SSC04c

PR24 Data tables commentary – Costs wholesale water

Contents

CW1

Diversions in our PR24 tables- FAO Ofwat's cost assessment team.

Background:

On 17/08/23, we submitted a query to Ofwat's cost assessment team regarding the treatment of diversions in Ofwat's cost models. The final methodology confirmed that diversions would be assessed outside of the modelling, but Ofwat's published cost models were including our gross renewals figures. We received the following response:

"I confirm that diversions costs (NRSWA and non s-185 inc HS2) will be assessed outside the base cost models. We are in the process of understanding how companies report these costs in the APRs to ensure that adjustments are made correctly. Not all companies have followed South Staffs approach and reported them in infrastructure renewals."

We were grateful for the clarification in this response but concerned that companies were treating diversions differently. This is particularly important for SSC due to the HS2 diversions we have completed this AMP and are forecasting next AMP meaning our diversions costs are proportionally higher than other companies.

Therefore, this summary note details our approach to diversions in the PR24 cost tables, to ensure the costs are not misinterpreted.

AMP7:

Historically, in APRs we have not reported diversions as third-party costs. To ensure AMP7 reporting consistency we have followed the same approach for 2022-23, 2023-24 and 2024-25.

- **CW2.4**: NRWSA and non-s185 diversions are included in our renewals expenditure (gross).
- **CW1.3/CW1a.3**: s-185 diversions are included in developer services opex.
- **CW11.7-CW11.10**: No diversions costs included as not treated as third party costs.
- **CW1.5/1a.5:** No diversions costs included as not treated as third party costs.

AMP8:

It is clear from the methodology, and the new CW11 table (which has no equivalent RAG references), that we are expected to report diversions costs as third-party costs moving forward, and that this will be excluded from the econometric modelling. So, we have changed our approach to diversions reporting for AMP8 to the following:

- **CW2.4**: No diversions costs are included in this line (net- excluding our contribution to diversions too)
- **CW1.3/CW1a.3**: No diversions costs are included in this line.
- **CW11.7-CW11.10**: All diversions costs are included in these lines.
- **CW1.5/1a.5:** All diversions costs included in third party costs.

HS2 and the price control:

We also note from Ofwat's final methodology that they propose to include HS2 revenue within the price control for AMP8, when this has previously been excluded. In our consultation responses we strongly opposed this decision and propose that Ofwat amend this for the reasons outlined below.

We have reported AMP8 HS2 costs in CW11.10, and they total £18.569m. The costs for this submission were assessed on 5th September 2023 and represent our best estimate at the time for the costs for Phase 1 and 2A diversions in our region. At the time of submission, Phase 2 of HS2 is still planned to go ahead so our forecasts reflect this.

HS2 costs are much more uncertain than standard diversions costs. The project is highly complex and large scale, meaning costs and timescales are hard to predict and entirely outside management control. This is compounded by the highly political nature of the project, and with a general election due next year it is impossible to know how the project will progress out to 2030.

As a small water only company, these costs are a significant proportion of our totex plan (c2% of gross totex). If we underestimated the costs of the project, we would not be able to absorb the cost differences within the allowances we have put forward, as we have proposed a stretching and efficient business plan. As we are required to complete these diversions, we would risk the delivery of our plans for customers and the environment by having to trade off against any HS2 costs not included. Therefore, we have no choice but to include all potential HS2 costs we might expect for AMP8, despite the high level of uncertainty on the project.

Therefore, the potentially high costs, and significant uncertainty of HS2 mean it should not be included in the price control. Whilst an end of period true-up mechanism for actual costs would mitigate the challenges, this would be insufficient to protect a company of our size against the potential materiality of any cost differences on our financial metrics and could cause bill shocks for customers in AMP9. Therefore, it is the best approach for our customers and our business for HS2 to be removed from the price control.

Conclusion:

- For cost modelling and historic efficiency assessments, our historic data must be adjusted using our APR tables (4P) to remove diversions costs.
- Our AMP8 data is as per the table guidance set out in the methodology.
- HS2 should be excluded from the revenue cap.

For all lines, please see detailed commentary on cost breakdowns in contributing tables.

Line Reference	Commentary
CW1.1	We have separately submitted a version of CW2 which shows the cost breakdown post RPE and frontier shift. Please refer to appendix SSC19g. This line includes the uplift for power costs that we have provided further detail on in appendix SSC19. This line is inclusive of frontier shift of 1.1% per annum cumulative, as per table Sup11, to appropriate cost categories.
CW1.2	Aligned to CW3.142.
CW1.3	AMP7: S185 diversions costs, as per current APR reporting. AMP8: Aligned to DS2e.10. Diversions are categorised as third -party costs.
CW1.4	Total of above 3 lines.
CW1.5	Sum of CW11.11 and CW11.15. AMP7: Rechargeable works, and non-price control third party expenditure. No diversions costs include as these are included in CW1a.1. AMP8: All diversions costs, rechargeable works, and non-price control third party expenditure.
CW1.6	Total of above 2 lines
CW1.7	Aligned to DSe1.15- operational expenditure only
CW1.8	This line is inclusive of frontier shift of 1.1% per annum cumulative, as per table Sup11, to our base capex proposals.
CW1.9	Aligned to CW3.141.

CW1.10	Aligned to DS2e.10 (capex only).
CW1.11	Total of CW1a.8, CW1a.9 and CW1a.10.
CW1.12	Aligned to CW11.26 + CW11.30.
CW1.13	Total of CW1a.11 and CW1a.12.
CW1.14	Aligned to Dse1.15 – capital expenditure only.
CW1.15	Total net totex pre-efficiency and RPE.
CW1.16-18	No pension deficit costs.
CW1.19-24	Atypical costs in 2022-23 only – costs in relation to the 2022 cyber attack.

CW1a

CW1a is linked to table CW2 – these tables represent the pre-RPE and pre-frontier shift efficiency values of our totex plan. Note that the impact of the power RPE is significantly positive, which means that CW1 is higher overall than CW1a.

Line Reference	Commentary
CW1a.1	Aligned to CW2.14
CW1a.2	Aligned to CW3.142
CW1a.3	AMP7: S185 diversions costs, as per current APR reporting. AMP8: Diversions are categorised as third -party costs.
CW1a.4	Total of above 3 lines
CW1a.5	Sum of CW11.11 and CW11.15 AMP7: Rechargeable works, and non-price control third party expenditure. No diversions costs include as these are included in CW1a.1. AMP8: All diversions costs, rechargeable works, and non-price control third party expenditure.
CW1a.6	Total of above 2 lines
CW1a.7	Aligned to DSe1.15- operational expenditure only
CW1a.8	Aligned to CW2a.17
CW1a.9	Aligned to CW3.141
CW1a.10	Aligned to DS2e.10 (capex only)
CW1a.11	Total of CW1a.8, CW1a.9 and CW1a.10
CW1a.12	Aligned to CW11.26 + CW11.30
CW1a.13	Total of CW1a.11 and CW1a.12
CW1a.14	Aligned to Dse1.15 – capital expenditure only
CW1a.15	Total net totex pre-efficiency and RPE
CW1a.16- 18	No pension deficit costs
CW1a.19-24	Atypical costs in 2022-23 only – costs in relation to the 2022 cyber attack.

CW2

This table is the breakdown of costs in CW1a and represents the pre-RPE and pre-frontier shift totex. Note that we have separately supplied a post RPE and post frontier shift version of table CW2 as appendix SSC19g, which represents the final plan costings.

Line Reference	Commentary
CW2.1	Refer to appendix SSC19 for detailed information on future power costs. We have also supplied the additional data request for electricity input prices (SSC19h) and a breakdown of our power prices (SSC19i – commercially sensitive).
CW2.2	No income treated as negative expenditure forecast, in line with historic reporting.
CW2.3	Bulk Supply and Bulk Discharge forecast costs based on 2023/24 expected final position, rolled forward to the end of AMP as no expected changes.
CW2.4	Line consists of renewals activity across small diameter and large diameter pipeline assets with the exception of diversions which have been captured in other tables. Line is inclusive of other renewal activities on the network for ancillary assets and is inclusive of associated traffic management costs with IRE expenditure. Small diameter infra renewals are planned to increase from current levels which will account for an increase in yearly costs as we transition between AMP7 and AMP8. Levels thereafter are expected to remain consistent. Note change in treatment of diversions between AMP7 and AMP8- see note on p3.
CW2.5	No non-infra renewals expensed in year, in line with historic reporting.
CW2.6	Other opex includes all operating costs that are not covered by other reporting lines. In AMP8, this line is inclusive of: The movement of catchment management enhancement capex base operating costs as per the guidance on this issue. Increases in labour costs as we fill positions that have been made temporarily dormant as a result of power and other input price pressure in AMP7. Savings in chemical use as result of reducing distribution input from leakage and demand savings over the period. The costs of maintaining leakage as we continue to deliver further reductions over AMP7 and AMP8, that we believe should be included in efficient base costs.
CW2.7	Aligned to CW10.9- see table commentary for CW10.
CW2.8 –CW 2.10	Service charges forecast costs based on 2023/24 expected final position, rolled forward to the end of 2030 as no expected changes.
CW2.11-CW2.13	Location specific costs & obligations forecast costs based on 2022/23 expected final position, rolled forward to the end of AMP as no expected changes.
CW2.14	Total base operating expenditure forecast.
CW2.15	No capital expenditure on infra-asset maintenance forecast, in line with historic reporting.
CW2.12	Line comprised of atypical base spend with some notable projects with a large proportion of capex expenditure such as the 2 projects for reservoir rebuilds. Details of one of these rebuild ("Langley Reservoir") can be found in section 5.1.7.2 of the SSC36 Evidencing our enhancement expenditure in 2025-2030 appendix as the capex is split between enhancement and base. A significant element of the costs in this line are allocated to base maintenance activities as Surface water treatment works and smaller production sites. There is a notable increase in the expenditure towards the middle of the AMP which is mostly being driven by the two reservoir projects as their forecasts cross over each other in the middle of the AMP. Gross costs for reinforcement mains schemes excluded from this line. Contributions for schemes at Hampton Loade treatment works from Severn Trent are excluded from this line as per latest RAG consultation.
CW2.13	Projects incurring TMA costs based on 2022/23 expected final position, rolled forward to the end of 2030 as no expected changes.

