	0	5.82	5.82	5.82	5.82
HUGH	0	0	1.6	1.6	1.6
PICC/MARL	0	0	0	6.4	6.4
AMER	0	0	0	3	3
Total	**6.67**	**12.49**	**32.69**	**42.09**	**42.09**

NB ODI requires the reduction in the average deployable output to be calculated for 1 April to 31 March each year.

Line 5 – Abstraction incentive mechanism

At present, AIM is a performance commitment without a financial ODI. For this reason, we have not forecast out/under performance costs for the remainder of the AMP period. Operating AIM always has a cost associated with it and we welcome the fact that AIM will become a financially incentivised ODI in AMP7. AIM is only assessed during low flow periods, as defined by bespoke catchment triggers. Although the sensitivity of different catchments to low flows varies, whether AIM is active or not is ultimately driven by the occurrence of drought. This is a naturally occurring event which is difficult to forecast. We expect no variation from our underlying baseline position and therefore our effective forecast is 0.

Line 6 – Compliance with water quality standards (%)

We expect our mean zonal compliance (MZC) performance to remain stable for the rest of the AMP. We are delivering an enhancement to our pesticide removal treatment at Iver WTW during 2018/19 and this may lead to a small improvement in performance while the installation of metaldehyde removal treatment at North Mymms WTW will not be delivered until March 2020.

Line 7 – Customer contacts for discolouration (number per 1000 population)

We expect our performance with regards to customers contacting us concerning discolouration of their water supply to remain stable for the rest of the AMP as we have now completed the mains cleaning projects in our four highest risk zones. Early indications from 2018 are that contact rates remain low and we are on track to continue to meet this performance commitment.

Line 8 – Unplanned interruptions to supply > 12 hours (no. of properties)

Meeting this performance commitment continues to be very challenging. We take our performance around supply continuity very seriously and have been very active in developing operational response plans to address this issue, even though our evidence confirms that our underlying asset performance remains stable. We continue our investment programmes for trunk main and mains renewals including 'hot spot' reduction as part of our calmer networks initiative set out at PR14. Implementation of our operational response plans is proving to be effective and since September 2017 we have gone 9 months, with the severe freeze/thaw weather event being our only significant no water event. During the freeze/thaw event we were able to ensure supply interruptions were identified and mitigated with minimal impact to our customers (c. 1300 properties for 13 hours). Our average minutes of interruption per property measure is also markedly improved.

In developing our plan, we conducted in-depth analysis to understand the underlying causes of failure across the 5 incidents that resulted in us failing to meet our target during 2017/2018. This analysis found a number of themes:

- timing of incident
- criticality of asset
- operational knowledge and experience
- decision making
- escalation
- repair versus restoration
- supply chain

We have established a dedicated improvement team consisting of front line operational managers and senior managers from across the business to develop and deliver a programme of works built around these common themes. As a result, 5 core work packages have been identified which have been reviewed, challenged and agreed by our Board:

- Functional Standby – having the right people available at the right times in the right locations to make the right decisions

- New contracts linked to ODIs – closer relationships with our tier 2 supply chain specifically targeting ODI success and removing commercial barriers
- Network Control Desk – implementing our control vision strategy to reduce time to respond
- Equipment and materials – complete review of our plant and equipment and an in-house restoration capability
- Extended 'working window' – new operating models

Progress against plan is tracked through steering groups and reports to our Executive team and Board. Some of the headline items delivered to date include:

- The establishment of 24/7 Network Control Desk
- 90% coverage of DMAs with 15-minute GPRS loggers
- A new Business Lead for Rapid Response and Restoration with 2 Managers and 33 Field Technicians dedicated to delivering restoration of water supplies during an incident
- A dedicated Interruption to Supply Programme Manager
- Equipment, plant and tools required for quick repair and restoration stored at new regional hubs across our company area

We are working on extending our working window such that we have full coverage provided by key personnel throughout the working week with less reliance on standby teams.

Line 9 – Number of burst mains (no. of bursts)

We have reduced burst levels in the distribution network through the increased renewal programme started in AMP4 and extended to AMP5 and AMP6 and we expect to meet our performance commitment target of 3,100 bursts or less, over the next two years. We are currently around 30% below the performance commitment target for this year. We continue to target the pipes that burst more frequently in our mains renewal programme.

Line 10 - Affected customers not notified of planned interruptions

In 2016/17, we missed our target by just 1 property. In 2017/18 we experienced a challenging year, missing our target by 286 properties. We are making improvements in the following areas:

- Properties affected because of GIS inaccuracies or unforeseen events.
- Issues with the network, such us faulty valves.
- Planning and coordination.

We expect to meet our performance commitment targets over the next two years.

Line 11 - Planned work taking longer to complete than notified

We have achieved this target in every year in the period. Last year, we experienced over 30 events affecting 484 properties with planned works taking longer than notified. We will continue to promote our early warning reporting procedure. This involves escalation and decision making by the senior manager(s) 3 hours before planned supply restoration time. If the risk of failing to restore a supply on time is high, other measures such as installation of an overlander supply will be implemented. These measures are focusing on restoration rather than completing the works late in the day.

Over half of all events during 2017/18 affected properties between 4 and 7 hours. Our aim is to improve escalation and respond more quickly if an incident occurs. Also, to reduce events involving missed services to a single property we have introduced additional checks during planned works. Furthermore, in Q3 2018/19 we are starting "water always on" trials. This is being conducted as part of readiness for AMP7 and the new ODI of under 3 hours for all planned interruptions.

Line 12 - SIM Service Score

Forecast for 2018/19 is 81.3 and 2019/20 is 82.4.

For the quantitative element, we expect to see continued reduction in both unwanted contacts and complaints, with a greater reduction in 2nd stage than 1st stage as we continue delivering improvements to customer journeys and targeted training.

For the qualitative element, we expect to continue along the same trajectory we have seen the last 2 years, with improvements to our survey score.

Line 13 - Value for Money Survey

Forecast for 2018/19 is 67.8 and 2019/20 is 67.8.

The index is influenced by various measures. Based on analysis of these measures, we have considered likely performance and how it will feed through to the overall value for money index. Our projection is that the index will be at a similar level over the next two years as we have seen based on historic trends as well as metering roll out plans, future bills, estimated levels of supply interruptions, customer communications activity and the influence of broader economic outlook. The slight improvement is driven by future bills being lower and customer perception improving compared to 2015/16, as well as overall satisfaction levels increasing, following customer journey transformation programmes delivering benefits.

App6 - PR14 reconciliation – sub-measures

General

As we do not have sub-measures this table is a nil return.

App7 - Proposed price limits and average bills

Please refer to the “Financial Model Based Data Tables” section at the end of this document.

App8 - Appointee financing - Section A

Please refer to the “Financial Model Based Data Tables” section at the end of this document.

App9 - Adjustments to RCV from disposals of interest in land

General

The table has been completed for the three years to 2017/18, based on the actual figures reported in our Annual Report and Financial Statements. These have been subject to external audit. For the last two years of the period covered by the table, we have entered our forecasts of land sales as required.

At the time that price limits are finalised, the actual figure for the fourth year will be known and can be used in the calculation of price limits.

Any variation between forecast and actuals for year 5 will be adjusted for at the following price review.

App10 - Financial ratios

App11 - Income statement based on the actual company structure

App11a - Income statement based on a notional company structure

App12 - Balance sheet based on the actual company structure

App12a - Balance sheet based on a notional company structure

App13 - Trade receivables

App14 - Trade and other payables

App15 - Cashflow based on the actual company structure

App15a - Cashflow based on a notional company structure

App16 - Tangible fixed assets

App17 - Appointee revenue summary

App18 - Share capital and dividends

App19 - Debt and interest costs

For all of the above please refer to the “Financial Model Based Data Tables” section at the end of this document.

App20 - Cost of debt / analysis of debt

General

The cost of debt/analysis of debt forms part of our regulatory requirements and is audited by our external auditors, PwC.

The figures are derived from AWL bond sheets with supporting information from Centrus, who provide our bond prices; the data was extracted from Reuters.

The RPI and CPI assumptions are based on the March 2018 figures as published by the office of National Statistics on their website: https://www.ons.gov.uk/economy/inflationandpriceindices).

App21 – Direct procurement for customers

General

The table refers to one project, 'Regional reservoir for the South East' that falls under direct procurement for customers. As this will be a joint project undertaken together with Thames Water, estimates of costs received from Thames Water have been used (per email received from Anthony Owen, Project Manager, Thames on 19 July 2018).

Although we have agreed with Thames Water that our contribution will be one third of the total cost, we have completed table App21 with the whole investment since we are still developing an understanding of Direct Procurement. We understand that this is consistent with Thames Water submission of table App21. Our revised draft WRMP19 and PR19 plans will reflect the agreed 1/3 : 2/3 split of costs and volumes.

Section A, Lines 1 - Development costs to 2 - Procurement:

These costs represent development and procurement costs incurred at the initial stages of the project.

Section A, Line 7 - Expected CAP capex:

These costs are the capex associated with the construction phase of the project and include various activities and categories (e.g. civils, distribution mains, network, etc.).

Section A, Line 8 - Expected CAP opex:

These costs are the opex (electricity, labour, maintenance) associated with the project.

App22 – Pensions

Section A

Line 1, 3 and 4 - Charge for DB schemes ~ residential retail, wholesale water resources and wholesale network plus

The total of these three lines added together show the total pension accounting charges under FRS101 for Defined Benefit schemes (Pension Current Service Cost).

Assumptions: -

- 2012/13 to 2017/18 charges are taken from our Annual Report and Financial Statements. (employee cost).
- 2018/19 charge is taken from our financial budget.
- 2019/20 onwards we assume an annual 5% reduction in defined benefit members, based on an assessment of the retirement profile of active members, plus an increase in cost for inflation.

Allocation between Retail, Water Resources and Network Plus has been based on actual and forecast membership of the scheme. We have identified the cost centre for each member and then allocated their cost using the same method as our internal allocation model used to populate tables within the regulatory accounts for 2017/18. Please refer to our Methodology Statement for further detail.

https://stakeholder.affinitywater.co.uk/docs/Methodology-Statement-Accounting-Separation-2017-18.pdf

Section B

Line 10, 12 and 13 - Charge for DC schemes ~ residential retail, wholesale water resources and wholesale network plus

The total of these three lines added together show the total pension accounting charges under FRS101 for Defined Contribution schemes.

Assumptions: -

- 2012/13 to 2017/18 charges are taken from our Annual Report and Financial Statements (employee cost).
- 2018/19 charge is taken from our financial budget.
- 2019/20 onwards: we assume the impact of joiners and leavers will net off against each other hence the charge remains constant apart from an increase in cost for inflation.

Allocation between Retail, Water Resources and Network Plus has been determined on the same basis as for section A – Defined benefit scheme.

https://stakeholder.affinitywater.co.uk/docs/Methodology-Statement-Accounting-Separation-2017-18.pdf

Section C

Line 19, 21 and 22 - Cash contributions (DB schemes, ongoing) ~ residential retail, wholesale water resources and wholesale network plus

The total of these three lines added together show the total ongoing cash contributions to Defined Benefit schemes.

Under our current agreement, in 2018/19 the total ongoing cash contributions to the scheme will be £4.2m.

Following negotiations with our pension trustee, we have assumed our ongoing annual contribution will rise to £5m from 2019/20 and for all future years. In AMP7 the contributions have been converted into 2017/18 CPIH.

Allocation between Retail, Water Resources and Network Plus is performed on the same basis as Section A

Section D

Line 19, 21 and 22 - Cash contributions (DB schemes, deficit recovery) ~ residential retail, wholesale water resources and wholesale network plus

The total of these three lines added together show the total deficit recovery contributions to Defined Benefit schemes.

Following negotiations with our pension trustee we have assumed no additional contribution from 2019/20 and for all future years.

Allocation between Retail, Water Resources and Network Plus is performed on the same basis as Section A.

App23 - Inflation measures

General

We have completed this table with actual values for the inflation indices using the Office for National Statistics publications.

We have projected inflation by assuming that the Bank of England accomplishes its inflation target of 2% per year for CPI.

By comparing the historical values of the CPI, CPIH and RPI inflation indices, we can determine the average spread between the different indices. Over the full period for which CPIH data is available we have found that each month, CPIH is on average 0.13% points lower than CPI. Accordingly, our forecast of CPIH is 1.87%. We have also found that each month, RPI is 0.74% higher than CPIH on average. Therefore, our forecast for RPI is 2.61%.

App24 - Input proportions

General

This table reports forecast proportions of expenditure (operating and capital) for the following input price categories for each business unit:

- Labour
- Energy
- Chemical
- Materials, Plant, Equipment
- Other

Operating Expenditure

We build our operating expenditure forecast by cost types; hence the relevant cost types have been allocated to the most appropriate category.

Capital Expenditure

We reviewed each individual investment portfolio and allocated expenditure in the above categories on a case-by-case basis.

App24a - Real price effects (RPEs) and efficiency gains

Blocks B & C Wholesale real price effects

We have considered our wholesale costs and how input price inflation may alter those costs in the period 2020-25. Although there are multiple input prices that influence wholesale business costs, we have concentrated on those we consider most material:

- Power
- Labour
- Materials and consumables
- Construction Output Price Inflation

Power

Our power costs arise predominantly from purchasing electricity supplies for our operations. We have projected input prices for electricity using the Department of Business, Energy and Industrial Strategy's *Updated Energy and Emissions Projections, 2017 Annex M Growth and Price Projections.* This statistical bulletin presents a range of energy price scenarios corresponding, for example, to high and low economic growth and high and low prices for primary fuels used in power generation. We have taken an unweighted average of the published industrial electricity price scenarios to produce average/mean estimates of electricity prices. The BEIS projections predict real terms growth in electricity prices averaging 1.8% per year, as in the table below. As these prices are already published in real terms, we have not further deflated them by CPIH:

	2020/21	2021/22	2022/23	2023/24	2024/25
Real 2017 price p/kWh	11.57	11.83	11.81	11.95	12.24
Real Growth Rate (%)	3.2%	2.3%	-0.2%	1.2%	2.5%

Labour

We have studied the evolution of labour costs and made use of a report prepared for us by Economic Insight to project labour costs. Economic Insight projected that nominal wage inflation could be expected to be in the range 2.1% to 2.9% per year, with an average/mean estimate of 2.4%.

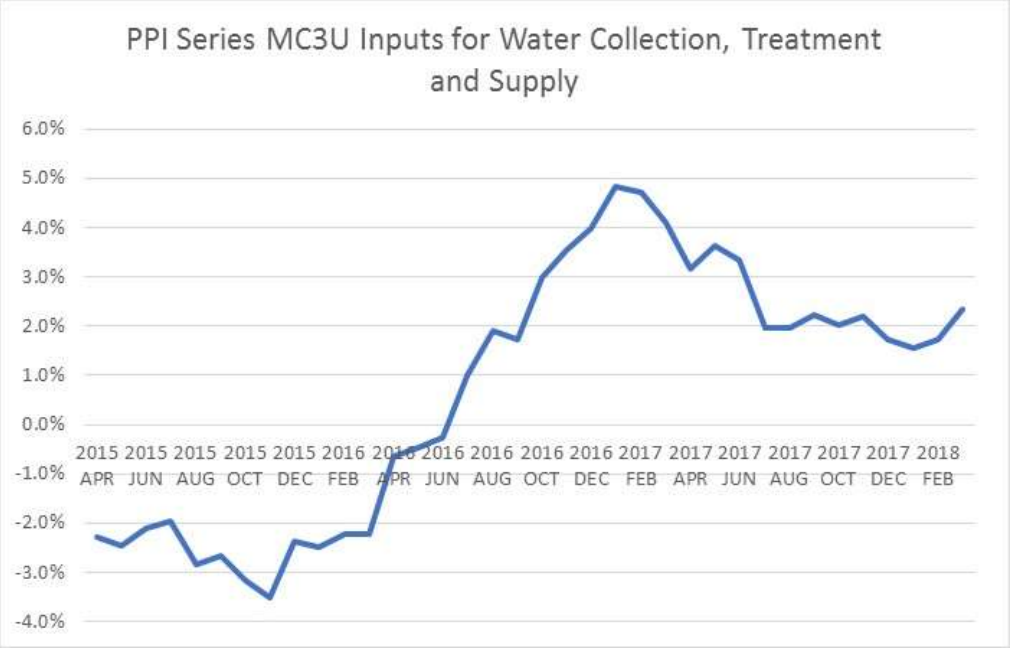
To produce their estimates, Economic Insight considered a range of evidence, based on:

- Econometric modelling
- Extrapolation of existing trends in labour market statistics
- Projections made by independent forecasters

We have chosen to use Economic Insight's advice, taking their average/mean case, 2.4% per year as the nominal labour input price increase.

Materials and consumables, including chemicals

We have measured the price of input materials and consumables to the water industry using the MC3U Series, which is a component of the ONS Producer Price Inflation series. Since 2015, when input prices were undergoing deflation, input prices have recovered and are running at a nominal rate of about 2.0% per year. Extrapolating from past data, we project that materials and consumables input prices will increase by 2.0% per year, in line with recent trends in the PPI evidence.



Source: ONS

Construction Output Price Inflation

We have studied Construction Output Price Index (COPI) data published quarterly by the ONS since 2015, and by extrapolation of this data, have produced our forecast of COPI.

We have found that since April 2015, COPI has been running at a nominal annual average rate of 1.69%. The rate of inflation has increased since mid-2015, following a period of falling construction prices. Our projection is 1.69% nominal construction output price inflation, the average rate observed over the period January 2014 to November 2017.

Source: ONS

Real Price Effect

Not including electricity, for the reason noted above, we converted nominal values for inflation into real terms, by dividing by CPIH as projected in Table App23 and in accordance with the formula in the Final Guidance on Business Plan Data Tables. For real price effects, we calculated the weighted average real inflation, by multiplying the projected real terms input price inflation for each expenditure category by the weights in Table App24, which show the contribution of each category to wholesale Totex. The results of this calculation form the entries for the table.

Blocks F & G - Input price pressures included in residential retail and business retail

We commissioned Economic Insight to estimate input price inflation for our retail business. They have calculated a bespoke Affinity Water retail inflation index based on the proportionate contributions of input costs to our total retail expenditure and projected movements in the following input price series:

- Labour cost
- Bad debt
- Postage costs
- Information Technology
- Property
- Meter reading

Economic Insight's report concludes that an average/mean estimate of nominal input price inflation for our retail business would be 1.89% per year on average as below:

	2020/21	2021/22	2022/23	2023/24	2024/25
Forecast of Gross Retail IPP (%)	1.68%	1.95%	1.91%	1.93%	1.96%

Source: Economic Insight

For depreciation charges, Economic Insight recommend that we use the nominal input price inflation index they calculated for Information Technology, on the basis that most investment in the retail business can be thought of as arising in IT activities.

	2020/21	2021/22	2022/23	2023/24	2024/25
Forecast of Gross Retail IPP (%)	0.72%	0.73%	0.74%	0.74%	0.74%

Source: Economic Insight

Blocks H & I: Wholesale assumed efficiency

The guidance to the table requires that efficiency gains be expressed as the difference in expenditure between what the company expects to spend in year 't' and what it would have had to spend in year 't-1' to deliver the same level of services. It further notes that 'the assumed efficiency gain should be expressed as a percentage reduction relative to the year before.'

Lines 26 and 31

Starting with our total operating expenditure recorded in Table WS1, we deducted enhancement operating expenditure to produce our 'base opex' line, corresponding to what we would have had to spend in opex to deliver the same level of services as in the prior year.

Our assumed efficiency gains are then the real terms percentage reductions in base opex expenditure each year, relative to the prior year.

Line 27

There is no expenditure projected for maintaining the long-term capability of assets in water resources, so this line is zero.

Lines 28, 29, 30 and 32, 33, 34 and 35

It has been more difficult to produce efficiency gain assumptions for capital expenditure as required by the guidance - 'the difference in expenditure between what the company expects to spend in year 't' and what it would have had to spend in year 't-1' to deliver the same level of services'. This is because for maintenance expenditure, whilst we maintain the same level of service, our capital expenditure profile is not smoothed through the period. Instead it reflects our choices about the timing of maintenance investments and the effects on expenditure in individual years, of large maintenance projects. The annual variability of capital expenditure means that in some years, expenditure is rising relative to its prior year. This does not automatically mean that we have become less efficient, but that the size and nature of the investments we propose are different to prior years.

Enhancement expenditure, by its very nature, is changing the level of service. As such, it is not readily possible to compare one year's expenditure with its prior year whilst at the same time, holding the level of service constant. Enhancement expenditure tends also to be unevenly phased so subject to year on year fluctuations unrelated to efficiency improvement.

Therefore, for the capital expenditure lines we have derived our exposition of assumed efficiency gains in capital expenditure activities by comparing our projection of capital expenditure priced in real 2017/18 terms, at our current costs, with the post efficiency expenditure we propose in our plan (Table WS1) which includes our planned efficiencies. The figures we present then are the year-on-year percentage changes in capital expenditure resulting from the efficiency improvements we have included in our plan.

Blocks L & M: Assumed efficiency gains in residential retail and business retail

Block L

Lines 46 & 47

Starting with operating expenditure and capital expenditure as reported in table R1, we derived assumed efficiency gains in retail by removing input price inflation and growth in customer numbers to produce our underlying real terms opex and capex projection that holds the level of service constant. We have considered that providing retail services to a growing number of customers over the period constitutes an enhancement to service levels. We have then calculated our assumed efficiency targets as the percentage change in expenditure each year relative to its prior year.

Block M

We have entered zeroes for this block as we have exited the non-residential retail market.

App25 - PR14 reconciliation adjustments summary

General

The inputs to this table are the final adjustments to prices for the 2010 to 2015 (AMP5) period arising from:

- true-up of actual capex spend in 2014/15 compared to the expected expenditure at the time of the PR14 determination
- correction to indexation of RCV.

We have used the values published by Ofwat, in Updated 2010/15 Reconciliation (December 2017) to populate this table, after making the necessary indexation adjustments.

App26 - RoRE Scenarios

General

App26 was completed in line with Ofwat's guidance contained within the published document 'Delivering Water 2020: Our methodology for the 2019 price review, Appendix 12: Aligning risk and return', within Section 3 titled 'Scenario analysis and risk assessment'. The pre-tax economic impact, in a 2017/18 CPIH year average price base, of an upside and downside case for each of the prescribed scenarios listed in the guidance has been assessed and modelled. We felt that the prescribed scenarios in the guidance covered the relevant attributes to our business so chose not to include any additional scenarios. The upside and downside scenarios applied to the base business plan submission for each of the variables below were assessed to be within the P90/P10 probability range as per the guidance.

Tables A & B - Revenue

These sections were completed by using past data and expert opinion to derive the suitably probable economic impact of movements in review for each of the price controls while also considering the impact of water trading incentives. It was assessed that the supply/demand pressures driven by weather related activity would be the main area of impact and this was suitably modelled for each of the price controls. This was applied through a 3% increase or decrease on the modelled revenue in the base business plan submission to represent the economic impact for an upside and downside scenario respectively.

Tables C & D – Totex

Within each wholesale price control, the level of economic impact associated with the suitable probability of increased/decreased costs after a sharing mechanism has been modelled and represented. Using past data and expert opinion, the main factors considered within this modelling were the economic impact of asset failures and demand/supply pressures. The suitable level impact applied was an increase of 4% in all totex for a downside scenario and a decrease of 4% for an upside scenario. A sharing rate of 50% was applied within each period to ascertain the economic impact of this movement.

Tables E & F – Residential Retail Costs

The level of economic impact driven by the movement in costs within the residential retail price control has been modelled focusing on the movement in bad debt as the key contributing factor.

Tables G & H – Business Retail – no input required for AWL

Tables I & J – ODI

The economic impact for penalties/rewards in each proposed ODI was modelled based on a suitable level of probability and assigned to the relevant price control.

Tables K & L – WaterworCX

This section examines the economic impact of a resulting reward/penalty within the C-MeX and D-MeX mechanics as per guidance issued by Ofwat. The impact from C-MeX was attached to the residential retail price control and the impact from D-MeX was attached to the Water Network price control. For C-MeX, the level of reward/penalty was applied to modelled Residential Retail revenue within each period to ascertain the economic impact of an upside and downside scenario. The upside scenario applied a 1.2% reward against modelled revenue of £29.4m while a downside scenario was assessed as a 2.4% penalty. The economic impact of D-MeX was calculated using the level of reward/penalty applied to modelled Developer Services income within each period. The upside scenario of a 2.5% award was used while a downside scenario of a 5% penalty was applied.

Tables M & N – Financing

Forward curves for gilts and libor were used to assess the suitable upside and downside scenarios to apply to the assumptions around new debt raised within the AMP. The economic impact was spread across the wholesale price controls using the RCV allocation amounts as shown in App8. This was applied by increasing the interest rate assumption for all new debt raised in the AMP within our financial modelling by 2% for the downside scenario and reducing the assumption by 2% for the upside scenario.

Table O – Tax rate – linked to input from App29.

App27 - PR14 reconciliation - financial outcome delivery incentives summary

General

We confirm that the entries we have made in Table App27 are consistent with those in Table App5. We also confirm that as an 'enhanced' company, the +/1 to 2% RoRE aggregate collar/cap is not applicable.

App28 - Developer Services (wholesale)

General

The following are key to the completion of App28.

- The submission as presented has been wholly derived from the supporting schedules contained within the workbook
- The broad balance between bill-paying customers and developers has been maintained in line with our Charging Arrangements for New Connections Services 2018/2019.
- Costs and output are in base year 2017/18 and are forecast according to the change in volumes of connected properties.
- Infrastructure charges for new connections have been prepared in accordance with Ofwat's final rules 'New connections charges for the future - England in November 2017', in that the total value of income offset allowances has been included within our company's redefined water infrastructure charge.
- The strategic infrastructure programme expenditure is the result of a comprehensive zonal review of the future developments in our operational area and validated against our WRMP forecast.
- We can confirm, where necessary, actual figures are consistent with those published in our Annual Performance Reports.

Section A, Line 1 - Total number of new residential connections and 2 - Total number of new business connections

Lines A1 and A2 are as per WS3 lines 14 and 13 respectively and show a significant increase in new residential connections and an associated decrease in new business connections in year 2020/21. This is the result of a data cleansing exercise linked to the reallocation of properties incorrectly transferred to the non-household (NHH) market during the seeding of the market. The net effect on total new connections is unchanged and therefore so is the overall impact on costs and contributions as costs and contributions are forecast on a per property basis using actual costs and numbers of properties connected from 2017/18.

A1 column H – numbers for 2016/17 have been revised from 24.037 as reported in 2016/17 to 13.931. During 2016/17, we saw a significant increase in connections arising from our Water Savings Programme (WSP). This is our programme of universal metering and Home Water Efficiency Checks (HWEC). This resulted in additional household properties being added to our billing records as new unoccupied metered properties prior to customers switching to a measured charge (due to the fact that our WSP was designed to provide customers with a two-year period in which they can choose to switch to a measured charge). This was as a result of timing issues around switching and the volume of meter installations during the year. We have subsequently been able to remove occupied unmetered properties as shown in 2017/18. This has been explained in our response to OFWAT Query_AFW_APR_CE_002.

Section C – Line 11 - Diversions (s185)

2016/17 diversions (s185) contributions include £1.618m of payments received for costs incurred in relation to the HS2 rail programme. As disclosed in our Annual Performance Report ('APR') for the year-ending 31 March 2017, these payments were included in the diversions line within the analysis of capital contributions and land sales table (table 2E of our APR) to offset the expenditure incurred (included within tables 2B, 4B and 4D of our APR). £7.639m of HS2 payments received relating to 2017/18 included in table 2E of our APR for the year-ending 31 March 2018 have not been included within this table and the diversions (s185) contributions figures for the remaining years of AMP6 and for AMP7 also exclude forecast receipts.

Section I Line 36 - Band A – grants and contributions received during the year – for non-contestable works

With respect to new mains, the proportion of non-contestable works has been set at 5% and reflects the cost of carrying out the connection to our existing mains.

App29 - Wholesale tax

Block A, Lines 1 - Brought forward capital allowance 18% ~ Water resources and 2 - Brought forward capital allowance 18% ~ Water network plus

We have forecast the balance of the main Plant & Machinery pool (assets with an expected useful life of less than 25 years) at 31 March 2020 by rolling forward the actual pool balance as at 31 March 2018. We have apportioned the brought forward balance between Water Resources and Water Network Plus on the basis of the RCV split.

We have not disclaimed any capital allowances in previous periods.

Block B, Lines 7 - Brought forward capital allowance 8% ~ Water resources and 8 - Brought forward capital allowance 8% ~ Water network plus

We have forecast the balance of the main long-life asset pool (assets with an expected useful life of 25 years or more) at 31 March 2020 by rolling forward the actual pool balance as at 31 March 2018. We have apportioned the brought forward balance between Water Resources and Water Network Plus on the basis of the RCV split.

We have not disclaimed any capital allowances in previous periods.

