Cost Water
PR24 data tables commentary

PR24 Draft Determination Representations – August 2024

Costs (wholesale) water PR24 Data Table Commentary

Overview of changes to Costs of Wholesale Water tables

We have updated our data tables to reflect our Draft Determination Representations in accordance with Ofwat requirements, including updating 2023-24 forecasts with actuals for both APR aligned and non-APR aligned data.

We have provided commentary on material changes made to the data in the tables. Please refer to our original data table commentary (ANH07 to ANH18) if more information is required.

We have made changes to the following Cost of Wholesale Water tables since submitting the version of our data tables that our Draft Determination is based on (ANH03 Data tables - March 2024 update). Please see the Change Log in ANH_DD_004 - v7 Main data tables for a more detailed summary and the individual tables themselves for changes in red font:

- CW1
- CW1a
- CW2
- CW3
- CW4
- CW5
- CW6
- CW7
- CW7a
- CW8
- CW9
- CW10
- CWW11
- CW12
- CW13
- CW14
- CW15
- CW16
- CW17
- CW18
- CW19
- CW21

CW1 Totex analysis - water resources and water network+ (post frontier shift and real price effects)

Base costs

Our costs reported in line 1, Base Operating expenditure, and line 8, Base Capital expenditure, have been aligned with the DD allowances with the exception of the items included in our Representations. Please refer to the 'Driving cost efficiency - base' chapter for more detail (ANH_DD_001). These items have been allocated to the Price Controls and split between Base Operating and Capital expenditure as follows:

Table 1 DD Representations cost allocation Post RPE and Frontier Shift (£m)

	Water Resources		Water Network +	
	Opex	Capex	Opex	Capex
Energy	14		71	
Mains Renewal CAC				191
Leakage CAC			68	
Boundary boxes CAC				138
Modelling update to include 2024 data	4	1	22	9
Totals	**18**	**1**	**161**	**338**

As a result of the above, the opex/capex split differs from that published by Ofwat in the DD. In Chapter 14 Risk and Return (ANH_DD_001) we discuss the impact of opex and capex splits on the Pay as you go rates. As Ofwat makes any final changes to our Totex submission it is thus crucial that these are also reflected in the final PAYG rates, such that they continue to reflect the natural rate for each price control.

Developer Service activities

Developer Services activities for Water expenditure and revenue includes; infrastructure charges, site-specific services and diversions.

The data populated correlates with data presented in tables DS1e for water revenue, DS2e for water expenditure and table CW11 for water diversions.

Years 3 & 4 (2022-23 & 2023-24) for AMP7 has been populated in line with our APR submissions. All future years have been reported based on forecast shown in table DS4. All future years have been populated to report in ‘treated water distribution’ only.

The data populated here is inclusive of frontier shift and real price effect with the exception of diversion/third party services lines which are pre-adjustment.

Enhancement expenditure

Please refer to the commentary within CW3 for details of enhancement expenditure.

CW2 Base expenditure analysis - water resources and water network+

Please refer to the base operating expenditure commentary within CW1 for commentary in relation to CW2.

CW3 Enhancement expenditure - water resources and water network+

We have provided detailed evidence in response to Ofwat's Draft Determination in ANH_DD_0018 to ANH_DD_021. Each line of expenditure in the table is cross referenced to an enhancement case. We have developed a comprehensive evidence base covering all our enhancement expenditure and aligned the structure of our enhancement cases to the evidential requirements set out by Ofwat in the Final Methodology Appendix 9, Annex 1.

Other enhancement (Freeform lines - by exception) Lines 3.130 - 3.139

Table 2 Additional lines description

Line reference	Additional line use	Rationale
Additional line 1	AMP7 use	This line was used for AMP7 costs.
Additional line 2	PFAS	PFAS is a discrete new investment that does not fit into another Ofwat Investment Category
Additional line 3	(Unused)	Line 3 was used for an earlier iteration of reporting but later removed. Therefore, Line 3 is unused.
Additional line 4	(Unused)	Line 4 was used for an earlier iteration of reporting but later removed. Therefore, Line 4 is unused.
Additional line 5	DWI ECAF	DWI ECAF is a discrete new investment and has beenrequested to not be put with the other Cyber investment so it has been put in as an additional line.

CW4 Raw water transport, raw water storage and water treatment data

Raw water transport and storage

Simple disinfection works - Treatment type analysis (CW4.13-26)

We have updated our data on the basis of changes in year four as reported in our APR 24 and applied these changes to future years. Additionally we have made updates to the data for AMP8 reflecting updates to our water quality enhancements for nitrate, odour and PFAS, and to our WRMP enhancements for disinfection using ultra violet treatment. The details of these investments can be reviewed in our Enhancement Strategy documents:

- ANH_DD_018 Resilient to flood PR24 DD Representation enhancement strategy
- ANH_DD_019 Ecological quality PR24 DD Representation enhancement strategy
- ANH_DD_020 Carbon neutral PR24 DD Representation enhancement strategy
- ANH_DD_021 Sustainable growth PR24 DD Representation enhancement strategy

Energy Consumption - Raw Water Transport and Water Treatment (CW4.7 and CW4.50)

There has been no change to the methodology used to calculate the forecast of energy consumption for Raw Water Transport and Water Treatment, rather the lines have been advanced by one year with updated information.

For the whole of the water function, we have applied a financial split from regulatory accounts between abstraction, raw water transport, water treatment and treated water distribution for electricity consumption. This financial split is based upon assessments of proportional use by different business units made by the finance team and operational managers. The split used in 2023's draft Business Plan was that used in the 2022/23 APR and our update has used the split from the 2023/24 APR. This accounts for some of the differences between the original and updated forecasts.

More generally, the energy consumption figures in table CW4 lines 7 and 50 have been updated for the following:-

- The forecast for 2023/24 has been updated with the final APR 2023/24 figures;
- The updated forecast for 2024/25 is now based upon our budgeted forecast for that year for electricity and gas, including forecasts of 'behind the meter' renewable electricity from solar arrays;
- The revised phasing of capital investment schemes in the updated Plan; and
- Updated abstraction forecasts which we have used to adjust consumption forecasts.

Forecasts of on-site fuel consumption and transport utilise the actual figures used in APR 2023/24. The allocation to different business units has been determined by the split of electricity in our 2024/25 budget and this allocation has remained constant in the forecasts through to the end of AMP8.

There has been no change to the allocation of optimisation efficiencies.

Water treatment - other information

CW4.48: Zonal population receiving water treated with orthophosphate

Note that the population forecast has been updated to reflect the 2023/24 base-line.

The zonal population receiving water treated with orthophosphate is calculated from the information reported to the DWI in the Details Tables provided annually in accordance with the Information Direction. All Public Water Supply Zones (PWSZ) receiving orthophosphate dosed water are identified in the Details Tables which also document the population of each PWSZ.

There has been a steady increase in the population receiving orthophosphate dosed water, which is partly due to the increase in the number of WTWs with orthophosphate dosing plant in operation, as well as the general increase in total population we serve. This now stands at 100 per cent for 2023/24 and 2022/23, up from 98.58 per cent for 2021/22. This means that for 2023/24 the total population served is 5,064,108.

For the resubmission we have re-aligned the WRMP24 forecast population increase to the revised 2023/24 base-line value of 5,064,108. We forecast for future years that our full population, as forecast for WRMP24 will be classed as receiving orthophosphate dosed water. We expect the Anglian Water population to increase to 5,332,732,by 2029/30 (268,624 by the year 2029/30)

CW5 Treated water distribution - assets and operations

Assets and operations

Note that the demand forecast has been updated using the WRMP24 model and assumed demand management options (preferred plan), but re-assessed to include the 2023/24 out-turn, as the updated base-line.

This has led to revised:

· Demand (DI forecasts) (rebased to the 2023/24 out-turn, and expected AMP7 out-turn). DI out-turns for 2029/30 are similar (approximately 1ML/d higher) to those originally forecast for WRMP24.

· Revised PCC forecasts (rebased to the 2023/24 out-turn). We are now predicting a lower than originally forecast PCC 2029/30 out-turn for WRMP24.

· Revised Leakage forecast (rebased to the 2023/24 out-turn, and expected AMP7 out-turn). We are now predicting a higher than originally forecast leakage 2029/30 out-turn for WRMP24.

· Revised Non-HH demand forecast (rebased to the 2023/24 out-turn). We are now predicting a higher than originally forecast non-HH demand 2029/30 out-turn for WRMP24, mainly due to an increase in the base-line value.

CW5.4: Water delivered (non-potable)

2023/24 base-line figures have been aligned to APR out-turn values.