CW3

Line Reference	Commentary
CW3.3 - 36	See Section 3.1 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix
CW3.46	WRMP Water Efficiency Programme is solely contained within this line. See Section 2.2 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix.
CW3.49	See Section 3.2 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix
CW3.55	Expenditure associated with Grafham Water transfer main. See Section 2.1 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix
CW3.60 - 90	There are both base and enhancement costs to our metering programme, these lines represent the enhancement elements as broken out in CW7. Enhancement case in Section 2.3 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix.
CW3.99	Expenditure associate with this line is for schemes detailed in our Raw Water Deterioration enhancement case. See Section 4.1 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix.
CW3.108 - 111	Expenditure associate with this line is for schemes detailed in our Lead replacement strategy. See Section 4.2 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix.
CW3.120	Expenditure associate with this line is for schemes detailed in our Production and Distribution Resilience and Smart operations enhancement cases. For production resilience see Section 5.2 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix. For distribution resilience see Section 5.1 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix. For Smart Operations see Section 5.3 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix. In the case of Langley Reservoir (Section 5.1) costs have been proportionally allocated on the basis of a review of the cost breakdown where costs were allocated based on whether they were delivering against the rebuild of the existing reservoir (assets that already existed and services the existing reservoir) and those that could be directly linked as a requirement of the additional capacity provided by the proposed reservoir. The aggregated ratio of costs is 60:40 in favour of enhancement capex.
CW3.123	See Section 3.4 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix.
CW3.126	See Section 3.5 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix.
CW3.129	See Section 3.3 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix.

CW4

Line Reference	Commentary
CW4.1; CW4.2	We have zero of these assets and will continue to have zero in the future.
CW4.3	We currently have 8 raw water transport stations, and we have no plans to alter asset/network configurations in period. The number may fluctuate ±1 site each year depending on which sites are used operationally, but minor fluctuations are not known or planned for at this time so we have forecast forward at APR23 value.
CW4.4	We have no plans to materially change installed capacity at our raw water transport stations. In practice, there may be small variation in this line in period, if we have to replace a pumpset as part of a failure or future capital work, but these are not known at this point and we have no specific schemes planned at this time. We have therefore forecast forward at APR23 value.
CW4.5	We have no plans to materially change length of raw water transport mains. In practice, there may be small variation in this line in period, if we do any unplanned remedial works or any data validation that can alter databases by a small amount, but these are not known at this point and we have no specific schemes planned at this time. We have therefore forecast forward at APR23 value.
CW4.6	APH is an operationally variable number, as it varies depending on which sites are used, their supply volumes, and network conditions. Whilst we have no plans to materially change the asset configurations of our sources or network, we have considered the following factors for raw water transport APH: • Our starting baseline was the three year average of data from 2020/21 to 2022/23. We took an average of these three years as the starting point of the future forecast. • We considered the impact of the additional groundwater sites we are introducing in Cambridge (Croydon, St Ives, and Kingston). These sites have no raw water transport function so there is no impact to this line. • Over the period to 2030, DI is forecast to reduce by 7.5% overall (line CW5.38, 2022/23 actual to 2029/30 forecast) as we reduce leakage and customer demand. The impact of this reduction in DI would mean that we pump less water overall, which includes the sites which contribute to the raw water transport APH value. A lower volume pumped would not change the static head element of the calculation – i.e the physical height difference between the start and end points of the transfer remains the same, but the lower volume would mean a slightly lower flow velocity on average, so a slightly lower frictional loss in the pipework. We examined the difference between static head and frictional losses for our Hampton Loade site to estimate this impact. We used the treated water distribution part of the site to do this, but we think the assumption can also apply to raw water distribution. We chose this site because of its high volume and because it has an almost 1:1 transfer between the source at Hampton Loade and the reservoir at Sedgley, making the calculation easier. Other sites, including Seedy Mill, are more centrally located within our network and so there are multiple network interactions occurring simultaneously, making it more difficult to estimate frictional losses. Our estimate at Hampton Loade showed that approximately 14% of the reported treated water distribution APH value is frictional losses rather than static head. This means that when we reduce DI, we should see a benefit of 14% of this DI reduction value pass through into our APH value. We have applied this assumption to raw water transport, water treatment and treated water distribution APH forecasts. These factors mean that the raw water transport APH forecast reduces slightly over the period. We consider this a reasonable assumption given that DI should also reduce, but that the asset utilisation mix doesn't materially change. We did discuss this approach with our auditors who supported the rationale and assumptions.
CW4.7	We have followed the same approach for all of the energy consumption forecasts. We have taken the average energy use for 2021/22 and 2022/23, and reduced this proportional to the change in DI over the future years. This is to ensure we take account of leakage and demand reduction, as per our DI forecast, in energy use as well. We would not expect the relationship to be exactly 1:1, due to operational variability and the impact of static power consumption, for example offices. However these are reasonably small component compared to the cost of pumping and treatment which would be expected to track a reducing DI forecast. Overall power consumption is forecast to fall by 7.2% by 2029/30. This is slightly different to the DI reduction (7.5% as noted above) because we have used an average of the 2021/22 and 2022/23 power consumption values as our starting point as there is some operational variability. Note that this forecast reduction in power use is also mapped across to both our costs and carbon emissions forecasts.

	Note that we have previously communicated an issue to Ofwat on treatment of exports in carbon emissions and the same applies to these power lines. We have included a separate note on these issues alongside the commentary for carbon emissions in the performance commitment table OUT4.
CW4.8; CW4.9; CW4.10; CW4.11	We have no raw water transport imports or exports, so these lines are zero and continue to be zero.
CW4.12	We have no plans to materially change length of raw water transport mains. In practice, there may be small variation in this line in period, if we do any unplanned remedial works or any data validation that can alter databases by a small amount, but these are not known at this point and we have no specific schemes planned at this time. We have therefore forecast forward at APR23 value.
CW4.13; CW4.14; CW4.15; CW4.16; CW4.17; CW4.18; CW4.19; CW4.20; CW4.21; CW4.22; CW4.23; CW4.24; CW4.25; CW4.26	We have considered these lines together as they relate to categorisation of treatment sites by complexity. We have evaluated whether our expenditure plans result in any changes to treatment complexity over the period, comparing to the already reported 2022/23 baseline. The majority of sites remain unchanged during the period, the changes we do have planned for the forecast years are as follows: • Hampton Loade installation of ceramic membrane as per current AMP7 delivery scheme, operational from 2025/26, but does not alter treatment complexity category (remains W5). • Bourne Vale borehole site, manganese removal via cartridge filtration. There is no specific complexity category for this so on discussion with our technical assurer we have concluded that the operating costs are similar to membrane filtration so we include this in the W4 category from 2027/28. • UV disinfection upgrades at Cookley (2029/30), Maple Brook (2027/28), Fulbourn (2028/29), Great Chishill (2029/30), and Great Wilbraham (2028/29). • We are also installing UV at Pipehill in the AMP8 period (operational from 2030/31) but there is no impact to treatment complexity as site is already W5. • Three sites in Cambridge are being brought back into supply, from previously being long term mothballed, to support demands in the region. These were included in our PR19 plans. Croydon operational from 2025/26 with enhanced disinfection and pressure filtration (W2), Kingston operational from 2026/27 with nitrate treatment (W4) and St Ives operational from 2025/26 with UV (W4). Supply volumes from these sites are consistent with PR19 proposals and reflect the design capacity of the sites. • Duxford Airfield/Sawston Mill was temporarily taken out of supply in 2021/22 due to issues with PFAS, we are currently installing GAC filtration to treat for this issue at which will be operational by 2024/25, which in conjunction with the UV disinfection already at the site will mean the site becomes W5. For calculating treatment volumes we have looked at the average of the supply volumes from 2020/21, 2021/22 and 2022/23 and considered the impact of any site outages. In general we have taken forward the average of the historical data, with a small number of exceptions where either unplanned or planned outage meant the year is not representative, in which case we have chosen a value representative of the expected treatment volume instead. For all sites we then ensure that the DI forecast for each region, taking account of growth, leakage and demand reductions as per our performance commitment targets, is included proportionally across all of the input volumes. This means that the larger surface water sites take a higher proportion of the volume reductions which is what we would expect to do in practice. As there are always operational factors that may adjust the mix of sites being utilised in any year, this approach is proportionate and consistent across all of the categories and years.
CW4.27; CW4.28; CW4.29; CW4.30; CW4.31; CW4.32; CW4.33; CW4.34; CW4.35; CW4.36; CW4.37; CW4.38; CW4.39; CW4.40; CW4.41; CW4.42	We have considered these lines together as they relate to categorisation of treatment sites by size band. The size band is derived from PWPC and so we have evaluated whether our expenditure plans result in any sites having an increased or decreased PWPC over the period, or whether there are any new sites to be included. The majority of sites remain unchanged during the period, the changes we do have planned are as follows: • As per the treatment complexity lines above, three sites in Cambridge are being brought back into supply, from previously being mothballed, to support demands in the region. These were included in our PR19 plans. Croydon, Kingston and St Ives all fall under 2 Ml/d and so are all size band 1. • Note that Duxford Airfield/Sawston Mill was counted as a size band 1 site in 2022/23, as the site is out of supply being upgraded, we have removed it from being counted at all in 2023/24 and it becomes included again in 2024/25 as a size band 3 site (4.3 Ml/d design capacity). The % of DI derived from each size band is calculated from the same data used to forecast treatment volumes by complexity group for the lines above, and as with those lines it is also including any changes to DI that will result from growth, leakage and demand reductions. So the size band lines, treatment complexity lines, and DI forecasting is all consistent across data tables.
CW4.43	We have evaluated whether our expenditure plans result in any sites having an increased or decreased PWPC over the period, or whether there are any new sites to be included. We have completed this line consistent with the sites which are being reintroduced, as per the treatment complexity lines above. These are Croydon, St Ives, Kingston