Block C, General

We calculated the percentage allocations in Section C by analysing gross (i.e. before deducting contributions) new capital expenditure on a project-by-project basis. We analysed the projects in-house, and engaged Chandler KBS, our capital allowances adviser, to review our assessment of the tax treatment of large and/or complex projects.

Block C, Lines 16 - Proportion of new capital expenditure qualifying for a full deduction in the year ~ Water resources and 22 - Proportion of new capital expenditure qualifying for a full deduction in the year ~ Water network plus

We claim Research & Development Allowance (RDA) for capital expenditure on qualifying Research & Development. It is not possible at this stage to forecast the amount of AMP7 capital expenditure that will qualify for RDA due to likely frequent changes to the types of expenditure which will qualify.

We also claim Enhanced Capital Allowances (ECA) on qualifying water and energy efficient plant and equipment. ECA is only available for specific products on the Government's Energy Technology List (ETA) and Water Technology List (WTA) at the time of purchase, and at this stage it is not possible to forecast which products will be eligible during AMP7.

Block D, lines 43 - P&L expenditure not allowable as a deduction from taxable trading profits ~ Water resources and 44 - P&L expenditure not allowable as a deduction from taxable trading profits ~ Water network plus

We have estimated disallowable expenditure, which is mainly business entertaining, car lease rental restriction and legal fees related to capital transactions.

Block D, lines 48 - P&L expenditure relating to renewals not allowable as a deduction from taxable trading profits ~ Water resources and 49 - P&L expenditure relating to renewals not allowable as a deduction from taxable trading profits ~ Water network plus

All P&L expenditure relating to renewals is allowable as a deduction from taxable trading profit.

Block D, lines 53 - Change in general provisions ~ Water resources and 54 - Change in general provisions ~ Water network plus

We do not anticipate having any general provisions as at 31 March 2020.

Block E, lines 63 - Finance lease depreciation ~ Water resources and 64 - Finance lease depreciation ~ Water network plus

There are two elements to finance lease depreciation:

- Depreciation of assets held under finance leases that are subject to tax in accordance with Statement of Practice 3/91;
- Depreciation of the right-of-use asset in respect of leases that were accounted for as operating leases prior to the introduction of IFRS 16.

We are not expecting a significant transitional adjustment on adoption of IFRS 16, therefore no further tax adjustments are required in respect of finance leases.

Block F, lines 68 - Grants and contributions taxable on receipt ~ Water resources and 69 - Grants and contributions taxable on receipt ~ Water network plus

The tax treatment of all grants and contributions that are taxed on receipt follows the accounting treatment, therefore we do not make any adjustments in the tax computation in respect of these grants and contributions.

Block F, lines 73 - Amortisation on grants and contributions ~ Water resources and 74 - Amortisation on grants and contributions ~ Water network plus

We account for contributions to mains extensions and diversions as deferred revenue, however for tax purposes we treat these contributions as capital items. Contributions are deducted from the long-life asset pool when received, thereby reducing the capital allowances claimed. Amortisation of the deferred revenue is treated as non-taxable income, in order to avoid taxing the contributions twice.

Block H, line 88 - Statutory corporation tax rate

This is the main corporation tax rate of 17% with effect from 1 April 2020 (Section 46, Finance Act 2016).

App30 - Void properties

General

We are planning to reduce the number of residential void properties by 1% per year over the period 2020/21 - 2024/25. We plan to reduce the number of non-residential void properties by 0.5% per year over the same period.

This will move our overall residential void rate from 2.62% in 2017/18 to 2.30% in 2024/25, matching 2016/17 industry upper quartile performance.

Our forecast of void properties in this table is equal to the performance commitment we have set out in table App1. Further explanation of our performance commitment is provided in the commentary to table App1.

Explanation of Void Properties

Based on 2015/16 industry data sharing, our residential void property rate 3.30%, was below the weighted industry average of 3.74%. As explained below, our reported data used in the data share includes properties that are uneconomic to bill. Excluding these, our void rate was 2.26%, close to the industry upper quartile performance of 2.15%.

In 2016/17, industry data sharing shows that our residential void property rate 3.55%, was below the weighted industry average 3.93%. Excluding properties that are uneconomic to bill, our void rate was 2.62%, also close to the 2016/17 industry upper quartile performance, 2.31%.

We conclude, from industry comparisons, that our void rate compares favourably with other companies, particularly because we have the second highest transience rate in the industry. Transience increases the number of changes of occupation relative to our comparators, and hence increases the number of opportunities for customers to neglect to inform us that they have become new occupiers of a property. The graph below, prepared for us by Economic Insight, provides comparison of customer transience across the industry.

Source: Economic Insight

It remains problematic to draw firm comparisons of voids across companies because of differences in approach to void property management across the industry. We know for example, that some companies continue to bill in the name of the occupier, where we do not. The act of billing in the name of the occupier allows those companies to record a property as billed and occupied, even where it may actually be empty. Companies also have different

approaches to determining which properties are uneconomic to bill, so there will be some inconsistencies in the number of exclusions from void property counts for this reason. We would like Ofwat to take the higher transience in our area and the inconsistency in reporting across the industry into account when assessing our void property performance.

Void Management

We manage void properties by operating a dedicated void property team to locate properties that are recorded as empty but are actually occupied – 'false voids'. Typically, this occurs when customers move into a vacant property but neglect to notify us that they have taken occupation. Our team is trained to use our billing system to verify the occupation status of properties and to make sure that false voids are billed.

We detect false voids using a number of approaches:

- Monitoring consumption data via meter readings
- Using external consultants (e.g. Experian and Equifax) to provide evidence of occupation based on consumer credit activity
- Targeted communication by letter and telephone
- Door step visits
- Improvements to home mover processes to facilitate customer driven notification
- Engagement with landlords through Landlord Tap to improve detection of occupation by tenants.
- Our programme of work to develop system flags to track and accelerate void detection activities in our Pinn area, as this has the highest percentage of tenanted properties

As well as improving false void detection through the approaches listed above, we project that we will improve our performance as we grow the metered customer base over the next five years. With more meters, we will be able to gather evidence of occupation through meter reading data. This will allow us to better target our activities and bring more false voids into charge more quickly.

Line 1 - Number of void properties - residential

For the years 2012/13 - 2017/18 for which actual figures are available, line 1 shows the actual numbers of unmeasured and measured residential voids, excluding properties that were unbilled because it would have been uneconomic to do so. We define properties that are uneconomic to bill as measured properties that we record as being unoccupied and where the meter readings show consumption as being between $0m^3$ and $5m^3$. We have made these exclusions as this is required by the reporting guidance.

To prepare the figures on this basis, we have used our past records to count the number of unoccupied measured properties with consumption between $0m^3$ and $5m^3$ and deducted this from the measured voids reported in Table 4A of our Annual Report & Financial Statements. The figures reported had not excluded uneconomic to bill properties. The table below compares the void property counts prepared under each basis.

There is some minor inconsistency with the data we have used to count and exclude uneconomic to bill cases. This arises because the billing reports we used were collated from reports run on dates around, but not corresponding exactly, with year-end. In addition, the figures for 2012/13 exclude uneconomic to bill properties only from our Central Region. This is because billing reports for our Southeast and East regions, pre-dating the merger of the companies that were amalgamated to form Affinity Water, can only be obtained at a disproportionate cost and would not have a material impact on the total number reported.

We have prepared our projections for 2018/19 onwards on the basis that they exclude properties that are unbilled because it would be uneconomic to do so.

Comparison of figures reported in our Annual Reports & Financial Statements with Table App30

	Total number of residential void properties in App30, excluding properties unbilled because it was uneconomic to do so (000s)	Total number of residential void properties reported in our Annual Reports & Financial Statements, including properties unbilled because it was uneconomic to do so (000s)
2012/13	22.266	31.839
2013/14	24.573	36.849
2014/15	29.988	42.380
2015/16	30.453	44.418
2016/17	31.375	48.156
2017/18	35.747	55.368

Source: Economic Insight

We have not made any adjustments to the historic figures for customer migration between residential and non-residential categories that resulted from billing system data cleansing ahead of non-household retail market opening.

App31 - Past performance

General

We set out in our Business Plan our understanding of the drivers of our past performance and the lessons we have learned. Furthermore, we will advise on the additional measures we have put in place to ensure that we can deliver our 2020 to 2025 business plan.

Section A, Lines 1&2

General - Since the start of this review period, significant improvements have been achieved in overall complaint numbers, with a 22% reduction during 2016/17 compared to 2015/16. We have achieved a further 30% reduction during 2017/18 compared to 2016/17. The overall reduction since 2015/16 equates to 46%. The forecast for 2018/19 is to sustain positive trajectory and deliver a further 12% reduction. This is expected to be achieved through the continuation of improvement initiatives throughout the business. A further improvement of around 8% is forecast for 2019/20.

The level of Escalated (Stage 2) complaints has also seen consistent improvement, with a 12% reduction achieved during 2016/17 compared to 2015/16 and a further 34% reduction during 2017/18 compared to 2016/17. The overall reduction since 2015/16 therefore now equates to 42%. We are forecasting continuing improvements for 2018/19 and 2019/20, with a 20% improvement in 2018/19 and further 10% improvement in 2019/20.

Section A, Lines 3/4/5

We have seen an increase in CCW referrals during the period to date (please note, we have not received 2017/18 data from CCW so this is our forecast estimate). As our metering roll-out continues we know that this will likely generate some customer complaints, and we expect this to continue during the life of the metering programme. We have, however, identified improvements to manage complaint resolution, to avoid the need for customers to go directly to CCW. However, as CCW provide additional support with referrals to WATRS, we expect these numbers to remain constant. The table below provides case by case details of all WATRS referrals in the first three years of AMP6.

Date of Referral	Defence Submitted	Date of Response by WATRS	Monetary Claim Made (£)	Outcome	Action Required by AW
20/4/2015	27/4/2015	15/6/2015	10,000	No response from claimant	
22/4/2015	29/4/2015	19/5/2015	5,778	Accepted	Pay customer £200 compensation.
16/7/2015	23/7/2015	23/7/2015	5,000	Claim settled	
18/8/2015	24/8/2015	26/8/2015		AW objected - upheld	
26/10/2015	29/10/2015	18/11/2015	2,000	Accepted	Pay customer £200 compensation.
2/2/2016	8/2/2016	22/2/2016	850	Accepted	Provide an apology and pay customer £150 compensation.

2/2/2016	10/2/2016	17/3/2016	1,500	Rejected by WATRS	
20/4/2016	26/4/2016	12/7/2016	500	Accepted	Pay customer £300 compensation.
26/4/2016	4/5/2016	19/5/2016		Rejected by WATRS	
15/6/2016	22/6/2016	24/8/2016		No response from claimant	
2/8/2016	9/8/2016	3/10/2016		No response from claimant	
18/8/2016	25/8/2016	12/10/2016		No response from claimant	
28/9/2016	3/10/2016	15/11/2016		No response from claimant	
8/11/2016	15/11/2016	5/12/2016		Withdrawn	
13/1/2017	17/1/2017	24/3/2017		No response from claimant	
19/1/2017	30/1/2017	23/2/2017		Rejected by WATRS	
07/4/2017	11/4/2017	5/6/2017		No response from claimant	
24/4/2017	24/4/2017	-		AW objected - upheld	
22/5/2017	5/6/2017	26/6/2017	509.20 (plus free water for 1 year)	Rejected by WATRS	
14/7/2017	28/7/2017	2/8/2017	12,898	Withdrawn	
1/8/2017	10/8/2017	8/9/2017	1,181	Accepted	Provide an apology and pay customer £2,700.
15/8/2017	17/8/2017	11/9/2017	533	Accepted	Apply a credit of £200 to customer's account.
24/8/2017	8/9/2017	12/9/2017	1,840	Claim settled	
14/11/2017	23/11/2017	12/1/2018		No response from claimant	
4/1/2018	9/1/2018	6/3/2018	261	Accepted	Pay customer £261.15.
29/1/2018	2/2/2018	6/3/2018		Rejected by WATRS	

30/1/2018	1/2/2018	5/4/2018	337	No response from claimant	

Performance by business area – The Billing area, which also incorporates our Debt Recovery teams, has seen a consistent reduction in complaints, with volumes down 65% since 2015/16. This has been achieved through initiatives focused on factors that drive customer dissatisfaction, including the Moving Home, Recovery and Metered Payment Scheduling processes. The Water Operations area has also delivered improvements, although to a slightly lesser extent. A major contributor has been emergency incidents we have experienced during the period, which have resulted in large numbers of complaints being received from customers affected by these supply interruptions. However, despite the impact of these incidents, the level of Water Operations complaints in 2017/18 still showed an encouraging reduction of 19% on 2016/17 levels. Metering complaints have been adversely affected by the introduction of our Water Saving Programme and the level of installation activity within this programme. However, whilst Metering complaints during 2017/18 showed a small increase on 2016/17, they remained below the levels of 2015/16.

Section C

OFWAT has confirmed that WoCs do not need to complete this Section.

Section D

We have not received any formal cautions nor have we been subject to prosecution for breach of drinking water quality requirements and there is therefore no commentary in respect of this line.

Section E

We have not been the subject of enforcement action under the Water Industry Act 1991, our licence or competition law and there is therefore no commentary in respect of this line.

App32 – Weighted average cost of capital for the Appointee

General

Section A was completed using Ofwat's published early view and guidance on WACC pages 16-18 of the document attached to the following link, https://www.ofwat.gov.uk/wp-content/uploads/2017/12/Appendix-12-Risk-and-return-CLEAN-12.12.2017-002.pdf. The notional gearing assumption of 60% was used with the WACC calculation as per the document linked above.

The inputs for the 2025-2030 range take the WACC assumption for 2020-2025 driven by the linked document above and adjusts the cost of debt for the debt profiled at the end of AMP7 as per the guidance assumption.

Section B uses the guidance from Section A as a basis and applies the dividend policy for our actual gearing of 80% thus reflecting our target actual structure. The actual cost of debt from App20 is applied to the embedded cost of debt calculation and new debt is assumed to target a similar level of cost to the current capital structure, maintaining current cost of debt.

App33 – Wholesale operating leases reclassified under IFRS16

General

The lease of our main office (the Hub), all vehicle leases and the Data Centre lease will be reclassified under IFRS 16. Leases for printers and other facilities items will not be reclassified.

Allocation of leases between Retail, Water Resources and Water Network Plus has been based on the designated user of the lease. We have identified which cost centre they are paid from and then allocated their cost using the same method as our internal allocation model used to populate tables within the regulatory accounts for 2017/18. Please refer to our Methodology Statement for further detail.

https://stakeholder.affinitywater.co.uk/docs/Methodology-Statement-Accounting-Separation-2017-18.pdf

Where more than one business unit utilises an asset, it is allocated on the basis of principal use. Using this methodology, all of our leases are allocated to either Retail (outside the scope of App33) or Water Network Plus.

Assumptions

- The Hub lease expires in 2025/26. It will be renewed, but the new lease is outside the scope of App33.
- The size of our fleet will remain constant. When a vehicle lease ends, another lease will be taken out immediately and on the same terms (length and cost of lease).
- The lease of server space for our Data Centre will cease on (if not before) 31 December 2020. The maximum cash payment will be £177k. We intend not to renew this lease, but even if it is renewed, the new lease is outside the scope of App33.
- Leases for printers and other facilities items will not be reclassified as they are of low value. Their future opex value will remain constant at 2017/18 levels.
- A cost of capital of 4.5% has been used to determine capex value (NPV of the lease over its lifetime). This differs to the discount rate of 3.17% used to calculate the opening RCV adjustment on leases in existence at the start of AMP7.

Section A

None of our leases reclassified under IFRS 16 have been allocated to Water Resources on a principal use basis.

Section B

Lines 22, 24, 26, 28 – Existing leases are those which commenced before 1 April 2018. All of our vehicle leases are between 2 and 5 years, such that all leases will expire by 31 March 2023.

Lines 23, 25 – New leases are those commencing between 1 April 2018 and 31 March 2020. No new leases will expire before 31 March 2022.

Lines 27, 29, 31, 33 – New leases are those commencing between 1 April 2018 and 31 March 2020. All of our vehicle leases are between 2 and 5 years such that all leases will expire by 31 March 2025.

Line 34 – The Hub lease is the only existing lease which expires after 1 April 2025.

Lines 35, 36 – No existing or new leases (commencing before 1 April 2018) will expire after 31 March 2030.

Line 38 – The discount rate of 3.17% is our wholesale cost of capital on a blended 50:50 RPI/CPIH basis.

Section C

None of our leases reclassified under IFRS 16 have been allocated to Bioresources as we do not operate in this market.

Section D

None of our leases reclassified under IFRS 16 have been allocated to Wastewater Network Plus as we do not operate in this market.

Section E

None of our leases reclassified under IFRS 16 have been allocated to Dummy on a principal use basis.

Section F

Line 107 – Current treatment of the Hub leases and vehicle leases.

Line 108 – Current and future treatment of leases for printers and other miscellaneous leases.

Line 110 – A capex value of £15.1m will be recognised on transition with a further £1.1m - £2.8m of additions each year thereafter (due to profiling of the replacement of vehicles).

Lines 111, 112 – There are no finance leases included on the balance sheet.

Wholesale water service tables

WS1a - Wholesale water operating and capital expenditure by business unit including operating leases reclassified under IFRS16

PLEASE NOTE THIS TABLE HAS BEEN COMPLETED BASED ON CURRENT ACCOUNTING STANDARDS AND DOES NOT INCLUDE ANY RECLASSIFICATION FOR OPERATING LEASES IFRS16.

This table breaks down actual and forecast wholesale operating and capital expenditure by business units for the periods 2017/18 to 2024/25.

The 2017/18 figures are taken from our published regulatory accounts table 4D. Along with the regulatory accounts we are required to publish our methodology statement on cost allocation. Please see the below link for further detail.

https://stakeholder.affinitywater.co.uk/docs/Methodology-Statement-Accounting-Separation-2017-18.pdf

AMP7 Forecast

The AMP7 Wholesale Totex Portfolio has been developed on a bottom-up basis and has been challenged in terms of scope and efficiency and then optimised. It has been reviewed and signed off internally by our PR19 Steering Committee, Executive Management Team and Board. It has been rigorously audited by Atkins and PwC. Submitted figures are inclusive of target efficiencies. For further details please refer to the Wholesale Technical Appendix.

Items in the AMP7 Portfolio originate from four different sources: -

1. **Pioneer asset risk model** – capital maintenance investment
2. **Economic Balance Supply Demand (EBSD) model** – capital and operational expenditure schemes to maintain the supply demand balance
3. **Business case** – robust documents making the case for holistic capital and operational expenditure schemes that cannot be modelled using Pioneer or EBSD
4. **Deep dives** – financial planning sessions to review financial modelling results and finalise departmental operational expenditure

Each item in the AMP7 Portfolio has been assessed and split according to capex or opex category.

BLOCK A - Operating expenditure (excluding Atypical expenditure)

Lines 1 – 4 and 7 – 9

AMP6 year 4 and 5 operating expenditure is based on our latest board approved forecast. We have used our actual operating expenditure in 2017/18 as the base year to allocate costs between wholesale business units in all future years. Therefore, AMP6 year 4 and 5 costs are allocated across business units based on the same proportion as 2017/18.

Our AMP7 forecast for operating expenditure takes our exit position for AMP6 and adjusts for known operational differences (some results of investment portfolios) during the next five years. We have also included efficiencies during AMP7. Similarly, in AMP7 our forecast of operating expenditure has been allocated across business units based on the same proportion as for 2017/18.

For further detail on year on year movement by expenditure type please refer to the main business plan narrative and the affordability and Financeability chapter.

Line 5 - Renewals expensed in year (Infrastructure)

Renewals expenditure is forecast as total infrastructure renewal expenditure along with the rest of our investment portfolios. We then calculate an element to expense based on various drivers.

We assume all renewals expenditure is treated water distribution.

Line 10 - Third party services

This line shows the cost we incur in exporting treated water to South East Water and other small rechargeable work. We have assumed our cost (and income) from third party services will remain at the same level as 2017/18, remaining constant throughout AMP7.

BLOCK B: Capital Expenditure (excluding Atypical expenditure)

Capex elements of the Portfolio items have been further assessed and attributed to lines 12-31. Each AMP7 capex expenditure item in turn was attributed to the correct line using a process summarised in the flow diagram below.

For each AMP7 capex item:

The following definitions were used to split each investment line into the correct categories. Please note that the definitions are based on Regulatory Accounting Guideline 2.03

Enhancement - expenditure required to improve or expand service. This includes maintaining a positive supply demand balance, satisfying new regulatory and legal requirements, building resilience above and beyond current levels and delivering stretching new Performance Commitments and targets. All enhancement expenditure should be supported by customers or should have a clear (and new) regulatory or statutory driver.

Maintenance - baseline expenditure required to deliver current levels of service. This includes maintaining and replacing our assets, producing and distributing water to current customers, continuing to meet existing regulatory and legal requirements and delivering the Performance Commitments and Customer Outcomes set out in our current Plan. Maintenance is the same as 'base' or 'Botex'.

Infrastructure – Infrastructure assets generally comprise:

a. underground systems of mains and sewers;
b. impounding and pumped raw water storage reservoirs;
c. dams;
d. sludge pipelines;
e. sea outfalls; and
f. information about infrastructure assets e.g. zonal investigations records.

Non-Infrastructure - All other assets, typically above ground, are classified as non-infrastructure.

Lines 12 - 19

AMP6 year 4 and 5 operating expenditure is based on our latest board approved forecast. We have allocated costs across business units based on individual investment portfolios. Each portfolio has been assessed and then allocated to the correct business unit based on Ofwat's definitions and guidance as stated above.

Our AMP7 capital expenditure is developed as described above. Similar to AMP6, we have allocated costs across business units based on individual investment portfolios where each portfolio has been assessed and allocated to the relevant business unit.

Line 20 - Grants and contributions (price control)

In 2017/18, we included £7.6m of contributions from HS2 within the total figure. However, from 2018/19 onwards we have assumed any contributions from HS2 will be netted off against cost within the above lines (12-19) and therefore no HS2 contributions are included within this line. We have only included contributions from developers for new connections, diversions and requisitioned mains.

Block C - Cash Expenditure (excluding Atypical expenditure)

Line 22 - Pension deficit recovery payments

This line shows the pension deficit recovery payment for 2017/18 and 2018/19.

For a split between ongoing and deficit recovery payment please see Table App22.

Block D - Atypical expenditure

We are not expecting any Atypical expenditure in AMP7.

WS1 - Wholesale water operating and capital expenditure by business unit

PLEASE NOTE THIS TABLE HAS BEEN COMPLETED BASED ON THE ASSUMPTION WE ADOPT IFRS16 OPERATING LEASES FROM 2019/20

The lease of our head office, all vehicle leases and the data centre lease will be reclassified under IFRS16. Leases for printers and other facilities items will not be reclassified. Please refer to Table App33 and commentaries for further detail.

All figures in this table are equal to WS1 apart from the following adjustments:

1. **Lease for our head office**.

   Our lease cost per year is £1.547m. We have removed the element which related to wholesale from our opex (line 7 ~ Other operating expenditure excluding renewals) from 2019/20 onwards.

   This lease expires in 2025-26. It is assumed that we will renew the lease, but the additional capex will occur in AMP8.

2. **Vehicle leases**

   Our vehicle cost is approx. £2.400m per year across the whole business. We have removed the element which related to wholesale from our opex (line 7 ~ Other operating expenditure excluding renewals) from 2019/20 onwards.

   The size of our fleet will remain broadly constant. When a vehicle lease ends, another lease will be taken out immediately and on the same terms (length and cost of lease), hence additional capex has been added to reflect the change (on line 13 Maintaining the long term capability of the assets ~ non-infra).

3. **Data Centre**

   The annual charge for our data centre is £0.237m. We have removed the element which related to wholesale from our opex (line 7 ~ Other operating expenditure excluding renewals) in 2019/20.

   This lease is due to cease on 31 December 2018. We do not intend to renew this lease hence no additional capex is needed under IFRS 16.

The net effect of all the adjustment is a reduction to totex of £6.7m as our head office lease will be renewed in AMP8.

WS2 - Wholesale water capital and operating enhancement expenditure by purpose

General

The AMP7 Wholesale Totex Portfolio has been developed on a bottom-up basis and has been challenged in terms of scope and efficiency and then optimised. It has been reviewed and signed off by our PR19 Steering Committee, Executive Management Team and Board. It has been rigorously audited by Atkins and PwC. Submitted figures are inclusive of target efficiencies. For further details please refer to the Wholesale Technical Appendix.

Items in the Portfolio originate from four different sources: -

1. **Pioneer asset risk model** – capital maintenance investment
2. **Economic Balance Supply Demand (EBSD) model** – capital and operational expenditure schemes to maintain the supply demand balance
3. **Business case** – robust documents making the case for holistic capital and operational expenditure schemes that cannot be modelled using Pioneer or EBSD
4. **Deep dives** – financial planning sessions to review financial modelling results and finalise departmental operational expenditure

Each item in the AMP7 Portfolio has been assessed and segmented into capex and opex elements.

Enhancement - expenditure required to improve or expand service. This includes maintaining a positive supply demand balance, satisfying new regulatory and legal requirements and building resilience above and beyond current levels. All enhancement expenditure should be supported by customers or should have a clear (and new) regulatory or statutory driver.

Section A: Enhancement expenditure by purpose ~ capital

AMP7 capex elements of the Portfolio items have been assessed and attributed to lines 12-31 in WS1. Any (enhancement) elements attributed to WS1 lines 14 and 15 have been further assessed and attributed to lines 1-39 in WS2.

The following definition has been used to identify enhancement expenditure. Please note that the definition is based on Regulatory Accounting Guideline 2.03.

Enhancement - expenditure required to improve or expand service. This includes maintaining a positive supply demand balance, satisfying new regulatory and legal requirements, building resilience above and beyond current levels and delivering stretching new Performance Commitments and targets. All enhancement expenditure should be supported by customers or should have a clear (and new) regulatory or statutory driver.

Assumptions made when attributing enhancement elements to WS2 lines 1-39 are as follows:

Line 1 excludes expenditure required to support flows in the River Ivel. River Ivel expenditure is included in line 20 because the driver is flow rather than ecology.

Line 5 excludes expenditure for a new conditioning treatment plant, despite the plant benefiting water quality taste, odour and colour. Instead, this expenditure is included in line 8 because it is an output of the revised Water Resources Management Plan. It is a supply scheme required to maintain the supply demand balance post-sustainability reductions.

Lines 7 and 9 are blank because AMP7 expenditure to maintain the supply demand balance is driven by dry year annual average conditions and not by peak conditions.

Lines 8 and 10 include expenditure to maintain the supply demand balance. The included elements are outputs of the revised Water Resources Management Plan.

Line 14 includes expenditure to improve resilience at our large WTW in Brett. All other enhancement expenditure that either improves or maintains resilience is attributed to an alternative line due to the existence of alternative primary drivers.

Line 17 is blank because WINEP / NEP expenditure for Drinking Water Protected Areas schemes is better described, and is therefore included in line 18. This is because the expenditure requirement for the elements has arisen from PR14 investigations or sustainable abstraction work.

Line 21 includes 10% of the AMP7 Water Saving Programme expenditure. This is the portion that is associated with meters requested by optants.

Line 22 includes 86% of the AMP7 Water Saving Programme expenditure. This is the portion that is associated with meters we have installed. The remaining 4% of the AMP7 Water Saving Programme expenditure is attributed to line 10.

Lines 24-38 are purposely blank.

See Wholesale Technical Appendix for more detail.

Section B: Enhancement expenditure by purpose ~ operating

AMP7 opex elements of the Portfolio items and AMP6 elements of the expenditure have been assessed and attributed to lines 1-11 in WS1. Any (enhancement) elements attributed to WS1 lines 1-11 have been further assessed and attributed to lines 40-77 in WS2.

Assumptions made when attributing enhancement elements to WS2 lines 40-77 are as follows:

Leakage: the portion of opex associated with leakage reductions has been attributed to:

- Treated water distribution; and
- Line 49 – demand-side enhancements to the supply/demand balance (dry year annual average conditions).

All expenditure to maintain the supply demand balance is driven by dry year annual average conditions and not by peak conditions.

Only expenditure associated with leakage reductions has been included. Expenditure to maintain baseline leakage is included as maintenance in WS1.

Water imports: the portion of opex associated with additional water imports has been attributed to:

- Water resources; and
- Line 57 – WINEP / NEP Water Framework Directive measures.

Additional imports are associated with the implementation of sustainability reductions.

Energy and chemicals: the portion of opex associated with additional energy has been attributed to:

- Water resources; and
- Line 57 – WINEP / NEP Water Framework Directive measures

Additional energy and chemicals are needed for new pumping (AMP6 and AMP7) and treatment (AMP7 only) associated with the implementation of sustainability reductions.