The forecast figures for water delivered (non-potable) have been derived from the revised draft WRMP24 forecast. These reflect values for non-potable demand in our South Humber Bank water resources zone and include an initial assessment of non-potable demand requirements for hydrogen production and carbon capture. These figures remain unchanged.

CW5.5: Water delivered (potable)

2023/24 base-line figures have been aligned to APR out-turn values.

Forecast water delivered values have been derived from our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24.

The forecast reflects the Normal Year Annual Average (with the revised 2023/24 water balance base-line.

These values include the effects of the WRMP24 demand management options; full smart meter rollout by 2030, water efficiency, metering policy, non-household water efficiency, COVID impacts and government led interventions included in the preferred plan. The forecast figures exclude distribution losses and DSOU values.

The full forecast methodology and preferred plan details are provided in our ‘Revised Draft WRMP24 Technical Report: Demand Forecast’ and ‘Revised Draft WRMP24 Technical Report: Demand Management Preferred Plan’ reports.

Despite a population increase of 310K, we expect potable consumption to decline from 1008.75Ml/d (2023/24) to 988.54Ml/d (2029/30).

CW5.6: Water delivered (billed measured residential properties)

2023/24 base-line figures have been aligned to APR out-turn values.

Forecast water delivered values have been derived from our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24.

The forecast reflects the Normal Year Annual Average (with the revised 2023/24 water balance base-line).

These values include the effects of the WRMP24 demand management options; full smart meter rollout by 2030, water efficiency, metering policy, non-household water efficiency, covid impacts and government led interventions included in the preferred plan.

Note that these updated forecast values reflect the lower than anticipated (in the WRMP24 forecast) household demand and PCC values for 2023/24 of 127.6 l/h/d (as opposed to the original PCC value of 133.2 l/h/d for 2023/24).

With demand management and despite growth we expect these values to remain relatively stable rising from 531.36Ml/d in 2023/24 (as opposed to the original WRMP24 value of 552.71) to 539.88Ml/d by 2029/30 (due to growth in the region).

CW5.7: Water delivered (billed measured businesses)

2023/24 base-line figures have been aligned to APR out-turn values.

Revised forecast water delivered values have been derived from our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24.

The forecast reflects the Normal Year Annual Average (with the revised 2023/24 water balance base-line).

These values include the effects of WRMP24 non-household demand management options included in the preferred WRMP24 plan.

Revised forecast Non-household consumption has been derived from the WRMP forecast using regression analysis of the various industrial sectors and forecasting future consumption based upon the East of England Forecast Model (EEFM) and appropriate factors, GVA (Gross value Added), employment and population growth.

We have recently experienced significant pressure regarding non-household demand growth and this is reflected in the revised baseline figure of 305.12Ml/d (as opposed to 299.76 Ml/d anticipated in the WRMP24 forecast, 2021/22 base-line).

With demand management and despite growth we expect the revised forecast values to remain relatively stable decreasing from 305.12Ml/d in 2023/24 to 305.8Ml/d by 2029/30. This would still reflect an approximate 10 Ml/d saving due to non-household demand management options.

CW5.8: Proportion of distribution input derived from impounding reservoirs

2023/24 base-line figures have been aligned to APR out-turn values.

Revised forecast figures have been revised from the original draft determination and rebased to the 2023/24 out-turn.

Historical Distribution input (DI) data used to derive the proportional split is supplied by the Leakage Team. The past three years data has been used to derive an average split and this has been applied for the forecast period. We, consequently forecast the proportion of distribution input derived from impounding reservoirs will be approximately 2.1%.

Table 3

	2020-21	2021-22	2022-23	2023-24	2024-25
Proportion of distribution input derived from impounding reservoirs	0.02	0.022	0.021	0.021	0.21
Proportion of distribution input derived from pumped storage reservoirs	0.403	0.40	0.417	0.407	0.409

	2020-21	2021-22	2022-23	2023-24	2024-25
Proportion of distribution input derived from river abstractions	0.073	0.070	0.068	0.070	0.070
Proportion of distribution input derived from groundwater works, excluding managed aquifer recharge (MAR) water supply schemes	0.504	0.508	0.495	0.502	0.500

The reported baseline estimates are based upon distribution input (DI) from the following reservoir sources:

- Ravensthorpe WTW (Ruthamford North RZ): 100% yield from natural inflow (“natural”).
- WTW supplied from both Ravensthorpe Reservoir and Hollowell Reservoir Alton WTW (East Suffolk RZ): % natural yield from Alton Water Pitsford
- WTW (Ruthamford North RZ): % natural yield from Pitsford Reservoir

CW5.9: Proportion of distribution input derived from pumped storage reservoirs

2023/24 base-line figures have been aligned to APR out-turn values.

Forecast figures have been revised from the original draft determination and rebased to the 2023/24 out-turn.

Historical Distribution input (DI) data used to derive the proportional split is supplied by the Leakage Team. The past three years data has been used to derive an average split and this has been applied for the forecast period. We, consequently forecast the proportion of distribution input derived from pumped storage reservoirs will be approximately 40.9%.

The reported baseline estimates are based on distribution input (DI) from the following reservoir sources:

- Alton WTW (East Suffolk RZ): % pumped yield from Alton Water
- Ardleigh WTW (South Essex RZ): % pumped yield from Ardleigh Reservoir
- Covenham WTW (East Lincolnshire RZ): 100% pumped yield from Covenham Reservoir

- Grafham WTW (Ruthamford South RZ): 99% pumped yield from Grafham Reservoir
- Pitsford WTW (Ruthamford North RZ): % pumped yield from Pitsford Reservoir
- Wing WTW and Morcott WTW (Ruthamford North RZ): % pumped yield from Rutland Water

CW5.10: Proportion of distribution input derived from river abstractions

2023/24 base-line figures have been aligned to APR out-turn values.

Forecast figures have been revised from the original draft determination and rebased to the 2023/24 out-turn.

Historical Distribution input (DI) data used to derive the proportional split is supplied by the Leakage Team. The past three years data has been used to derive an average split and this has been applied for the forecast period. We, consequently forecast the proportion of distribution input derived from river abstraction will be approximately 7%.

The reported baseline estimates are based DI from the following river abstraction sources:

- Bedford WTW (River Ouse)
- Elsham WTW (River Ancholme) - (Combined site BH/SW)
- Hall WTW (River Trent)
- Heigham WTW (River Wensum) - (Combined site BH/SW)
- Marham WTW (River Nar) - (Combined site BH/SW)
- Stoke Ferry WTW (River Wissey) - (Combined site BH/SW)

CW5.11: Proportion of distribution input derived from groundwater works, excluding managed aquifer recharge (MAR) water supply schemes

2023/24 base-line figures have been aligned to APR out-turn values.

Forecast figures have been revised from the original draft determination and rebased to the 2023/24 out-turn.

Historical Distribution input (DI) data used to derive the proportional split is supplied by the Leakage Team. The past three years data has been used to derive an average split and this has been applied for the forecast period. We, consequently forecast the proportion of distribution input derived from groundwater works will be approximately 50.0%.

CW5.23: Energy Consumption - Treated Water Distribution

There has been no change to the methodology used to calculate the forecast of energy consumption for Treated Water Distribution, rather the line has been advanced by one year with updated information.

For the whole of the water function, we have applied a financial split from regulatory accounts between abstraction, raw water transport, water treatment and treated water distribution for electricity consumption. This financial split is based upon assessments of proportional use by different business units made by the finance team and operational managers. The split used our PR24 Business Plan was that used in the 2022/23 APR and our update has used the split from the 2023/24 APR. This accounts for some of the differences between the original and updated forecasts.

More generally, the energy consumption figures in table CW5 lines 23 have been updated for the following:-

- The forecast for 2023/24 has been updated with the final APR 2023/24 figures;
- The updated forecast for 2024/25 is now based upon our budgeted forecast for that year for electricity and gas, including forecasts of ‘behind the meter’ renewable electricity from solar arrays;
- The revised phasing of capital investment schemes in the updated Plan; and
- Updated abstraction forecasts which we have used to adjust consumption forecasts.

Forecasts of on-site fuel consumption and transport utilise the actual figures used in APR 2023/24. The allocation to different business units has been determined by the split of electricity in our 2024/25 budget and this allocation has remained constant in the forecasts through to the end of AMP8.

There has been no change to the allocation of optimisation efficiencies.

CW5.25: Total number of treated water distribution imports

The reported data is supported by analysis which is has been provided by the leakage team. Forecast values have been maintained as a constant.

CW5.26: Water imported from 3rd parties to treated water distribution systems

Historical data used to derive a three-year average value and this has been applied for the forecast period.