	and Duxford Airfield/Sawston Mill. The PWPC increase has been included in the year that the sites go operational, which is assumed to be the year following the expenditure.
CW4.44; CW4.45	We have populated the grey solutions with the treatment works upgrades that we have included in the treatment complexity forecast in lines CW4.13 to CW4.26 above, and which have also been used to populate the line CW4.47 below and the PWPC line CW4.43 above. To align to line CW4.47, we have included the PWPC in the year which the expenditure is taking place. Please see line CW4.47 below for the list of schemes that is included. The PWPC is as per the 2022/23 value, which is not forecast to change for these sites over the period. We do not have any green solutions that can be tagged directly to a production treatment site, therefore this line is zero.
CW4.46	As in our APR, this line is zero for all years.
CW4.47	We have aligned this line to our expenditure plans for treatment upgrades as used to populate the water treatment complexity lines in CW4.13 to CW4.26. For those lines we included the scheme in the year in which it becomes operational and is producing water, but for this line we have included it in the year of the expenditure, which is assumed to be the year before the asset becomes operational. This means that: • In 2023/24 we include Duxford Airfield /Sawston Mill PFAS treatment; • In 2026/27 we include Bourne Vale manganese and Maple Brook UV; • In 2027/28 we include Fulbourn UV and Great Wilbraham UV; • In 2028/29 we include Cookley UV and Great Chilshill UV; In 2029/30 we include Pipehill UV.
CW4.48	Almost 100% of our supply area in both regions is supplied with orthophosphate dosed water for plumbosolvency control. The only exception is a small hamlet (Odsey) in Cambridge which is supplied via an import from Anglian which is not orthophosphate dosed. This population is 98, which we have deducted from the total population forecast.
CW4.49	APH is an operationally variable number, as it varies depending on which sites are used and their supply volumes. Whilst we have no plans to materially change the asset configurations, we have considered the following factors for water treatment APH: • Our starting baseline was the three year average of data from 2020/21 to 2022/23. We took an average of these three years as the starting point of the future forecast. • We considered the impact of any new or upgraded treatment processes. Our treatment APH is very low, because most treatment processes do not have any pressure overhead. We include pressure overheads for pressure and membrane filtration types, and other types of vessels, for example nitrate treatment. When combined with the many sites for which there is no or limited treatment overhead, this results in only a small treatment APH value. Whilst we are introducing new or upgraded treatment processes, we do not consider these will make any material impact to our total treatment APH value, as when combined across all sites the impact will be very small. • As with the other APH components, we have considered the impact of DI reduction. DI is forecast to reduce by around 7.5% by 2030 as a result of leakage and consumption reductions (line CW5.38, 2022/23 actual to 2029/30 forecast). This will mean less water required to be pumped as a whole. Within treatment, it is difficult to assess the impact this will have, but similar assumptions can be made on a reduction in frictional losses as a result of the DI reduction. We have therefore assumed that the 14% frictional losses we estimated for treated water distribution can also apply here. This may be an over- or under- estimate in the case of water treatment, but the value is so small relative to the other components, this assumption is unlikely to have a material impact. These factors mean that water treatment APH reduces marginally over the period, as it is a relatively small value in the first place. This is reasonable given that we felt it was right to include an impact from DI reduction, but that the treatment process complexity is increasing over the period which may introduce new pressure overhead, and that the underlying asset mix isn't materially changing. We discussed this rationale and assumptions with our technical auditors who supported the approach.
CW4.50	We have followed the same approach for all of the energy consumption forecasts. We have taken the average energy use for 2021/22 and 2022/23, and reduced this proportional to the change in DI over the future years. This is to ensure we take account of leakage and demand reduction, as per our DI forecast, in energy use as well. We would not expect the relationship to be exactly 1:1, due to operational variability and the impact of static power consumption, for example offices. However these are reasonably small component compared to the cost of pumping and treatment which would be expected to track a reducing DI forecast. Overall power consumption is forecast to fall by 7.2% by 2029/30. This is slightly different to the DI reduction (7.5% as noted above) because we have used an average of the 2021/22 and 2022/23 power consumption values as our

	starting point as there is some operational variability. Note that this forecast reduction in power use is also mapped across to both our costs and carbon emissions forecasts. Note that we have previously communicated an issue to Ofwat on treatment of exports in carbon emissions and the same applies to these power lines. We have included a separate note on these issues alongside the commentary for carbon emissions in the performance commitment table OUT4.
CW4.51; CW4.52; CW4.53; CW4.54	We have no water treatment imports or exports, so these lines are zero and continue to be zero.
CW4.55	We have no works which require new MCERTS flow monitoring, as agreed with the EA as part of WINEP programme development.
CW4.1; CW4.2	We have zero of these assets and will continue to have zero in the future.
CW4.3	We currently have 8 raw water transport stations, and we have no plans to alter asset/network configurations in period. The number may fluctuate ±1 site each year depending on which sites are used operationally, but minor fluctuations are not known or planned for at this time so we have forecast forward at APR23 value.

CW4a

We have no accelerated or transition expenditure, so this table has been left blank.

CW5

<table>
<tr><th>Line Reference</th><th>Commentary</th></tr>
<tr><td>CW5.1</td><td>As explained in lines CW5.16 to CW5.20 we are adding new booster sites and three new source sites in the next few years. In total this adds 220kW of additional pumping capacity which is included in this line in the year in which it is forecast to become operational.</td></tr>
<tr><td>CW5.2</td><td>Our capital maintenance programme includes the enhancement of the capacity of Langley service reservoir which will increase in size from 5 to 10 Ml but we are planning the build phase for this is 2027-2029 and so the reservoir will not become operational until 2030. Therefore within AMP7 there is no change to the total service reservoir volume as a result of the plans at Langley. No service reservoirs will be abandoned or reduced in capacity over the period.</td></tr>
<tr><td>CW5.3</td><td>We have no plans to alter our asset configuration for water towers. The ones we already have will remain operational and we are not proposing any new towers or capacity increases to existing towers. We have rolled forward the APR23 value.</td></tr>
<tr><td>CW5.4</td><td>We do not supply non-potable water, hence this line is zero in all years.</td></tr>
<tr><td>CW5.5</td><td>This is the sum of residential and non-residential consumption in the water balance, along with operational use, water taken unbilled, plus the supply pipe losses as shown in the leakage data CW5.60 to CW5.67.</td></tr>
<tr><td>CW5.6</td><td>This is the sum of measured billed household consumption in the water balance (CW5.31), plus the associated supply pipe losses (CW5.60).</td></tr>
<tr><td>CW5.7</td><td>This is the sum of measured billed non-residential consumption in the water balance (CW5.33), plus the associated supply pipe losses (CW5.62).</td></tr>
<tr><td>CW5.8; CW5.9; CW5.10; CW5.11; CW5.12; CW5.13; CW5.14; CW5.15</td><td>These lines are operationally variable from year to year, as a result of normal day to day operating choices on site utilisation. Our forward plans for AMP8 do not require any material systematic changes to the overall resource mix of the network or configuration of assets that drives this mix. Therefore whilst Ofwat can expect to see small movements from year to year in annual reporting of these lines, for the purposes of planning we do not expect any material movements. For surface water, 2022/23 was an unusual year due to the impact of the major construction scheme at Seedy Mill which reduced the utilisation from that site. For groundwater sites we have applied the average of the three years rolling forward, but for surface water sites we applied the average of 2020/21 and 2021/22 due to the unusual 2022/23 year. This approach sums to just under 1, so we then proportionally adjust to ensure sum totals to 1. Note that we do not have any assets which fall under AR, ASR, saline or water reuse, so these lines are all zero. We do have the capability to run our Hampton Loade site in river abstraction mode, rather than its normal operating mode of bankside storage, but over previous years we have not needed to do this so we continue to forecast zero for river abstraction volume.
<table>
<tr><th></th><th>2020/21</th><th>2021/22</th><th>2022/23</th><th>Average, proportionally adjusted</th></tr>
<tr><td>Proportion of DI from impounding reservoirs</td><td>0.151</td><td>0.154</td><td>0.132 (excluded from average)</td><td>0.154</td></tr>
<tr><td>Proportion of DI from pumped storage</td><td>0.280</td><td>0.288</td><td>0.322 (excluded from average)</td><td>0.285</td></tr>
<tr><td>Proportion of DI from river abstractions</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>Proportion of DI from groundwater sources</td><td>0.569</td><td>0.558</td><td>0.546</td><td>0.561</td></tr>
</table>
</td></tr>
</table>