Water saving programme: the portion of opex associated with our water saving programme (installing household meters and completing home water audits) has been attributed to:

- Treated water distribution; and
- Line 49 – demand-side enhancements to the supply/demand balance (dry year annual average conditions).

All expenditure to maintain the supply demand balance is driven by dry year annual average conditions and not by peak conditions.

WS2a - Wholesale water cumulative capital enhancement expenditure by purpose

General

The AMP7 Wholesale Totex Portfolio has been developed on a bottom-up basis and has been challenged in terms of scope and efficiency and then optimised. It has been reviewed and signed off by our PR19 Steering Committee, Executive Management Team and Board. It has been rigorously audited by Atkins and PwC. Submitted figures are inclusive of target efficiencies. For further details please refer to the Wholesale Technical Appendix. Figures for each year include all relevant expenditure for projects completed in that year, irrespective of the year in which expenditure was actually incurred.

Items in the AMP7 Portfolio originate from four different sources: -

1. **Pioneer asset risk model** – capital maintenance investment
2. **Economic Balance Supply Demand (EBSD) model** – capital and operational expenditure schemes to maintain the supply demand balance
3. **Business case** – robust documents making the case for holistic capital and operational expenditure schemes that cannot be modelled using Pioneer or EBSD
4. **Deep dives** – financial planning sessions to review financial modelling results and finalise departmental operational expenditure

Each item in the AMP7 Portfolio has been assessed and segmented into capex and opex elements.

Section A: Cumulative capital enhancement expenditure by purpose

AMP7 capex portfolio items have been assessed and attributed to lines 12-16 in WS1. Any (enhancement) elements attributed to WS1 lines 14 and 15 have been further assessed and attributed to lines 1-38 in WS2.

WS2 lines 1-38 are presented in cumulative format in WS2a SECTION A (columns V-AT). SECTION A, columns V-AT have been reviewed and signed off by the Director of Asset Strategy.

WS3 Wholesale water properties and population

General

The data presented in WS3 is modelled data and not providing projections to 2030.

Lines 1 to 5 - Residential and business properties billed:

The numbers in these five lines relate to numbers of residential and business properties within our supply area. The property numbers here are derived from the revised WRMP19, specifically the demand forecast.

The allocation of residential property numbers between measured (lines 1 and 2) and unmeasured (line 4) differs from that reported in our APR 2017/18 table 4Q. This is because properties where customers are on a social tariff are included in the measured lines in the APR table but in unmeasured for the purposes of this table. The total residential properties (line 7) is consistent with that reported in the APR.

Line 6 - Total business connected properties at year end and 7 - Total residential connected properties at year end:

For 2017/18 we have based these values on the APR 2017/18 figures.

To generate the numbers for subsequent years' residential and business properties at year end, we have used the data in the previous lines within WS3. The numbers in line 6 are derived using a sum of line 3 and line 5 (i.e. the business properties) plus non-household void property numbers from the baseline demand forecast. The numbers in line 7 are derived using the sum of lines 1, 2 and 4 plus the household void property numbers from the baseline demand forecast.

Line 8 -Total connected properties at year end:

The total properties connected at year end is simply the addition of total business properties at year end and total domestic properties at year end. Therefore, this line is derived using a sum of line 6 and line 7.

Line 9 - Number of residential meters renewed and 10 - Number of business meters renewed:

Volumes of meters replaced during 2017/18 were obtained from APR18. Future replacement volumes are estimated using our deterioration model which uses actual data up to 2016/17. The estimate of total meters to be replaced according to our policy of exchange when stopped or unreadable is then calibrated to the AR18 figure.

Replacements of business meters is based on actual meter exchanges carried out according to the Market Reform codes (AR18). We assume that the volume of business meters remains the same over the coming years and AMP7. A small deterioration allowance of 0.1%/year has been allowed for based on the deterioration curves calculated for all dumb meters using an average age of meter of 12 years.

Line 11 - Number of meters installed at the request of optants:

For 2017/18 we have taken this value from the APR 2017/18 figure.

One of the components of the WRMP demand forecast is the number of meter optant properties. This line requires the number of meters installed at the request of optants, which allows us to take this number directly from the demand forecast used in WRMP. This figure is non-cumulative.

Line 12 - Number of selective meters installed:

This line requires the number of selective meters installed. We have taken this to mean the number of WSP (Water Saving Programme) meters installed. These values have been provided by our WSP team and incorporated into the WRMP baseline process within the demand forecast. These values are then taken from the demand forecast for use in WS3.

Line 13 - Total number of new business connections:

For 2017/18 we have taken this value from the APR 2017/18 figure.

The total number of new business connections is calculated using line 6, which provides the annual total number of business connections. The calculation is simply the line 6 value for the year in question minus the previous year. This will give the number of new business connections for the particular year.

The numbers are negative because our business property forecast, which is based on historic trends, shows a decline in business property numbers. There is a larger decline in cell J17 (i.e. start of AMP7) owing to the reclassification of non-households as a result of Market Reform.

Line 14 - Total number of new residential connections:

For 2017/18 we have taken this value from the APR 2017/18 figure.

The total number of new residential connections is calculated using line 7, which provides the annual total number of business connections. The calculation is simply the line 7 value for the year in question minus the previous year. This will give the number of new residential connections for the particular year.

Line 15 - Total population served:

The figure entered for 2017/18 differs to that reported in our APR 2017/18 due to a revised forecast, following our APR submission, based on occupancy rates.

The total population served is an essential piece of the WRMP. As such, line 15 can be populated directly using the demand forecast compiled for WRMP.

Line 16 - Number of business meters (billed properties):

We have assumed that the number of business meters is the same as the number of businesses metered. We have consulted with our Finance team who have explained that businesses typically will only have one meter to be billed against to avoid multiple accounts/bills.

Line 17 - Number of residential meters (billed properties):

We have taken the sum of lines 1 and 2 to be the value used in line 17. Properties will only have one meter, so the sum of all of the external and internal domestic metered properties is used in this line.

Line 18 - Company area:

Our GIS team is able to provide an audited AR17 total company area. Although this is required as a forecast, we are not expecting our company area to change.

WS4 - Wholesale water other (explanatory variables)

Line 1 - Number of lead communication pipes replaced for water quality

- 2017/18 figure taken from the Lead Pipe Replacement Programme (LPRP) team's progress report and does not include the 304 lead communication pipes that were lined.
- The figures for 2018/19 and 2019/20 are taken from the current LPRP projections for the rest of AMP6. At this time, it is assumed that all lead communication pipes will be replaced, not lined, as we will not know which technique is possible until the work commences.
- The figures for AMP7 are taken from the Company's drinking water quality submission to DWI in December 2017 which proposed removing/relining all lead communication and supply pipes in Z075, Underground Zone 1 in the Brett community. The projection is for the work to be spread evenly across AMP7. For the purpose of this report it is assumed that all lead communication pipes will be replaced, not lined, as we will not know which technique is possible until the work commences.

Lines 2-5 – Demand and supply side enhancements to the water balance

- Lines 2-5 show incremental enhancements to the supply demand balance (both supply and demand side). Demand side enhancements include options to reduce consumption and to reduce leakage
- Option utilisation from the most up to date WRMP modelling run has been used to populate figures for the period 2020/21 to 2024/25
- 2017/18 shows actual figures reported as part of AR18
- The rest of AMP6 values (2018/19 and 2019/20) are taken from the WRMP14 forecasts
- The table shows the same amount of demand savings for both peak and average conditions. The DYAA condition is driving the investment and dictates the options activated at both DYAA and DYCP (the two conditions are assessed simultaneously in the Economics of Balancing Supply and Demand model (EBSD). Once a demand-side option is selected in the EBSD model, it is then utilised up to its maximum capacity. We have identified the same level of potential savings at both average and peak through our WRMP optioneering work as there is no clear evidence that different levels of savings can be achieved for different planning conditions.

Lines 6-8 – Energy Consumption

- Our Energy 2030 strategy sets out our ambition for energy optimisation and renewable energy strategy up to 2030.
- The strategy document refers to an industry standard Cornwall report which anticipates increases in unit cost rates hence and influences our mix of energy sources. Allocation between water resources and network plus is based upon percentage allocation in APH and factors in costs from vehicles and offices as a contributing percentage.
- Combined consumption Growth Rate is 0.25% per year in line with our strategy and we have factored in the effects of new asset investments phased by anticipated delivery date.
- Further net increases in energy consumption are embedded in the number as we reflect the essential changes in water movement around our network as sustainability reductions impact supply/demand balance.
- Benefits which are in-line with our Energy 2030 strategy have been deducted, broadly split between, firstly, capital maintenance and focused pump efficiency alterations and, secondly, site and process optimisation.

Line 9 - Mean zonal compliance and 11 - Compliance Risk Index

- We expect our Mean Zonal Compliance (MZC) performance to remain steady for the rest of AMP6.
- Compliance Risk Index (CRI) is a relatively new measure and is subject to a number of variables. As such it is very difficult to predict future performance but in broad terms we have predicted that 2018's performance will likely be the average of our last four years' performance and then we expect to see a small improvement in performance in 2019 following the completion of our pesticide removal project at Iver WTW and another improvement in 2020 following the completion of our pesticide removal project at North Mymms WTW. We then expect performance to remain steady throughout AMP7. We have set our target at 0 however and with our ODI, included in App1: Performance commitments (PCs) and outcome delivery incentives (ODIs), we have set a deadband to our predicted performance while this measure matures.
- Event Risk Index (ERI) is a very new measure and is subject to some significant variables. As such it is extremely difficult to predict future performance but in broad terms we expect to see a slight improvement on the average performance for 2016 and 2017.

Line 12 - Volume of leakage above or below the sustainable economic level

The values here are in line with App2. Our SELL, which is consistent with the new leakage methodology, has the leakage target values subtracted from it to generate the values in this line. The leakage targets are derived using a modelled forecast through the WRMP process for AMP7 and actual ODI's for AMP6.

The APR 2017/18 figure was derived based on the old leakage methodology, hence the respective numbers are different.

WS5 – Other wholesale water expenditure

General

The 2017/18 figures differ from our published regulatory accounts (table 4V). As part of the PR19 process we have refined the methodology of allocating direct and indirect employment costs. This has resulted in a shift of costs and FTE from indirect to direct.

Section A - Other total expenditure

Lines 1 – 4 - Employment costs and FTE ~ directly and indirectly attributable

Please note we have populated these lines on a Total Expenditure basis, based on the "as is" insource/outsource model through AMP7.

For 2017/18 the data has been derived from our accounting separation model. Each cost centre has been allocated to direct or indirect employment and apportioned across the business unit accordingly.

For the remaining years of AMP6 we have used our latest board approved forecast to determine the employment costs and FTEs.

We have identified efficiencies which can be achieved during AMP7 and reflected this within employment cost and FTEs.

Our unit cost for direct employment is dropping across the years as we are reviewing our favourable terms & conditions which will result in a lower cost to employ per FTE. Our indirect unit cost is increasing throughout AMP7. This is because we are aiming to employ specialist skills to support the business in achieving its outcomes.

Line 5 - Costs associated with Traffic Management Act

For 2017/18 this cost is equal to our published regulatory accounts table 4V. The cost is directly picked up from the general ledger.

We assume this cost will remain constant throughout AMP7.

Section B - Service charges

Lines 6 – 8 Environment Agency service charges/ discharge consents and Other service charges / permits

The total of these lines equal WS1 line 3 Abstraction Charges / Discharge consent.

For 2017/18 this cost is equal to our published regulatory accounts table 4V. The cost is directly picked up from the general ledger.

We have used the same apportionment split for the remaining years.

WS7 - Wholesale water local authority rates

Section A

Line 1 - Wholesale Water business rates charge for current year before transitional relief

The charge includes Cumulo rates and local authority rates (Hub Rates – charge for our head office building).

- **Cumulo Rates**

The Cumulo rates have been calculated by multiplying the Rateable Value (RV) by the Non-Domestic Multiplier. We have an RV of £29.194m from 2017/18 following the revaluation exercise in 2017.

We have assumed our Non-Domestic Multiplier increases with RPI of 2.61% each year from 2019/20.

- **Hub Rates**

We have assumed Hub rates increase with RPI of 2.61% each year from 2018/19.

Line 2 - Wholesale Water business rates transitional relief

This charge calculates the limit to how much our bill can change for Cumulo rates each year following the revaluation exercise in 2017. Our bills will gradually phase to the correct amount by 2020/21.

Section B

Line 12 - Change in wholesale water business rates costs due to Inflation (RPI)

Cumulo rates - shows the effect of an increasing non-domestic multiplier due to inflation. We have assumed RV rates remain the same at £29.194m in AMP7.

Local authority rates - shows the effect of inflation.

Line 13 - Change in wholesale water business rates costs due to CPIH deflator

Shows the effect of an increasing non-domestic multiplier due to inflation, which is then deflated by CPIH in AMP7.

WS8 – Third part costs by business unit for the wholesale water services

Section A

Not Applicable

Section B

Line 5 – Bulk Supplies

This line shows the cost associated with us exporting treated water to South East Water and other rechargeable work. This line is equal to table WS1 line 10 Third party services.

We have assumed our cost (and income) from third party services will remain at the same level as 2017/18 and remain constant throughout AMP7.

Section C

Not Applicable

Section D

Not Applicable

WS10 – Transitional spending in the wholesale water service

This table is intentionally left blank as we are not proposing any transitional spending in the wholesale water service.

WS12 - RCV allocation in the wholesale water service

General

This table has been compiled by taking figures from audited accounts and in the case of forecast information, table WS1 of the current business plan. When accounting by service was introduced, we used the categorisation of our latest MEA (Modern Equivalent Asset) exercise to allocate the current cost value across the services as we do not possess a current cost asset register. This allocation method was used in our regulatory accounts until March 2015. Since then we have been coding additions specifically by service type.

This methodology underpins all the figures in table WS12.

Line Commentary

Line 1

The balance brought forward from 31 March 2015 has been lifted directly from note 6 of our 2014/15 Regulatory Accounts (Non-infrastructure Assets plus Infrastructure Assets). The split between Water Resources tariffs and Network Plus is per the introduction above.

Line 2

Disposals in 2015/16 and 2016/17 were solely vehicles (all fully depreciated and sold with a NBV of zero) and mains. The only impact seen is therefore within Network Plus. The current cost of the mains has been calculated by inflating the NBV from the original "date laid "to March 2017 prices.

Line 3

We have not made any reclassifications.

Line 4

Inflation has been applied to line 1 lifting the values from March 2015 to March 2017 prices.

Line 5

Additions are taken from Table 4D of the March 2016 Regulatory Accounts (inflated to March 2017 prices) and Table 4D of the March 2017 Regulatory Accounts. The column for Raw Water Abstraction has been allocated to Water Resources and the remainder to Network Plus.

Line 6

Current cost depreciation for March 2016 and March 2017 was calculated and included within Table 4G of the regulatory accounts. In the absence of a current cost asset register, in line with the guidance within RAG 1.06 (2.1.5), we indexed the March 2015 value (per note 6 in the Regulatory Accounts) and adjusted for additions. To this we added the average non-expensed IRE over the AMP.

We also made a small allowance for assets that have already been depreciated to zero NBV since the previous year. For non-infrastructure assets, this was based on the annual falloff of the historic values found in table 33 of the June Return (line 7) which we have taken to be a suitable proxy for this. For infrastructure assets, we assumed an overall average life of 100 years and reduced the CCD by 1%.

The allocation between Water Resources and Network Plus is brought forward from note 6 with CCD on new additions within 2015/16 and 2016/17 being calculated specifically by asset into the appropriate category.

Line 7

We have not made any other adjustments.

Line 9

Additions for 2017/18 are taken from Table 2D of the 2018 Regulatory Accounts and converted to March 2017 prices.

Line 10

Depreciation for 2017/18 is taken from the calculation of CCD within table 4G of the 2018 Regulatory Accounts and converted to March 2017 prices.

Lines 11 & 13

Additions are taken from Table WS1 of the 2019 Business Plan and adjusted to March 2017 prices.

Line 12

Line 18

We considered all of the options set out by Ofwat on pages 5&6 of its Technical guidance (Jan 2017) - http://bit.ly/2kCRFkW – this gives guidance on how Ofwat want the calculations to be done and what aspects they would like companies to consider. The following table gives our reflections on these methods and estimates the outcome of using those methodologies.

The method that seemed most appropriate was the fourth one, as this reflects the way in which RCV has been constructed. However, this would give a very low allocation to water resources. The reason for this is that we, like other WoCs had a very low initial RCV at privatisation, due to the methodology which Ofwat used in order to calculate initial RCVs. After privatisation, the company has not built any significant new resources assets, so the amount of capex spent on water resources is relatively low, and this would lead to a very low allocation using this method.

We took a pragmatic view and decided to use the net MEAV methodology, which Ofwat's documents showed a strong preference for, and has a reasonable logic to it (it reflects the replacement value of the assets). Most of the other methodologies give a similar answer to the net MEAV approach, with the exception of capital maintenance. We believe that capital maintenance is not suitable as a basis of allocation as it is not stable over time.

Approaches/cross checks	Observations/Ofwat comments	Allocation estimate
Net MEAV approach to RCV allocation	Companies can consider a roll forward of the 2014/15 Net MEAV (based on the full revaluation of assets carried out at PR09)	11.4%

Approaches/cross checks	Observations/Ofwat comments	Allocation estimate
Gross MEAV approach to RCV allocation	This may not be totally unfocussed as assets existing in privatisation would be less represented than those that have been replaced more recently	12.9%
Splitting pre-privatisation assets at a discount to the RCV and post privatisation assets at full value	This may be difficult to calculate given changes to asset records and accounting classification since privatisation.	0.5%-4% estimate (depends on detail of method)
Historic expenditure –e.g. proportion of past expenditure, or operating costs and accounting charges, incurred on water resources	Depending on the data and the life of the assets, this may provide a good crosscheck or alternative approach to net MEAVs.	11.1% (14/15)
Totex	There is some logic for this, but perhaps an average over several years would be appropriate as the capex element of this may be 'lumpy'. This calculation is based on 2015/16 figures	12.1%
Capital Maintenance	There is logic to this, but it could be skewed by the age profile of assets, and could be 'lumpy'	20.4%
Projected expenditure –e.g. proportion of future expenditure expected on water resources	The proportion of future expenditure expected on water resources could be tested. Given the long life of water resource assets, the period of time that would need to be considered may be longer than company planning horizons.	This would naturally be based on Business Plan 2018 expenditure projections, which are unknown, but expected to be in the 10-15% range (lower end of the range more likely)
Economic value	The revenue stream from prices for water resources and other aspects of water supply set on a consistent long run basis. The historic and future expenditure considerations	It doesn't seem possible estimate this today with any accuracy, as the value depends upon the methodology adopted at PR19. 15% +/- 5%

Approaches/cross checks	Observations/Ofwat comments	Allocation estimate
	associated with the access price and compensation payments could be considered with this approach, building on Water Resource Management Plans	would appear to be a reasonable estimate.
Averaged or hybrid approaches	In arriving at the RCV allocation, the choice between different approaches	Any combination of the above

The commentary for this line is specifically designed to reflect the feedback Ofwat gave to our January 2018 submission on page 6 of:

https://www.ofwat.gov.uk/wp-content/uploads/2018/04/Initial-proposals-on-water-resource-RCV-allocations-feedback-to-companies.pdf

Lines 12 & 14

Depreciation has been calculated in a similar way to Line 6. New additions are depreciated using the average asset life derived from the CCD on new additions in 2015/16 and 2016/17. The allocation between Water Resources and Network plus is assumed to be in the same proportion as per Line 6.

Line 15

There are no other forecast adjustments.

Line 18

We have adopted a net MEAV approach.

WS12a - Change in RCV allocation in the wholesale water service

General

The percentage share of RCV we propose to allocate to Water Resources has changed modestly, from 11.01% in our January 2018 submission to 11.00% now.

The change reflects the influence on Net MEAV of revisions we have made to our projected additions and capital maintenance charges, along with the effects of an additional year of inflation. As we are using the unfocused Net MEAV approach to RCV allocation, changes to our Net MEAV projection result directly in changes to RCV allocation.

Lines 5-7

To value each of the reasons for change we began with the January 2018 submission, and made successive, stepwise changes to the calculations, holding all other variables constant. This allowed us to isolate the effects on the value of RCV in each business unit for each of the following:

- Changes due to an extra year of inflation that increases RCV in water resources by £4.17m, and increases RCV in network plus by £33.74m
- Changes in the level of additions in 2017/18 and 2019/20 that increase water resources RCV by £0.06m, and reduce network plus RCV by £0.06m
- Changes in the level of capital maintenance charges in 2017/18 – 2019/20 which increase water resources RCV by £0.094m and decrease network plus RCV by £0.094m.

Line 8

We confirm that we have not made any re-allocations of assets between business units.

WS13 - PR14 wholesale revenue forecast incentive mechanism for the water service

General

Line 7

We have overwritten the value of 0.00% for the specified discount rate with the value 3.70%. This is in line with the guidance in the PR14 Reconciliation Rulebook, p45.

Line 22

The entries for line 22 for years 2015/16 and 2016/17 are pre-populated. The guidance to the table says that 'if a company is aware that previous years data has not been correctly reported, they should restate the figure in the pre-populated cells using the definition in the RAGs for 2017/18 reporting'.

In accordance with this guidance, we have over-written the values in these cells to correct previously reported figures.

This correction is needed because we became aware that we had not included mains requisition contributions in the total for Grants and Contributions in Table 2I for the prior years, 2015/16 and 2016/17. The amounts were not included because we had instead entered them under the heading 'other contributions' in table 2E, rather than under the heading 'Requisitioned Mains (s43, s55 and s56)'. As a result, the amounts were not carried forward into the total in table 2I which was used to pre-populate the cells.

The table below shows the figures published in the Annual Report and Financial Statements, and the revised amounts that the we wish to use for the purposes of the Wholesale Revenue Forecasting Incentive Mechanism (WRFIM). The revisions correctly include the contributions received for requisitioned mains. We have populated table WS13 and the WRFIM feeder model accordingly, so that at the price review, the incentives and revenue carry forward can be assessed correctly and at the time of tariff setting for 2019/20, we can adjust our tariffs correctly for accumulated revenue forecast errors.

	2015/16 £000	2016/17 £000
Table 2I Grants and Contributions – Regulatory Accounts	8,816	11,653
Table 2I Grants and Contributions - Revised	9,199	13,185

Line 26

In our 2017/18 annual report, we have recorded an accumulated WRFIM balance of £6.775m. This is predominantly the result of higher receipts from developer contributions than anticipated at the last price review and at the time of tariff setting. We are considering how best to implement the necessary WRFIM corrections in our 2019/20 tariff setting, and beyond. Having considered the alternatives and their consequences, we have concluded that setting tariffs in 2019/20 to clear the full WRFIM balance would reduce water bills in 2019/20, only for bills to have to rise again the following year. If instead we spread the adjustment we need to make over the two years 2019/20 and 2020/21, we can avoid this bill instability. To give effect to this, we have revised our WRFIM calculations from those submitted in July 2018, to spread the adjustment in a way that we calculate will achieve the most stable bill profile between the two years 2019/20 and 2020/21.

We understand that by spreading the corrections, customers will be no worse off because the WFRIM mechanism recognises the time value of money. In addition, we understand that we risk a higher incentive penalty than otherwise as a result of maintaining a positive

WRFIM balance for a longer period. We have judged that these consequences are preferable to those arising from bill instability.

As the current price control period has evolved, we have become increasingly concerned about the effects of volatility in developer contributions on water bills. One of the objectives of the WRFIM mechanism and licence amendment was to prevent large tariff effects from accumulated revenue forecasting errors. However, as contributions have accelerated in recent years, their inclusion within the single till is having the opposite effect, heightening bill instability. This price review provides an opportunity to review the operation of WRFIM, and based on our experience of the mechanism and to further the aim of bill stability, we suggest that in AMP7, developer contributions be taken outside of the coverage of the WRFIM mechanism.

WS15 - PR14 wholesale total expenditure outperformance sharing for the water service

General

This table was completed by first completing Ofwat's totex menu model available for download from the regulator's website with the link:

https://www.ofwat.gov.uk/wp-content/uploads/2016/10/Totex-Menu-2016-05-17-change-log-removed.xlsx

This model uses various sources:

- Actual reported figures from our published and audited annual regulatory accounts, the Annual Performance Report (APR).
- The current forecast for the remainder of AMP6 is taken from the Company's board approved financial model 'Tamblin Internal Model v3.35' along with the calculation spreadsheet for converting statutory accounting basis opex to regulatory accounting basis opex.
- Numbers stated in the PR14 Final Determination published on Ofwat's web site are also required to complete the feeder model.

Section D line 15 - We have overwritten the 5.006 in the AFW version of the tables released on 25 June 2018 with the figure 2.134. The figure of 2.134 has been used in the feeder models that correspond to previously published numbers relating to Water Transition Expenditure from 2014/15.

Section F does not require any inputs as this section is only activated after a successful Interim Determination of K (IDoK) on Water Business Rates which is not the case for AWL.

Lines 26 & 27 were completed using Ofwat's Indexation model spreadsheets available for download from Ofwat's website (uploaded to supporting documentation file):

https://www.ofwat.gov.uk/publication/pr19-rcv-adjustments-feeder-model-published-june-2018/

https://www.ofwat.gov.uk/publication/pr19-revenue-adjustments-feeder-model-published-june-2018/

They required populating with inflation data available from the ONS web site from:

https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/chaw/mm23

and

https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/l522/mm23

These lines also required outputs from the totex menu model mentioned above.

Changes post 15 July submission

WS15 was updated to replace the forecasted numbers in 2017/18 with actual numbers from the published accounts for line 11 - Water: Third party services (capex) and line 14 - Water: Disallowables. This was run through the feeder models and resulted in a change to the numbers in Table G.

WS17 - PR14 water trading incentive reconciliation

General

We have concluded that we do not need to complete this table, as we have not introduced or made material use of new imports in the period 2013 to 2020. The incentive value of water we have imported, that might be argued to relate to new imports, is not material, less than £1,000 in the period 2015/16 to 2017/18.

WS18 - Explaining the 2019 Final Determination for the water service

General

Section A Line 1

The percentage values included for 2015/16 and 2016/17 have been taken from Table 11i of the annual returns submitted to the Environment Agency in July 2018. The forecast for metered households for 2017/18 to 2019/20 reflects our latest programme of installations for AMP6 which has been adjusted to account for the incidence rate of multiple unit properties e.g. flats and difficult to meter properties such as those requiring internal metering but where we have experienced refusal of access.

For AMP6 we provided a 2-year transition period for customers to choose to move on to measured charges after having a meter installed. Our water savings programme is designed to support customers during this 2-year transition to encourage reduction of consumption. To do this we have carried out a water check in 1 in 3 houses and provided regular comparative consumption information to each household. This has helped us meet our PCC reduction target for 2017/18. We have assessed the average saving per household so far at 18% which is higher than our original forecast of 13.6%.

Our forecast of metered households in AMP7 has been adjusted to also take account of the challenges we have met during AMP6. We are planning to achieve 78% of properties metered by the end of AMP7. We have meanwhile adjusted our forecast of water saved during AMP7 to align with the rate of savings achieved so far in AMP6 and increased our complimentary water conservation activities to reflect our performance commitment target for weighted average PCC.

Section A Line 2

We completed our mains cleaning programme in March 2017 and this has resulted in a lower number of contacts from customers regarding discoloration of their water supply. We continue to manage our water supplies so that the aesthetic quality remains stable. The vast majority of customer contacts we receive regarding taste or odour are related to the interaction of the chlorine residual in the water supply with domestic fittings and we continue to provide appropriate advice to customers. Consequently, we believe customer contacts for discoloration, taste or odour will remain, in broad terms, around the 2017/18 performance level throughout AMP7.

Section B Line 3

A catchment scheme refers to specific catchment measures that will be implemented in the catchment. For example, the AMP7 Lower River Wey Pesticides catchment scheme is a programme of catchment-based pesticide reduction schemes with the objective of reducing agricultural pesticide pollution at the source rather than relying solely on water treatment. We are developing a Payment for Ecosystem Services (PES) methodology and other incentive mechanisms applicable to all “at risk” pesticides. We are on target to deliver three AMP6 catchment schemes by 31 March 2020.

Our AMP6 catchment management programme also includes investigations. A catchment investigation refers to determining the source(s) and pathway(s) for certain pollutants and to gain a more detailed understanding of the likely long-term trends. An example of this would be our AMP7 Lower River Colne investigation of “at risk” pesticides in nitrate groundwater concentrations at the abstraction. This will include monitoring, catchment characterisation such as wet weather walkovers, reviewing historic cropping patterns and gaining a better understanding of application timing and what is being applied. In AMP6 we completed 16 catchment management investigations in Year 2 (2016/17).

Completed investigations and schemes (measures) are reported in the Environment Agency's annual NEP Tracker spreadsheet. The AMP6 catchment projects (investigations and measures) are listed below with reference codes and completion dates.