CW5.27: Total number of treated water distribution exports

2023/24 base-line figures have been aligned to APR out-turn values.

The reported data is supported by analysis which is has been provided by the leakage team. Forecast values have been maintained as a constant.

CW5.28: Water exported to 3rd parties from treated water distribution systems

Historical data used to derive a three-year average value, and this has been applied for the forecast period.

CW5.29: Peak 7 day rolling average distribution input

For our revised draft WRMP24, we have produced a 3-day peak projection for our Critical Period forecast. This has been produced at the water Resource Zone level based upon our PCC and peak DI analysis. This is reflected in our peak forecast, showing a >20% increase in demand for our peak period.

Water balance - Company level

CW5.31: Measured household consumption (excluding supply pipe leakage)

2023/24 base-line figures have been aligned to APR out-turn values.

Revised forecast Measured household consumption values have been derived from our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24. (Normal Year Annual Average forecast (2023/24 base-line).

These values include the effects of demand management options (full smart meter rollout by 2030, water efficiency), metering policy, COVID impacts and government led interventions (included in the preferred plan).

The revised forecast, with demand management and including growth we expect these values to increase from 507.07 Ml/d to 523.68 Ml/d, as opposed to 527.4Ml/d in 2023/24 to 540.4Ml/d by 2029/30 in the WRMP24 projections.

This change is predicated upon the reduced PCC values we are now seeing due to smart metering.

The full forecast methodology and preferred plan details are provided in our 'Revised Draft WRMP24 Technical Report: Demand Forecast' and 'Revised Draft WRMP24 Technical Report: Demand Management Preferred Plan' reports.

CW5.32: Unmeasured household consumption (excluding supply pipe leakage)

2023/24 base-line figures have been aligned to APR out-turn values.

Revised forecast Unmeasured household consumption values have been derived from our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24. (Normal Year Annual Average forecast (2023/24 base-line).

These values include the effects of demand management options (full smart meter rollout by 2030, water efficiency), metering policy, covid impacts and government led interventions (included in the preferred plan.

The revised forecast, with demand management and including growth we expect these values to decrease from 127.79 Ml/d to 99.01 Ml/d, as opposed to 130.6Ml/d in 2023/24 to 102.6Ml/d by 2029/30 in the WRMP24 projections. This decrease is predicated upon the reduced PCC values we are now seeing due to smart metering and metering policy

The full forecast methodology and preferred plan details are provided in our 'Revised Draft WRMP24 Technical Report: Demand Forecast' and 'Revised Draft WRMP24 Technical Report: Demand Management Preferred Plan' reports.

CW5.33: Measured non-household consumption (excluding supply pipe leakage)

2023/24 base-line figures have been aligned to APR out-turn values.

Forecast Measured non-household values have been derived from our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24. (Normal Year Annual Average forecast (2023/24 base-line).

These values include the effects of non-household demand management options included in the preferred plan.

Revised Non-household consumption has been derived from the WRMP24 model, using regression analysis of the various industrial sectors and forecasting future consumption based upon the East of England Forecast Model (EEFM) and appropriate factors, GVA (Gross value Added), employment and population growth.

For the revised forecast, with demand management and despite growth we expect these values to remain relatively stable increasing from 304.11Ml/d to 304.91Ml/d, as opposed to a decrease from 298.8Ml/d in 2023/24 to 298.2Ml/d by 2029/30 in the WRMP projection, noting that demand management is predicted to save approximately 10Ml/d of water.

CW5.34: Unmeasured non-household consumption (excluding supply pipe leakage)

2023/24 base-line figures have been aligned to APR out-turn values.

Revised forecast Unmeasured non-household values have been derived from our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24. (Normal Year Annual Average forecast, 2023/24 base-line).

These values include the effects of non-household demand management options included in the preferred plan.

Non-household consumption has been derived from the WRMP24 model, using regression analysis of the various industrial sectors and forecasting future consumption based upon the East of England Forecast Model (EEFM) and appropriate factors, GVA (Gross value Added), employment and population growth.

For the revised forecast, with demand management and despite growth we expect these values to remain relatively low changing from 1.92 to 1.26Ml/d by 2029/30 (as opposed to 1.2Ml/d in 2023/24 to 1.24Ml/d by 2029/30) , noting that over-all approximately 99.5% of our non-household customers measured.

CW5.35: Total annual leakage

2023/24 base-line figures have been aligned to APR out-turn values.

Total leakage has been derived from our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24 (Normal Year Annual Average forecast, 2023/24 base-line).

Revised total Leakage losses are derived in line with the new base-line and original WRMP24 demand management options from the WRMP24 preferred plan and are expected to decrease to approximately 168.2Ml/d by 2029/30, once leakage and metering demand management options have been included.

The full forecast methodology and preferred plan details are provided in our 'Revised Draft WRMP24 Technical Report: Demand Forecast' and 'Revised Draft WRMP24 Technical Report: Demand Management Preferred Plan' reports.

CW5.36: Distribution system operational use

2023/24 base-line figures have been aligned to APR out-turn values.

The value for 'Distribution system operational use' has been derived from Water-Balance data provided by the Leakage Team from the revised base-line for the forecast (2023/24) and has been maintained as a constant.

CW5.37: Water taken unbilled

2023/24 base-line figures have been aligned to APR out-turn values.

The value for 'Water taken un-billed' has been derived from Water-Balance data provided by the Leakage Team from the revised base-line for the forecast (2023/24) and has been maintained as a constant.

CW5.38: Distribution input

2023/24 base-line figures have been aligned to APR out-turn values.

The revised forecast distribution input (demand) has been derived using our revised WRMP24 model (2023/24 baseline) - Normal Year Annual Average forecast. This includes the effects of demand management options (full smart meter rollout by 2030, water efficiency and leakage reduction), metering policy, COVID impacts and government led interventions.

The full forecast methodology and preferred plan details are provided in our 'Revised Draft WRMP24 Technical Report: Demand Forecast' and 'Revised Draft WRMP24 Technical Report: Demand Management Preferred Plan' reports.

The revised forecast predicts decreasing values from 1151.76 Ml/d in 2022/23 to 1127.79 Ml/d in 2029/30, despite forecast increases in population (310K) and households over this period.

CW5.39: Distribution input (pre-MLE)

Note that the MLE adjustment has not been updated for this submission (1.52%), although this has been applied to the new demand forecast values.

2023/24 base-line figures have been aligned to APR out-turn values. The in-year 2023/24 value has been provided by the relevant team.

Revised forecast distribution input (demand) per MLE has been derived using the average difference seen between SWORPS values and reported end of year DI. Considering the last 5 years, this gives an average difference of 1.52%. This average uplift has been applied to the predicted demand values from our revised draft WRMP24 - Normal Year Annual Average forecast.

Components of total leakage (post MLE) - Company level

CW5.58: Leakage upstream of DMA

Note this value has been updated for the revised dataset.

2023/24 base-line figures have been aligned to APR out-turn values.

The value for 'Leakage upstream of DMA' has been provided by the Leakage Team and has been maintained as a constant for the plan period, as in the WRMP at 7.46Ml/d.

CW5.59: Distribution main losses

2023/24 base-line figures have been aligned to APR out-turn values.

Note the APR value for distribution losses is higher than that originally forecast for the WRMP24 submission, leading to a higher out-turn for 2029/30.

Revised forecast leakage distribution losses have been derived from the WRMP24 model (rebased to 2023/24) and are expected to decrease from 135.55 Ml/d in 2023/24 to 131.79Ml/d by 2029/30 (as opposed to the original forecast of 120.3Ml/d by 2029/30).

This decrease includes the preferred pan demand management reductions due to mains replacement in AMP8.

Note these figure excludes the 'Leakage upstream of DMA' volume of 7.46Ml/d

CW5.60: Customer supply pipe losses - measured households excluding void properties

2023/24 base-line figures have been aligned to APR out-turn values.

Revised forecast 'Customer supply pipe losses - measured households excluding void properties' values have been derived from the WRMP24 model (rebased to 2023/24), Normal Year Annual Average forecast).

This includes the effects of housing growth, smart meter savings and metering policy. Values are expected to decrease from 23.18 Ml/d (2023/24) to 16.2Ml/d (2024/25) as opposed to the original WRMP24 forecast of 25.3Ml/d (2023/24) to 17.1Ml/d (2029/30).

CW5.61: Customer supply pipe losses - unmeasured households excluding void properties

2023/24 base-line figures have been aligned to APR out-turn values.

Revised forecast 'Customer supply pipe losses - unmeasured households excluding void properties' values have been derived from the WRMP24 model (rebased to 2023/24, Normal Year Annual Average forecast).