CW5.16; CW5.17; CW5.18; CW5.19; CW5.20	Line CW5.16 is the total of the other four lines. We are currently bringing into service disused groundwater sites in the Cambridge region in AMP7, this is three new sites under the groundwater pumping category, line CW5.17, and we have used the same delivery profile for this line as used for the treatment category and size band changes, where these sites also impact. We are currently building 5 new distribution boosters to support growth in Cambridge, these will be operational by 2024/25 so are included in that year. One further booster is planned to be operational by 2027/28. This is a total of 6 new sites which add to line CW5.19. There will be no changes to surface water treatment sites or to import boosters, these lines remain as per APR23.
CW5.21; CW5.22	As per line CW5.2, the Langley project will not become operational until 2030, so there is no change to the number of reservoirs or water towers in AMP8 period.
CW5.23	We have followed the same approach for all of the energy consumption forecasts. We have taken the average energy use for 2021/22 and 2022/23, and reduced this proportional to the change in DI over the future years. This is to ensure we take account of leakage and demand reduction, as per our DI forecast, in energy use as well. We would not expect the relationship to be exactly 1:1, due to operational variability and the impact of static power consumption, for example offices. However these are reasonably small component compared to the cost of pumping and treatment which would be expected to track a reducing DI forecast. Overall power consumption is forecast to fall by 7.2% by 2029/30. This is slightly different to the DI reduction (7.5% as noted above) because we have used an average of the 2021/22 and 2022/23 power consumption values as our starting point as there is some operational variability. Note that this forecast reduction in power use is also mapped across to both our costs and carbon emissions forecasts. Note that we have previously communicated an issue to Ofwat on treatment of exports in carbon emissions and the same applies to these power lines. We have included a separate note on these issues alongside the commentary for carbon emissions in the performance commitment table OUT4.
CW5.24	APH is an operationally variable number, as it varies by a small amount each year depending on which sites are used, their supply volumes, and network conditions. Whilst we have no plans to materially change the asset configurations of our sources or network, we have considered the following factors for treated water distribution APH: Our starting baseline was the three year average of data from 2020/21 to 2022/23. We took an average of these three years as the starting point of the future forecast. We considered the impact of the additional groundwater sites we are introducing in Cambridge (Croydon, St Ives, and Kingston). These sites are small relative to our whole network and so will only have a very small impact, if any, on treated water distribution APH. Also these sites are in Cambridge, which is a flatter region, and are pumping water to the same network which will be broadly at the same network pressures as other Cambridge sites. All this considered, the impacts of these sites will be minimal. Over the period to 2030, DI is forecast to reduce by 7.5% overall, as we reduce leakage and customer demand. The impact of this reduction in DI would mean that we pump less water overall, which includes the sites which contribute to the treated water distribution APH value. A lower volume pumped would not change the static head element of the calculation – i.e the physical height difference between the start and end points of any transfer remains the same, but the lower volume would mean a slightly lower flow velocity on average, so a slightly lower frictional loss in the pipework. We examined the difference between static head and frictional losses for our Hampton Loade site to estimate this impact. We used the treated water distribution part of the site to do this. We chose this site because of its high volume and because it has an almost 1:1 transfer between the source at Hampton Loade and the reservoir at Sedgley, making the calculation easier. Other sites, including Seedy Mill, are more centrally located within our network and so there are multiple network interactions occurring simultaneously, making it more difficult to estimate frictional losses. Our estimate at Hampton Loade showed that approximately 14% of the reported treated water distribution APH value is frictional losses rather than static head. We have applied this assumption to raw water transport, water treatment and treated water distribution APH forecasts. As mains size in the whole of our network will have been designed using similar engineering principles over time, we think that 14% will be reasonably homogenous, on average, across the whole network. This means that when we reduce DI, we should see an average benefit of 14% of this DI reduction value pass through into our APH value. These factors mean that the treated water distribution APH forecast reduces slightly over the period. We consider this a reasonable assumption given that DI should also reduce, but that the asset utilisation mix doesn't materially change and only the frictional losses component of pumping head will be impacted, not the static head component of the value. We discussed this rationale and assumptions with our technical auditor who were in agreement the approach is reasonable.

<table>
<tr><td>CW5.25; CW5.26;
CW5.27; CW5.28</td><td>We operate several small imports and exports, the largest of which by far is the Severn Trent export from the supply system downstream of Hampton Loade and Sedgley Reservoirs. There is natural year to year variation on the volume of water imported or exported, so for these lines we use the average of the years 2020/21 to 2022/23. There are no plans for any material configuration changes that would require any more material deviations in this forecast.
<table>
<tr><td></td><td>2020/21</td><td>2021/22</td><td>2022/23</td><td>Average</td></tr>
<tr><td>Nr of treated water distribution imports</td><td>11</td><td>11</td><td>11</td><td>11</td></tr>
<tr><td>Volume of water imported</td><td>0.14</td><td>0.10</td><td>0.11</td><td>0.12</td></tr>
<tr><td>Nr of treated water distribution exports</td><td>16</td><td>16</td><td>16</td><td>16</td></tr>
<tr><td>Volume of water exported</td><td>44.33</td><td>44.45</td><td>40.24</td><td>43.01</td></tr>
</table></td></tr>
<tr><td>CW5.29; CW5.30</td><td>The peak week DI is impacted by external conditions primarily the strength of the summer weather conditions and the timing of this primarily to school holiday periods. Whilst we are reducing DI over the period as a result of leakage and PCC savings, we do not know whether PCC savings would pass directly through into peak week DI, it does depend a lot on the conditions and the timing. Given these uncertainties we have maintained the same peak DI ratio as in 2022/23 and applied this ratio to our forecast total DI value as shown in line CW5.38.</td></tr>
<tr><td>CW5.31; CW5.32,
CW5.33; CW5.34;
CW5.35; CW5.36;
CW5.37; CW5.38;
CW5.39; CW5.40;
CW5.41; CW5.42;
CW5.43; CW5.44;
CW5.45; CW5.46;
CW5.47; CW5.48;
CW5.49; CW5.50;
CW5.51; CW5.52;
CW5.53; CW5.54;
CW5.55; CW5.56; CW5.57</td><td>The water balance forecast is influenced by the following factors:
Growth in residential and business customer base
Leakage, residential demand and business demand savings
Meter penetration increases
We have used each regions WRMP as the basis for the forecasts for the water balance lines in each region from 2025/26 onwards. The total company water balance is the sum of the two regions.
However the current levels of DI and PCC are higher than those expected within the WRMP, as a result of lingering impacts from behavioural change from the Covid pandemic. We have provided extensive additional detail on this issue in our PCC penalty abatement appendix and in our outcomes appendix where we set our PCC targets for AMP8.
This means that we consider the most appropriate approach is to utilise the WRMP reduction forecasts for the long term but adjusted for the actual 2022/23 position. To do otherwise would see the tables show an abrupt and unrealistic step change between 2022/23 and 2023/24. We are already half way through 2023/24 and are not seeing the reductions that would align exactly with the WRMP values. We recognise that this creates a disconnect with the WRMP but we think using realistic values is the most appropriate approach for these tables as it is then aligned to our proposed performance commitment targets. Over the long term, we will still trend down to the same demand forecasts as required by the Environment Act, but the glidepath to this is different compared to the WRMP.</td></tr>
<tr><td>CW5.58; CW5.59;
CW5.60; CW5.61;
CW5.62; CW5.63;
CW5.64; CW5.65;
CW5.66; CW5.67;
CW5.68; CW5.69;
CW5.70; CW5.71;
CW5.72; CW5.73;
CW5.73; CW5.74;
CW5.75; CW5.76;
CW5.77; CW5.78;
CW5.79; CW5.80;
CW5.81; CW5.82;
CW5.83; CW5.84;
CW5.85; CW5.86; CW5.87</td><td>Note that as in APR23, our leakage methodology does not separate trunk mains and DMA leakage in the SST region. Therefore for lines CW5.68 and CW5.69 we can only provide a combined figure, which we have inserted as a total into line CW5.69 and left line CW5.68 blank.
For CAM, we do have this split and so have included it in lines CW5.78 and CW5.79.
However the total lines CW5.58 and CW5.59 can also only be completed as a combined value, as they are a sum of the two separate regions.
The sum components of these regional leakage tables sum to the total annual leakage we are proposing to deliver in our leakage performance commitment, and as shown in the water balance.</td></tr>
</table>