List of AMP6 Schemes

Scheme Name	Reference	2015/16	2016/17	2017/18	2018/19	2019/20
River Thames DrWPA Investigation	6AFD10001		Completed 31/3/2017			
River Thames DrWPA Catchment Management - DWI Reference AFW032	6AFD100018					To be completed 31/3/2020
NORM DrWPA catchment management - DWI reference: AFW030	6AFD100019					To be completed 31/3/2020
ARDL Reservoir DrWPA catchment management (Affinity Water) - DWI reference AFW031	6AFD100020					To be completed 31/3/2020
CHAR	6AFD100022		Completed 31/3/2017			
Investigation at BROM	6AFD100024		Completed 31/3/2017			
Investigation at KIND SGZ	6AFD10005		Completed 31/3/2017			
SgZ at KINW	6AFD10009		Completed 31/3/2017			
SgZ at REDR	6AFD10010		Completed 31/3/2017			
SgZ at CHIP	6AFD10011		Completed 31/3/2017			
NETH, LANE group	6AFD10012		Completed 31/3/2017			
EAST, LANE Group	6AFD10013		Completed 31/3/2017			

TOLP, LANE Group	6AFD10014		Completed 31/3/2017			
SLIP	6AFD10015		Completed 31/3/2017			
OFFS	6AFD10016		Completed 31/3/2017			
OUGH	6AFD10017		Completed 31/3/2017			
SgZ at NORM - agricultural investigation	6AFD10023		Completed 31/3/2017			
ROYD SgZ	6AWD10007		Completed 31/3/2017			
SgZ at NORM - landfill investigation	6AWD10008		Completed 31/3/2017			
Total		**0**	**16**	**0**	**0**	**3**

WINEP3 lists 17 catchment schemes (referred to as measures on WINEP3) and six investigations for delivery in AMP7. These are to be delivered through a similar process as AMP6, with the six catchment investigations to be completed by end of Year 2. The catchment schemes consist of 15 catchment management measures and two invasive non-native species (INNS) schemes. The two INNS schemes (7AF200001 and 7AF200002) will be delivered through the implementation of our biodiversity programme. All AMP7 catchment schemes are to be delivered by 31 March 2025.

It is noted that there is a discrepancy between the WINEP3 delivery dates and our planned dates. This is due to a difference in approach between the EA areas and we are currently addressing this through the detailed scoping of schemes and ongoing dialogue with the EA.

List of AMP7 Catchment Investigations and Schemes

Reference	Activity Type	Scheme Name	Delivery Date
7AF200021	Investigation	ROES Agricultural Pesticides Investigation	31/3/2022
7AF200022	Investigation	STAN Nitrate Investigation	31/3/2022
7AF200023	Investigation	River Colne (Hertfordshire-Rickmansworth To Thames Confluence) "At Risk" Pesticides Investigation	31/3/2022
7AF200024	Investigation	NORM Sgz Nitrate Investigation	31/3/2022

7AF300001	Investigation	WHIH Nitrate investigation	31/3/2022
7AF200012	Investigation	NEWP nitrate investigation	31/3/2022
7AF200015	Scheme	NORM DRWPA "At Risk" Pesticides Catchment Management	31/3/2025
7AF200016	Scheme	LANE "At Risk" Pesticides Catchment Management	31/3/2025
7AF200017	Scheme	ESSE "At Risk" Pesticides Catchment Management	31/3/2025
7AF200018	Scheme	KINW Nitrate Catchment Management	31/3/2025
7AF200019	Scheme	CHIP Nitrate Catchment Management	31/3/2025
7AF200020	Scheme	CHAR Nitrate Catchment Management	31/3/2025
7AF200038	Scheme	BROM Catchment Scheme	31/3/2025
7AF200039	Scheme	KIND Catchment Scheme	31/3/2025
7AF200025	Scheme	River Thames Drinking Water Protected Area (DrWPA) for Lower Thames Abstraction No Deterioration Catchment Scheme	31/3/2025
7AF200026	Scheme	Lower River Wey (Guildford to Thames Confluence) Drinking Water Protected Area (DRWPA) for Lower Thames Abstraction No Deterioration Catchment Scheme	31/3/2025
7AF200009	Scheme	SLIP nitrate catchment management	31/3/2025
7AF200010	Scheme	OFFS nitrate catchment management	31/3/2025
7AF200011	Scheme	OUGH nitrate catchment management	31/3/2025
7AF200013	Scheme	River Colne (Essex) "at risk" pesticides catchment management (Affinity Water)	31/3/2025
7AF200014	Scheme	ARDL Reservoir DrWPA " at risk" pesticides catchment management (Affinity Water)	31/3/2025
7AF200001	Scheme	Reduce risk of spread of INNS on landholdings	31/3/2025
7AF200002	Scheme	Support partnership projects to prevent introduction and spread of INNS	31/3/2025

Section C Line 4 – Number of people receiving help with their bill.

We have based the calculations on the numbers of customers on our Social Tariff (LIFT) and Watersure. Figures for 2015 to March 2018 have been based on actual reportable figures. To project the number of customers receiving support for 2018/19 to 2024/25, we have used the level of cross subsidy (£4.50 for AMP7) x discount level x the number of households. The number of customers on our LIFT tariff falls slightly towards the end of the period. It has been necessary to restrict the numbers receiving assistance if we are to manage the cross subsidy within the £4.50 willingness to pay limit.

Section D Line 6

Our projections of the total volume of water traded are taken from and consistent with, our Water Resources Plan projections of the volumes we expect to import and export.

Section E Line 7

Our AMP6 Water Resources National Environment Programme (NEP) implementation work consists of both sustainability reductions (SR) and adaptive management, also referred to as morphological mitigation (morph) including: river restoration and habitat enhancement works. We have discussed the length of river improved with the Environment Agency and agreed the annual lengths by river to be reported. These have been calculated in accordance with the EA technical guidance document "Completing the WINEP spreadsheet supplementary guidance: Environmental outcomes", which refers to the EA's Operation Instructions: "Reporting KPI 1311 / Corporate Scorecard Measure 1 EA 1 - km enhanced". The word 'improve' is used as a synonym for "enhance".

The lengths of river improved in AMP6 include those resulting from implementation of our sustainability reductions programme and morphological works. These have been summed for each year to give annual totals for the AMP6 period.

Where river restoration/habitat enhancement work ('morph') has occurred in the same year as a sustainability reduction and within the same reach of river, only the length improved by the sustainability reduction has been included in the table. Lengths of river improved by river and action type are shown below, with figures in blue italic excluded from the total.

Length of River Improved (km) in AMP6 as agreed with EA

River	Action Type	2015/16	2016/17	2017/18	2018/19	2019/20
Ver	SR		31.400			
	Morph					3.660
Hughenden Stream	SR			3.500		
Beane	SR			16.660		
	Morph	0.200		*0.550*	4.140	2.000
Mimram	SR			12.380		
	Morph	0.550		*0.603*		2.350
Misbourne	SR				16.900	
	Morph				*0.270*	
Gade	SR				24.000	
	Morph				*1.420*	1.200
Upper Lea	Morph				0.929	1.100
Little Stour	Morph				0.000	4.000
Total		0.750	31.400	32.540	45.969	14.310

Figures in blue italics excluded from total, as work completed within reach also improved by SR

AMP7 Length of river improved

Projects for AMP7 are outlined on the EA's WINEP3 table issued in March 2018. Schemes with a Water Framework Directive (WFD) improvement driver (WFD_IMP_WRFlow) have been included for two measure types; sustainability changes and morphological mitigation works (referred to as Adaptive Management or Land Management/ Habitat Restoration/

Improvement on WINEP3). Sustainability changes have also been included with a WFD no deterioration driver (WFD_ND_WRFlow), where licences are proposed to be capped to recent actual use to prevent deterioration of waterbody status. The length of river improved by a no deterioration sustainability change measure has also been included, in accordance with EA guidance.

AMP7 schemes have been assigned a *green* or *amber* level of certainty on WINEP3. We have included the length of river improved from the rivers classified with a *green* and *amber* level of certainty, which is consistent with our performance commitment for number of river restoration projects completed. We have included a table below showing the split of lengths between *green* and *amber* rivers improved. Table WS2 includes costs for both *green* and *amber* measures, with *amber* schemes included in our cost adjustment mechanism in accordance with environmental uncertainty guidance.

These rivers are all chalk streams which are relatively short in total length but have a significant and important value in terms of biodiversity, being a globally rare habitat. There are approximately 240 chalk streams in the country of which approximately 8-9% are located in our supply area.

Length of river improved from implementation of the sustainability reductions has been calculated in accordance with the EA methodology and lengths included on the table agreed with the EA. The length of river improved by no deterioration sustainability change measures have also been included based on lengths provided on WINEP3. There is a small departure from WINEP3 total length of river improved figure (102.028km) due to the EA having revised their calculations for a number of rivers since issuing WINEP3 to us.

We have calculated an average length of river improved per project based on delivery in AMP6 (763m) and used this to forecast the length improved each year for AMP7. This is based on our experience of delivering similar work in AMP6 and therefore gives confidence in our forecast. There is a significant variety of work to be delivered and we will identify the most appropriate and cost beneficial schemes in collaboration with the EA and other catchment partners.

The greatest lengths of improvement are expected to result from the implementation of sustainability reductions which are to be delivered by December 2024. We have programmed morphological works in Years 1-4 on those rivers where a sustainability change will also occur in Year 5. This morphological work will make a significant contribution towards WFD objectives and improving the resilience of these chalk streams, as identified in the River Basin Management Plan bundle of measures.

It is recognised that there is uncertainty regarding the length of river improved where complexities exist in a waterbody for example the River Brett. Following the investigation and options appraisal element of our AMP7 programme these lengths of river will be reviewed.

We will put in place a change protocol with the EA to manage the programme and changes to the forecast length of river improved, including schemes moving from *amber* to *green*.

WINEP3 Green Sustainability Change and Adaptive Management Length of river improved (km)

River	Action Type	2020/21	2021/22	2022/23	2023/24	2024/25	Total (km)
Ver	SR					21.430	**21.430**
	Morph	0.763	0.763	0.763	0.763		**3.052**
Beane	Morph	0.763	0.763	0.763	0.763		**3.052**

Upper Lea	SR					10.300	**10.300**
	Morph	0.763	0.763	0.763	0.763		**3.052**
Mimram	SR					10.300	**10.300**
	Morph	0.763	0.763	0.763	0.763		**3.052**
Misbourne	SR					16.900	**16.900**
	Morph	0.763	0.763	0.763	0.763		**3.052**
Gade	Morph	0.763	0.763		0.763	0.763	**3.052**
Cam	SR (ND)					46.828	**46.828**
Ivel	SR (ND)					1.200	**1.200**
Total		**4.578**	**4.578**	**3.815**	**4.578**	**107.721**	**125.270**

WINEP3 Amber Sustainability Change and Adaptive Management Length of river improved (km)

River	Action Type	2020/21	2021/22	2022/23	2023/24	2024/25	Total (km)
Brett	SR					4.900	**4.900**
	Morph		0.763	0.763	0.763	*0.763*	**3.052**
Bulbourne	Morph		0.763	0.763	0.763	0.763	**3.052**
Chess	SR					4.300	**4.300**
	Morph		0.763	0.763	0.763	*0.763*	**3.052**
Ivel	Morph		0.575	0.575	0.575	*0.575*	**2.300**
Cam	Morph		2.325	2.325	2.325	*2.325*	**9.300**
Upper Colne	Morph	0.763	0.763	0.763	0.763		**3.052**
Lower Colne	Morph		0.763	0.763	0.763	0.763	**3.052**
Total		**0.763**	**6.715**	**6.715**	**6.715**	**15.152**	**36.060**

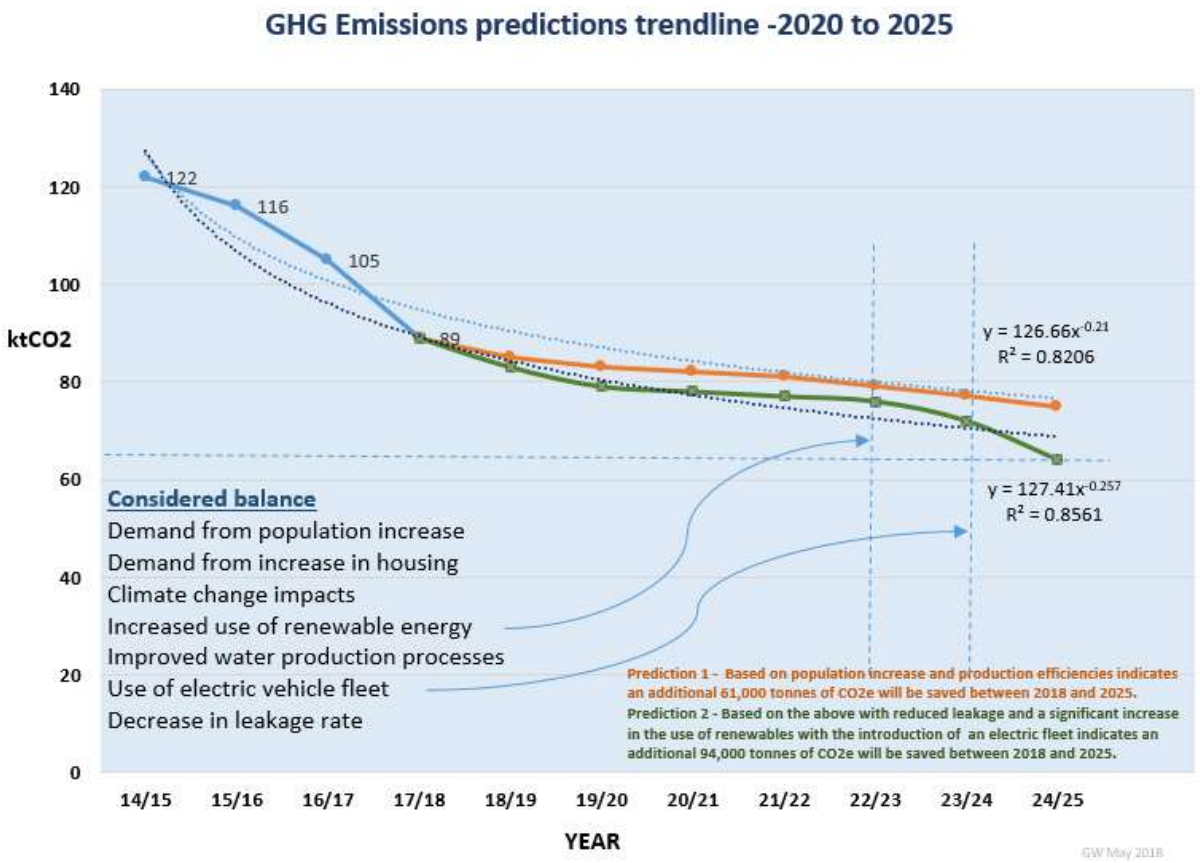
Figures in blue italic excluded from total, as work completed within reach also improved by SR.

WINEP3 Green and Amber Length of river improved (km)

Length of river improved	2020/21	2021/22	2022/23	2023/24	2024/25	Total
Green and Amber Total	5.341	11.293	10.530	11.293	118.447	156.904

Year 5 total excludes amber Cam and Ivel morph works (in red italic), as they are in the same river reach as green SR.

Section E Line 8



Our total gross GHG emissions are expected to continue their downward trend as the emissions associated with our purchased electricity (accounting for over 80% of our total) benefit from more renewable generation. This trend is expected to continue up to 2025 as we improve our leakage rates, implement efficiencies in our water production processes and move towards a fleet of electric vehicles.

We will continue to support the deployment of renewable energy by flexing our electrical demand at times of supply stress and through our participation in the National Grid's Power Responsive Programme. We will also continue the migration of our outsourced IT services to the cloud in a further effort to reduce our IT related GHG emissions.

The additional demand for water from the increase in supplied housing stock and the impact of likely local climate change effects on water sources is likely to affect the rate of decrease in emissions. Our prediction takes these into account based on general improvements and the uptake of technological advances.

Without increasing the use of renewable energy and the adoption of an electric fleet, the decrease in our GHG emissions is likely to become less significant over time due to these impacts and our prediction is based on a best fit trend from our GHG emissions data since 2015. The normal curve indicates that by 2025 our annual GHG emissions will be in the order of 75ktCO2e whereas the preferred curve that incorporates innovation indicates that our emissions to be at 64ktCO2e with an additional 33,000 tonnes of CO2e to be saved over the period.

Our current reported GHG emission statement is as per the following table.

Greenhouse gas ('GHG') emissions statement[9]

GHG emission source	2017/18		2016/17	
	Gross[10] (tCO_2e)	Intensity[11] ($kgCO_2e/ML$)	Gross (tCO_2e)	Intensity ($kgCO_2e/ML$)
Scope 1	**6,204**	**18.7**	**6,141**	**18.8**
Fuel combustion	1,501	4.5	1,722	5.3
Process and fugitive emissions	2,524	7.6	2,322	7.1
Vehicle fleet	2,179	6.6	2,097	6.4
Scope 2	**75,580**	**228.4**	**89,927**	**275.2**
Purchased electricity	75,580	228.4	89,927	275.2
Statutory total (scope 1 & 2)[12]	81,784	247.1	96,068	294.0
Scope 3	**7,326**	**22.2**	**8,538**	**26.1**
Business travel in other vehicles	33	0.1	40	0.1
Outsourced IT activities	226	0.7	364	1.1
Electricity- transmission and distribution	7,067	21.4	8,134	24.9
Total gross emissions	**89,110**	**269.3**	**104,606**	**320.1**

[9] We report our GHG emissions following the 2015 UK Government's Environmental Reporting Guidelines and using the 2015 UK Government Conversion Factors for Company Reporting. We have included emissions within the direct management responsibility of the company. This is consistent with our financial reporting boundary except for scope 3 emissions, which are off-balance sheet emissions. Significant scope 3 emissions have been quantified for outsourced data support and emissions from the distribution and transmission of grid electricity. The data has been externally verified as part of our regulatory reporting requirements.

[10] We measure our gross GHG emissions in tonnes of carbon dioxide equivalent ('tCO_2e').

[11] We also monitor our relative operational GHG emissions from year to year through expressing our emissions by way of an industry standard intensity ratio, kilograms of CO_2e per megalitre ('$kgCO_2e/ML$') of clean water supplied.

[12] Statutory carbon reporting disclosures required by the Companies Act 2006 (Strategic Report and Directors' Report) Regulations 2013.

Our CO2e emission predictions based on the two scenarios to 2025 are as follows

Actual		Prediction 1	Saving p.a.	Prediction 2	Saving p.a.
Year	KtCO2e	ktCO2e	ktCO2e	ktCO2e	ktCO2e
2014/15	122				
2015/16	116				
2016/17	105				
2017/18	89	89		89	
2018/19		85	4	83	6
2019/20		83	6	79	10
2020/21		82	7	78	11
2021/22		81	8	77	12
2022/23		79	10	76	13
2023/24		77	12	72	17
2024/25		75	14	64	25

Block F Line 9

We have calculated the change in the average residential customer water bill over the period by dividing our forecast average household revenue by the expected number of billed households to produce expected average revenue per household. This is the same method we use to estimate average household bills for the Discover Water website. The average revenue per household we used includes the revenue effects of our forecasts of SIM penalty and gearing benefit sharing. We note that this average bill series differs from the average household bill projections presented in App7 because the latter series does not include the effects of SIM and gearing benefit sharing. To present bill changes in real CPIH 2017/18 price base terms, we have used the November to November movement in inflation indices, to align with the indexation adjustments to allowed revenue in the wholesale price control formula.

The wholesale water resource tables

Wr1 - Wholesale water resources (explanatory variables)

General

Lines 1-8

Inputs

For years prior to 2017/18 we used Abstraction as the base data. This year Distribution Input (DI) was used as the base data as per guidance notes. The number of works in each category was taken from our works management system.

2018-25 Data

The forecast DI (adjusted for imports and exports) is based on our Water Resources Management Plan (WRMP) for a normal year. We apportioned the DI against the ratio for 2017/18 based on the three supply areas (Central, Southeast and East) and then at site level. When calculating site volumes, we applied abstraction licence changes and sites which we have agreed to turn off. For 2018/19 the sites where manual adjustments were made within the calculation are Amersham, Marlowes, Piccotts End, Runleywood Chalk and Uttlesford Bridge. For 2024/25 the sites where manual adjustments were made within the calculation are Amersham, Debden Road, Digswell, Holywell, Newport and Oughtonhead. Iver is assumed to be running at near capacity at 215ML/D from 2018 to 2025.

Line 9: Number of Impounding Reservoirs

Inputs

Data is taken from our Asset Management system.

Methodology

Historically, Ardleigh was reported as an Impounding Reservoir (AR13) but due to changes in definitions it is now classified as a Pumped Storage Reservoir.

Differences from 2016/17 Annual Return

Heron Lake and Queensmead Lake are gravel pits for which we have abstraction licenses such that we can use them in emergencies. Whilst they are not conventional Impounding Reservoirs this is the closest category that these sites could be put into. As they were utilised during 2017/18 we have included them for this year.

2018-25 Data

Due to high demand Heron Lake and Queensmead Lake have been used in 2018/19 so are included for this year, but due to the emergency nature of the sources we do not plan to use them for the rest of AMP7. There are no plans for any new Impounding Reservoirs to be built during AMP7.

Line 10: Number of Pumped Storage Reservoirs

Inputs

Data is taken from our Asset Management Information System.

Methodology

Data is extracted at asset type level for Dams and Impounding Reservoirs (DI).

Differences from 2016/17 Annual Return

None

2018-25 Data

We have no plans for any Pumped Storage Reservoirs to be built during AMP7.

Line 11: Number of River Abstractions

Inputs

Data is taken from our Asset Management Information System (our primary data source) in the first instance and site surveys for Southeast and East regions which were undertaken in 2017.

No river abstractions exist in our East and Southeast regions.

The definition for Line 13 states that any independent source should be counted individually. Where multiple abstraction types on a single site are present, each has been included in the appropriate line.

Methodology

Data is extracted at asset type level for Intake Pumping Stations (IP).

Chertsey and Walton river abstractions are included in this line.

Ardleigh has been excluded as its function is predominantly a pumped storage reservoir, drawing water from the river Colne, though a small river is also impounded by the reservoir. This means that it is also not double-counted, since, although it has two functions, it is one independent source.

Differences from 2016/17 Annual Return

None

2018- 25 Data

We have no plans to change the number of River Abstractions during this period.

Line 12: Number of Groundwater Works, excluding Managed Aquifer Recharge (MAR) water supply schemes

Inputs

Data is taken from the Annual Water Resource Usage report from Water Resources and Daily Ops reports for the Central region. For East and Southeast regions, data was collected from our Asset Management Information System (our primary data source) and Daily Ops reports.

Definition clarifications (in May 2017) confirm that multiple boreholes on a single site feeding a treatment works should be classed as one source, and the definition for Line 13 states that any independent source should be counted individually. Where multiple abstraction types on a single site are present, each has been included in its respective line.

A subsequent review of the data during the work to populate the PR19 tables highlighted two sites which were reported in AR18 that should have been excluded. Both of these sites recorded a flow on the Daily Ops reports, but neither when into supply. The figure for 2017/18 should now be 115 and not 117 which was reported for AR18.

Methodology

A comprehensive list of all sources was obtained from our corporate databases. Chertsey and Walton borehole abstractions are included in this line. Denton, Tappington and Rakesole North are individual borehole sites which pump to Rakesole South WTW to be treated, and are therefore independent sources at separate sites and therefore counted individually. There are many other examples of this.

Differences from 2016/17

Hughenden taken offline as part of the sustainability reductions delivered during AMP6.

2018-25 Data

Tappington South is due to come online during 2022/23.

Runley Wood Chalk, Periwinkle Lane, Chesham and Chartridge are all due to be turned off by the end of 2024.

Runley Wood Greensands is planned to be recommissioned by 2024.

Line 13: Number of Artificial Recharge (AR) Water Supply Schemes

We do not have any Artificial Recharge Water Supply Schemes. There are no plans for any Artificial Recharge Water Supply Schemes to be implemented during the 2018-25 period.

Line 14: Number of Aquifer Storage and Recovery (ASR) Water Supply Schemes

We do not have any Aquifer Storage and Recovery Water Supply Schemes. There are no plans for any Aquifer Storage and Recovery Water Supply Schemes to be installed during the 2018-25 period.

Line 15: Number of Saline Abstraction Schemes

We do not have any Saline Abstraction Schemes. There are no plans for any Saline Abstraction Schemes to be installed during the 2018-25 period.

Line 16: Total Number of Sources

Inputs / methodology

This figure is the sum of Lines 9 to 15.

Differences from 2016/17

Reasons for any differences can be found in the “Differences” sections of each of Lines 9 to 15.

2018-25 Data

Reasons for any differences can be found in the “Differences” sections of each of Lines 9 to 15.

Line 17: Number of Reuse Schemes

We do not have any Reuse Schemes and there are no plans for any Reuse Schemes to be implemented during the 2018-25 period.

Line 18: Total number of water reservoirs

Inputs / methodology

Data is extracted from our Asset Management Information System and site surveys using recently reviewed and updated asset data.

In addition to Ardleigh Reservoir, Heron Lakes and Queensmead Lake have also been included for 2017/18 due to emergency water use within this period. Chertsey raw water reservoir continues to be excluded as the reservoir is used for settlement as part of the water treatment process. Hilfield Park also continues to be excluded as it is not used operationally (but does incur costs to maintain as it is preserved as a nature reserve). Eastbury has been removed as it is a tank rather than a raw water reservoir and is used for balancing flow not diurnal storage.

2018-25 Data

Heron Lakes and Queensmead Lake have been used in 2018/19, but not accounted for in projected figures for the next 6 years due to their use as emergency water sources only.

Line 19: Total capacity of water reservoirs

Inputs / methodology

Data was extracted from our Asset Management Information System and site surveys using recently reviewed and updated asset data. Impounding licence and bathymetric survey report data has also been used to obtain some capacity figures.

2018-25 Data

The capacity is in line with the number of water reservoirs detailed in line 18.

Line 20: Total number of intake and source pumping stations

Inputs / methodology

Data is extracted from our Asset Management Information System and site surveys using recently reviewed and updated asset data.

Fulling Mill and Hughenden have ceased abstraction due to sustainability reductions. Runley Wood (Chalk) was not operational during this period.

A coordinated review of our sources and source pumping stations identified that Stansted should be included as one source pumping station (not two as previously reported in AR18). Although our Asset Management Information System identified Stansted as two separate pumping stations, they are in fact two boreholes, in close proximity on the same site. In accordance with RAG 4.07 guidelines, Stansted should therefore only be counted once.

2018-25 Data

The number of intake pumping stations remains constant through 2018-25. The number of source pumping stations increases by one in 2018/19 as Runley Wood (Chalk) is due to come back into service. Projected figures remain constant for the remainder of AMP6 and the first two years of AMP7. In 2022/23 there is the addition of Tappington South Pumping station. In the last year of AMP7 the proposed recommissioning of Runley Wood (Greensands) and the potential decommissioning of Chesham, Chartridge, Periwinkle Lane and Runley Wood (Chalk) are accounted for.

Line 21: Total capacity of intake and source pumping station

Inputs / methodology

Data is extracted from our Asset Management Information System and site surveys using recently reviewed and updated asset data.

2018-25 Data

The capacity is in line with the number of intake and source pumping stations detailed in line 20. The decreased capacity in 2023/24 is due to proposed smaller borehole pumps at Digswell.

All data provided for 2018-25 is based on EA decisions for AMP7 Sustainability Reductions, public consultation for WRMP and Resilience schemes.

Line 22 – Total length of raw water mains and conveyors

Zero length entered. We do not have any apparatus as specified in Appendix 2 of RAG4.07 as 'green coloured pipework'.

Line 23 – Average Pumping Head Raw Water Abstraction

Inputs / methodology

The APH calculation has been completed using the new guidance from Ofwat set in RAG2.07 & RAG4.07 appendix 1 issued 2017/18.

The forecast DI for each region (Central, East and Southeast) is derived from our WRMP, for a normal year. The abstraction forecast is extrapolated from the actual AMP6 reported DI figures, taking into account imports and exports and applying an adjustment for treatment works losses, river augmentation volumes and raw water supplies (a total of 2.6% of abstraction).

When calculating site volumes, we have accounted for abstraction licences changes and sustainability reductions. In addition, internal transfer volumes have been adjusted to reflect capital investment improvements & optimum operational strategy to meet demand.

The proportion of the APH that has been calculated from measured (telemetry) flow and pressure values is 92% for 2016/17.

The proportion of the APH that has been calculated from historic telemetry flow and pressure values, in the forecast period is 76%. The remaining uncertainty comes from engineering calculation of lift and headlosses through the price controls.

2018-25 Data

For 2018/19 the sites where manual adjustments were made for abstraction within the calculation are Amersham, Marlowes, Piccotts End, Runleywood Chalk and Uttlesford Bridge.