This includes the effects of housing growth, smart meter savings and metering policy. Values are expected to decrease from 11.98 Ml/d (2023/24) to 9.14Ml/d (2024/25) as opposed to the original WRMP24 forecast of 12.7Ml/d (2023/24) to 10.2Ml/d (2029/30).

CW5.62: Customer supply pipe losses - measured non-households excluding void properties

2023/24 base-line figures have been aligned to APR out-turn values.

Revised forecast 'Customer supply pipe losses - measured non-households excluding void properties' values have been derived from the WRMP24 model (rebased to 2023/24, Normal Year Annual Average forecast).

This includes the effects of housing growth, smart meter savings and metering policy. Values are expected to decrease from 1.01Ml/d (2023/24) to 0.89Ml/d (2024/25) as opposed to the original WRMP24 forecast of 0.97Ml/d (2023/24) to 0.89Ml/d (2029/30).

CW5.63: Customer supply pipe losses - unmeasured non-households excluding void properties

2023/24 base-line figures have been aligned to APR out-turn values.

Revised forecast 'Customer supply pipe losses - unmeasured non-households excluding void properties' values have been derived from the WRMP24 model (rebased to 2023/24, Normal Year Annual Average forecast). Values are expected to remain constant at 0.06Ml/d.

CW5.64: Customer supply pipe losses - void measured households

2023/24 base-line figures have been aligned to APR out-turn values.

Revised forecast 'Customer supply pipe losses - void measured households' values have been derived from the WRMP24 model (rebased to 2023/24, Normal Year Annual Average forecast). Void uspl is derived as an aggregate value for WRMP24 and has, consequently been apportioned on the basis of known void splits. Forecast values are expected to remain relatively constant at 1.6-1.5Ml/d from 2023/24 to 2029/30.

CW5.65: Customer supply pipe losses - void unmeasured households

2023/24 base-line figures have been aligned to APR out-turn values.

Revised forecast 'Customer supply pipe losses - void unmeasured households' values have been derived from the WRMP24 model (rebased to 2023/24, Normal Year Annual Average forecast). Void uspl is derived as an aggregate value for WRMP24 and has, consequently been apportioned on the basis of known void splits. Forecast values are expected to reduce from 0.28Ml/d (2023/24) to 0.26Ml/d (2029/30).

CW5.66: Customer supply pipe losses - void measured non-households

2023/24 base-line figures have been aligned to APR out-turn values.

Forecast ‘Customer supply pipe losses - void measured households’ values have been derived from our revised draft WRMP24 - Normal Year Annual Average forecast. Void uspl is derived as an aggregate value for WRMP24 and has, consequently been apportioned on the basis of know void splits. Forecast values are expected to decrease from 0.92Ml/d from 2023/24 to 0.87M/d by 2029/30.

CW5.67: Customer supply pipe losses - void unmeasured non-households

2023/24 base-line figures have been aligned to APR out-turn values.

Forecast ‘Customer supply pipe losses - void measured households’ values have been derived from our revised draft WRMP24 - Normal Year Annual Average forecast. Void uspl is derived as an aggregate value for WRMP24 and has, consequently been apportioned on the basis of know void splits. Forecast values are expected to be near zero. Values are expected to remain constant at 0.04Ml/d

CW6 Water network+ - Mains, communication pipes and other data

Treated water distribution - mains analysis

Our forecast for 2024/25 for CW6.2 Total length of potable mains relined has been adjusted to 0.3km to allow for trials of spray lining to restore structural integrity, with CW6.3 Total length of potable mains renewed adjusted down by the same amount.

Treated water distribution - mains age profile

The mains age profiles have been altered slightly to include the base mains replacement alteration to 0.2%. This has resulted in some slight changes to some of the older age bands (for AMP8) and a subsequent change in lengths for the latest age band total length of potable mains post 2021, as these older mains would be replaced for newer mains in their respective years and therefore the lengths are moved from older age bands to the latest.

CW7 Demand management - Metering activities

Metering activities - Explanatory variables

Note that figures have been updated regarding updated 2023/24 and 2024/25 anticipated meter installation values. These revised values, consequently revise calculated benefits.

Forecast values from 2025/26 to 2029/30 have not changed.

CW7.15: New residential meters installed for existing customers - supply-demand balance benefit

Demand management savings for the year 2023/24 have been derived using 2023/24 base-line data in accordance with the APR methodology. This uses in year values for PCC and savings based upon WRMP19/24 assumptions for meter savings.

Demand management savings have been derived for the installation of basic meters, AMR meters and AMI meters for both AMP& (based upon WRMP19 assessment) and AMP8 based upon the revised assessment from WRMP24.

Note that for the purposes of this reporting we have currently derived the savings:

- in alignment with APR reporting and WRMP19 assumptions for AMP7, and
- in alignment with WRMP24 assumptions for AMP8.

For 2024/25 we have assumed savings in alignment with WRMP19.

Meter installation figures have been revised in line with anticipated 2024/25 figures:

- properties which change from being unmeasured to having a 'visual read' basic meter on average save 15% of their unmeasured per property demand (equating to a half yearly value calculated to account for installations throughout the year), and
- properties which change from being unmeasured to having an AMI (smart meter with daily read via the network) on average save 21% of their unmeasured per property demand (equating to a half yearly value calculated to account for installations throughout the year).

This has been based upon a base-line assessment of 172 l/h/d per person with an occupancy of 2.65, implying a consumption value per property of 455 l /p/d, with a 15% reduction in PHC and this value then divided in 2 for a half year saving. This equates to a per property saving of 34.18 l/prop/d for Basic and AMR meters and l/p/d for AMI smart meters.

So this would calculate:

(((172*2.65)*0.15))/2 = 34.18 (15%)

For AMP8 we have assumed savings in alignment with the rebased WRMP24 model:

- Properties which change from being unmeasured to having a 'visual read' basic meter on average save on average 56.19 l/prop/d (as opposed 59.16 l/prop/d originally) of their unmeasured per property demand (equating to a half yearly value calculated to account for installations throughout the year)
  - Overall savings would be 20% (56 l/prop/d) of PHC (374 l/prop/d) (15%)
  - 56.19 / 2 (half yearly savings) = 28.09 l/prop/d
  - (as opposed to 59.16 / 2 (half yearly saving) = 29.58 l/prop/d)
- Properties which change from being unmeasured to having an AMI (smart meter with daily read via the network) on save on average 70.18 l/p/d (as opposed to 73.28 l/p/d) of their unmeasured per property demand (with a half yearly value calculated to account for installations throughout the year) = (70.18 l/p/d) (SM install + behaviour + PL)
  - Overall savings would be 70.18 l/prop/d of PHC 374/prop/d (18%) / 2 (to account for the half year = 35.09 l/prop/d (as opposed to 36.64 l/prop/d previously)

This has been based upon a average PCC values and occupancy rate from the revised WRMP24 forecast for AMP8 (re-baselined to 2023/24).

CW7.16: New business meters installed for existing customers - supply-demand balance benefit

For the purposes of the table outputs and given that new installations (17 per year) are so small we have attributed demand management savings to meter replacement (see below).

Note that currently meter penetration for business customers is 99.5%, with only 0.5% being unmeasured, so there will be an insignificant number of new business meter installation.

CW7.17: Replacement of basic meter with smart meters for household customers - supply-demand balance benefit

Demand management savings for the year 2023/24 have been derived using 2023/24 base-line data in accordance with the APR methodology. This uses in year values for PCC and savings based upon WRMP19 and WRMP24 assumptions for meter savings.

For the replacement of current customers who already have a basic meter, we have assumed that:

- The replacement of a basic visual read meter with an AMR meter saves no extra water (as the read times are so infrequent).
- The replacement of a basic visual read meter with an AMI smart meter (daily read) enables behavioural change initiatives, cspl, plumbing loss reductions.

Note that for the purposes of this reporting we have currently derived the savings:

- In alignment with APR reporting and WRMP19 assumptions for AMP7, and
- In alignment with the revised WRMP24 model assumptions for AMP8 (rebased to 2023/24)

For AMP 7 we have assumed savings in alignment with WRMP19:

Meter installation figures have been revised in line with anticipated 2024/25 figures.

- Replacing a basic meter with a AMI smart meter saves 6% of consumption, or 8.44l/prop/d

For AMP 8 we have assumed savings in alignment with the revised WRMP24 model (2023/24 baseline):

- Replacing a basic meter with a AMI smart meter saves 13.99 l/prop/d (as opposed to 14.12/prop/d), which equates to a savings of 5.52l/prop/d as a 2% behaviour change and 8.47l/prop/d for plumbing loss savings

CW7.18: Replacement of AMR meter with AMI meter for household customers- supply-demand balance benefit

Demand management savings for the year 2023/24 have been derived using 2023/24 base-line data in accordance with the APR methodology. This uses in year values for PCC and savings based upon WRMP19/24 assumptions for meter savings.