CW6

<table>
<tr><th>Line Reference</th><th>Commentary</th></tr>
<tr><td>CW6.1</td><td>
We are forecasting mains growth at the average historical rate using data from 2018/19 to 2022/23, which is 43.1km per year. The average mains growth is added to the preceding value each year in the table forecast.
<table>
<tr><th></th><th>2018/19</th><th>2019/20</th><th>2020/21</th><th>2021/22</th><th>2022/23</th><th>Average growth rate</th></tr>
<tr><td>Total length of mains, APR 6C.1</td><td>8529.9</td><td>8579.5</td><td>8622.1</td><td>8675.4</td><td>8702.2</td><td>43.1</td></tr>
<tr><td>Total length of new potable mains, APR 6C.4</td><td>45.9</td><td>57.3</td><td>43.0</td><td>49.9</td><td>32.1</td><td>45.7</td></tr>
</table>
The change in APR line 6C.1 does not exactly align with 6C.4 each year because 6C.1 is derived from our GIS system where changes are recorded but data validation across the whole network occurs on a continual basis, and there may be timing differences between new mains in 6C.4 being constructed and being added to GIS.
We have validated this against the length of new development mains where the forecast going forward is for 37km per annum, as per lines DS4.13 and DS4.14. We would expect total mains growth to be higher than the new development mains forecast, as the total mains growth would include diversions and other new mains we lay outside of new development schemes.
On balance the historic growth rate as recorded in APR line 6C.1 is representative of our expected future mains growth rate.
</td></tr>
<tr><td>CW6.2</td><td>We do not undertake mains relining, only renewal, so this line is zero.</td></tr>
<tr><td>CW6.3</td><td>We had lower than planned mains renewals in AMP7 due to other external cost pressures. Going forward, our business plan is to restore previous levels of renewals at around 0.56% replacement rate per annum, or equivalent to a renewal length of 50km per annum.</td></tr>
<tr><td>CW6.4</td><td>This is the 43.1km annual average growth rate we have used in line CW6.1.</td></tr>
<tr><td>CW6.5; CW6.6; CW6.7; CW6.8</td><td>
We have examined the change in the size distribution of mains from 2020/21 to 2022/23. Most mains growth is <320mm, but there is a small amount of growth in the other categories with the exception of >610mm which has reduced slightly. We do not have any plans for large diameter mains reduction so we have maintained the 2022/23 value for mains length >610mm. For the other three categories we have proportionally spread the 43.1km expected mains growth across the lines, with the bulk of this going in the <320mm category as expected.
<table>
<tr><th></th><th>2020/21</th><th>2021/22</th><th>2022/23</th><th>Average growth</th><th>Proportional to 43.1km total mains growth</th></tr>
<tr><td>Mains growth, <320mm</td><td>36.5</td><td>43.7</td><td>28.4</td><td>36.2</td><td>37.7</td></tr>
<tr><td>Mains growth, 320mm – 450mm</td><td>1.9</td><td>8.0</td><td>0.1</td><td>3.3</td><td>3.5</td></tr>
<tr><td>Mains growth, 450mm – 610mm</td><td>4.0</td><td>1.6</td><td>0.0</td><td>1.9</td><td>1.9</td></tr>
<tr><td>Mains growth, >610mm</td><td>0.2</td><td>-0.1</td><td>-1.3</td><td>-0.4</td><td>Assume zero change</td></tr>
</table>
</td></tr>
<tr><td>CW6.9; CW6.10; CW6.11; CW6.12; CW6.13;</td><td>All new mains are added to the >2021 line, as are all mains renewals.</td></tr>
</table>

CW6.14; CW6.15; CW6.16; CW6.17	In the other lines representing older mains, we have looked at the past three years to determine the average replacement rate for that category. The two older categories of pre-1900 mains are primarily trunk mains which are still operational, we are not proposing to focus any renewal activity on these so these remain the same. There is minimal renewals activity, as would be expected, on mains in the newer category since 2001, so we have maintained this value the same across all future years. Mains renewal is mostly impacting the age categories from 1900 to 2000, in different proportions. We have taken the average proportion for the last three years for each of these categories and rolled it forward, scaling for the increase in renewals activity to 50km per year.
CW6.18	Forecasted number of lead CP's from 25/26 is based on a reduction by the number of replacements being forecasted in lines CW6.21 & 22 which captures almost all of the replacement activities undertaken with the exception of cut offs. Based on numbers from the APR the average number of lead supplies that are cut off in the South Staffordshire region is 20 and 16 in the Cambridge region. These numbers have been added on top of those from lines CW6.21 & 22 to provide a total yearly reduction. There is an expected increase in the number of lead CP's that will be replaced as we transition from AMP7 to AMP8. Details of the numbers can be found within our Lead Strategy enhancement case. See reference below
CW.19	The forecasted reduction on this line is based on the average number of replacements that take place using data provided in the APR. Within the South Staffordshire region an average of 4 has been used. Within the CAM region over the past 6 years only 1 replacement has been completed. A replacement of 1 in the Cambridge region has been assumed as a minimum for the entire of AMP8. Number of galvanised iron CP's is based on the number replaced during R&M works, rehab or disconnections.
CW6.20	This line has been calculated by using the number of other CP's reported in FY23 and increasing the number annually using the forecasted new connections as reported in the table DS4 (rows 9 & 10) with the addition of the number of lead and galvanised iron replacements forecasted during AMP9 (with the exception of cut offs).
CW6.21	This line has been populated with the expected number of lead communication pipes to be replaced during the proposed enhancement cases within the lead replacement strategy enhancement case (See reference below). Summary of replacements: Based on Sample Failures: 74 per annum across a 5 year programme Lead Pilot scheme: 1200 – numbers split out annually based on proportion of budget in phasing of project. Years 2 & 3 of AMP8 with 24% of the replacement allocated in the first year of the project and the remaining 76% in the final year. Lead replacement programme: 75 replacements per annum across a 5 year programme For AMP7 figures: As per what was reported in 22/23 APR the figure includes replacements based on sample failures as well as CP's replaced during renewal schemes. The remaining two years of AMP7 are filled out using the same logic. Average WQ replacement rate (19/20 to21/22) + Average lead cp replacement rate per km (See commentary for line CW6.22)
CW6.22	Assumed that this line includes numbers replaced by base capital and opex budgets also. Rehab: Historic figures from APR used to quantify a Lead CP replacement rate per km of mains renewed. Average used to calculate the number of CP's being replaced based on level of renewal for AMP8. 45 replacements per 1km of main renewal in SSC. 10 in CAM and 35 in SST. R&M (Leakage and low pressure): Levels of replacement assumed to stay the same as previous years. Annual average used to forecast for AMP8. Average annual replacement rate in SST = 236 Average annual replacement rate in CAM = 111 Total for line in remaining AMP7 years: Annual average of replacements through R&M Total for line in AMP8: (Forecasted annual renewal length (km)*replacement rate per km)+R&M average annual replacement rate
CW6.23	Spatial Analysis with the company GIS has provided an average length of communication pipe of 5m. This length has been used to communicate length of replacements in previous data submissions. This value has been multiplied against the number of lead communication pipe replacements for each year to provide a total length.

CW6.24	Assumed that we are only including those supply pipes that the company physically replaces or funds the replacement of. This only includes the proposed replacement schemes within the lead replacement strategy outlined in the enhancement case. Totals for this line: Double of the CP replacement numbers associated with the lead enhancement with the exception of lead replacement due to sample failure.
CW6.25	Spatial Analysis with the company GIS has provided an average length of supply pipe of 12m across all property types and for schools Cambridge has an average length of 27.5m and South Staffordshire 31.6m. The length of 12m has been applied to the number of services pipes being targeted within the lead pilot scheme (1200) and the lengths associated with schools have been allocated to the number of service replacement being targeted within the vulnerable lead replacement programme.
CW6.26	There are no internal lead supply pipes being targeted within any of the proposed replacement schemes.
CW6.27	There are no internal lead supply pipes being targeted within any of the proposed replacement schemes.
CW6.28	We do not expect any change to our supply area size, so this forecast remains as per APR23.
CW6.29	Our aspiration for CRI is zero, and this is our performance commitment target. However in practice this is difficult to achieve. We are unsure whether Ofwat expects us to forecast our performance commitment target here, which will be zero, or our forecast performance. We would typically expect our actual performance to be between 1 and 2 points per year based on recent history, but it can be as high as >8. At this stage we have left this line as zero reflecting our performance commitment target. 89% of vulnerable replacements within South Staffordshire and 11% in Cambridge.
CW6.30	As with CRI, our aspiration for ERI is also zero. However in practice this is difficult to achieve. We are unsure whether Ofwat expects us to forecast zero here as the aspiration, or our real world expectation. At this stage we have left this line as zero reflecting our aspiration as a compliance measure.

Specific Ofwat request	Commentary
PR24 Final Methodology submission table guidance – section 3: Costs (wholesale) – water , P.59 requested commentary	For details on lead replacements that will be completed within our lead replacement strategy enhancement case see Section 4.2 of our "SSC36 Evidencing our enhancement expenditure in 2025-2030" appendix. Data sources for forecasting number of lead supplies on the network has been developed over recent years using new data sources to better understand risks around lead on the network. We now use buildings data purchased from a third-party so that we can understand the era that properties were constructed within. This allows us to infer where there is a risk that lead may be present within the service pipe.

CW6a

We have no accelerated or transition expenditure, so this table has been left blank.

CW7

We have a contract set up for AMI capable meters, such that all new meters are AMI capable. Hence, other lines have been left blank.