For 2024/25 the sites where manual adjustments were made for abstraction within the calculation are Amersham, Debden Road, Digswell, Chesham, Chartridge, Holywell, Mud Lane, Newport, Periwinkle Lane, Oughtonhead, Springwell Farm & Wenden.

Iver is assumed to be running at near capacity at 215ML/D from 2018 to 2025, with an associated increase in re-lift throughout the network.

The observed step change in APH from 2017/18 to 2018/19 is representative of the variance between actual and optimum operational performance, irrespective of outage. The uplift in APH is due to the implementation strategy of increased utilisation of surface works, maximising associated re-lift for transport.

Line 24: Total Number of Raw Water Abstraction Imports

We do not have any raw water abstraction imports.

Line 25: Water Imported from 3rd Parties raw water abstraction systems

We do not have any raw water abstraction imports.

Line 26: Total Number of Raw Water Abstraction Exports

We do not have any Raw Water Abstraction Exports.

There are no plans for any Raw Water Abstraction Exports to be implemented during the 2018-25 period.

Line 27: Water exported to 3rd parties from raw water abstraction systems

We do not have any raw water abstraction export points and therefore the exported volume is zero.

Wr2 - Wholesale water resources opex

This table provides further analysis of operating expenditure for water resources.

Section A - Opex analysis

Lines 1 – 6

The totals of the lines for power, income treated as negative expenditure and Local Authority and cumulo rates agree with the relevant lines in table WS1.

We have used the below 2017/18 assumptions to allocate the costs between water resources units. This information is collated as a part of cost assessment table 21.

	Impounding Reservoir	Pumped Storage	River Abstractions	Boreholes, excluding MAR water supply	Artificial Recharge (AR) water supply schemes	Other	Source
2017/18	0.2%	0.6%	35.1%	64.1%	0.0%	0.0%	Information in Table 21 of the 2018 cost assessment tables

Line 7 - Historical Cost Depreciation

This line shows the historical cost depreciation for capital expenditure within the Water Resources.

We have taken an average asset life based on existing assets up until 2017/18 of 34.6 years. As our water resources capital expenditure in AMP7 will increase, this will lead to depreciation rising throughout the period.

We have used the same 2017/18 assumptions as above to allocate the costs between water resources units.

Section B - Analysis of abstraction charges (forecast only)

Line 9 - Application charge

We have allocated all our abstraction to application charge.

Wr3 - Wholesale revenue projections for the water resources price control

Please refer to the “Financial Model Based Data Tables” section at the end of this document.

Wr4 - Cost recovery for water resources

Please refer to the “Financial Model Based Data Tables” section at the end of this document.

Wr5 - Weighted average cost of capital for the water resources control

General

We have completed this table using the same values for actual and notional gearing, debt and asset betas as in the table for the appointed business. These values are the same as those published in the PR19 Methodology: Appendix 12: Aligning risk and return ps.16-18.

Wr6 - Water resources capacity forecasts

Pre-2020 capacity:

- The DYAA and DYCP pre-2020 capacities were assumed to mean baseline DO minus climate change following the description of: sources 'forecast forwards to account for any changes'. Outage and Treatment Losses have not been accounted for, as per the guidance for this table.
- This baseline data has been compiled for our revised WRMP19 and is consistent with what is being run in WRSE Phase 4.

Post-2020 incumbent cumulative capacity:

- For the DYAA and DYCP rows, we used the most up-to-date baseline information and ran the Economics of Balancing Supply and Demand (EBSD) model to generate an options set (Run 14).
- These rows contain the potential maximum benefit (Ml/d) of the supply-side options, as well as the utilisation of Grafham.
- Grafham is modelled as an import so EBSD can select a cost-effective usage of this relatively expensive source, although it is licenced Deployable Output. Hence its inclusion in this line. It is the capacity of the option which is presented and not the usage.
- It is important to note that the maximum availability of Grafham to us declines owing to a climate change reduction profile provided by Anglian Water as part of their revised WRMP19.
- We are entitled to a greater capacity of Grafham than shown in the first 4 years of AMP7 in this table. There are limitations on its use which we have planned investment in AMP7 to remove through the water conditioning plant at Sundon.

Post-2020 third party bilateral cumulative capacity:

- The DYAA and DYCP rows for the third party bilateral cumulative capacities have been assumed to be the neighbouring water company and third-party imports as selected by the EBSD model in run 14 (described above).
- The maximum benefit (Ml/d) of each import has been included where the specific import was selected and utilised by the model. The values presented in Wr6 are consistent with the maximum capacity and not the amount the model utilises from this option.

Wr7 - New water resources capacity ~ forecast cost of options beginning in 2020-25

General

- In line with Ofwat guidance and definitions, demand-side and leakage options are not included in the table
- The table shows only WRZs where supply-side options expenditure is forecast to begin during 2020-2025 (Lee, Pinn and Dour)
- Option-level costs are consistent with the overall investment portfolio
- Opex values follow the yield profile of the option whereas the capex profile is applied based on the lead-in time required to complete the scheme
- Capex has been allocated to the asset types based on a percentage split derived from the WRMP option Long Run Marginal Cost Sheets
- The data herein is consistent with supply-side options current at 3 September 2018 for use in our revised draft WRMP
- Costs for the option AFF-RTR-WRZ4-1040: Sunnymeads to Iver 2 (100Ml/d) have been taken from two data sources: the cost of the option in WRMP and the upstream costs as advised by Thames Water. For this second element, we have agreed a 1/3 – 2/3 split of costs and volumes with Thames Water, therefore our contribution will be one third of the total cost

Sections B to M for each WRZ – Line 4 - Annualised unit cost of post-2020 capacity

This line has been populated using the water resources annualised unit cost model developed by Reckon LLP. An annualised unit cost of post-2020 capacity is shown for each WRZ.

Wr8 - Wholesale water resources special cost factors

General

This table is intentionally left blank as we are not proposing special cost factors for our water resources functions.

The Wholesale water network plus tables

Wn1 - Wholesale water treatment (explanatory variables)

General

Lines 1 & 2: Total number of raw water transfer stations and their capacity

The figures in these lines differ to those reported in our APR 2017/18. This is because, following a review of the reporting guidelines, we have now included our Grove and Denge raw water pumps, which supply customers directly.

We have interpreted this measure as being sites where raw water is pumped from other Abstraction sites to Treatment sites. As such we have not included our intake sites where we use pumps to move the water from river to treatment as we consider these to be intake pumping stations.

Criteria

Data has been taken from our Asset Management Information System in the first instance and site surveys for Southeast and East which were undertaken in 2017.

Methodology

Unlike the other measures this is a new measure and as such we currently do not have a simple method of identifying the data using the raw data. Reviews of other data sources (Telemetry, Operating Manuals, P& IDs) have been undertaken to check all of the known raw water transport network.

We ran a Business Objects querying all Pumps currently held on our Asset Management Information System and their relevant Kw rating (where recorded). We identified the relevant Pumps from the three sites mentioned in line 1 (Eastbury, Jupes Hill, The Grove) then totaled the kW rating recorded against each pump. Denge data came from a recent site survey.

No data gaps were found for any of the Pumps in question.

Eastbury (Central)

6 pumps - 4 Pumps rated as 459kW and 2 at 300kW

Re-lifts raw water from 4 abstraction sites to Clay Lane for Treatment.

Jupes Hill (East)

2 pumps – Both rated at 55kW

Re-lifts raw water from Stratford St May and Dedham, to Horsley Cross for Treatment.

Denge (Southeast)

3 pumps – All rated at 5.5kw

Pumps partially treated water to 3 non-household customers. We have included this as part of this line as this is the best fit for these Pumps.

The Grove (Central)

2 pumps – Both rated at 11kW

Pumps raw water to a non-household customer.

We have three further customers which receive raw water from our supplies, but they are supplied directly off the borehole pumps which are included in Wr1 lines 20 & 21.

There are no plans to change the number of Raw Water Transfer Stations during the 2018-2025 period

Lines 3: Average Pumping Head – raw water transport

Inputs / methodology

The APH calculation has been completed using the new guidance from Ofwat set in RAG2.07 & RAG4.07 appendix 1 issued 2017/18.

The forecast distribution input (DI) for each region (Central, East and Southeast) is derived from our WRMP, for a normal year. The abstraction forecast is extrapolated from the actual AMP6 reported DI figures, taking into account imports and exports and applying an adjustment for treatment works losses, river augmentation volumes and raw water supplies (a total of 2.6% of abstraction).

When calculating site volumes, we have accounted for abstraction licence changes and sustainability reductions. In addition, internal transfer volumes have been adjusted to reflect capital investment improvements & optimum operational strategy to meet demand.

The proportion of the APH that has been calculated from measured (telemetry) flow and pressure values is 92% for 2016/17.

The proportion of the APH that has been calculated from historic telemetry flow and pressure values, in the forecast period is 76%. The remaining uncertainty comes from engineering calculation of lift and headlosses through the price controls.

2018-25 Data

For 2018/19 the sites where manual adjustments were made for abstraction within the calculation are Amersham, Marlowes, Piccotts End, Runleywood Chalk and Uttlesford Bridge.

For 2024/25 the sites where manual adjustments were made for abstraction within the calculation are Amersham, Debden Road, Digswell, Chesham, Chartridge, Holywell, Mud Lane, Newport, Periwinkle Lane, Oughtonhead, Springwell Farm & Wenden.

Iver is assumed to be running at near capacity at 215Ml/d from 2018 to 2025, with an associated increase in re-lift throughout the network.

Line 4 - Total number of raw water transport imports

Criteria

Data has been taken from our Asset Management Information System (our primary data source.)

Methodology

This is a new measure and as such we do not have a simple method of identifying the data using the raw data. Reviews of other data sources (Telemetry, Operating Manuals, P& IDs) have been undertaken to check all the known raw water transport network and connections with other companies.

We import raw water for emergency use only to our Iver works from Thames Water via a tunnel. There are no plans to increase the number of raw water transport imports during the 2018-25 period.

Line 8 - Total length of raw and pre-treated (non-potable) water transport mains for supplying customers

Due to a change in guidance with regards to reporting line criteria in the final methodology, following publication of our APR, the figure in this line is not directly comparable to that reported in our APR 2017/18.

Data is taken from our GIS system (our primary below ground asset database).

We ran a query on our GIS database to determine the total length of all in-use (excluding abandoned or isolated records) non-potable mains (water type = raw water, process water and other = 224.5km), plus our Iver import tunnels – 13.0km. Total 237.5km.

This total includes 5.4km of non-potable mains directly supplying customers.

Lines 9-23

For years prior to 2017/18 we used Abstraction as the base data. This year, DI was used as the base data based on OFWAT guidance. The number of works in each category was taken from our Asset Management Information System. The forecast DI was obtained as described in commentary above for Line 3

Lines 14,16,18,19,20,21 all contain APR values for 2017/18 whereas future years are based on a forecast DI from modelled data.

Lines 24-37 – inputs and methodology

Inputs

Data was taken from our Asset Management Information System in the first instance and site surveys for Southeast and East which were undertaken in 2017.

Methodology

Data was extracted using Business Objects for all sites with Treatment Works (WP) where the process level is marked as available. These processes are cross checked against the current Telemetry mimics in the Central region.

Line 24: Total number of SW simple disinfection works

We do not have any SW works and there are no plans for any SW simple disinfection works to be installed during the 2018-25 period.

Line 25: Total number of SW1 works

We do not have any SW1 works and have no plans for any SW1 works to be installed during the 2018-25 period.

Line 26: Total number of SW2 works

We do not have any SW2 works and have no plans for any SW2 works to be installed during the 2018-25 period.

Line 27: Total number of SW3 works

We do not have any SW3 works and have no plans for any SW3 works to be installed during the 2018-25 period.

Line 28: Total number of SW4 works

We do not have any SW4 works and have no plans for any SW4 works to be installed during the 2018-25 period.

Line 29: Total number of SW5 works

Our East region has one SW5 site, Ardleigh, which is maintained by Anglian Water with a 50% investment from Affinity Water. Our Southeast region has no surface works sites.

As per the guidance all the sites have multiple complex treatments (GAC, Ozone, Membranes) and there are no plans for any of the current sites to change category during the 2018-25 period.

Line 30: Total number of SW6 works

We do not have any SW6 works and there are no plans for any SW6 works to be installed during the 2018-25 period.

Line 31: Total number of GW simple disinfection works

As per the guidance we have only included sites with Marginal Chlorination as a single treatment process on site treating a raw water supply.

Differences from 2016/17 Annual Return

We now have 5 fewer sites than in 2016/17. Hughenden treatment has been turned off as part of the sustainability reductions programme. Redbourn, School Lane, Uttlesford Bridge and Wymondley have all had UV installed so have moved from GW to GW4 category.

2018-25 Data

We have 3 sites where we will be installing UV Treatment:

- Newport – to be installed by the end of 2018/2019
- Marlowes – to be installed during AMP7 increasing it from GW to GW4
- Temple End – to be installed during AMP7 increasing it from GW to GW4

Line 32: Total number of GW1 works

We do not have any GW1 works and there are no plans for any GW1 works to be installed during the 2018-25 period.

Line 33: Total number of GW2 works

As per the guidance this only includes sites where we have Super Chlorination as the most complex process. Two sites, Redricks Lane and Thaxted, also have RGFs but these are a simple physical treatment so do not affect the rating.

Differences from 2016/17 Annual Return

We now have 1 fewer than in 2016/17. Horsley Cross has been reclassified as GW3 after we realised that its previous GW2 classification was not in line with other sites that have similar treatment processes.

There are no plans for any of the current sites to change category during the 2018-25 period.

Line 34: Total number of GW3 works

As per the guidance we have included sites which have Superchlorination and another single complex treatment (Flocculation, Air Stripping). We have also classified Orthophosphate Dosing as a secondary complex treatment in this line.

Differences from 2016/17 Annual Return

We have 1 more site than in 2016/17. Horsley Cross has been reclassified as GW3 after we realised that its previous GW2 classification was not in line with other sites that have similar treatment processes.

2018-25 Data

Horsley Cross - planned to have treatment installed by the end of 2019/20 increasing it from GW3 to GW4. Runley Wood Greensands – site to be turned back on and recommissioned during AMP7, expected to be GW3.

Line 35: Total number of GW4 works

As per the guidance, we have included sites which have a single stage complex chemical/physical treatment with significantly higher costs than the previous treatment categories. This is mainly UV Treatment or GAC, but we do have 4 sites which have another type of treatment which fall into this category.

Differences from 2016/17 Annual Return

We have 3 more sites than 2016/17. Redbourn, School Lane, Uttlesford Bridge and Wymondley have all had UV installed so have moved from GW to GW4.

Debden Road has been reclassified as GW5 after we realised that its previous GW4 classification was not in line with other sites that have similar treatment processes. Sacombe is no longer treating water – it is now a raw water source to Whitehall WTW.

2018-25 Data

We have 5 sites that will have UV treatment installed:

- Newport – to be installed by the end of 2018/19 increasing from GW to GW4.
- Horsley Cross - planned to be installed by the end of 2019/20 increasing it from GW3 to GW4.
- Marlowes – to be installed during AMP7 increasing it from GW to GW4.
- Temple End – to be installed during AMP7 increasing it from GW to GW4.
- Hart Lane – to be installed during AMP7 increasing it from GW4 to GW5.

A further 4 sites will Nitrate Removal installed:

- Oughton Head – to be installed during AMP7 turning the site back on for use and expected to be GW4.
- Stansted – to be installed during AMP7 increasing it from GW3 to GW4.
- Kingsdown – to be installed during AMP7 increasing it from GW4 to GW5.
- Broome – to be installed during AMP7 increasing it from GW4 to GW5.

We will also turn off 3 sites:

Chesham, Chartridge and Runley Wood Chalk are due to be turned off by the end of AMP7, as part of the sustainability reductions programme.

Line 36: Total number of GW5 works

As per the guidance we have included sites which have a multiple stage complex chemical/physical treatment with significantly higher costs than the previous treatment categories. These are sites with a combination of UV Treatment, GAC, or Membranes.

Differences from 2016/17 Annual Return

We now have 1 more than in 2016/17. Debden Road has been reclassified as GW5 after we realised that its previous GW4 classification was not in line with other sites that have similar treatment processes.

2018-25 Data

Hart Lane will have UV treatment installed during AMP7 increasing it from GW4 to GW5.

Two sites will have Nitrate removal installed

- Kingsdown – To be installed during AMP7 increasing it from GW4 to GW5
- Broome – To be installed during AMP7 increasing it from GW4 to GW5

A further site will be turned off. Periwinkle - due to be turned off by the end of AMP7 as part of the sustainability reductions programme

Line 37: Total number of GW6 works

We do not have any GW6 works and there are no plans for any GW6 works to be installed during the 2018-25 period.

Line 38: Number of treatment works requiring remedial action due to raw water quality deteriorate on

Information has been collected from our Water Quality team, based on the DWI Undertakings that are in place for AMP6. We have included 6 water treatment works as requiring remedial action because of raw water deterioration in AMP7. These are listed in the table below. We included these schemes in our submissions to DWI in December 2017. We have not to date requested DWI technical support (or legal instruments) in respect of these schemes in light of the indications from DEFRA, DWI and EA that a consultation on targeted bans for metaldehyde use would be introduced in early 2018. That consultation has not materialised therefore we have written to DWI on 7 August 2018 requesting a review of our existing undertakings to extend the geographical area to which they relate. The number of sources requiring intervention in AMP7 is one lower than in AMP6 as we are scheduled to commission our new treatment facility at North Mymms by the end of AMP6.

2017/18	6	Four surface works (Iver, Egham, Chertsey and Walton), North Mymms, Ardleigh
2018/19		Four surface works (Iver, Egham, Chertsey and Walton), North Mymms, Ardleigh
2019/20		Four surface works (Iver, Egham, Chertsey and Walton), North Mymms, Ardleigh
2020/21	5	Four surface works (Iver, Egham, Chertsey and Walton) and Ardleigh
2021/22		Four surface works (Iver, Egham, Chertsey and Walton) and Ardleigh
2022/23		Four surface works (Iver Egham, Chertsey and Walton) and Ardleigh
2023/24		Four surface works (Iver Egham, Chertsey and Walton) and Ardleigh
2024/25		Four surface works (Iver, Egham, Chertsey and Walton) and Ardleigh

Line 39: Number of properties receiving water dosed with orthophosphate

Figures for 2017/18 were provided by our Water Quality team. Our assumption is that there will be no change to the number of WTWs where orthophosphate dosing will occur, so the 2017/18 figure has been increased across the years in line with forecast population growth trends as reported in Table WS3 Line 15 (taken from WRMP forecast). The calculation of the population growth factor applied to the population receiving ortho-dosed water is detailed below.

	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Total population served (Table WS3 Line 15)	3,603.807	3,649.302	3,692.982	3,826.743	3,867.549	3,906.851	3,944.375	3,979.896
Year on year change in population factor	1.000	1.013	1.012	1.036	1.011	1.010	1.010	1.009
Zonal population receiving water treated with orthophosphate	2,791.612	2,827.903	2,861.838	2,964.864	2,997.477	3,027.452	3,057.727	3,085.246

Line 40 – Average Pumping Head – Water Treatment

Inputs / methodology

The APH calculation has been completed using the new guidance from Ofwat set in RAG2.07 & RAG4.07 appendix 1 issued 2017/18.

The forecast distribution input (DI) for each region (Central, East and Southeast) is derived from our WRMP, for a normal year. The abstraction forecast is extrapolated from the actual AMP6 reported DI figures, taking into account imports and exports and applying an adjustment for treatment works losses, river augmentation volumes and raw water supplies (a total of 2.6% of abstraction).

When calculating site volumes, we have accounted for abstraction licence changes and sustainability reductions. In addition, internal transfer volumes have been adjusted to reflect capital investment improvements & optimum operational strategy to meet demand.

The proportion of the APH that has been calculated from measured (telemetry) flow and pressure values is 92% for 2016/17.

The proportion of the APH that has been calculated from historic telemetry flow and pressure values, in the forecast period is 76%. The remaining uncertainty comes from engineering calculation of lift and headlosses through the price controls.

2018-25 Data

For 2018/19 the sites where manual adjustments were made for abstraction within the calculation are Amersham, Marlowes, Piccotts End, Runleywood Chalk and Uttlesford Bridge.

For 2024/25 the sites where manual adjustments were made for abstraction within the calculation are Amersham, Debden Road, Digswell, Chesham, Chartridge, Holywell, Mud Lane, Newport, Periwinkle Lane, Oughtonhead, Springwell Farm & Wenden.

Iver is assumed to be running at near capacity at 215ML/D from 2018 to 2025, with an associated increase in re-lift throughout the network.

Lines 41-48 – Band Disclosure

We have used source level Deployable Output (DO) to reflect the maximum production capacity as the DO is constrained by the same factors as production capacity i.e. licence constraints, treatment constraints etc. We have three new supply side options included in AMP7, as well as 13 sites impacted by sustainability changes and/or sustainability reductions. These changes do not always cause a site to move to a different 'band', but often this is the case. The number of works has been taken from our Asset Management Information System.

Lines 49-56 – Band Disclosure

For years prior to 2017/18 we used Abstraction as the base data. This year, DI was used as the base data based on guidance notes. The number of works in each category was taken from our Asset Management Information System. The forecast DI was obtained as described in commentary for Line 12 in WN2.

Line 57 & 58: Total number of water treatment imports

We do not have any Water Treatment Imports from other Wholesalers.

There are no confirmed plans to create any Water Treatment Imports from other Wholesalers during the 2018-25 period so the forecast is left as zero for the BP submission, however, we are in discussion with Thames Water regarding a potential cross-connection between our respective treatment works at Walton to enhance mutual operational resilience.

Line 59 & 60: Total number of water treatment exports

We do not export Water to any Wholesalers Treatment Works.

There are no confirmed plans to create any Water Treatment Exports to other Wholesalers during the 2018-25 period so the forecast is left as zero for the BP submission, however, we are in discussion with Thames Water regarding a potential cross-connection between our respective treatment works at Walton to enhance mutual operational resilience.

Wn2 - Wholesale water distribution (explanatory variables)

Line 1 – Total length of potable mains as at 31 March

Data taken from the Geographical Information System (GIS).

For 2017/18 we ran a query to return all 'In Use' mains in the database and sum of mains length calculated. Future year forecasts 2018/19 onwards use this length as a base, the figures entered are the net effect of all planned and unplanned changes to the live network, with new water mains being installed and existing water mains being abandoned and isolated due to planned and emergency works.

The table below shows our programmes of work which involve the laying of new or abandoning of existing mains. Figures are in km. The total amounts at the bottom of the table are carried forward to Line 1.

	Total length of new mains	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Developer Services	New Mains	48	49	51	52	52	52	52	53
	Diversions	3	3	3.5	3.5	3.5	3.5	3.5	3.5
	Reinforcement	3	3	3.5	4	4	4	4	4
Trunk Mains	New Trunk Mains	0	2	3	7.5	7.5	7.5	8.5	8.5
Mains Renewals	Distribution	63	46	36	45	45	45	45	43
	Trunk	8	10	7	4	4	4	4	4
Above Ground	Mains Laying	2	1	1	1	1	1	1	1
Sustainability Reductions	Mains Laying	1	1	1	1	1	1	1	1
Operations	Cut-out replacement, Ad-hoc lay etc	2	1	1	2	2	2	1	2
HS2	Mains Laying	0	4	13	0	0	0	0	0
Total	**New Main Installed**	**130**	**120**	**120**	**120**	**120**	**120**	**120**	**120**

Developer Services	Abandonment	5	5	5	6	6	6	6	6
Renewals		76	59	45	54	54	54	54	54
Above Ground		1	1	1	2	2	2	2	2
Operations		16	16	16	18	18	18	18	18
HS2		0	4	13	0	0	0	0	0
Total	**Existing Main Abandoned**	**98**	**85**	**80**	**80**	**80**	**80**	**80**	**80**

Total	**Net Increase in New Main**	**32**	**35**	**40**	**40**	**40**	**40**	**40**	**40**

Line 2 – Total length of mains relined

No relining planned.

Line 3 – Total length of mains renewed

The table below lists all programmes where water mains are to be renewed and the length laid (km). Renewal activities also include diversions.

Line 3: Total Length of Mains Renewed									
Programme	**Sub-Programme**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
Developer Services	Diversions	1.3	3.0	3.5	3.5	3.5	3.5	3.5	3.5
Mains Renewals	Trunk	8.0	10.0	7.0	4.0	4.0	4.0	4.0	4.0
	Distribution	63.0	46.0	36.0	45.0	45.0	45.0	45.0	43.0
HS2	Diversions	0.0	4.0	13.0	0.0	0.0	0.0	0.0	0.0
Total Mains Renewed		**72.3**	**63.0**	**59.5**	**52.5**	**52.5**	**52.5**	**52.5**	**50.5**

Line 4 - Total length of new mains

The table below lists all programmes expected to install new water mains which extend our water network due to property building activity or new work to modify or improve the water network.

Line 4: Total Length of New Mains									
Programme	**Sub-Programme**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
Developer Services	New Mains	46.0	49.0	51.0	52.0	52.0	52.0	52.0	53.0
	Reinforcement	2.0	3.0	3.5	4.0	4.0	4.0	4.0	4.0
Trunk Mains	New Mains	2.0	2.0	3.0	7.5	7.5	7.5	8.5	8.5
Sustainability Reductions	New Mains	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Above Ground	New Mains	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Network Operations	New Mains	0.5	1.0	1.0	2.0	2.0	2.0	1.0	2.0
Total New Mains		**51.5**	**57.0**	**60.5**	**67.5**	**67.5**	**67.5**	**67.5**	**69.5**

Lines 5 through 8 – Total lengths of potable mains by diameter

Volumes taken from our Geographical Information System and adjusted for the programmes of work forecasted.

Line 9 - Capacity of booster pumping stations

Inputs / methodology

Data was extracted from our Asset Management Information System and site surveys using recently reviewed and updated asset data.

Through a detailed and systematic review of our assets and their processes it was identified that 3 previously included booster stations (Jupes Hill, Eastbury and The Grove) do not distribute potable water so have now been excluded. Similarly, it was also identified that two booster stations (Debden Road and Dunmow) were part of the water treatment process and therefore are also not distributing potable water. Decommissioned or disposed assets have been excluded. There is one additional converted booster station that has been added (Skeete).

2018-25 Data

Capacity increases in 2018/19 with Runley Wood (Chalk) due to come back into service. There are further increases in 2020/21 with a proposed new booster station from Egham to Iver and in 2021/22, where 3 new booster stations are proposed (Bulls Green to Preston, Preston to Sundon and Harefield). Oxhey Woods is to have new boosters in 2022/23. In the final year of AMP7 compacity continues to increase with the recommissioning of Runley Wood (Greensands), the upgrade of existing boosters at Ickenham, proposed additional booster at Oxhey Woods and the decommissioning of Runley Wood (Chalk).

Line 10 - Capacity of service reservoirs

Inputs / methodology

Data was extracted from our Asset Management Information System and site surveys using recently reviewed and updated asset data. Drawings, operational manuals and reports, and telemetry data have also been used to verify capacity.

Two new reservoirs have now been constructed at Sibleys and Paddlesworth and put into service during 2017 (June and October respectively). Bovingdon Reservoir 1 has been decommissioned.

2018-25 Data

There is an increase in years 3 and 4 of AMP7 to account for proposed additional service reservoir storage to be constructed at Chaul End (20 Ml/d), Preston (15 Ml/d) and Bulls Green (10 Ml/d) to improve operational resilience. The strategy for this additional storage is included in the resilience chapter of our business plan submission.

Line 11 - Capacity of Water towers

Inputs / methodology

Data was extracted from our Asset Management Information System and site surveys using recently reviewed and updated asset data.

2018-25 Data

There are no new water towers proposed for 2018-25. High Street Green Tower has been removed from 2018/19 onwards as it went offline in March 2018. There are currently no plans for decommissioning of any existing water towers.

All data provided for 2018-25 (lines 9-11) is based on EA decisions for AMP7 Sustainability Reductions, public consultation for WRMP and Resilience schemes.

Line 12 – Distribution Input

The first year of data required is 2017/18 and we have used actual distribution input (DI) as per the annual return figures. The subsequent years follow the values in the WRMP demand forecast.

Line 13-20

Inputs

For years prior to 2017/18 we used Abstraction as the base data. This year, DI was used as the base data as per guidance notes. The number of works in each category was taken from our works management system.

2018-25 Data

The forecast DI (adjusted for imports and exports) is based on our Water Resources Management Plan for a normal year. We apportioned the DI against the ratio for 2017/18 based on the three supply areas (Central, Southeast and East) and then at site level. When calculating site volumes, we applied abstraction licence changes and sites which we have agreed to turn off. For 2018/19 the sites where manual adjustments were made within the calculation are Amersham, Marlowes, Piccotts End, Runleywood Chalk and Uttlesford Bridge. For 2024/25 the sites where manual adjustments were made within the calculation are Amersham, Debden Road, Digswell, Holywell, Newport and Oughtonhead. Iver is assumed to be running at near capacity at 215ML/D from 2018 to 2025.