For the replacement of current customers who already have a AMR meter, we have assumed that the replacement of a AMR meter with an AMI smart meter (daily read) enables behavioural change initiatives, cspl, plumbing loss reductions.

Note that for the purposes of this reporting we have currently derived the savings:

- In alignment with APR reporting and WRMP19 assumptions for AMP7, and
- In alignment with WRMP24 assumptions for AMP8 (based upon the revised WRMP24 model - 2023/24 baseline)

For AMP 7 we have assumed savings in alignment with WRMP19:

Meter installation figures have been revised in line with anticipated 2024/25 figures.

- Replacing an AMR with a AMI smart meter saves 6% of consumption, or 8.44l/prop/d

For AMP 8 we have assumed savings in alignment with the revised WRMP24 model (2023/24 baseline):

- Replacing a basic meter with a AMI smart meter saves 13.99 l/prop/d (as opposed to 14.12/prop/d), which equates to a savings of 5.52l/prop/d as a 2% behaviour change and 8.47l/prop/d for plumbing loss savings

CW7.19: Replacement of basic meter with smart meters for business customers - supply-demand balance benefit

Calculated as in the original submission.

CW7.20: Replacement of AMR meter with AMI meter for business customers- supply-demand balance benefit

In line with WRMP19 we have assumed no savings from meter installations for business customers through AMP7, as we are still instituting demand management options with our retailers.

For AMP8 we have used WRMP24 assumptions to determine the overall demand management savings applicable to this sector.

Table 4

	Type of visit	Properties per year	Expected saving (per property per day)
Low	Delivery of smart meter targeted water saving efficiency packages, similar to household drop20 campaigns. This will be undertaken on a scaled basis (dependent on the size of water consumption).	3,000	86 litres per water efficiency package
Medium	Specialist water efficiency audits, with find and fix for consumers using approximately 25,000 litres per property per day.	79	2,127 litres
High	Specialist water efficiency audits with find and fix for larger consumers (approx. 500,000 litres per property per day).	10	43,775 litres
All	**Retailer incentives for plumbing loss reduction** A £100 incentive to retailers to reduce plumbing losses.	3,000	59 litres
All	**Smart meter identified plumbing loss fix** Non-household plumbing loss repairs for properties identified, through smart metering, to have continuous flow. These visits will be aligned with water efficiency visits.	3,000	240 litres
All	**Smart meter identified customer supply pipe leakage (cspl) fix** Non-household repairs for properties identified, through smart metering, to have continuous flow. These visits will be aligned with water efficiency visits.	3,000	9 litres

Note that these savings are not directly linked to per property installations per year, but to the number of visits (water efficiency audits) carried out per year.

Consequently, we have divided the volumes saved between the meter volumes being changed from basic to AMI and AMR to AMI proportionately

Table 5

	2026	2027	2028	2029	2030
Smart meter savings apportioned to upgrade from basic to AMI	1.65	1.66	1.65	1.65	1.65
Smart meter savings apportioned to upgrade from AMR to AMI	0.34	0.33	0.34	0.34	0.34

Per capita consumption (excluding supply pipe leakage)

Forecast measured per capita consumption has been derived using our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24.

We note that there has been a significant change to the new base-line 2023/24 values, as opposed to the original 2021/22 based WRMP24 forecast, with a -4.1% difference in 2023/24 measured PCC and a -5.1% difference in unmeasured 2023/24 PCC, leading to lower out-turns for 2029/30. This leads to a revised average out-turn PCC for 2029/30 (NYAA) of 118.7 l/h/d (as opposed to our original WRMP24 value of 123.5 l/h/d (a -3.8% difference).

CW7.22: Per capita consumption (measured)

2023/24 base-line figures have been aligned to APR out-turn values.

Forecast measured per capita consumption has been derived using our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24.

The forecast reflects the Normal Year Annual Average (with the revised 2023/24 water balance base-line).

Measured per capita consumption has been derived in alignment with WRMP24 preferred plan impacts from:

- Metering policy,
- Smart meter installation (behaviour change and plumbing loss reduction),
- Water efficiency and other demand management options
- Covid19 impacts
- Effects of government led interventions

Further details regarding WRMP24 modelling and the preferred plan can be found in the 'Revised Draft WRMP24 Preferred Plan: Technical Report' and the 'Revised Draft WRMP24 Demand Forecast: Technical Report'.

For our preferred plan we expect measured PCC values to decrease from 120.63 l/h/d in 2023/24 to 113.15 l/h/d in 2029/30. (as opposed to 125.8 l/h/d for 2023/24 to 117.26 l/h/d by 2029/30 in the original WRMP24 plan).

Note that this reflects current recent reductions in PCC due to the smart meter rollout, population and occupancy change and societal change (cost of living crisis).

CW7.23: Per capita consumption (unmeasured)

2023/24 base-line figures have been aligned to APR out-turn values.

Forecast unmeasured per capita consumption has been derived using our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24.

The forecast reflects the Normal Year Annual Average (with the revised 2023/24 water balance base-line).

Unmeasured per capita consumption has been derived in alignment with WRMP24 preferred plan impacts from:

- Metering policy,
- Smart meter installation (plumbing loss reduction),
- Water efficiency and other demand management options
- COVID impacts
- Effects of government led interventions

Further details regarding WRMP24 modelling and the preferred plan can be found in the 'Revised Draft WRMP24 Preferred Plan: Technical Report' and the 'Revised Draft WRMP24 Demand Forecast: Technical Report'

Note that forecast values are based upon our 2021/22 water balance base-line.

For our preferred plan we expect unmeasured PCC values to decrease from 165.39 l/h/d in 2023/24 to 159.82 l/h/d in 2029/30 (as opposed to 174.27 l/h/d for 2023/24 to 172.13 l/h/d by 2029/30 in the original WRMP24 plan)

Note that this reflects current recent reductions in PCC due to the smart meter rollout, population and occupancy change and societal change (cost of living crisis).

Average unit cost of typical metering activities - meter upgrade

In the development of our draft determination representations and update ofassociated data tables, we identified an error relating to lines CW7.34-41 (inclusive) of our business plan data tables. Costs were provided in these lines for meter upgrades. However, we confirm that we do not propose any meter upgrade activityin AMP8, and these costs were included in error. We have rectified the error byremoving these costs from CW7.34-41 in our draft determination representations data tables. As such, there is no average unit cost for this type of work.

Average benefits of typical metering activities - new meter installations

Average benefits for each meter installation type have been recalculated in line with the revised 2024 WRMP model (with the 2023/24 base-line values), including updated PCC values and updated population and occupancy figures. No significant changes are shown in the revised figures.

CW7.42: New meter installation - residential property - benefits per meter installation

For demand management savings, we have assumed that the installation of basic visual read or AMR meters will enable the following savings, based upon the revised WRMP24 model (2023/24 baseline)

- Leakage saving from unmeasured to visual read/AMR - A reduction in leakage (from the unmeasured cspl value to the measured cspl value) of 31.19l/prop/day, based upon water balance data
- Installation of smart meter behaviour change x occ + plumbing loss - A 15% +2% reduction in per household consumption due to behaviour change (from the unmeasured value) based upon WRMP24 AMP8 forecast PCCs and occupancy rates of 70.18 l/prop/d (as opposed to 73.3l/prop/d)
- Saving from no meter to visual read - This has been derived using a WRMP24 AMP8 assessment of a 15% reduction in the average unmeasured consumption value for AMP8 to be 56.19 l/prop/d (as opposed to 59.16 l/prop/d).

We consider that AMR meters would behave similarly to visual read meters, due to the time between meter reads, not allowing customers real time access to their data. Consequently, AMR values match those above for leakage and consumption/wastage.

AMI Smart meters (hourly read) will enable the further reductions in demand (based upon WRMP24 assumptions):

- Average savings for customer supply pipe leakage (cspl) for AMP8 have been assumed to be 4.69 l/prop/d
- Average savings for plumbing losses for AMP8 have been assumed to be 8.47 l/prop/d. Thus, Total savings for continuous flow have been assessed to be 13.16 l/prop/d
- A 2% (based upon WRMP24) savings due to behaviour changes, due to the availability of smart meter data and it's impact on behaviour, assessed at 5.52 l/prop/d.
- A reduction in leakage (from the unmeasured cspl value to the measured cspl value) of 31.19l/prop/day plus the smart meter saving of 4.69l/prop/d, giving a total of 35.88l/prop/d
- A reduction in consumption of 70.18l/prop/d (as opposed to 73.28 l/prop/d), including the 15% reduction from unmeasured to measured, an additional 2% reduction for the smart meter and the 8.47 l/prop/d from plumbing losses.