Line Reference	Commentary
CW7.1	Cost of new meter optants-unit rate of £280 per meter multiplied by number of fitted meters. This includes the cost of an AMI capable meter These costs are based on our historic unit rates of meter optant costs and are more expensive than selective meter replacements as one meter is fitted per appointment. We are confident in these costs and their efficiency as they are based on historic data.
CW7.2	Cost of selective meter replacements through our universal metering programme for households, unit rate of £162 per meter. AMP7 We have proposed to catch up on our AMP7 metering programme through selective meter fits. Through other work on our network, we have fitted boundary boxes for meters on properties, but not the meter. Therefore, we plan to utilise these options first for the most efficient delivery, and the cheapest costs. These costs are based on the cost of the meter, and the labour cost to fit it. AMP8 This includes the cost of an AMI capable meter. These also include costs of the fit, which are based on analysis of the remaining meters we have available to fit over the next two AMPs, considering their location, the type of fit required, and economies of scale through increased numbers of jobs completed in single a single trip.
CW7.3	We only have c3,000 unmeasured NHH across our customer base. Our WRMP24 process identified significant benefits for business demand by reaching 100% NHH meter penetration over the next two AMPs. These costs reflect the new business meters fitted.
CW7.4	These costs are for our meter replacement programme for HH. We are not planning significant uplifts in replacements in HH metering as we focus on new meters. However, we will complete replacements as part of the universal programme where efficient to do so, estimated by the uplift in costs between AMP7 and AMP8.
CW7.5	As we have significantly higher meter penetration of NHH already, our WRMP24 identified significant benefits from meter replacements with AMI meters. These costs relate to the replacement of basic and AMR meters in AMP8.
CW7.6	Historically, we have experienced c7000 optants per year. We expect to see uptake in metes increase as we begin our universal metering programme. We will be advertising the programme, and its benefits widely, and are considering reward options for switching early to incentivise faster take up. Therefore, we are expecting 9000 per year for AMP9.
CW7.7	In AMP7, we will fit 14,914 selective meters in Y4 and Y5 to catch up on our PR19 targets. Our AMP8 metering programme will focus on selective metering. We plan to fit 22,845 meters per year through the universal programme. These figures algin to our WRMP24 in SST and CAM.
CW7.8	We plan to fit 466 new NHH meters every year in AMP8. This is an uplift from historic levels as we start our universal metering programme.
CW7.9	Small uplift from AMP7 to AMP8 HH renewals. We are not planning significant uplifts in replacements in HH metering as we focus on new meters. However, we will complete replacements as part of the universal programme where efficient to do so, estimated by the uplift in costs between AMP7 and AMP8.
CW7.10	Large uplift in from AMP7 to AMP8 NHH renewals. As we have significantly higher meter penetration of NHH already, our WRMP24 identified significant benefits from meter replacements with AMI meters.
CW7.11-CW7.12	We have assumed 50% basic replacements and 50% AMR replacements for HH based on historic activity.
CW7.13-CW7.14	We have assumed 67% basic replacements and 33% AMR replacements for NHH based on the proportion of NHH on these types of meter across our customer base.

<table>
<tr><td>CW7.15</td><td>These benefits have been calculated as part of the WRMP24 process.
They differ from historic rates due to updated and improved calculations of metering benefit.</td></tr>
<tr><td>CW7.16</td><td>These benefits have been calculated as part of the WRMP24 process.
They differ from historic rates due to updated and improved calculations of metering benefit.</td></tr>
<tr><td>CW7.17-CW7.18</td><td>No benefit assumed for HH meter replacements as per WRMP24.</td></tr>
<tr><td>CW7.19-CW7.20</td><td>Benefits assessed based on NHH universal AMI metering as part of WRMP24.</td></tr>
<tr><td>CW7.21</td><td>The guidance suggests meter penetration is percentage of measured properties, but this does not accurately represent our metering penetration. We plan to fit meters as part of our universal metering programme, but not switch our customers to measured billing for 2 years as part of the transition process. This creates a lag before they show in our measured properties. Therefore, we have used % or properties with a meter. Difference shown below.
<table>
<tr><th></th><th>2022-23</th><th>2023-24</th><th>2024-25</th><th>2025-26</th><th>2026-27</th><th>2027-28</th><th>2028-29</th><th>2029-30</th></tr>
<tr><td>% Measured properties- bill on a meter</td><td>51%</td><td>52%</td><td>54%</td><td>56%</td><td>59%</td><td>64%</td><td>68%</td><td>73%</td></tr>
<tr><td>% properties with a meter</td><td>51%</td><td>53%</td><td>56%</td><td>61%</td><td>65%</td><td>70%</td><td>74%</td><td>79%</td></tr>
</table>
This excludes void properties.
Our metering strategy is identical to our WRMP24 submissions, but our property forecast varies (see SUP1A/B commentary). Therefore, this will not match the equivalent WRMP line.</td></tr>
<tr><td>CW7.22</td><td>CW5.31 measured consumption divided by SUP1A.20 (measured population) to give litres per head.</td></tr>
<tr><td>CW7.23</td><td>CW5.32 unmeasured consumption divided by SUP1A.21 (unmeasured population) to give litres per head.</td></tr>
<tr><td>CW7.24</td><td>Total cost of new selective and optant meter replacements, divided by number of new business and selective meters for AMP8.
£6.221m / 31,845 = £195.35
Optants unit rate: £280
This includes the cost of an AMI capable meter These costs are based on our historic unit rates of meter optant costs and are more expensive than selective meter replacements as one meter is fitted per appointment. We are confident in these costs and their efficiency as they are based on historic data.
Selective unit rate: £162
This includes the cost of an AMI capable meter. These also include costs of the fit, which are based on analysis of the remaining meters we have available to fit over the next two AMPs, considering their location, the type of fit required, and economies of scale through increased numbers of jobs completed in single a single trip.</td></tr>
<tr><td>CW7.25</td><td>Total cost of new business meters divided by numbers of new business meters for AMP8.
New meter unit rate: £813
Including for meter cost £350 (max price for largest size) + excavation cost £227 (from our data from new connections charges) + two-way traffic lights £236
Our NHH meter penetration is already 91%. We believe the remaining NHH meters to fit are the most challenging and costly, as these are the last left. This is why it is our highest unit rate. However, our WRMP strongly supports the benefits associated with the costs of reaching 100% NHH penetration.
NHH metering costs are far harder to predict than HH due the variability between customers, such that confidence is lower in the unit rates than with HH.</td></tr>
<tr><td>CW7.26-CW7.27</td><td>Total costs of residential meters renewed divided by number of meters renewed.
Replacement unit rate: £215.16
This is the actual run rate for meter replacements over the past few years.
We have not included any enhancement spending as we only plan to complete business as usual replacements, and the cost difference between a basic, AMR and AMI capable meter for a household size is not material at this scale.</td></tr>
<tr><td>CW7.28-CW7.29</td><td>Total costs of business meters renewed divided by number of meters renewed.
NHH replacement unit rate: £113.89</td></tr>
</table>

	This includes the average cost of a 20-30mm meter plus additional labour costs for fitting. This is c half the cost of a HH replacement as we will be completing these alongside our universal metering programme such that we experience efficiencies in fitting costs. Our usual NHH replacement programme would complete 230 meter replacements per year, compared to the 4657 per year planned for AMP8. New NHH meters are more expensive as they are larger sizes. It is not possible to absorb these costs within our base allowance, but we need to deliver the meters to deliver a step change business demand in line with our WRMP24 plans. We have excluded the costs of our usual 230 base meter replacements from our enhancement case, meaning the unit rate drops to £103.27 per NHH meter replacement enhancement. This represents 9% of our costs.
CW7.30-CW7.31	Total costs of residential meters renewed divided by number of meters renewed. Replacement unit rate: £215.16 This is the actual run rate for meter replacements over the past few years. We have not included any enhancement spending as we only plan to complete business as usual replacements, and the cost difference between a basic, AMR and AMI capable meter for a household size is not material at this scale.
CW7.32-CW7.33	Total costs of business meters renewed divided by number of meters renewed. NHH replacement unit rate: £113.89 This includes the average cost of a 20-30mm meter plus additional labour costs for fitting. This is c half the cost of a HH replacement as we will be completing these alongside our universal metering programme such that we experience efficiencies in fitting costs. Our usual NHH replacement programme would complete 230 meter replacements per year, compared to the 4657 per year planned for AMP8. New NHH meters are more expensive as they are larger sizes. It is not possible to absorb these costs within our base allowance, but we need to deliver the meters to deliver a step change in business demand in line with our WRMP24 plans. We have excluded the costs of our usual 230 base meter replacements from our enhancement case, meaning the unit rate drops to £103.27 per NHH meter replacement enhancement. This represents 9% of our costs.
CW7.34-CW7.41	We have not assumed any difference in upgrade and replacement costs as the equipment and infrastructure is the same.
CW7.42	Our WRMP24 did not differentiate between water savings from leakage and from consumption/wastage. As the primary driver and benefits assessment was based on reducing consumption, we have included all benefits under wastage.
CW7.43-CW7.51	Our NHH metering benefits were assessed as a whole for delivery of the programme in our WRMP assessments. We have assumed a new meter delivers twice the savings of a replacement, and a basic or AMR meter replacement has the same benefit associated.