Lines 21 – 27 - Water delivered, total leakage, distribution losses and water taken unbilled

The first year of data required is 2017/18 and we have used APR data. The subsequent years follow the values in our WRMP forecast.

Line 21 - Water delivered (non-potable)

Non-potable water includes

- Eden Springs (WRZ1) Tanker takes direct from site - 0.06 Ml/d
- East Bergholt (WRZ8) Used for irrigation - 2.97 Ml/d
- The Grove Golf Course (WRZ6) - 0.09 Ml/d
- Dungeness Power Station (WRZ7) - 1.02 Ml/d
- RSPB Romney Marsh (WRZ7) - 0.001 Ml/d
- Aythorpe Roding (WRZ5) - 0 Ml/d
- Cemex UK (WRZ7) - 0 Ml/d

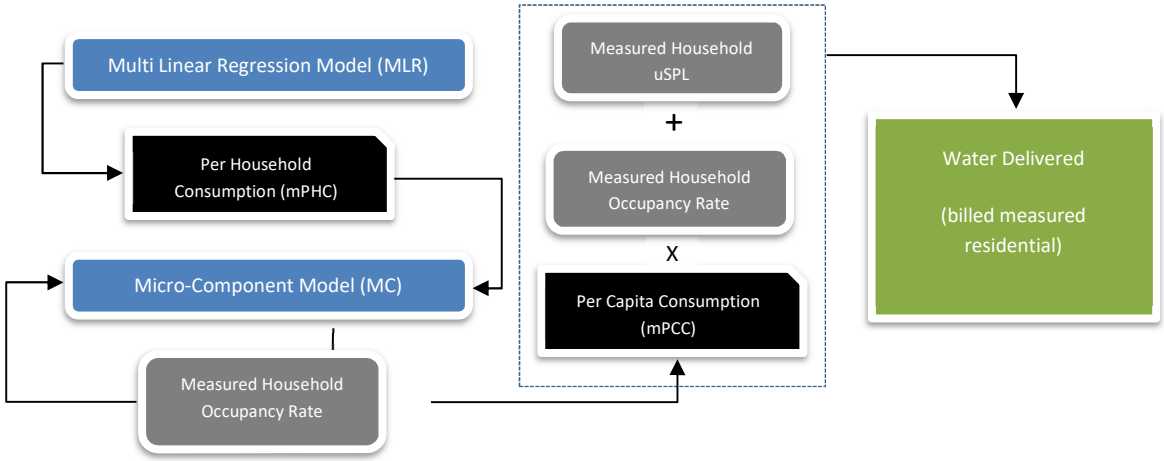
Line 22 – Water delivered (potable)

Throughout the planning period *Water Delivered Potable is* calculated as below:

$$\sum \begin{pmatrix} Water\ Delivered\ NonHH\ Measured \\ Water\ Delivered\ NonHH\ Unmeasured \\ Water\ Delivered\ NonHH\ Unmeasured \\ Water\ Delivered\ HH\ Measured \\ Water\ Delivered\ HH\ Unmeasured \\ Water\ Taken\ Unbilled \end{pmatrix}$$

Line 23 – Water delivered (billed measured residential)

Per Household Consumption forecast is derived via the MLR and MC models. Per Capita Consumption is then calculated by dividing mPHC with measured occupancy rate for each given year. Measured Household uSPL is included in the reported figures. The diagram below illustrates the steps involved in producing Water Delivered (billed measured residential).



Technical reports on the MLR and MC models are available if requested.

Line 24 – Water delivered (billed measured business)

Forecast was generated by consultants Servelec Technologies. Their report can be provided if requested. There is a notable drop from 2019/20 – 2020/21 (15Ml/d), this is due to the reclassification of non-household properties at the start of AMP7 in line with Market Reform.

Line 25 – Total Leakage

Our chosen Base Year was 2016/17. For 2017/18 we have included the actual value as per the annual return total leakage figure. For the remainder of AMP6 we have used the Leakage Performance commitments. For 2020/21 to 2024/25 we have used our proposed leakage performance commitments.

Line 26 – Distribution Losses

Throughout the planning period *Distribution Losses* is calculated as below:

$$Total\ Leakage - \begin{pmatrix} Measured\ NonHH\ uSPL \\ Unmeasured\ NonHH\ uSPL \\ Measured\ HH\ uSPL \\ Unmeasured\ HH\ uSPL \\ Voids\ uSPL \end{pmatrix}$$

Line 27 – Water Taken Unbilled

Water Taken Unbilled is a combined estimation of legally and illegally taken water via the company's distribution network.

Estimations are based on a report prepared by consultants Jacobs to support the estimation of minor components for dWRMP2009.

The reported value in our base year has been carried forward throughout the planning period.

Line 28-30 – Number of lead/GI/Other communication pipes

Inputs

Data was taken from PR14 Asset Inventory, Works Management System (WMIS), Lead Replacement Program information and other sources.

Methodology

Our methodology is consistent with our previous business plan and annual reporting as detailed below. We are currently reviewing our methodology to improve the accuracy of our reporting as part of our continuous improvement process.

Financial Year 2012/13 totals were collected from the PR14 Asset Inventory and were used as a baseline.

For 2017/18 data, WMIS was used for the Central Region and Maximo for the Southeast Region. The Central data was split by material; therefore, the quantities of lead and galvanized iron were obtained. Southeast Region data was provided as a combined total and split on the same proportions as Central. The number of replacements in the East Region is estimated at 25 total replacements.

The number of lead communication pipes replaced as part of our undertaking was collected from the Lead Replacement Program data.

The Number of New Connections was collected from Table 9 “Properties and Population”, lines 12 and 13.

2018-25 Data

The forecast for 2018/19 to 2024/25 was based on the average year-on-year variance from 2012/13 to 2017/18 and the forecast data of “Number of lead communication pipes replaced for water quality” from WS4 Line 1.

Line 31 - Number of booster pumping stations

Inputs / methodology

Data was extracted from our Asset Management Information System and site surveys using recently reviewed and updated asset data.

2018-25 Data

The number of booster pumping stations are in line with the booster capacities detailed in line 9.

Line 32 - Total number of service reservoirs

Inputs / methodology

Data was extracted from our Asset Management Information System and site surveys using recently reviewed and updated asset data.

2018-25 Data

The number of service reservoirs are in line with the capacities detailed in line 10.

Line 33 - Number of water towers

Inputs / methodology

Data was extracted from our Asset Management Information System and site surveys using recently reviewed and updated asset data.

2018-25 Data

There are no new water towers proposed for 2018-25 and similarly no proposed decommissioning of existing water towers so capacity remains the same. High Street Green Tower has been removed from 2018/19 onwards as it went offline in March 2018.

All data provided for 2018-25 (lines 9-11) is based on EA decisions for AMP7 Sustainability Reductions, public consultation for WRMP and Resilience schemes.

Lines 34 –41 – Total length of mains laid by age banding

Data taken from GIS system, our primary below ground asset database.

Length in km of In Use mains per age banding. The sum of lines 34-41 equal Line 1; the meterage increase in Line 41 year-on-year matches the sum of lines 3 (Total length of potable mains renewed) and 4 (Total length of new potable mains).

Lines 34 to 40 relate to mains laid between periods. Future changes to these bands have been calculated based on the last six years’ historical abandonment rate per band and projected forward making allowance for a reduced renewal programme of approx. 64%.

Line	Line Description	Avg Loss (km) pa	Scaled Down to c64% (km)
34	Total length of potable mains laid or structurally refurbished pre-1880	-0.6	-0.5
35	Total length of potable mains laid or structurally refurbished between 1881 and 1900	-1.3	-1.0
36	Total length of potable mains laid or structurally refurbished between 1901 and 1920	-4.8	-3.0
37	Total length of potable mains laid or structurally refurbished between 1921 and 1940	-27.8	-16.0
38	Total length of potable mains laid or structurally refurbished between 1941 and 1960	-52.9	-34.0
39	Total length of potable mains laid or structurally refurbished between 1961 and 1980	-35.1	-23.5
40	Total length of potable mains laid or structurally refurbished between 1981 and 2000	-3.1	-2.0
	Total	**-125.6**	**-80.0**

Line 41 records all mains laid since 2000 taken from our GIS.

Line 42 – Average Pumping Head Treated Water Distribution

Inputs / methodology

The APH calculation has been completed using the new guidance from Ofwat set in RAG2.07 & RAG4.07 appendix 1 issued 2017/18.

The forecast distribution input (DI) for each region (Central, East and Southeast) is derived from our WRMP, for a normal year. The abstraction forecast is extrapolated from the actual AMP6 reported DI figures, taking into account imports and exports and applying an adjustment for treatment works losses, river augmentation volumes and raw water supplies (a total of 2.6% of abstraction).

When calculating site volumes, we have accounted for abstraction licence changes and sustainability reductions. In addition, internal transfer volumes have been adjusted to reflect capital investment improvements & optimum operational strategy to meet demand.

The proportion of the APH that has been calculated from measured (telemetry) flow and pressure values is 92% for 2016/17.

The proportion of the APH that has been calculated from historic telemetry flow and pressure values, in the forecast period is 76%. The remaining uncertainty comes from engineering calculation of lift and headlosses through the price controls.

2018-25 Data

For 2018/19 the sites where manual adjustments were made for abstraction within the calculation are Amersham, Marlowes, Piccotts End, Runleywood Chalk and Uttlesford Bridge.

For 2024/25 the sites where manual adjustments were made for abstraction within the calculation are Amersham, Debden Road, Digswell, Chesham, Chartridge, Holywell, Mud Lane, Newport, Periwinkle Lane, Oughtonhead, Springwell Farm & Wenden.

Iver is assumed to be running at near capacity at 215ML/D from 2018 to 2025, with an associated increase in re-lift throughout the network.

The observed step change in APH from 2017/18 to 2018/19 is representative of variance between actual and optimum operational performance, irrespective of outage. The uplift in APH is due to the implementation strategy of increased utilisation of surface works, maximising associated re-lift for transport.

Line 43 Total number of treated water distribution import points

Distribution import points are considered to include those used for the purpose of:

- Strategic mass balance
- Local mass balance
- Strategic resilience
- Local resilience

It will not include:

- Fringe supplies – consumers connected to the AWL network, but situated outside the statutory boundary and consumers situated within the AWL statutory boundary but supplied by other companies.
- Inset agreements – consumers supplied by third parties operating inside the AWL statutory boundary for example Independent Water Networks Ltd.

These are captured with SS0-126 Cross boundary supplies an extract of which is shown below.

Community	Agreement		Connection	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	Connection Type
Central	AWS -Grafham	Ml/d	1	33.00	25.00	30.00	40.00	30.00	26.00	58.00	58.00	Bulk
Wey	Thames Ladymead	Ml/d	1	1.74	1.80	1.80	1.80	1.80	1.80	1.80	1.80	Bulk
Pinn	Thames Fortis & Hampstead Lane	Ml/d	2	0.31	0.35	0.35	0.35	0.35	0.35	0.35	0.35	Resilience & Bulk
Wey & Pinn	Thames Kempton & Stonebridge	Ml/d	2	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	Resilience
Stort	Essex & Suffolk	Ml/d	1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	Bulk
Stort	Cambridge	Ml/d	3	0.08	0.20	0.20	0.20	0.20	0.20	0.20	0.20	Resilience & Bulk
Dour	SWS - Kingsdown	Ml/d	1	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	Bulk
Dour	SEW - Chalksole	Ml/d	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Resilience
Brett	AWS -Ardleigh	Ml/d	1	5.44	6.00	6.00	6.00	6.00	6.00	6.00	6.00	Bulk
	Total	Ml/d		44.72	37.51	42.51	52.51	42.51	38.51	70.51	70.51	

The construction of HS2 will affect 6 of our groundwater sources with a combined capacity of 60 M/d. We have agreed with HS2 that we will install additional treatment at 2 sources, monitor the raw water quality at 3 more and secure an additional contingency supply transfer from Thames Water by recommissioning a currently non-operational connection between our respective systems at Pinner. We expect this supply to be commissioned in 2019/20 and have added that to our forecast. As this is a precautionary measure we are forecasting zero additional volume taken at this time (line 44).

We are continuing our dialogue with neighbouring companies to improve operational resilience of our supply regions. We have proposed a further new cross-connection with Thames Water at Cockfosters that would improve mutual resilience and have forecast that new connection to be commissioned in 2019/20. The volume take has been recorded as zero as any transfer would replace that taken from our current Fortis Green supply connection with Thames.

Line 44 The average daily water imported from third parties treated water distribution systems

Forecast and modelling of imported water volumes are aligned with:

- Distribution Input
- Distribution losses
- Total leakage
- AMP7 efficiency commitments
- Sustainability Reduction Programme

Line 45 Total number of treated water distribution export points

Distribution export points are considered to include those used for the purpose of:

- Strategic mass balance
- Local mass balance
- Strategic resilience
- Local resilience

It will not include:

- Fringe supplies – consumers connected to the AWL network, but situated outside the statutory boundary and consumers situated within the AWL statutory boundary but supplied by other companies.
- Inset agreements – consumers supplied by third parties operating inside the AWL statutory boundary for example Independent Water Networks Ltd.

These are captured with SS0-126 Cross boundary supplies

Community	Agreement	Connections		2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	Connection Type
Wey	SEW - Surrey Hills	1	Ml/d	21.25	36.00	36.00	36.00	36.00	36.00	36.00	36.00	Bulk
Lee	AWS - Chalton Village	1	Ml/d	0.1	0.12	0.12	0.12	0.12	0.12	0.12	0.12	Bulk
Stort	CWS - Odsey	1	Ml/d	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Bulk
Dour	SWS - Napchester	1	Ml/d	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Bulk
		4		21.37	36.14	36.14	36.14	36.14	36.14	36.14	36.14	
Stort	IWN Ltd - Bishops Stortford		Ml/d									Inset
Lee	IWNL - Bidwell		Ml/d		Not considered as BW for the purposes of business planning							Inset
Dour	IWNL - Hythe		Ml/d									Inset

As a result of the hot dry weather in summer 2018 we implemented a new operational connection in High Wycombe to supply Thames Water. This additional supply has been added to our reported value for 2018/19.

Line 46 The average daily water exported to 3rd parties' treated water distribution systems

Forecast and modelling of exported water volumes are aligned with the WRMP of those neighbouring water companies with whom we have Bulk Water Export agreements.

As part of our dialogue with neighbouring companies to secure additional mutual transfers we have discussed an option to reduce our current export to South East Water at Egham. South East have indicated their agreement in principle to this change and we have included a project in our resilience programme to transfer the resulting surplus supplies from our Wey region from 2024/5. At the current time, we have not forecast a change in volume exported in AMP7.

Wn3 - Wholesale revenue projections for the water network plus price control

Please refer to the “Financial Model Based Data Tables” section at the end of this document.

Wn4 – Cost recovery for water network plus

Please refer to the “Financial Model Based Data Tables” section at the end of this document.

Wn5 - Weighted average cost of capital for the water network plus control

General

We have entered the same values for actual and notional gearing, debt and asset betas as for the Appointed Business table. These values themselves are the same as published in the PR19 Methodology: Appendix 12: Aligning risk and return, pg. 16-18.

Wn6 - Wholesale water network plus special cost factors

General

We submitted our draft special cost factors to Ofwat in May 2018. We submitted the following claims:

- High Occupancy (resulting in extra costs due to higher treatment, pumping and capital maintenance costs per property, or per length of main)
- Treatment Complexity (higher costs associated with more complex treatment processes that arise from our portfolio of water sources)
- Regional Wages (wages are higher in Southeast England than the national average)
- Sundon Reservoir Conditioning Works (resulting from sustainability reductions)

The first three of these claims are modelling adjustments to the wholesale models. They are factors which we believe materially affect our costs, but which we don't expect to be accounted for in the models. This is a difficult exercise, because we cannot know what Ofwat's models will and will not cover. It is entirely possible that Ofwat's final models will account for these factors, in which case the adjustment claims will be redundant.

We carefully reviewed the draft models published by Ofwat March 2018, enabling us to assess the likelihood of the factors driving our costs being included in the models. Some models accounted for high occupancy, most accounted for treatment complexity, but in variable ways (some of which fully captured our costs, and some of which did not). Very few models accounted for differences in regional wages. On this basis, we continue to submit all three modelling adjustment claims.

The only major difference between the claims in our business plan and the draft submission in May is that we are no longer including the Sundon conditioning works as a project specific special factor instead wishing this to be assessed as part of our overall enhancement investment programme for AMP7.

Set out below are the cost adjustment claim summary forms following the format set out in Ofwat information note IN18/11.

Block A: Special cost claim 1

Lines 1 to 4

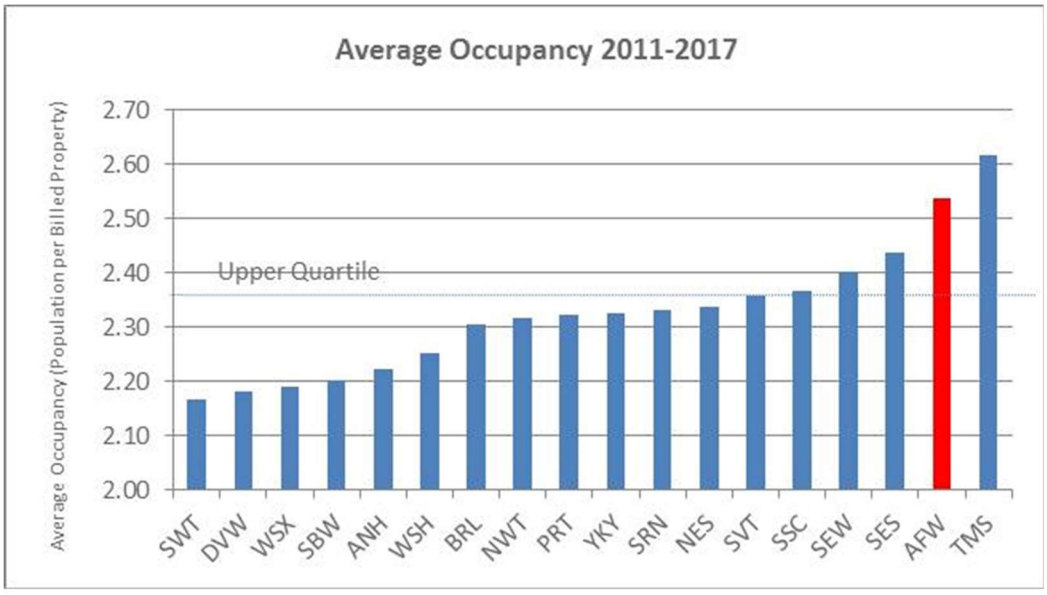
Cost Adjustment Claim Summary Forms, High Occupancy

Name of claim	High Average Occupancy	
Name and identifier of related claim submitted in May 2018	AFW 001	
Business plan table lines where the Totex value of the claim is reported	Table WN6 Line 3 – 4	
Total value of claim for AMP7	£27.906m	
Total Opex of claim for AMP7	£9.346m	
Total capex of claim for AMP7	£18.560m	
Depreciation on capex in AMP7 (retail controls only)	£0.00	
Remaining capex required after AMP7 to complete construction	£0.00	
Whole life Totex of claim	Not applicable	
Do you consider that part of the claim should be covered by our cost baselines? If yes please provide an estimate	Please see further information below. If the cost baselines are prepared from models that include simple population density measures, then our claim value would fall below the materiality threshold. If the cost assessment does not use models that include simple population density measures, or such models are given only a small weighting in the assessment, then we consider that the claim would not be covered.	
Materiality of claim for AMP7 as percentage of business plan (5 year) Totex for the relevant controls	3.23%	
Does the claim feature as a Direct Procurement for Customers (DPC) scheme? Please tick	Yes	No
		✓
	Brief summary of evidence to support claim against relevant test	List of accompanying evidence including document references, page or section numbers
1. Need for investment/expenditure	See below	See below
2. Need for the adjustment (if relevant)	See below	See below
3. Outside management control (if relevant)	See below	See below

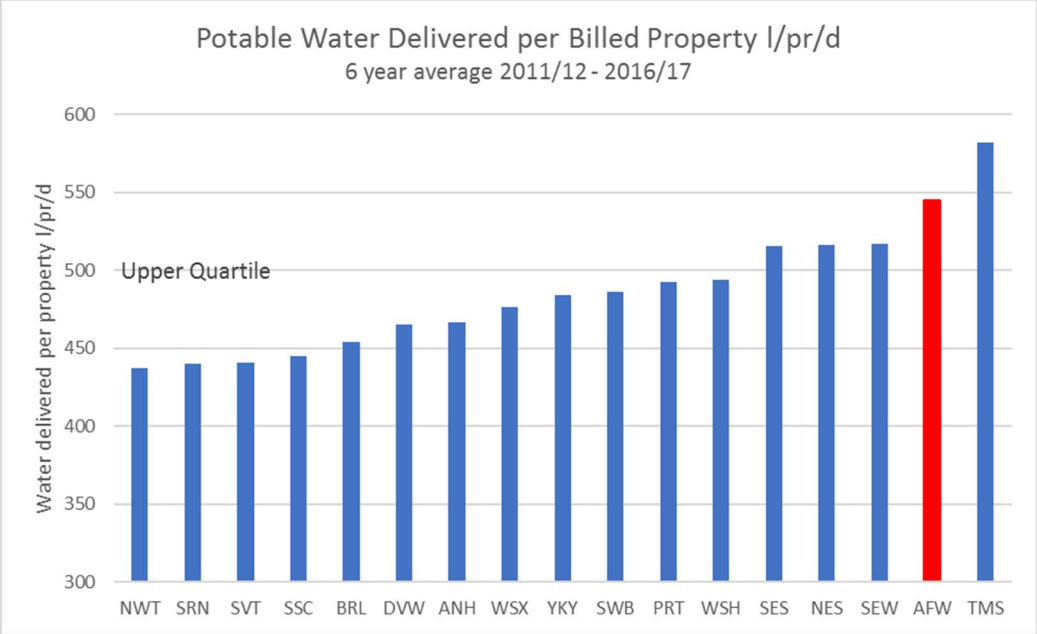
4. Best option for customers (if relevant)	See below	See below
5. Robustness and efficiency of claim's costs	See below	See below
6. Customer protection (if relevant)	See below	See below
7. Affordability (if relevant)	See below	See below
8. Board assurance (if relevant)	See below	See below

1. Need for investment/expenditure

Using data in the master data share file, we show that we have the second highest number of occupants per property in the industry and this results in high consumption per property. We incur higher Totex to provide, operate and maintain the larger capacity production and distribution assets necessary to satisfy these higher demands.



The effects of high occupancy are seen in the volume of water delivered per property.



2. Need for cost adjustment

Is there persuasive evidence that the cost claim is not included (or, if the models are not known, would be unlikely to be included) in our modelled baseline?

The models proposed by Ofwat for water resources plus, network plus water and wholesale water, use either the number of connected properties or the length of main as scale variables. These scale variables cannot capture variations in cost caused by the number of occupants per property, which produce differences in the volume of water delivered per property.

In the models proposed by Ofwat, 5 out of 10 of the water treatment only models use the volume of water treated as a scale variable. But the water treatment models measure only a part (17%) of our wholesale water Botex expenditure (Annual average £30m water treatment modelled costs out of £168m total modelled Botex). Therefore, these models can only be considered as partially capturing the effects that are the subject of this claim.

Of the non-water treatment models published by Ofwat, we note that 3 out of 12 of the wholesale water models, 2 out of 8 network plus models and 2 out of 8 treated water distribution models, use population density as an explanatory variable. In addition to capturing the effects of urbanisation on network costs, this variable could be considered as reflecting high occupancy levels and the costs that arise from that. The weighted density measure is likely to be a less effective variable for high occupancy since it only counts the most densely populated areas. This is less satisfactory because water demand is a function of average occupancy across the whole company, not just the occupancy rates in the most densely populated neighbourhoods.

It is not yet clear how much weight the water treatment models will carry in the final assessment, or whether Ofwat will choose model specifications that include population density measures. We have studied the differences in predicted costs in formulations of the Ofwat consultation models that include population density variables versus those that do not. We considered that this would help us estimate how much of our claim might already be included in models.

Beginning with the wholesale water models, we compared our simple average predicted expenditure across models OWW1 – OWW3 that do not include density variables, with the average across models OWW7 – OWW9 that include the simple population density measure.

We found that the models without density predict modelled botex of £165.8m. The models including simple population density predict on average £168.5m, a difference of £2.7m

An alternative approach is to study the results of the Network Plus models where we found that models ONPW1 – ONPW4, without density, predict modelled botex £154.0m whilst ONPW5 – ONPW6 including simple population density predict £164.7m, a difference of £10.7m. In addition to the effects on demand of high occupancy, it is likely that this difference also reflects the costs of operating networks in urbanised areas.

The treated water distribution models OTWD1 – OTWD4, without density, predict modelled expenditure £104.5m whilst OTWD5 – OTWD6 including simple density predict £111.1m, a difference of £6.6m. The difference between the £10.7m effect of density in the network plus models and the £6.6m effect in treated water distribution can be considered as the effect of density on treatment, resources and raw water transport. This is £4.1m.

In water treatment, the models OWT1 to OWT6 which do not include density, predict expenditure £41.9m where models OWT7-OWT8 with simple density predict expenditure £42.1m, about the same, or a little higher, although as noted above, models OWT2, OWT4 and OWT6 already use the volume of water as a scale variable.

From the range of econometric evidence, our conclusion is that if Ofwat select models for cost assessment that do not include the simple population density variable, our predicted expenditure is likely to be £2.7m - £4.1m lower per year than otherwise and the assessment is not likely to include our claim. On the other hand, if Ofwat includes and gives high weighting to models including simple population density measures in its assessment, our claim could be reduced by £2.7m - £4.1m per year. In this case it would be under £2.0m per year and under the materiality threshold.

Is it clear the allowances would, in the round, be insufficient to accommodate special factors without a claim?

Since we value the claim at £27.9m and this exceeds the materiality threshold of 1% set by Ofwat, we believe that the models, in the round, would not accommodate this factor without our claim being allowed.

3. Outside management control

Is the cost driven by factors beyond management control?

Occupancy rates are the result of socio-economic factors that drive population density in the south east of the country. These are factors outside of management control.

Is there persuasive evidence that the company has taken all reasonable steps to control the cost?

Although we cannot control the number of customers per property we can influence the amount of water used by the occupants of those properties to reduce the effect on costs. Between 2015 – 2020, our Water Savings Programme is expanding metered charging to incentivise customers towards careful water use. As part of this programme we are also operating a programme of home visits for water efficiency audits. Our annual returns show for example that since the beginning of the current AMP period to 2017/18 we have increased the number of properties subject to measured charging by 10%. Our management reporting information shows that we have carried out 69,355 visits for home water efficiency checks during AMP6. We also operate an ODI for average water use which will produce reductions to customers' bills if we do not achieve our planned reductions in average water use

In AMP7 we target further reductions in water consumption per occupant and propose in Table App1 reductions in per capita consumption from 152l/h/d today to 129l/h/d by 2025. If we are

successful, we will reduce water consumption faster than the industry average in the period to 2025, which will narrow the gap between our water delivered per property and industry comparators. This will mean that we need to produce less water than before, and will reduce the value of our claim. Accordingly, the value of our claim falls each year, and approximately halves by the end of the AMP7 period.

What incremental improvement would the proposal deliver?

Not applicable

Is there persuasive evidence that an investment is required?

Not applicable

Where appropriate, is there evidence – assured by the customer challenge group (CCG) - that customers support the project?

Not applicable

4. Best option for customers

Does the proposal deliver outcomes that reflect customers' priorities, identified through customer engagement? Is there CCG assurance that the company has engaged with customers on the project and this engagement been taken account of?

Not applicable

Does the company consider an appropriate range of options with a robust cost benefit analysis before concluding that the proposed option should be pursued?

Not applicable

Is there persuasive evidence that the proposed solution represents the best value for customers in the long term, including evidence from customer engagement?

Not applicable

5. Robustness and efficiency of costs

Is there persuasive evidence that the cost estimates are robust and efficient?

Compared to the industry upper quartile, on average over the last six years, we have delivered 42Ml/d more water to meet the extra demands required of us by high occupancy.

	11/12	12/13	13/14	14/15	15/16	16/17	Annualised Assessment (last 6 years)
Affinity Water potable water delivered Ml/d	783	740	774	765	772	773	768
Upper Quartile potable water delivered Ml/d	728	704	723	720	719	714	726
Difference Ml/d	55	36	51	45	53	59	42

We value the cost adjustment factor as the additional variable Opex (power and bulk supply Opex) associated with producing and distributing the additional water, plus the average annual capital maintenance charge per Ml/d for each additional unit of water. Our reason for including capital maintenance is that if the occupancy and hence the demand for water were lower, we

would be able to operate with smaller capacity assets, that would require proportionately smaller maintenance expenditure.