These values have all been derived from the revised WRMP24 model (2023/24 baseline) data.

These savings have been based upon the revised draft WRMP24 assessments and average values for AMP8.

CW7.43: New meter installation - business property - benefits per meter installation

We currently assume no savings are attributable to the installation of a visual read or AMR meter.

We have additionally carried out smart meter assessment of leads and run-times from our smart meter data to derive the 9l/p/d and 240 l/p/d figures for plumbing loss and cspl savings.

For AMI smart meter installations (hourly read), based upon our current assessments of plumbing loss and customer supply pipe leakage we anticipate:

- An average 9 l/prop/d reduction in customer supply pipe leakage
- An average 240 l/prop/d reduction in plumbing losses (consumption)

We would only anticipate further reductions in business demand based upon demand management options (in addition to smart meter installation).

Average benefits of typical metering activities - meter replacement

CW7.44: Replacement of existing basic meter - residential property - benefits per meter installation

We currently assume no savings are attributable to the replacement of basic meters with an AMR meter, based upon the revised WRMP24 model (2023/24 baseline).

For basic meters that are replaced with a AMI smart meter we anticipate additional savings of:

- 4.7 l/prop/d due to cspl reductions
- 13.99 l/prop/d behavioural change reduction, including a saving of 8.47 l/prop/d due to plumbing loss reduction and a 5.52 l/prop/d reduction due to behaviour change.

CW7.45: Replacement of existing basic meter - business property - benefits per meter installation

We currently assume no savings are attributable to the installation of a visual read or AMR meter.

For AMI smart meter installations, based upon our current assessments of plumbing loss and customer supply pipe leakage we anticipate:

- An average 9 l/prop/d reduction in customer supply pipe leakage
- An average 240 l/prop/d reduction in plumbing losses (consumption)

CW7.46: Replacement of existing AMR meter - residential property - benefits per meter installation

For AMR meters that are replaced with an AMI smart meter (hourly read) we anticipate additional savings, based upon the revised WRMP24 model (2023/24 baseline):

- 4.7 l/prop/d due to cspl reductions13.99 l/prop/d
- behavioural change reduction, including a saving of 8.47 l/prop/d due to plumbing loss reduction and a 5.52 l/prop/d reduction due to behaviour change.

CW7.47: Replacement of existing AMR meter - business property - benefits per meter installation

For AMI smart meter (hourly read) replacement of an AMR meter, based upon our current assessments of plumbing loss and customer supply pipe leakage we anticipate:

- An average 9 l/prop/d reduction in customer supply pipe leakage
- An average 240 l/prop/d reduction in plumbing losses (consumption)

Average benefits of typical metering activities - meter upgrade

CW7.47: Replacement of existing AMR meter - business property - benefits per meter installation

For AMI smart meter (hourly read) replacement of an AMR meter, based upon our current assessments of plumbing loss and customer supply pipe leakage we anticipate:

- An average 9 l/prop/d reduction in customer supply pipe leakage
- An average 240 l/prop/d reduction in plumbing losses (consumption)

CW7.48: Upgrade of existing basic meter - residential property - benefits per meter installation

For the upgrade of a basic visual read meter to an AMR meter we currently attribute no additional saving, based upon the revised WRMP24 model (2023/24 baseline).

For basic meters that are upgraded to AMI smart meters (hourly read) we anticipate additional savings of:

- 4.7 l/prop/d due to cspl reductions
- 13.99 l/prop/d behavioural change reduction, including a saving of 8.47 l/prop/d due to plumbing loss reduction and a 5.52 l/prop/d reduction due to behaviour change.

CW7.49: Upgrade of existing basic meter - business property - benefits per meter installation

We currently assume no savings are attributable to the installation of an AMR meter, over a visual read meter.

For AMI smart meter (hourly read) installations, based upon our current assessments of plumbing loss and customer supply pipe leakage we anticipate:

- An average 9 l/prop/d reduction in customer supply pipe leakage
- An average 240 l/prop/d reduction in plumbing losses (consumption)

CW7.50: Upgrade of existing AMR meter - residential property - benefits per meter installation

For AMR meters that are upgraded to AMI smart meters (hourly read) we anticipate additional savings, based upon the revised WRMP24 model (2023/24 baseline).

- 4.7 l/prop/d due to cspl reductions
- 13.99 l/prop/d behavioural change reduction, including a saving of 8.47 l/prop/d due to plumbing loss reduction and a 5.52 l/prop/d reduction due to behaviour change.

CW7.51: Upgrade of existing AMR meter - business property - benefits per meter installation

For AMI smart meter (hourly read) installations, based upon our current assessments of plumbing loss and customer supply pipe leakage we anticipate:

- An average 9 l/prop/d reduction in customer supply pipe leakage
- An average 240 l/prop/d reduction in plumbing losses (consumption)

CW7a Transition and accelerated programme

CW7.17: Replacement of basic meter with smart meters for household customers - supply-demand balance benefit AID only

Demand management savings for the year 2023/24 have been derived using 2023/24 base-line data in accordance with the APR methodology. This uses in year values for PCC and savings based upon WRMP19 and WRMP24 assumptions for meter savings.

For the replacement of current customers (for AID) who already have a basic meter, we have assumed that:

- The replacement of a basic visual read meter with an AMR meter saves no extra water (as the read times are so infrequent).
- The replacement of a basic visual read meter with an AMI smart meter (daily read) enables behavioural change initiatives, cspl, plumbing loss reductions.

Note that for the purposes of this reporting we have currently derived the savings:

- In alignment with APR reporting and WRMP19 assumptions for AMP7, and
- In alignment with the revised WRMP24 model assumptions for AMP8 (rebased to 2023/24)

For AMP 7 we have assumed savings in alignment with WRMP19:

Meter installation figures have been revised in line with anticipated 2024/25 figures.

- Replacing a basic meter with a AMI smart meter saves 6% of consumption, or 8.44l/prop/d

CW7.18: Replacement of AMR meter with AMI meter for household customers- supply-demand balance benefit - AID

Demand management savings for the year 2023/24 have been derived using 2023/24 base-line data in accordance with the APR methodology. This uses in year values for PCC and savings based upon WRMP19/24 assumptions for meter savings.

For the replacement of current customers who already have a AMR meter, we have assumed that the replacement of a AMR meter with an AMI smart meter (daily read) enables behavioural change initiatives, cspl, plumbing loss reductions.

Note that for the purposes of this reporting we have currently derived the savings:

- In alignment with APR reporting and WRMP19 assumptions for AMP7, and
- In alignment with WRMP24 assumptions for AMP8 (based upon the revised WRMP24 model - 2023/24 baseline)

For AMP 7 we have assumed savings in alignment with WRMP19:

Meter installation figures have been revised in line with anticipated 2024/25 figures.

- Replacing an AMR with a AMI smart meter saves 6% of consumption, or 8.44l/prop/d

Forecast measured per capita consumption has been derived using our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24.

We note that there has been a significant change to the new base-line 2023/24 values, as opposed to the original 2021/22 based WRMP24 forecast,, with a -4.1% difference in 2023/24 measured PCC and a -5.1% difference in unmeasured 2023/24 PCC, leading to lower out-turns for 2029/30. This leads to a revised average out-turn PCC for 2029/30 (NYAA) of 118.7 l/h/d (as opposed to our original WRMP24 value of 123.5 l/h/d (a -3.8% difference).

CW7.22: Per capita consumption (measured)

2023/24 base-line figures have been aligned to APR out-turn values.

Forecast measured per capita consumption has been derived using our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24.

The forecast reflects the Normal Year Annual Average (with the revised 2023/24 water balance base-line.

Measured per capita consumption has been derived in alignment with WRMP24 preferred plan impacts from:

- Metering policy,
- Smart meter installation (behaviour change and plumbing loss reduction),
- Water efficiency and other demand management options
- Covid19 impacts
- Effects of government led interventions

Further details regarding WRMP24 modelling and the preferred plan can be found in the 'Revised Draft WRMP24 Preferred Plan: Technical Report' and the 'Revised Draft WRMP24 Demand Forecast: Technical Report'

Note that this reflects current recent reductions in PCC due to the smart meter rollout, population and occupancy change and societal change (cost of living crisis).