Specific Ofwat request	Commentary
Alignment to CW3	All new meter costs in this table are aligned to CW3 enhancement table metering lines. HH replacement costs included in base capital expenditure (CW2). NHH replacements- 91% costs in CW3 enhancement table, 9% in CW3. Details of metering enhancement case can be found at Section 2.3 of our "SSC36 Evidencing our enhancement expenditure in 2025-2030" appendix.
Data quality	All data is aligned to our WRMP24 and has been assured. NHH data is harder to estimate due to the variability in size, type of business and location. However, we are confident these are best estimates for the programme we will deliver. HH data is more uniform so we are confident in these rates of activity and cost.

CW7a

We have no accelerated or transition expenditure, so this table has been left blank.

Defra accelerated metering expenditure for SSC:

We, together with Anglian Water, have been developing a strategic resource option – Fens Reservoir, and successfully taking it through the RAPID gated process this planning period. Through the RAPID process, we have accelerated £18.2m (2017/18 prices) of investment for the development of Fens Reservoir planning in order to pass through Ofwat's RAPID process gates 2 and 3, which will be recoverable in AMP8 through the true-up mechanism.

In October 2022 the Department for Environment, Food and Rural Affairs (Defra) asked the regulated water companies in England to put forward infrastructure schemes for accelerated delivery in the final two years of AMP7. We actively took part in the process by submitting six schemes for accelerated delivery, with Ofwat approving our household and non-household metering programmes across Cambridge and South Staffs. Due the funding mechanism for the accelerated delivery also being subject to a true-up at AMP8, in the same way as RAPID, and the uncertainty regarding the efficient unit costs that would allowed, we are unable to facilitate the acceleration of the investment. Our commitment to Fens took priority as its fast development is critical to meeting the long-term water resource needs in our Cambridge region, and further investment subject to true-ups created challenges for our financial metrics and risked bill shocks for customers when transitioning to AMP8.

In the next 1.5 years, we will catch up on our AMP7 metering delivery, as we are behind from our PR19 target meter numbers due to the impact of the COVID-19 pandemic. This will enable us to trial our universal metering delivery and help to avoid delays to our ambitious metering programme in AMP8. These figures are represented in CW7.

CW8

Line Reference	Commentary
CW8.1-3	These lines refer to our water efficiency programmes, outlined in our WRMP24 strategy. Aligned to CW3.
CW8.4	The line outlines the requirement to build the infrastructure for the Grafham transfer during AMP8 ready for the water availability in 2031. This is reflected by the benefits recognition in AMP9 and beyond. As detailed in the enhancement business case for SDB, the work is required in AMP8 to ensure it is ready for the water as soon as it is available from Anglian Water in 2031/32. Aligned to CW3.

Specific Ofwat request	Commentary
CW8 – connection to WRMP	The activities outlined in this table include water efficiency activity for households and non-households. All metering and leakage activities are not covered in this table, as per the direction. Supply side options are also included. WRMP scheme references directly match those in both the Cambridge Water WRMP and the South Staffs Water WRMP. There are no changes since the revised draft WRMPs have been submitted and therefore all schemes directly reflect those included in the WRMPs. Lines include costs from Cambridge Water and South Staffs Water WRMPs combined.
CW8 – uplift to 2022/23 price base	The costs in the WRMP are in 2021/22 price base. For PR24 these have been uplifted to 2022/23 price base through a multiplication factor of 8.8%. In addition, capitalisation of company staff time to these projects have also been included in the costs.
CW8 – acceleration of spend	There has been no acceleration of any schemes in AMP7.

CW9

Line Reference	Commentary
CW9.1 - 140	**Our approach to all lines:** Investments have been phased at a project and programme level which has fed into this sheet. All projects costs have been accumulated into the final year of the project phasing as it is expected that this is when the benefits will begin. For AMP7, this only applies to our long term plan schemes at Hampton Loade and Seedy Mill. This aligns with when the expected benefit units begin within table CW15. Programmes have not had their costs accumulated as it is expected that benefits will be seen within each year of the programme. Annual expenditure has been left as reported in table CW3.
CW9.53	Expenditure against this line as not been included in this table as the benefits of this project will not be fully realised until water is available to transport through the pipeline. Construction is expected to finish in AMP8 but the additional SDB benefit will not be available until early in AMP9.

CW10

Line Reference	Commentary
CW10.1	The rateable values are as per the VOA ratings listing for both the 2017 and 2023 Valuation. The 2023 Valuation is made up of: • Central list rates - £7.200m • Green Lane head office, Walsall - £0.575m • Fulbourn Road office, Cambridge - £0.375m We have assumed that any future revaluation leaves our 2023 RV unchanged.
CW10.2	This equals CW10.1 multiplied by the charge multiplier. We have assumed that the current multiplier of £0.512 continues throughout the period in real terms.
CW10.3	The government confirmed that there would be no transitional relief for rates reductions following the 2023 revaluation so this line is zero.
CW10.5	We have not had any adjustments to our 2017 or 2023 revaluations and so this line is zero.
CW10.6	There are two adjustments to our rates where we charge out a proportion. The first is in relation to our shared Hampton Loade treatment works where Severn Trent pay one-third of the rates for the site. The other is a cross charge to the retail business for based on the floor space of our Green Lane site.
CW10.11	This represents the reduction in rates following the 2023 rates revaluation.

CW11

Line Reference	Commentary
CW11.1-7	Costs attributable to this category were derived from multiple activities at SSC, which could be identified using the account combinations in the Trial Balance. The company has analysed its expenditure over the last 3 years from producing our APR submissions to look at trends and identify any "Atypical costs" which shouldn't be included. This includes the following: • Fluoridation • Rechargeable works • Standpipe Hire • Bulk Supplies These costs have been removed from the expenditure lines and classified as 3rd Party operating expenditure, as per the Ofwat Table. Where salaried employees work on 3rd party operating expenditure, their proportion of time is reallocated to third party operating expenditure. The remaining costs have been identified from allocations. The cost assumptions are aligned to the revenue assumptions for third party operating expenditure.
CW11.8	The forecast for this line in AMP8 mirrors the equivalent revenue line DS1e.1 as developer-driven diversions should be 100% cost recovered under the principles of the new connection charging rules. The figures for AMP7 remain zero as we currently do account for class diversions as third-party costs.
CW11.9	The forecast for this line in AMP8 is related to the equivalent revenue line DS1e.2. We have forecast NRSWA-driven diversions to be 82% cost recovered and therefore DS1e.2 reflects 82% of CW11.9. The figures for AMP7 remain zero as we currently do not account for diversions as third-party costs.
CW11.10	The forecast for this line in AMP8 is related to the equivalent revenue line DS1e.3. We have had to base this upon the work packages that could be required in the coming years. We are totally dependent on the progress, guidance and instruction of the HS2 project (external not internal factors). The spend figures are based on tendered values for these work packages however these work packages are not all instructed at this stage. There is a mixture of contribution percentages across the work packages which are each based on the Bacon and Woodrow formula. The figures for AMP7 remain zero as we currently do not account for diversions as third party costs.
CW11.11	Ofwat calc for total price control third party
CW11.12-15	There is no expectation for these costs to change so we have rolled forward 22/23 APR reported figures to 2030.
CW11.16, CW11.18 to CW11.30	No forecast or historic third-party costs in these areas
CW11.17	Fluoride capex in 2025/26 and 2026/27 to undertake systematic refurbishment of fluoride dosing installations - funded by OHID (Office for health improvement and disparities). Water treatment price control.

Specific Ofwat request	Commentary
Year on year variations	Diversions costs lines- please see note on page 3.

CW12

We have no transition expenditure, so this table has been left blank.

CW13

This table represents our best value plan, which includes mandatory schemes and discretionary schemes. Further information on our view of mandatory versus discretionary investment can be found on table Sum4.

Specific Ofwat request	Commentary
PR24 Final Methodology submission table guidance – section 3: Costs (wholesale) – water , P.88 requested commentary	There are no third-party contributions associated with investments in our enhancement plan. A longer period to calculate the present value of costs has been used to that requested. 2023-2065 has been used for the calculation. The current financial year (2023/2024) is the default starting period of the investment forecasting within our Investment analytics system (Copperleaf). Present Value calculations start from the current financial year. We have calculated benefits over a 40 year planning horizon from 2025 onwards and as such whole life costs have been forecasted over that period which include whole life costs up to that point. Average asset lives have been applied to investments to determine the intervals between repeat CAPEX costs. WACC = 3.23% (Ofwat's early view) STPR - Risk to life = 1.50% STPR = 3.50% The above values have been utilised within our Investment analytics system to generate cost and benefit present values. To generate CPV we have combined the STPR and WACC rates and applied them to our whole life costs for each investment. WACC has been applied to benefits associated with private value. STPR – Risk to Life has been applied to benefits associated with societal value. Details of whole life costs can be found within section 3.2.3 of our SSC37 Our Asset Management approach to best-value investment planning through 2025-2030 and beyond appendix

CW14

This table represents our least cost plan, which retains all mandatory schemes but removes schemes on resilience, leakage enhancement beyond WRMP, lead and carbon. Further information on our view of mandatory versus discretionary investment can be found on table Sum4.