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	6yr avg	
	£m	£m	£m	£m	£m	£m	£m	
Opex Power expenditure	13.382	15.597	16.865	16.156	18.317	17.790	16.351	
Opex Bulk supplies	2.694	3.304	2.366	2.791	5.266	5.506	3.655	
Total Variable Opex	16.076	18.901	19.231	18.947	23.583	23.296	20.006	
Variable Opex for additional water	1.1273	0.9089	1.2707	1.1113	1.6147	1.7860	1.082	
Total capital maintenance expenditure	91.163	103.311	102.956	100.769	72.606	123.891	99.116	
Capital maintenance required for additional water	6.393	4.968	6.803	5.910	4.971	9.498	6.424	
Total	7.520	5.877	8.074	7.022	6.586	11.284	7.506	

To project our costs to 2024/25, we have used our forecasts of power and bulk supply operating expenditure from Table WS1. As noted above, the value of the claim is falling because we project that we will achieve our commitment to reduce average water use. If we are successful in this, we will need to produce and distribute less water, so expenditure will be lower than otherwise.

	20/21	21/22	22/23	23/24	24/25
	£m	£m	£m	£m	£m
Opex Power expenditure	23.216	22.317	22.317	21.368	21.368
Opex Bulk supplies	9.225	8.025	7.725	12.625	12.625
Total Variable Opex	32.441	30.342	30.042	33.993	33.993
Variable Opex for additional water	2.335	2.067	1.769	1.678	1.498
Total capital maintenance expenditure	77.190	65.287	65.962	50.499	49.539

Capital maintenance required for additional water	5.555	4.448	3.883	2.492	2.183
Total	7.889	6.515	5.651	4.170	3.681

Is there high-quality third-party assurance for the robustness of the cost estimates?

Our work on this special factor claim has been reviewed by our independent Reporter. We have taken our Reporter's feedback into account in finalising our special factor claim.

6. Customer Protection

Are customers protected if the investment is cancelled, delayed or reduced in scope?

Not applicable

Are the customer benefits that relate to the claim linked to outcomes and to a suitable incentive in the company's business plan?

Not applicable

7. Affordability

Has the impact on affordability been considered?

Not applicable

For large investment schemes, is there persuasive evidence that the investment does not raise bill higher than what is affordable?

Not applicable

8. Board Assurance

Does the company's Board provide assurance that investment proposals are robust and deliverable, that a proper appraisal of options has taken place, and that the option proposed is the best one for customers?

Not applicable

Block B: Special cost claim 2

Lines 5 to 8

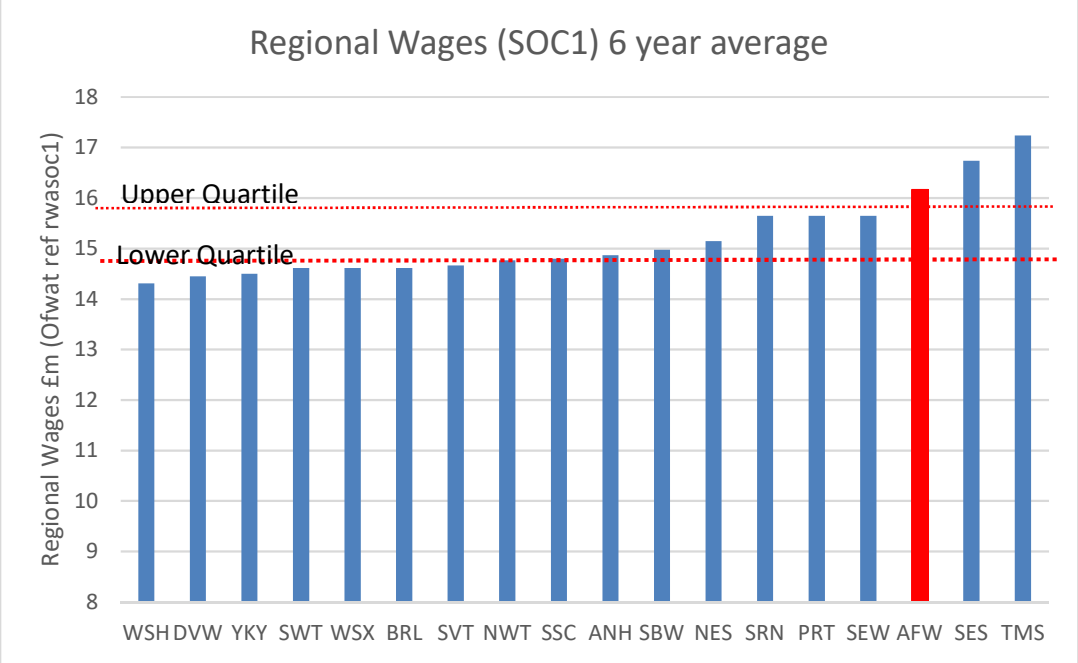
Cost Adjustment Claim Summary Forms, Regional Wages

Name of claim	Regional Wages	
Name and identifier of related claim submitted in May 2018	AFW 002	
Business plan table lines where the Totex value of the claim is reported	Table WN6 Line 7 – 8	
Total value of claim for AMP7	£12.5m	
Total Opex of claim for AMP7	£12.5m	
Total capex of claim for AMP7	£0.0m	
Depreciation on capex in AMP7 (retail controls only)	£0.00	
Remaining capex required after AMP7 to complete construction	£0.00	
Whole life Totex of claim	Not applicable	
Do you consider that part of the claim should be covered by our cost baselines? If yes please provide an estimate	Our best indication of cost baselines results from study of the Ofwat models released for consultation and the CEPA report. Neither of these have included regional wage adjustments so we do not believe that our claim is covered by cost baselines.	
Materiality of claim for AMP7 as percentage of business plan (5 year) Totex for the relevant controls	1.61%	
Does the claim feature as a Direct Procurement for Customers (DPC) scheme? Please tick	Yes	No
		✓
	Brief summary of evidence to support claim against relevant test	List of accompanying evidence including document references, page or section numbers
1. Need for investment/expenditure	See below	See below
2. Need for the adjustment (if relevant)	See below	See below
3. Outside Management control (if relevant)	See below	See below
4. Best option for customers (if relevant)	See below	See below
5. Robustness and efficiency of claim's costs	See below	See below

6. Customer protection (if relevant)	See below	See below
7. Affordability (if relevant)	See below	See below
8. Board assurance (if relevant)	See below	See below

1. Need for investment/expenditure

This claim The SOC1 and SOC2 data contained in Ofwat's master data set reflect the occupations relevant to the water industry, rather than the makeup of occupations in each region overall. They show that the wage premium for water industry occupations in our area of operation is 7%, third highest in the industry and above the upper quartile. The graph below shows the SOC1 comparison. An almost identical picture emerges from SOC2 data.



2. Need for cost adjustment

Is there persuasive evidence that the cost claim is not included (or, if the models are not known, would be unlikely to be included) in our modelled baseline?

None of the models published by Ofwat include regional wages as an explanatory variable, and the CEPA report prepared for Ofwat has not found econometric evidence to support the inclusion of regional wages in models. Thames Water have proposed models that include regional wages, but these have not proved to be statistically significant.

We think it unlikely that final models will include regional wages, nevertheless we continue to believe it is of economic significance to cost assessment.

We also note that the retail bad debt models issued for consultation make use of deprivation data and allow lower retail costs in areas of comparative affluence. These models reflect the benefits of high regional wages and incomes on default rates and bad debt costs. It seems one-sided to include the benefits of high regional incomes in one set of models, but not make allowance for the costs of those same influences in others.

Is it clear the allowances would, in the round, be insufficient to accommodate special factors without a claim?

Failing to control for regional wages in cost assessments risks underestimating costs for companies in high wage areas, whilst overestimating the costs of companies in lower wage cost areas. Our valuation of the effect of this special cost factor claim is at the materiality threshold, so allowances in the round are unlikely to accommodate the effect without allowance of the claim.

3. Outside Management Control

Is the cost driven by factors beyond management control?

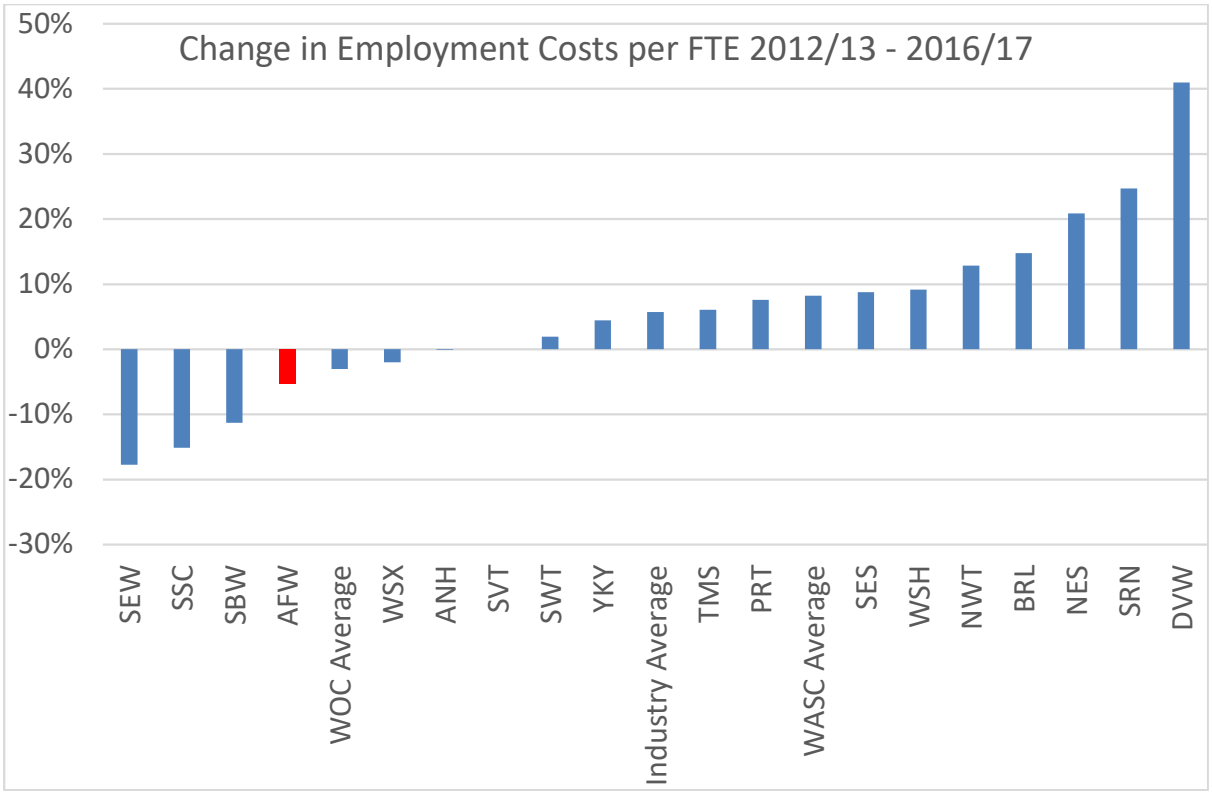
Our employment costs are primarily driven by our need to compete for the skills we need in labour markets. ONS data shows that there are regional differences in labour costs, with the highest cost regions being in and around London, our primary area of operations.

Our managers cannot control the underlying economics that cause high regional wages but they can manage our responses to the labour market conditions that we face. We have some degree of management control over labour costs, for example:

- Choice of inputs, for example substituting labour for capital
- Managing employees effectively so that they use time productively and perform to high levels of accomplishment
- The outcome of pay negotiations
- For non-location specific employees, the possibility of recruiting or basing operations in lower cost areas
- Choice over whether to buy in services or provide them with directly employed labour
- Choices over non-wage employment costs

Is there persuasive evidence that the company has taken all reasonable steps to control the cost?

To evidence our performance in controlling wholesale network plus employment costs, we have studied the evolution of employment costs as recorded in water company annual returns in the 5-year period 2012/13 to 2016/17 and released in Ofwat's master data set. The master data set records the direct and indirect employment costs that each company has attributed to water network plus, and the number of direct and indirect full time equivalent employees stated by each company. It is possible then to calculate a measure of employment cost per FTE and study how this has changed over the period of data capture.



We have studied the 5-year change in employment cost per FTE to compare our cost performance with that of the industry. The data shows that we have reduced our employment costs per FTE by 5% in nominal terms in the five-year period 2012/13 to 2016/17. The industry average position is that employment costs per FTE have risen by 6% over the same period. Within that industry average, WOCs have reduced unit costs by about 3% where WASCs unit costs have risen by about 8%.

The trends in average employment costs provide high level evidence that we have taken reasonable steps to manage our employment costs and in this matter, have produced better results than most of our comparator companies. The value of our claim would have been £0.2m higher each year, or £1.0m total if our employment costs had moved in line with the industry average. Our conclusion from the evidence is that our labour costs are higher than they otherwise would be because of regional wage differences in our area, but that over the last 5 years we have been able to control the inflation of those expenses more successfully than the rest of the industry on average. As a result, our special factor claim is £1m lower in total than it would otherwise have been.

4. Need for investment

What incremental improvement would the proposal deliver?

Not applicable

Is there persuasive evidence that an investment is required?

Not applicable

Where appropriate, is there evidence – assured by the customer challenge group (CCG) - that customers support the project?

Not applicable

5. Best option for customers

Does the proposal deliver outcomes that reflect customers' priorities, identified through customer engagement? Is there CCG assurance that the company has engaged with customers on the project and this engagement been taken account of?

Not applicable

Does the company consider an appropriate range of options with a robust cost benefit analysis before concluding that the proposed option should be pursued?

Not applicable

Is there persuasive evidence that the proposed solution represents the best value for customers in the long term, including evidence from customer engagement?

Not applicable

6. Robustness and efficiency of costs

Is there persuasive evidence that the cost estimates are robust and efficient?

We have valued the special cost factor by applying the SOC1 and SOC2 wages premium, 7% to our 2017/18 actual wholesale network plus employment costs as recorded in table 4V of our Annual Report and Financial Statements. In this report, our wholesale employment costs, excluding water resources were £36.063m. The 7% wages premium values the special factor claim at £2.5m per year, which equates to £12.5m over the 5 years of AMP7.

Is there high-quality third-party assurance for the robustness of the cost estimates?

Our work on this special factor claim has been reviewed by our independent Reporter. We have taken our Reporter's feedback into account in finalising our special factor claim.

7. Customer Protection

Are customers protected if the investment is cancelled, delayed or reduced in scope?

Not applicable

Are the customer benefits that relate to the claim linked to outcomes and to a suitable incentive in the company's business plan?

Not applicable

8. Affordability

Has the impact on affordability been considered?

Not applicable

For large investment schemes, is there persuasive evidence that the investment does not raise bill higher than what is affordable?

Not applicable

9. Board Assurance

Does the company's Board provide assurance that investment proposals are robust and deliverable, that a proper appraisal of options has taken place, and that the option proposed is the best one for customers?

Not applicable

Block C: Special cost claim 3

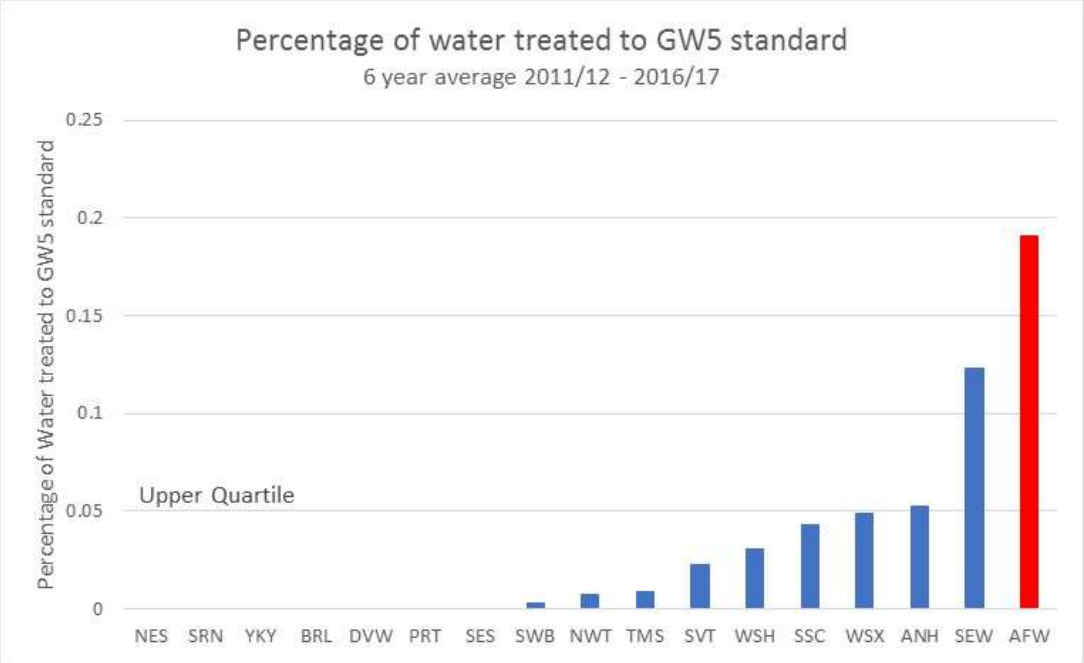
Lines 9 to 12

Cost Adjustment Claim Summary Forms, Treatment Complexity

Name of claim	Treatment Complexity	
Name and identifier of related claim submitted in May 2018	AFW 003	
Business plan table lines where the Totex value of this claim is reported.	WN6 Line 9	
Total value of claim for AMP7	£13.75m	
Total Opex of claim for AMP7 £m	£13.75m	
Total capex of claim for AMP7 £m	£0.0m	
Depreciation on capex in AMP7 (retail controls only) £m	£0.0m	
Remaining capex required after AMP7 to complete construction £m	£0.0m	
Whole life Totex of claim £m	Not applicable	
Do you consider that part of the claim should be covered by our cost baselines? If yes, please provide an estimate £m		
Materiality of claim for AMP7 as percentage of business plan (5 year) Totex for the relevant controls. %	1.0% - 1.25%	
	Yes	No
Does the claim feature as a Direct Procurement for Customers (DPC) scheme? (please tick)		✓
	Brief summary of evidence to support claim against relevant test	List of accompanying evidence, including document references, page or section numbers.
1. Need for investment/expenditure	See below	See below
2. Need for the adjustment (if relevant)	See below	See below
3. Outside Management control (if relevant)	See below	See below
4. Best option for customers (if relevant)	Not applicable	Not applicable
5. Robustness and efficiency of claim's costs	See below	See below
6. Customer protection (if relevant)	See below	See below
7. Affordability (if relevant)	Not applicable	Not applicable
8. Board assurance (if relevant)	Not applicable	Not applicable

1. Need for investment/expenditure

Across the E&W industry, Affinity Water treats the highest proportion of groundwater, using the most complex GW5 treatment processes. This can be seen on the chart below, taken from Ofwat's master data share file.



On average over the last 6 years, we have used GW5 complex treatment processes on 19.1% of our total water treated. This is above the upper quartile, (4.3%), more than 3 standard deviations above average and more than one standard deviation above the next nearest comparator (12.3%). This demonstrates that the treatment requirements of our groundwater differ significantly from those of our comparators.

2. Need for the adjustment (if relevant)

Is there persuasive evidence that the cost claim is not included (or, if the models are not known, would be unlikely to be included) in our modelled baseline?

Is it clear the allowances would, in the round, be insufficient to accommodate special factors without a claim?

Our different groundwater treatment complexity is not likely to be captured in econometric models for two reasons:

- Where Ofwat models issued for consultation include treatment complexity as an explanatory variable, they use the percentage of water treated in complexity bands 3-6, which does not distinguish well between companies that have high proportions of water treated using the most complex processes (for example they would not distinguish between a company that treated 50% of its water in complexity band 3, versus another company that treated 50% of its water in complexity band 5). As we treat a greater proportion of our water in band 5 than any other company, the model is not reflecting the difference between our complex treatment and those with simpler processes.

- Where the variable, proportion of borehole water is included in the models, it is usually interpreted as a proxy variable for cheaper to treat water, such as groundwater with simple

treatment. This proxy variable assumes that across the industry, borehole water is always and everywhere simple and cheap to treat. As the graph above demonstrates, this is not the case for Affinity Water, so the proportion of borehole water variable is likely to under-estimate our treatment complexity.

3. Outside Management control (if relevant)

Is the cost driven by factors beyond management control?

Is there persuasive evidence that the company has taken all reasonable steps to control the cost?

We have some management discretion to choose which treatment technologies we wish to employ to treat water. Our choices are those that prudent managers would make to ensure water is treated appropriately to manage non-compliance risks. Our managers can also, for example, take operational decisions to blend water from one or more sources to alter its properties prior to treatment. We can act to protect raw water quality to a certain degree, through for example catchment protection activities. We consider however that water treatment requirements are determined far more by the properties of the raw waters in our area and the importance of compliance with drinking water quality regulations.

What incremental improvement would the proposal deliver?

Not applicable

Is there persuasive evidence that an investment is required?

Not applicable

Where appropriate, is there evidence – assured by the customer challenge group (CCG) - that customers support the project?

Not applicable

4. Best option for customers (if relevant)

Does the proposal deliver outcomes that reflect customers' priorities, identified through customer engagement? Is there CCG assurance that the company has engaged with customers on the project and this engagement been taken account of?

Not applicable

Does the company consider an appropriate range of options with a robust cost benefit analysis before concluding that the proposed option should be pursued?

Not applicable

Is there persuasive evidence that the proposed solution represents the best value for customers in the long term, including evidence from customer engagement?

Not applicable

5. Robustness and efficiency of claim's costs

Is there persuasive evidence that the cost estimates are robust and efficient?

We have valued the effects of additional treatment complexity by studying the econometric evidence in models estimated by CEPA and Ofwat and published for the 2018 consultation.

The table below compares the efficiency scores for Affinity Water in the models re38 and re40 estimated by CEPA. These models differ because one included variables for treatment in bands 4-6, where the other does not.

Efficiency percentage CEPA Model re38 – (no treatment complexity variable)	70%
Efficiency percentage in CEPA Model re40 – (includes percentage of water treated in levels 4-6)	79%

The difference in expected expenditure between the two models is 9%, of our annual average modelled water treatment expenditure £30.6m. This is £2.75m, or £13.75m total for AMP7.

To cross check and provide a further valuation, we have tested an alternative approach, to adjust the variable, percentage of borehole water. The observations for Affinity water could be reduced by 19 percentage points in each year to reflect the average proportion of our water that is borehole water, but requires level 5 treatment.

We have compared the results of using Ofwat's OWT1 model, as published, with the alternative approach of re-estimating efficiency scores using OWT1 after adjusting the percentage of borehole water for complex groundwater as described above.

Expected annual expenditure for Affinity Water - Model OWT1 as published	£41.5m
Expected annual expenditure for Affinity Water - Model OWT1 after adjustment, reducing the percentage of borehole water variable by 19% to reflect complex groundwater	£44.9m

The difference in expected expenditure between the two models is £3.4m per year. Over the 5 years of AMP7 this amounts to £17.0m.

We have taken the lower of the two approaches to valuation, £13.75m as the value of this claim.

Is there high-quality third-party assurance for the robustness of the cost estimates?

Our valuations for this special factor claim are based on published third party data sources, the Ofwat and CEPA models released by Ofwat for consultation earlier this year.

6. Customer Protection

Are customers protected if the investment is cancelled, delayed or reduced in scope?

Are the customer benefits that relate to the claim linked to outcomes and to a suitable incentive in the company's business plan?

We currently operate an ODI for drinking water quality, based on Mean Zonal Compliance, which in addition to the drinking water quality regulations enforced by the Drinking Water Inspectorate, further incentivise us to maintain drinking water quality standards and protect customers should we not deliver the outcome as planned.

7. Affordability

Has the impact on affordability been considered?

Not applicable

For large investment schemes, is there persuasive evidence that the investment does not raise bill higher than what is affordable?

Not applicable

8. Board Assurance

Does the company's Board provide assurance that investment proposals are robust and deliverable, that a proper appraisal of options has taken place, and that the option proposed is the best one for customers?

Not applicable

The retail tables

R1 - Residential retail

General Overview

This table has been completed in outturn prices.

Line expenditure categories have been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts. Any variations on prior regulatory accounts submissions are detailed below.

Line 1: Customer Services

Line expenditure has been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts.

We have reclassified commission paid to local and housing authorities for collection of water bills in 2017/18 to show this as a debt management cost. In previous years this has been shown as a customer services cost and accounted for a drop of £0.7m in 2017/18.

Line 2: Debt Management

Line expenditure has been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts.

The reclassification mentioned under line 1: Customer services, accounts for an increase of £0.7m in debt management costs in 2017/18.

Line 3: Doubtful Debts

Line expenditure has been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts.

In 2017/18, we conducted a data cleanse exercise which focused on the billing accuracy of some of our most in-debt customers. This data has allowed us to increase the accuracy of our billed debt going forwards.

This has resulted in a one-off adjustment in 2018/19 to our provision for doubtful debt as we reflect the enhanced billing data we now hold. This change to our provisioning level can be seen in the bad debt charge for 2018/19. This one-off adjustment to our bad debt charge reverses in 2019/20 but ensures a lower rate of bad debt expense going forwards into AMP7, driven by our improved billing accuracy.

Line 4: Meter Reading

Line expenditure has been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts.

Line 5: Other Operating Expenses

Line expenditure has been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts.

Line 6: Local Authority and Cumulo Rates

Local authority rates have been allocated to residential retail based on the floor space that the team and support staff occupy.

This was previously reported in line 5 other operating expenses but has been separated for this table.

Line 7: Pension Deficit Repair costs

Our pension deficit repair cost has been calculated as the total cash contributions for our defined benefit pension scheme, minus the current service cost charges, which are included within our staff costs in lines 1,2 and 5.

Please note that this is a cash contribution value and does not represent an expense recorded in our regulatory income statement.

Only the current service costs of the scheme were included on retail tables in previous submissions of our regulatory accounts, which correctly reflected our retail expense under current accounting standards. We have re-stated our AMP5 and AMP6 residential retail costs to include the additional deficit repair contributions as calculated above.

The large contribution in 2012/13 contained a £16m one-off deficit repair contribution on change of ownership in June 2012, £2.0m of which related to retail.

The scheme is now in a technical provisions surplus position and we do not anticipate any further deficit payments throughout the remainder of AMP6 and AMP7.

Further details of our residential service costs and deficit repair payments can be seen in App22.

Line 9: Third party services operating expenditure

Line expenditure has been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts.

We do not provide any residential retail services to third parties and do not anticipate doing so in AMP7.

Line 11: Total depreciation on legacy assets existing at 31 March 2015

Line expenditure has been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts.

The total from Table 2D in the Regulatory Accounts (2015/16 – 2017/18) has been further analysed to identify assets existing at 31 March 2015. The figures for 2012/13 – 2014/15 have been calculated using the asset register at 31 March 2016.

Line 12: Total depreciation on assets acquired between 1 April 2015 and 31 March 2020

Line expenditure has been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts.

The total from Table 2D in the Regulatory Accounts (2015/16 – 2017/18) has been further analysed to identify assets acquired after 1 April 2015.

Line 13: Total depreciation on assets acquired after 1 April 2020

Line expenditure has been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts.

Line 15: Capital expenditure on assets principally used by retail

The total from Table 2D in the Regulatory Accounts (2015/16 – 2017/18) has been adjusted to include intangibles (2016/17 – 2017/18). The figures for 2013/14 – 2014/15 have been taken from Note 6 and in the case of 2012/13, Note 4.

Section B, line 16: Households connected

This has been calculated as the average number of connected properties during each year. Our assumptions on new properties are based on recent trends and underlying growth in the housing market, and align to the WRMP assumptions. Our WSP metering programme is driving the movement between unmeasured and measured and is based on customers switching to measured charges, which is typically up to two years after they have had a meter installed.

Section C line 17: Demand-side water efficiency ~ gross retail expenditure

Line expenditure has been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts.

Section C line 18: Demand-side water efficiency ~ expenditure funded by wholesale

Line expenditure has been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts.

This relates to our Home Water Efficiency Checks (HWEC) that the Water Savings Programme (WSP) perform before installing a customer's meter.

Section C line 20: Customer-side leak repairs ~ gross retail expenditure

Line expenditure has been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts.

Section C line 21: Customer-side leak repairs ~ expenditure funded by wholesale

Line expenditure has been produced in accordance with RAG 4.07 using the same assumptions as our 2017/18 regulatory accounts.

Section D line 24: Recharge from wholesale for legacy assets principally used by wholesale (assets existing at 31 March 2015)

The total from Table 2A in the Regulatory Accounts (2015/16 – 2017/18) has been further analysed to identify assets existing at 31 March 2015. The depreciation charge on these same assets plus any assets that were fully depreciated in 2012/13, 2013/14 and 2014/15 has been used to calculate the recharge for the remaining years (2012/13 - 2014/15)

Section D line 26: Recharge from wholesale assets acquired after 1 April 2015 principally used by wholesale

The total from Table 2A in the Regulatory Accounts (2015/16 – 2017/18) has been further analysed to identify assets acquired after 1 April 2015.