CW7.23: Per capita consumption (unmeasured)

2023/24 base-line figures have been aligned to APR out-turn values.

Forecast unmeasured per capita consumption has been derived using our WRMP24 model, which has subsequently been rebased to reflect the 2023/24 water balance, as opposed to the original 2021/22 WRMP base-line included in WRMP24.

The forecast reflects the Normal Year Annual Average (with the revised 2023/24 water balance base-line.

Unmeasured per capita consumption has been derived in alignment with WRMP24 preferred plan impacts from:

- Metering policy,
- Smart meter installation (plumbing loss reduction),
- Water efficiency and other demand management options
- Covid19 impacts
- Effects of government led interventions

Further details regarding WRMP24 modelling and the preferred plan can be found in the 'Revised Draft WRMP24 Preferred Plan: Technical Report' and the 'Revised Draft WRMP24 Demand Forecast: Technical Report'

Note that forecast values are based upon our 2021/22 water balance base-line.

Note that this reflects current recent reductions in PCC due to the smart meter rollout, population and occupancy change and societal change (cost of living crisis).

CW8 WRMP schemes (excluding leakage and metering activities)

CW8.1-10: Internal Interconnectors

As previously stated in our table CW8 commentary, two schemes (SUE24 and NTB10) were impacted by changes in our revised draft WRMP that occurred after the lockdown of our business plan costs were detailed in our business plan CW08 commentary, these have now been updated in table CW08 following query OFW-OBQ-ANH-023.

Since submitting our October Business Plan we have worked further with our delivery teams who have experience of delivering the PR19 interconnectors, reviewing pipe routes and crossings. We have now taken the decision to phase the above combined scheme from Bexwell to Norwich (NBR6, NTB10, NAY1) over 7 years rather than 5 as was the case in our original plan. This additional time is required due to deliverability risk in the project, the cost profile in CW8 has been updated for these schemes.

Since our business plan submission, we have seen a significant increase in the costs of the AMP7 interconnector delivery. As the best available source of cost intelligence for our AMP8 schemes, we have subsequently updated our PR24 interconnector costs based on this outturn delivery benchmark and reflected these updated costs in table CW8.

The storage volume associated with scheme SWC8 has been corrected, this was an error in the previous version of CW8.

CW8.11-19, 44-45: WRMP Supply Side Options

The Colchester reuse transfer scheme (EXS19b) has been adjusted to defer £10m of investment from AMP8 into AMP9 to align the delivery of this scheme with the Colchester reuse scheme.

Part of the Colchester reuse scheme is a transfer from Ardleigh to Great Horkesley, in our business plan this was included in the main reuse scheme, but we have now separated it out into a separate scheme (EXS19c), to more accurately reflect that they are two distinct schemes that are both required to deliver the benefit. We have provided scope data for this scheme in order that Ofwat can model it as part of the interconnector programme, further detail is provided in section 3.3.2 of our enhancement strategy Part 1 :Resilience to the risk of drought and flood.

The Colchester reuse scheme (EXS19a) is included in the place of the DPC allowance that was previously included in row CW8.25.

CW8.20: WRMP Supply Side Options - Recirculation Schemes

This row included costs for 13 schemes as a single row, as stated in our business plan, these have now been separated out in rows CW8.31 to CW8.43 and updated with additional cost intelligence.

CW8.21: Adaptive Planning

The costs included here have been updated to include the costs of developing a re-use scheme to support our Marham WTW option as detailed in our enhancement narrative.

CW8.22: Colchester Re-use Pilot Plant

The costs for this scheme have been reprofiled to reflect an earlier delivery.

CW8.23: Strategic Interconnector Hydraulic Model

The costs for this scheme have been removed from our enhancement plan to reflect the Ofwat DD publication.

CW8.24: East Suffolk WRZ IPZ

This scheme has been moved to table ADD21 to reflect the Ofwat DD publication. However Ofwat should note that in table CW3, due to a timing issue with the queries on table ADD21 this scheme is still reporting against the ‘Interconnectors delivering benefits in 2025-2030’ row rather than the resilience row.

CW8.25: Colchester Re-use DPC Allowance

The costs previously included here are for the Direct Procurement for Customers (DPC process have been removed and replaced with eth fill Colchester reuse scheme in row CW8.44.

CW8.26: Demand Side Measures - Non House Hold (NHH)

No changes

CW8.27: Demand Side Measures - Domestic

No changes

CW10 Wholesale water local authority rates

Figures have been updated to reflect the Ofwat DD publication, where costs were calculated based on the rateable values set at the 2023 revaluation and the 2023-24 multiplier set by central government.

CW11 Third party costs by business unit for the wholesale water service

Third party costs ~ operating expenditure Lines 11.1 - 11.15

This data is pre-frontier shift and real price effect.

Third party costs ~ capital expenditure Lines 11.16 - 11.30

For AMP8 we have used two different models to understand this; linear projection, based on prior AMP diversion activity, and AMP7 base level activity model. The data in this table is pre-frontier shift and real price effect.

CW12 Transitional expenditure - water resources and water network+

In our October Business Plan submission we proposed £68.8 million of expenditure across 2023/24 and 2024/25 broken down in the table below.

Table 6

Transition programme	Water (£m)	Water Recycling (£m)
AID CW(W) 17	12.14	18.98
Non-AID CW(W)12	15.48	22.20
Total	27.62	41.18

In our DD representation this has changed slightly to reflect actuals for 2023/24 as well as an updated forecast for 2024/25. We have updated the and provided an overview of the new cost breakdown in the table below. Our current actuals and forecast see us spending £81.9 million in 2023/24 and 2024/25.

In addition to forecasts we have also reviewed our list of schemes that we have submitted previously and have exchanged some schemes. All of our schemes align with the PR24 final methodology for transition spending.

Table 7

Transition programme	Water (£m)	Water Recycling (£m)
AID CW(W) 17	23.46	22.03
Non-AID CW(W)12	9.07	27.34
Total	32.53	49.37

For CW12 there were no changes due to schemes being added or removed. All changes to costs are the impact of actual costs and updated forecasts.

CW13 Best value analysis enhancement expenditure - water resources and water network+

There has been no change in the methodology used from our previous submission.
Variances in cost are a result of the overall change in our DD Representations.

CW14 Best value analysis of alternative option enhancement expenditure - water resources and water network+

EA/NRW environmental programme (WINEP/NEP) Lines 14.1 - 14.56

We used Copperleaf, our investment management system, to report on the least cost alternatives to populate the CW14 table, following Ofwat guidance.

Out of the 3,570 investments in our PR24 plan (Water and Waste), there were 441 that had an alternative that was least cost but not the preferred option. This is a reduction from 479 investments in the same position in our October Business Plan.

Our approach to determining best value option to put forward is described in "Our approach to Best Value Planning and Cost Benefit appraisal" (page 52 onwards) in ANH09 Cost Water data table commentary.

We have considered multiple alternatives throughout the optioneering process and used the best data that is available to us. Please see our Enhancement Strategies for information on our proposed investments.

- ANH_DD_018 Resilient to flood PR24 DD Representation enhancement strategy
- ANH_DD_019 Ecological quality PR24 DD Representation enhancement strategy
- ANH_DD_020 Carbon neutral PR24 DD Representation enhancement strategy
- ANH_DD_021 Sustainable growth PR24 DD Representation enhancement str

CW15 and CW16 Best value analysis benefits

Please refer to our enhancement case documents ANH_DD_018 to ANH_DD_022 for details of the enhancement benefits in these tables.

The same methodology was used as described in our October Business Plan (ANH09). There are significant changes from the previous set of tables as these now reflect our DD Representations.

The value-based decision making used to select options in our plan was based on our own updated PR24 value framework in combination with the EA's outcome measures, rather than Ofwat's. Therefore in some instances the valuations may differ from the Ofwat valuations used in tables CW15 and CW16, resulting in some areas of the least cost plan appearing to offer better value than their least cost alternatives in these tables.

Some least cost alternatives have shorter implementation periods than their best value alternatives resulting in earlier delivery of benefits than their best value counterparts. For this reason in some instances a greater level of benefit may be seen in the period covered by the tables.

CW17 Accelerated programme expenditure - water resources and water network+

As explained in the table commentary for CW12, we have included transition expenditure in accordance with the published guidelines in the PR24 Final Methodology.

The Accelerated Infrastructure Delivery (AID) programme has been run as a separate process to achieve early benefit for customers and provide confidence of Ofwat's support for the early start for this expenditure. Ofwat's Final Decision for AID was published at the end of June 2023.

Since October 2023 we have worked closely with our internal delivery teams and partners in the supply chain to advance these schemes.