R2 - Residential retail special cost factors

General

We submitted our draft special cost factors to Ofwat in May 2018. We submitted the following claims:

- Retail Transience (high turnover of customers, leading to increased retail costs)

We carefully reviewed the draft models published by Ofwat March 2018, enabling us to assess the likelihood of our claims being included. None of the models accounted for transience, on this basis we will continue to submit this modelling adjustment claim.

Set out below are the cost adjustment claim summary forms following the format set out in Ofwat information note IN18/11.

Block A: Special cost claim 1

Lines 1 to 4

Cost Adjustment Claim Summary Forms, Retail Transience

Name of claim	Transience	
Name and identifier of related claim submitted in May 2018	AFW 004	
Business plan table lines where the Totex value of the claim is reported	Table R2 Line 3	
Total value of claim for AMP7	£7.80m	
Total Opex of claim for AMP7	£7.80m	
Total capex of claim for AMP7	£0.00	
Depreciation on capex in AMP7 (retail controls only)	£0.00	
Remaining capex required after AMP7 to complete construction	£0.00	
Whole life Totex of claim	Not applicable	
Do you consider that part of the claim should be covered by our cost baselines? If yes please provide an estimate		
Materiality of claim for AMP7 as percentage of business plan (5 year) Totex for the relevant controls	4.8%	
Does the claim feature as a Direct Procurement for Customers (DPC) scheme? Please tick	Yes	No
		✓

	Brief summary of evidence to support claim against relevant test	List of accompanying evidence including document references, page or section numbers
1. Need for investment/expenditure	See below	See below
2. Need for the adjustment (if relevant)	See below	See below
3. Outside management control (if relevant)	See below	See below
4. Best option for customers (if relevant)	See below	See below
5. Robustness and efficiency of claim's costs	See below	See below
6. Customer protection (if relevant)	See below	See below
7. Affordability (if relevant)	See below	See below
8. Board assurance (if relevant)	See below	See below

1. Need for investment/expenditure

Using data provided for us by our consultants, Economic Insight, we show that transience in our supply area (14.08%) runs at the second highest rate in the industry. It lies above the mean (11.25%) and upper quartile (12.66%). It is more than one standard deviation (2.43%) above the mean.

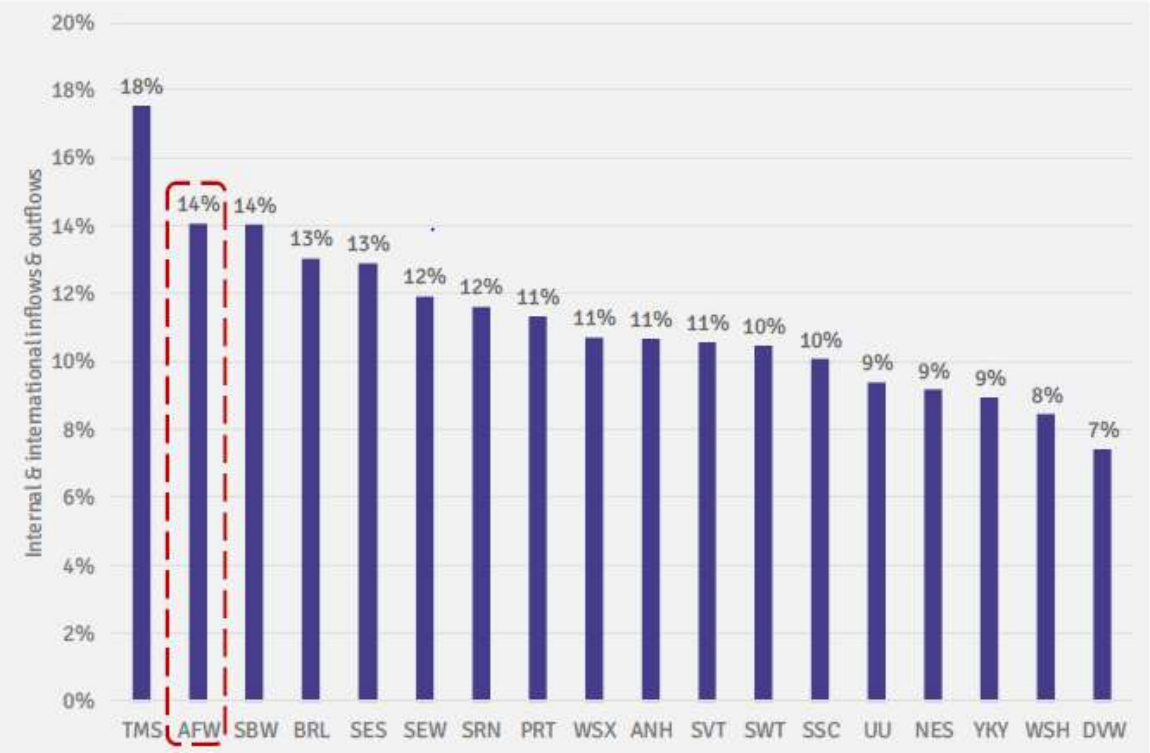
Data on transience in the UK is available for local authority areas from the Office for National Statistics (ONS). These distinguish between inflows and outflows; and between internal flows, which are population movements between UK local authorities, and international flows, to and from locations outside the UK. Data are not available on movements within UK local authorities. This generates nine transience measures, as set out in the table below.

Transience measures Variable	Description	
A	Internal inflows	Inflows from other UK local authorities
B	Internal outflows	Outflows to other UK local authorities
C	Total internal transience	A + B
D	International inflows	Inflows from locations outside the UK
E	International outflows	Outflows to locations outside the UK
F	Total international transience	D + E
G	Overall inflows	A + D
H	Overall outflows	B + E
I	Overall transience	G + H

By mapping the local authority transience data observations to water company supply areas, it is possible to generate measures of customer inflow and outflows for each water company

area, which provides the basis for company comparisons of transience. This is shown in the table and graph below.

Company	Internal Inflow rate	Internal Outflow rate	International Inflow rate	International Outflow rate	Total Inflow rate	Total outflow rate	Overall flow rate
TMS	6.7%	7.5%	2.3%	1.0%	9.0%	8.6%	17.5%
AFW	5.7%	6.2%	1.5%	0.6%	7.2%	6.9%	14.1%
SBW	6.5%	6.0%	1.0%	0.4%	7.6%	6.5%	14.0%
BRL	5.9%	5.4%	1.0%	0.8%	6.9%	6.2%	13.1%
SES	5.7%	5.9%	0.9%	0.5%	6.6%	6.3%	12.9%
SEW	5.6%	5.3%	0.7%	0.3%	6.3%	5.6%	11.9%
SRN	5.3%	5.0%	0.9%	0.4%	6.2%	5.4%	11.6%
PRT	5.3%	4.9%	0.7%	0.3%	6.1%	5.3%	11.3%
WSX	5.2%	4.6%	0.5%	0.4%	5.7%	5.1%	10.7%
ANH	4.9%	4.6%	0.8%	0.4%	5.7%	5.0%	10.7%
SVT	4.8%	4.6%	0.9%	0.4%	5.6%	5.0%	10.6%
SWT	5.1%	4.4%	0.5%	0.4%	5.7%	4.8%	10.5%
SSC	4.4%	4.5%	0.8%	0.4%	5.2%	4.9%	10.1%
UU	4.2%	4.1%	0.7%	0.4%	4.9%	4.5%	9.4%
NES	4.2%	4.1%	0.6%	0.3%	4.8%	4.3%	9.2%
YKY	3.9%	3.9%	0.8%	0.4%	4.7%	4.3%	8.9%
WSH	3.9%	3.7%	0.6%	0.2%	4.5%	4.0%	8.4%
DVW	3.3%	3.4%	0.4%	0.3%	3.8%	3.7%	7.4%



Transience increases our cost to serve relative to our comparators, principally by increasing bad debt costs since it is more difficult to collect outstanding revenues from customers who have moved out of our area without informing us of their new address. Transience also increases our frictional costs, such as the need to take additional closing meter reads when properties become unoccupied, issue additional final bills, manage more customer contacts and set up new accounts for new occupiers.

The 2.83 percentage point higher transience in our area equates to 33,000 more transient customer accounts to manage each year in our area than the industry average. This figure is derived by multiplying the percentage points of excess transience in our area by our number of billed properties.

From management information (see below) we calculate that the additional cost per transient customer is £47.31. By multiplying the additional cost to serve by the number of excess transient customers, we calculate that the additional retail costs of excess transience are £1.56m per year, or £7.80m over AMP7.

2. Need for cost adjustment

Is there persuasive evidence that the cost claim is not included (or, if the models are not known, would be unlikely to be included) in our modelled baseline?

None of the retail models proposed by Ofwat included transience within their explanatory variables.

Population density measures, which are correlated with transience were included in a quarter of the Ofwat wholesale models for consultation, but none of Ofwat's retail models included population density measures.

Some of the models proposed by companies included transience, either directly, or with indirect measures that might be correlated with transience, such as the proportion of private rented properties. We have no information to suggest that Ofwat intends to amend its models for consultation to include transience measures.

This leads us to conclude that transience has not been included in Ofwat's retail models, either explicitly or through proxy variables, and there is no information to let us expect that it will be

included in the final editions of the models. Our best assessment is that retail cost models are unlikely to reflect the differences in costs between companies that arise from high transience rates.

Is it clear the allowances would, in the round, be insufficient to accommodate special factors without a claim?

Since we value the claim at £6.6m and that this exceeds the materiality threshold, 4% set by Ofwat, we think that the models, in the round, would not accommodate this factor without our claim being allowed.

3. Outside Management Control

Is the cost driven by factors beyond management control?

Transience is a socio-economic phenomenon that depends upon the propensity of customers to move within our area and upon customer inflow and outflow to other water company areas and internationally. Managers cannot control the rate and flows of population migration. All types of customer migration create frictional costs for our retail business, but they are higher for migration in and out of our supply area.

Is there persuasive evidence that the company has taken all reasonable steps to control the cost?

Bad debt – customers that move from a supply address without notifying us or paying an outstanding bill are subject to debt recovery action. The majority of this action is completed by external debt collection agents who charge a commission based on cash collected. Thus, costs incurred are controlled by linking the fixed rate commission to cash recovered i.e. no cash recovered would incur no additional cost.

Home mover / change of hands – Measured customers require a meter reading to ensure accurate final billing. However, where customers can read the meter or we have sufficient usage data to accurately estimate a bill, we will not proceed with a final meter reading and therefore not incur the associated costs. During 2018/19, we plan to fully automate the on-line process, thus allowing customers to self-serve and register at a new address and complete a new account set-up online without the need for additional process steps involving operational resource. The online self-serve facility will be available 24/7.

In addition, advisors are trained in first time resolution for home movers providing an efficient service by reducing hand-offs and repeat contact and we have a proactive dedicated team focusing on false voids. Third-party data is used to validate responsibility for water charges, ensuring accurate and timely billing. Lastly, we actively use Landlord Tap - the national portal for landlords to advise tenant changes.

4. Need for investment

What incremental improvement would the proposal deliver?

Not applicable

Is there persuasive evidence that an investment is required?

Not applicable

Where appropriate, is there evidence – assured by the customer challenge group (CCG) - that customers support the project?

Not applicable

5. Best option for customers

Does the proposal deliver outcomes that reflect customers' priorities, identified through customer engagement? Is there CCG assurance that the company has engaged with customers on the project and this engagement been taken account of?

Not applicable

Does the company consider an appropriate range of options with a robust cost benefit analysis before concluding that the proposed option should be pursued?

Not applicable

Is there persuasive evidence that the proposed solution represents the best value for customers in the long term, including evidence from customer engagement?

Not applicable

6. Robustness and efficiency of costs

Is there persuasive evidence that the cost estimates are robust and efficient?

We have valued this special factor claim using management cost information and by studying the extent to which our retail costs to serve are exacerbated by customer transience. Our analysis is shown in the table below which allocates costs between transient and non-transient customers based on:

- The contribution to our bad debt provision of amounts attributable to transient customers versus others, based on our finding that 69% of the value of debt write-offs that we provide for, were attributable to transient customers.
- The cost of additional meter readings needed to issue final bills for transient customers, taking into consideration that ad hoc reads are more expensive (£6/read) than scheduled reads (£2.30) and the volume of ad hoc reads carried out for transient customers versus others.
- The number of contacts, where we found that 27% of customer contacts arose from the 14% of customers that were transient. The contact rate is essentially double that of non-transient customers

From our calculations, summarised below, we find that on average, a transient customer costs £62.43 to serve, 3.9 times as much to serve as a non-transient customer, £15.85.

	Total costs £m	Transient Customer Cost £m	Non-Transient Costs £m	Number of Transient Customers 000s	Number of Non-Transient Customers 000s	Cost to Serve per transient customer £	Cost ot Serve per Non-Transient Customer
Customer services	7.65	2.08	5.57	183	1,182	£ 11.40	£ 4.71
Debt management	2.04	1.23	0.81	183	1,182	£ 6.74	£ 0.68
Doubtful debts	8.63	5.21	3.42	183	1,182	£ 28.49	£ 2.89
Meter reading	2.89	0.46	2.44	91	636	£ 4.99	£ 3.83
Other opex	8.93	2.43	6.50	183	1,182	£ 13.31	£ 5.50
	30.14	11.41	18.73	822.70	5,363.15	£ 62.43	£ 15.85

Is there high-quality third-party assurance for the robustness of the cost estimates?

Our work on this special factor claim is being reviewed by our independent Reporter.

7. Customer Protection

Are customers protected if the investment is cancelled, delayed or reduced in scope?

Not applicable

Are the customer benefits that relate to the claim linked to outcomes and to a suitable incentive in the company's business plan?

Not applicable

Affordability

Has the impact on affordability been considered?

Not applicable

For large investment schemes, is there persuasive evidence that the investment does not raise bill higher than what is affordable?

Not applicable

8. Board Assurance

Does the company's Board provide assurance that investment proposals are robust and deliverable, that a proper appraisal of options has taken place, and that the option proposed is the best one for customers?

Not applicable

R3 - Residential retail ~ further information on bad debt and customer services

General Overview

This table has been completed in outturn prices.

Section A for 2012/13

During this period, we had three billing systems, one in each of our regulated companies; Affinity Water Central, Affinity Water East and Affinity Water Southeast. Our Southeast region billing system was not customised to generate aged debtor reporting and the Central and East systems produced outputs using different age brackets, as debt recovery was managed in each company separately. Any consolidation of these reports will be more misleading than useful for any analytical purposes as they would have to assume large apportionments of data across the defined age brackets. We believe that the seven years of aged debt data provided is sufficient to analyse trends in our recovery performance.

Line 2: Debt written off - residential

AMP6 historic values are as shown in our regulatory accounts for the same year. Future AMP6 years and AMP7 have been projected in line with our expected efficiencies detailed in table R1.

Based on our current systems, it is not possible to exclude court and other debt recovery costs from our write off values

Lines 3-15: Residential revenue outstanding

The above lines have been populated using pre-defined reports from our billing system for data relating to 2013/14 to 2017/18. Years 2018/19 and 2019/20 have been calculated based on our revenue expectations and improved doubtful debt performance as detailed in table R1.

Based on our current systems, it is not possible to exclude court and other debt recovery costs from our outstanding revenue figures

Line 16: Percentage of revenue collected each year

The percentage of revenue collected each year has been calculated based on our revenue expectations and improved doubtful debt performance as detailed in table R1.

Lines 17-21: Cost per channel of inbound contact

In line with table definitions, total contact centre costs have been divided by contact for each channel. As such the values shown on the table are not an accurate representation of the cost we incur for each channel as the same cost figure is being divided multiple times across each of the five channels.

Our costs per call, email and letters are increasing each year as fewer customers are expected to call our contact centres as they move to more digital channels to contact us.

Our cost per webchat and self-serve is reducing each year as more customers are anticipated to use these channels to contact us in the future.

Lines 22-27: Percentage of inbound contact by channel

Contacts by channel have been taken from our billing system for 2017/18 and projected to 2025 based on historic movement and adjusted for anticipated changes in customers behaviours and digital uptake.

Some of our contacts have been grouped together to ensure the 5 rows provided include the majority of our inbound contact.

Our email contact includes elements of our webforms that are processed manually. The automated elements are included under self-serve.

Webchat includes contact via social media as well as direct webchat on our website.

We receive a low volume of contact via SMS message that has been excluded from the analysis as it does not fit with any of the other contact types detailed. For this reason, our total contact percentages do not add to 100% on line 27.

Line 28: Cost per channel of inbound contact

Annual contact centre has been calculated from our residential retail costs used to populate table R1. The values stated are comprised of total expenditure from our billing, operational and debt contact centres as well as customer facing elements of meter reading, water saving, advanced care, directors office, internal communication and universal metering teams.

Overheads and management costs have been allocated on an FTE basis to each team mentioned above.

R4 - Business retail ~ Welsh companies

R5 - Business retail ~ non-exited companies operating in England

R6 - Business retail special cost factors

All of the above tables have been intentionally left blank as they are nil returns.

R7 - Revenue and cost recovery for retail

Please refer to the “Financial Model Based Data Tables” section at the end of this document.

R8 - Net retail margins

General

Row 1 was completed using the amount retail margin from Ofwat's document 'Delivering Water 2020: Our final methodology for the 2019 price review' issued December 2017 section 10.8.2, page 182-3.

Row 2 does not require any input as we have exited the NHH retail market.

R9 - PR14 reconciliation of household retail revenue

General

We have populated re-forecast customer numbers from the charges setting models we used at the time of setting tariff charges each year. We have completed actuals from table 2F of our Annual Report and Financial Statements.

We note that any differences between our forecasts and actuals that are not taken into account in PR19 price limits, such as the blind year 2019/20, will be accounted for in future reconciling adjustments at the next review.

During the first three years of this price control period, we have under-recovered retail revenue. This principally reflects higher take up of the social tariff than forecast each year when charges were set.

R10 - PR14 Service incentive mechanism

General

We have delivered improvements to our SIM score of 3.0% in 2017/18 against 2016/17 and 5.5% against 2015/16. We expect these improvements to continue during 2018/19 & 2019/20.

R10 Section D

We have calculated our expected SIM incentive as a 6% penalty on allowed retail revenue (household), as per the table below. This figure is calculated using the RPI inflation indices. The R10 table shows the equivalent value using CPIH inflation indices as required by Ofwat.

In projecting the penalty, within the allowed range -6% to -12%, we considered that customer satisfaction is good in absolute terms despite the fact that relative SIM results place us at the lower end of the industry range. We also considered that our SIM results have been on an improving trajectory over the first three years and we expect this to continue over the last two years.

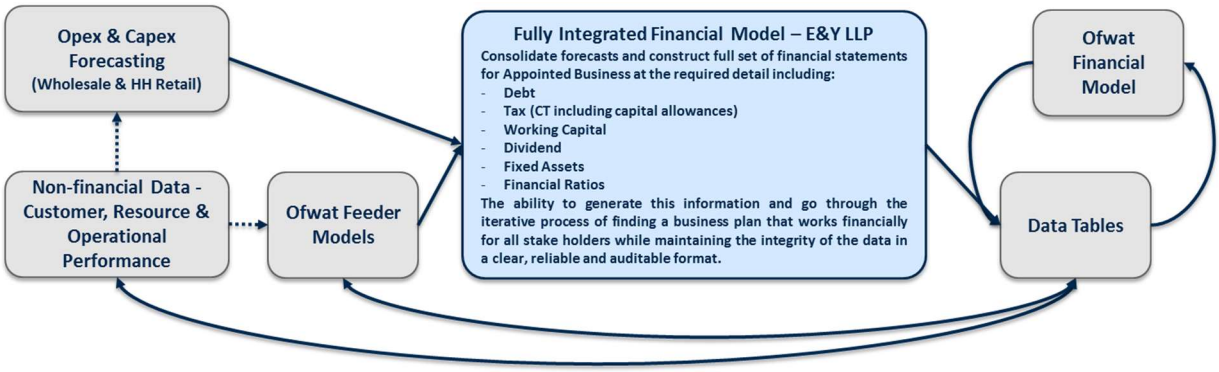
Item	Unit	2015/16	2016/17	2017/18	2019/18	2019/20	
Penalty	£m o/p	-6%	-6%	-6%	-6%	-6%	
Retail Allowed Revenue (outturn prices)	£m o/p	28.543	28.057	27.534	27.346	27.760	
Incentive	£m o/p	-1.713	-1.683	-1.652	-1.641	-1.666	
RPI	Dec	259.43	264.99	274.91	282.083	289.446	
Incentive 2017/18p	£m 17/18p	-1.815	-1.746	-1.652	-1.599	-1.582	-8.394

Financial Model Based Data Tables

General

There are several tables within the submission requirement and input requirements for Ofwat's PR19 Financial Model that rely on us carrying out financial forecasting and modelling for them to be completed. We took the approach to have a fully integrated financial model made for the specific purpose of completing this task; Ernst & Young LLP were commissioned to take on the model build (the Financial Model).

The Financial Model has been built based on regulatory accounting principles and applies financial modelling best practice. The Financial Model uses methods such as consistent and clear structuring and integrated economical and structural checks to ensure the integrity of the data and analysis is maintained and performed in a clear and auditable manner. The Financial Model will interact with Ofwat's published PR19 Financial Model, PR19 Feeder Models, PR19 Data Tables and PR19 Data Table and Financial Model Mapping Tool on a co-dependant basis to fully complete the submission requirement within the Data Tables. The illustration below displays the flow of data between the sources and outputs:



Output Tables

The data tables covered by the financial forecasting and modelling exercise are:

- App7 – Proposed price Limits and average bills
- App8 – Appointee financing – Section A
- App10 – Financial ratios
- App11 – Income statement based on the actual company structure
- App11a – Income statement based on notional company structure
- App12 – Balance sheet based on the actual company structure
- App12a – Balance sheet based on the notional company structure
- App13 – Trade Receivables
- App14 – Trade and other payables
- App15 – Cashflow based on the actual company structure
- App15a – Cashflow based on the actual company structure
- App16 – Tangible fixed assets
- App17 – Appointee revenue summary
- App18 – Share capital and dividends
- App19 – Debt and interest costs
- Wr3 – Wholesale revenue projections for the water resources price control
- Wr4 – Cost recovery for water resources
- Wn3 – Wholesale revenue projections for the water network plus price control
- Wn4 – Cost recovery for water network plus
- R7 – Revenue and cost recovery for retail

Base Year

The base year for the opening balance sheet is 2017/18, figures for this have been taken from the published 2017/18 Regulatory Accounts within the Annual Performance Report (APR).

Forecast Periods

The Financial Model operates on an annual period basis and covers the pre-forecast period which consists of the remainder of AMP6 (2018/19-2019/20), to calculate opening balances for AMP7 to be input into the Data Tables and Ofwat's PR19 Financial Model. The main forecast period is AMP7 (2020/21-2024/25) and extends to cover AMP8 also (2025/26-2029/30).

Regulatory Mechanics

Ofwat's PR19 Financial Model was used as the basis for the price control revenue build calculations and the Financial Model recreates the mechanics established by the Ofwat model. The Financial Model is built specifically for our needs so only covers the Water Resources, Water Network+ and Retail Household price controls.

Financial Calculations

The Financial Model uses financial modelling best practice and applies standard financial accounting principles to build up the financial statements. An income statement, cashflow statement and balance sheet are produced for each price control as well as for the total Appointee. Some key calculations are:

- Working capital – uses a 'days' approach based on the relevant revenue/cost/cashflow line (e.g. Trade debtors balance is calculated as a number of days outstanding based the revenue reflected in the income statement for that period)
- Corporation Tax – the forecast income statement and capital allowance calculations are used to derive profit to be applied for tax purposes and applies an input corporation tax rate to determine the tax charge for each period.
- Fixed Assets – capital assets are added to the opening asset register and depreciated over the input time frame to ascertain the depreciation charge and closing fixed asset balances for each period.
- Net Debt & Dividend – the amount of net debt and cash available for dividend is determined by the target gearing of Net Debt to RCV input into the model.

Data Table Inputs

As a basis for the financial forecast, the Financial Model requires inputs from several data tables, these are:

- WS1 - Wholesale water operating and capital expenditure by business unit
- R1 - Residential retail
- R8 - Net retail margins
- App22 - Pensions
- App23 - Inflation measures
- App25 - PR14 reconciliation adjustments summary
- App29 - Wholesale tax
- App32 - Weighted average cost of capital for the Appointee

Actual and Notional Debt Structures

The process requires that forecasting and testing is done with both the actual and notional debt structures. To be able to fulfil this need, two versions of the Financial Model have been prepared:

- Actual Debt Structure – this incorporates the actual financing structures in place at 31 March 2018 and applies the current financing strategy in forecast future periods

- Notional Debt Structure – this version puts in place a notional debt structure in line with the WACC assumption used (App32 – Weighted average cost of capital for the Appointee).

Price Base & Inflation

A large portion of the submission tables require inputs to be completed using the 2017/18 CPIH year average price base. This price base has been adopted within the Financial Model to fall in line with this requirement and uses the inflation forecast in data table App23 as the basis for conversion of 2017/18 CPIH year average figures to nominal and vice versa.

New Financing

The Financial Model calculates the new debt requirement for each period as the available net debt to RCV gearing capacity with an input target threshold (i.e. 80% net debt/RCV). The calculation will utilise available cash balances before the raising of new debt. New debt is raised using an RCF first and then re-financed into long term bonds when a suitable amount has been accrued.

Financial Analysis & Ratios

As part of assessing the suitability of the business plan it is necessary to examine key financial metrics. The Financial Model contains extensive analysis on the financial outputs and looks at financial metrics from several points of view:

- Securitised Debt Covenants – As part of the securitised debt structure in place around the regulated company there are restrictions specified financial ratios that must be complied with. These include Adjusted Interest Cover Ratios and Net Debt to RCV (gearing) Ratios.
- Rating Agency Key Metrics – We are required to be rated by at least 2 rating agencies who examine the financial performance of the regulated company to determine their ratings. Financial ratios such as Funds from Operations compared to Net Debt and Adjusted Interest Cover Ratios are key parts of this assessment.
- Ofwat's Financial Metrics – The regulator's approach to these financial performance metrics is examined to fall in line with metrics published each year as part of our Annual Performance Report.

Structural & Economic Integrated Checks

The Financial Model has been built to include an integrated audit function consisting of a series of formula and logic based tests that look at both structural and economic elements of its inputs, workings and outputs. This is built on financial modelling best practice principles and is used to ensure that the integrity of the data and cautions is maintained and that key economic tests, referencing the financial analysis and ratios functions, are compliant within tolerance levels. Failures in any of these tests would be brought to the user's attention within the top banner throughout the model which is clearly visible. Structural tests apply financial accounting principles such as:

- checking that the balance sheets balance;
- checking that the movements in cash balances on the balance sheets match the cashflow statements; and
- Checking that the movements in reserves on the balance sheets match the net profit on the income statements.

These checks provide reassurance that the financial calculations are being applied correctly as the data flows through the model. The economic checks allow the user to easily asses the suitability of the business plan inputs when examined against financial tolerance levels.

Table R7 – Revenue and cost recovery for Retail

We would like to note that table R7 has been prepared on the basis that the PR14 SIM forecast revenue adjustment at 2017/18 is not included as we do not believe it is covered by the table and guidance. We have however included this as part of Table R10 – PR14 Service incentive mechanism, and included it as a reduction to the numbers in our general modelling and reporting of total retail revenues.

Business Plan Presentation Proforma Tables

Please note the following aspects of these tables where we have noted discrepancies in the proforma tables provided.

2.2 Key Metrics

Line 5 Leakage/km/main/day: refers to PR19 Business plan table App7 line 7; we believe this should actually be App2 line7

Line 6 Leakage/property/day: refers to PR19 Business plan table App7 line 6; we believe this should actually be App2 line6

These changes were confirmed as correct with Stephen StPier, Ofwat

2.3 RCV

Table 2.3 RCV - Line 1: closing RCV reference should be App 8 lines 102 and 108, not just 108

Table 2.3 RCV Line 2: closing RCV reference should be App 8 lines 103 and 109, not just 109

These changes were confirmed as correct with Stephen StPier, Ofwat

2.4 Dividends

Line 1 Dividends based on PR14 actual company structure: Dividends based on PR14 actual company structure (nominal prices) to be drawn from APR table 1A line 15.
This line did not exist in APR 2015/16. However, we have provided the data.

6.1 Totex

Table 6.1 Totex: Lines 1&2: references line 36 'Water totex including cash items and atypical expenditure'; we believe this should actually be Line 21 'Totex'.

Ofwat have indicated that their preference is for us to use Line 36 and if there are particular concerns we have with this, we should explain this in a note in our submission. We have continued to reference Line 21 in the data tables as we feel Totex is the appropriate line to use.