The changes to the AID water costs in our plan are due to actual costs for 2023/24 and renewed forecasts for 2024/25.

The impact of these changes can be seen in the table commentary for CW12.

CW18 Cost adjustment claims - base expenditure: water resources and water network+

We propose three Water Cost Adjustment Claims (CACs). These are:

- CAC1, Mains Replacement. This CAC has not been previously submitted and has been added as a result of Ofwat's decisions at Draft Determination. The details of this CAC can be found in ANH_DD_010, while its key features are set out in our Base cost efficiency section.
- CAC2, Leakage. Ofwat rejected this CAC at Draft Determination. We disagree with the basis for its rejection and put forward additional analysis within our Base cost efficiency section as to why the CAC remains valid. See ANH-DD-011 for our Cost Adjustment Claim.
- CAC3, Boundary Box replacement. This too was not previously submitted as a CAC, although while within our Business Plan we proposed an Uncertainty Mechanism (UM) to address this issue, we said that if the UM were rejected we would replace it with a CAC. This we are now doing as the UM was rejected at Draft Determination. See ANH-DD-009 for our Cost Adjustment Claim.

CW19 Demand management - Leakage expenditure and activities

CW19.1 - 19.3: Leakage expenditure - company level

Costs are extracted from our SAP system. These costs have been allocated to the various categories by project code for Capex funded work. For Opex funded work, costs have either been allocated by cost centre or for leak repairs by a proportional split based on job volumes of the total repair cost of our IMR alliance.

Overall costs increased in 2022/23 due to additional investment put into leakage management to mitigate the impact of the hot summer and winter freeze/thaw event.

Forecasts - maintain expenditure has been forecasted using the average of the last three years cost. During AMP8 the expenditure detailed in our cost adjustment claim for boundary box replacements has been added. 50% of the repairs detailed in this CAC are due to leaks so 50% of the costs have been added.

Further details can be found here:https://www.ofwat.gov.uk/wp-content/uploads/2023/06/ANH_CAC_6.1-Boundary-box-replacements.pdf

Reduce expenditure is forecast in line with investments created to reduce leakage levels - these are for the smart metering of shared services and for leakage driven mains renewals.

Prevent activities and attributes - company level Lines 19.13-19.16

The data for PMAs only includes those areas of the network which are directly controlled by a pressure reducing valve. It does not include the areas which are calmed by active pressure control on pumps. During the year 23/24 we pressure managed an additional 38,772 properties by installing advanced flow modulation control on 5 pump sets. This provides the same calm and controlled network as achieved by the installation of active pressure reducing valves and reflects our aim of full system optimisation.

CW19.25 - CW19.28: DMA statistics

The 2022/23 DMA property count data aligns with the property figures reported in the APR.

We have no investments planned to alter the size of DMAs so have forecasted 2022/23 data forward. There will be minor changes in the future as the network expands/is reconfigured.

CW19.29: DMA availability

We report leakage at zonal level and therefore focus our meter maintenance activities on ensuring that the zonal availability target is met for compliance with the APR reporting rules. DMAs are used to drive targeting of leak detection activity. The figure reported here is for zonal availability.

We plan to increase our zonal availability to above 95 percent by the end of AMP7 and then maintain this level during AMP8.

CW19.40: Length of trunk main in flow balances

We don’t currently report leakage from trunk mains using flow balances, hence the figure is zero for 2022/23. As we report leakage at the zonal level, we have a relatively small length of trunk mains outside of our leakage reporting areas which are mainly strategic, large diameter mains.

We have started configuring trunk main balances as an alternative way of reporting trunk mains leakage and plan to continue to do this through AMP8.

We plan to have a number of trunk main balances set up in Year 5.

We are targeting 100 percent coverage by the end of AMP8 but may be unable to achieve this as no specific investment for large diameter meter replacement/new installs is proposed.

CW19.41: Length of trunk main

Since we completed the return for IN22/02 in August 2022 we have completed a full mapping exercise of all our mains upstream of our leakage reporting zones. The figure reported for 2022/23, 1312.684km, is lower that that reported previously of 1701km but represents a more accurate view of our trunk mains network length.

To forecast this line forward we have taken the planned commissioning dates of new upstream mains that are planned to be installed of the new network that will connect the north of Anglian Waters network to the south and east parts of the company.

Smart networks - company level Line 19.49

The 2022/23 figure has been calculated using property counts that align to the year end connected property count in table SUP1B. We feel that for better alignment with the rest of leakage reporting it would be more appropriate to use the average property count in table SUP1A.

We use a threshold of 80 percent of the DMA network being covered by sensors before we start to use the data to deploy leak investigations. We have therefore used the same threshold when preparing the overall property coverage figures.

The total % coverage has dropped slightly due to the removal of sensors in a small number of DMAs.

Active leakage control - company level Line 19.52

This is calculated to be the sum of the total number of hours spent on leakage detection activities during 2022/23.

We have no plans or investment to change the number of detection teams through the rest of AMP7 or AMP8 and so have carried 2022/23 figures forward.

Mains repairs - company level Lines 19.55 - 19.58

Data is extracted from our SAP system. It has been processed to ensure that where multiple jobs are created for the same repair they are only counted once. Repair times show the time from the time the job was moved to our repair partners to the time the repair was completed (but excluding reinstatement). Repair times increased in 2022/23 due to the impact of elevated burst numbers caused by extreme weather.

The number reported here is slightly higher than the figure reported in the APR for the mains repair PCL due to the inclusion of repairs that were recharged to third parties. Burst numbers and runtimes increased this year due to the impact of the hot summer weather and freeze/thaw event in winter.

Forecast - the six year average repair numbers and run times have been forecasted forward. The reduction in mains repairs as a consequence of our proposed climate vulnerable mains replacement programme has been included.

Mains repairs - region 1 Lines 19.59 - 19.62

We only report at the company level so no data or commentary in these lines.

Mains fittings repairs - company level Lines 19.67 - 19.70

Data is extracted from our SAP system. It has been processed to ensure that where multiple jobs are created for the same repair they are only counted once. Repair times show the time from the time the job was moved to our repair partners to the time the repair was completed (but excluding reinstatement).

Forecast job volumes and run time are calculated using the average of the previous six years data.

Communication pipe repairs - company level Lines 19.79 - 19.82

Data is extracted from our SAP system. It has been processed to ensure that where multiple jobs are created for the same repair they are only counted once. Repair times show the time from the time the job was moved to our repair partners to the time the repair was completed (but excluding reinstatement).

Forecast - the job count have been forecast forward from 2022/23 counts. Counts have been increased by the number of additional repairs as described in the related cost adjustment claim. The run times have been forecast as the average of the last six years data.

Supply pipes repairs - company level Lines 19.91 - 19.97

When a customer supply pipe leak is customer reported we liaise with the customer to help ensure the leak is repaired in a sensible time and if necessary, by issuing formal waste of water notices. Data about these leaks is stored in a database so counts and runtimes have been extracted from this database.

Company detected customer supply pipe leaks can either be found through proactive leak detection or via data from our smart meters. 2022/23 is the first year we have reported the smart meter leaks in this section and makes up the bulk of the leaks.

As our smart meter rollout continues through to the end of AMP8 the number of leaks identified by smart meters will increase and is reflected in the forecast, as is the reduction as a consequence to customer reported leaks.

CW19.95: Number of free supply pipe repairs

Since the start of AMP6 we have only offered a free repair service to vulnerable customers so the number reported here is low.

Forecast - this is currently forecasted to stay at current levels but we are currently completing trials that may change this in the future .

CW19.96: Number of supply pipe repairs where financial assistance provided

We do not offer financial assistance for supply pipe repairs.

Forecast - currently held flat.

CW19.97: Number of supply pipe repairs where other support provided

All customers with leaks on their supply pipe are provided with details of approved plumbers so the number is equal to the sum of CW19.91 & 92.

CW19.112 - Historical minimum achieved level of leakage

Historical minimum achieved level of leakage has been calculated using DMA level data and the best achieved targets set as part of our ongoing leakage monitoring processes. The data reported represents the lowest value for each DMA over the last six years. We are unable to analyse data for 2023/24 at this point. This value has being forecasted forward as a flat line.

CW21 Water - net zero enhancement schemes

In our original PR24 submission, table CW21, Net Zero enhancements water, contained a feasible investment. This proposed investment was not approved by Ofwat at draft determination. In our response to the draft determination we are no longer proposing any Net Zero enhancements for water and therefore table CW21 is blank.

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THE QUEEN'S AWARDS FOR ENTERPRISE: SUSTAINABLE DEVELOPMENT 2020

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