Line Reference	Commentary
CW14.65	Leakage enhancement is not part of our least cost option and is removed from this table.
CW14.137 & CW14.141	Lead replacement projects are removed from this line in our least cost option. Replacement of communication pipes on sample failure remains on line CW14.137.
CW14.165	Resilience expenditure is not part of our least cost option and is removed from this table.
CW14.181	Carbon expenditure is not part of our least cost option and is removed from this table.

Specific Ofwat request	Commentary
PR24 Final Methodology submission table guidance – section 3: Costs (wholesale) – water , P.91 requested commentary	There are no third-party contributions associated with investments in our enhancement plan. A longer period to calculate the present value of costs has been used to that requested. 2023-2065 has been used for the calculation. The current financial year (2023/2024) is the default starting period of the investment forecasting within our Investment analytics system (Copperleaf). Present Value calculations start from the current financial year. We have calculated benefits over a 40 year planning horizon from 2025 onwards and as such whole life costs have been forecasted over that period which include whole life costs up to that point. Average asset lives have been applied to investments to determine the intervals between repeat CAPEX costs. WACC = 3.23% (Ofwat's early view) STPR - Risk to life = 1.50% STPR = 3.50% The above values have been utilised within our Investment analytics system to generate cost and benefit present values. To generate CPV we have combined the STPR and WACC rates and applied them to our whole life costs for each investment. WACC has been applied to benefits associated with private value. STPR – Risk to Life has been applied to benefits associated with societal value. Details of whole life costs can be found within section 3.2.3 of our SSC37 Our Asset Management approach to best-value investment planning through 2025-2030 and beyond appendix

CW15

We have completed the delivery units benefit assessment with annual values, but the monetary benefit values as cumulative, due to the monetary benefit used to calculate the PV of benefits requiring to be cumulative to reach the correct value over the full time period. This is how our investment appraisal tool works.

Where we have not identified direct links to performance commitment benefits from enhancement projects, this table has been left blank. Our assessment of enhancement benefits in our investment appraisal tool includes wider factors, which are not directly linked to performance commitments.

This table represents our best value plan, which includes mandatory schemes and discretionary schemes. Further information on our view of mandatory versus discretionary investment can be found on table Sum4.

Line Reference	Commentary
CW15.1	Benefits taken from third party reports that can be found as part of our SSC37 Our Asset Management approach to best-value investment planning through 2025-2030 and beyond appendix.
CW15.56	Benefits taken from third party reports that can be found as part of our SSC37 Our Asset Management approach to best-value investment planning through 2025-2030 and beyond appendix.
CW15.145	Value has been aligned with that outlined in the Water Efficiency enhancement case within section 2.2 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix. See further details of our valuation processes in our SSC37 Our Asset Management approach to best-value investment planning through 2025-2030 and beyond appendix. Sections are outlined below.
CW15.146	Value has been aligned with that outlined in the Water Efficiency enhancement case within section 2.2 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix. See further details of our valuation processes in our SSC37 Our Asset Management approach to best-value investment planning through 2025-2030 and beyond appendix. Sections are outlined below.
CW15.156	Value has been aligned with that outlined in the Stretching Leakage enhancement case within section 3.2 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix. See further details of our valuation processes in our SSC37 Our Asset Management approach to best-value investment planning through 2025-2030 and beyond appendix. Sections are outlined below.
CW15.157	Value has been aligned with that outlined in the Stretching Leakage enhancement case within section 3.2 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix. See further details of our valuation processes in our SSC37 Our Asset Management approach to best-value investment planning through 2025-2030 and beyond appendix. Sections are outlined below.
CW15.178	We felt that linking the benefits of an additional 26 Ml/d pipeline to water supply interruptions risk involved too many assumptions and chose to demonstrate the value of the water that the additional capacity will provide when the pipeline has been installed. The benefits provided are based around the monetised value of the water volume. Benefits start from next AMP. The construction of the pipeline is forecast for completion within AMP8 but the additional capacity will come online in AMP9.
CW15.190; CW15.191; CW15.201; CW15.202; CW15.212; CW15.213; CW15.267; CW15.268; CW15.278; CW15.279	Value has been aligned with that outlined in the Smart Metering enhancement case within section 2.3 of our “SSC36 Evidencing our enhancement expenditure in 2025-2030” appendix. See further details of our valuation processes in our SSC37 Our Asset Management approach to best-value investment planning through 2025-2030 and beyond appendix. Sections are outlined below.
CW15.334 & CW15.345	Benefits provided are based on the sole value of replacing the number of services pipes associated with the lead replacement enhancement cases.
CW15.378;	Benefit values provided are based on avoidance of risk rather than incremental benefits against the performance commitments.
CW15.379	This is the benefit directly associated with the scheme to improve manganese treatment at Bourne Vale.

CW15.380	Carbon value here are to demonstrate the negative impact associated with the operation of new assets within the system.
CW15.401	This benefit is assessed based on risk mitigation against multiple non-PC related value models.
CW15.435	Benefit value associated with this line is solely that which is included within our Net zero enhancement expenditure which can be found within section 3.3 of our "SSC36 Evidencing our enhancement expenditure in 2025-2030" appendix.

Specific Ofwat request	Commentary
PR24 Final Methodology submission table guidance – section 3: Costs (wholesale) – water , P.97 requested commentary	Uncertainty around benefit impact has been limited through governance of data and assumptions throughout the planning process. Further details of this can be found within section 3.2.3 of our SSC37 Our Asset Management approach to best-value investment planning through 2025-2030 and beyond appendix. For details on where information has been sourced from to inform the benefits assessment of our enhancement investments please see sections 1.2, 1.3,1.6 & 3.2.3 of our SSC37 Our Asset Management approach to best-value investment planning through 2025-2030 and beyond appendix. When benefits start has been aligned with the phasing of the projects and as such aligns with how the cumulative costs have been provided in table CW9. Total benefit value are undiscounted annualised benefits. Benefit present values have been calculated in two stages. Private and societal value has been discounted using WACC and STPR-Risk to Life rates between 2025 and 2055 which has been taken directly from the Investment analytics system (Copperleaf). ODI rates have been included within the BPV. This was calculated outside of the Investment analytics system and then added to give a total BPV. ODI rates were discounted over the same period using the STPR-Risk to life rate STPR-Risk to life = 1.50% WACC = 3.23% (Ofwat early view).

CW16

We have completed the delivery units benefit assessment with annual values, but the monetary benefit values as cumulative, due to the monetary benefit used to calculate the PV of benefits requiring to be cumulative to reach the correct value over the full time period. This is how our investment appraisal tool works.

Where we have not identified direct links to performance commitment benefits from enhancement projects, this table has been left blank. Our assessment of enhancement benefits in our investment appraisal tool includes wider factors, which are not directly linked to performance commitments.

This table represents our least cost plan, which retains all mandatory schemes but removes schemes on resilience, leakage enhancement beyond WRMP, lead and carbon. Further information on our view of mandatory versus discretionary investment can be found on table Sum4.

CW17

We have no accelerated expenditure, so this table has been left blank.

CW18

This table has been completed consistent with our June 2023 early cost adjustment claim for topography. We have updated the claim value, and the full commentary about this update can be found in our cost assessment appendix, document SSC19.

CW19

Line Reference	Commentary
CW19.1 to CW19.9 maintain to reduction split	Split done for Prevent (rehab)/Aware/locate and Mend done in real terms for 22/23. I.e if we repaired 70Mld and leakage came down by 4Mld. The volume reduction percentage is 3.8%, therefore 3.8% percentage of spend in aware/locate and mend went towards reduction – proportional allocating the spend based on the percentage volume saved. For CAM leakage increased slightly in year 3 – therefore no spend on reduction. Same principle completed for 23/24 and 24/25 with AMP8 being based off WRMP works.
CW19.7 - Prevent PRV reduce	CAM has 10 PRVs - minimal maintenance spend due to number, therefore all included within SST cost base.
CW19.1 to CW19.9 – Prevent (Calm networks)	Calm Networks is included within our BAU training for all field teams – not specified as a separate costs
CW19.4 – Aware and locate – 23/24	Aware lower than 21/22 and Locate higher than 22/23. This is because in 22/23 we bought lift and shift acoustic loggers and used these (and continuing to use heavily in 23/24. Whereas in 21/22 we bought permanent acoustic (fixed) loggers. Lift and shift logging is counted as a "locate" activity, therefore included in there.
CW19.1, CW19.4, CW19.7 – Aware	All reporting costs (MUR, model builds etc) in aware
CW19.1 to CW19.9 – Aware and Locate	We have not included the cost of "locating" customer reported leaks. This falls under a Customer Liaison officer (CLO) task – who undertakes multiple different tasks a day and splitting out their workload has not been done. Same principle with other support functions.
CW19.1 to CW19.9 - Mend	Similar to locate costs – for the fixing of leaks, a CLO is often present to undertake the shut/check pressures etc. Back office support functions not included.
CW19.1 to CW19.9 – Prevent PRV reduce (22/23)	SST Prevent PRV reduce (reduction) – costs include: 1) study of possible improvements to existing PMAs and possible new PMA schemes. 2) Also included is cost of buying equipment to make improvements. Assumptions on hourly cost of team undertaking improvements and PMA set up
CW19.1 to CW19.9 - 2025-2030	Baseline expenditure included here is consistent with the targets in our WRMP for both regions.
CW19.13 to CW19.24	In 22/23 SST undertook a study on pressure management. This study highlighted new possible PRV schemes that could be built. For the number of "new properties covered by PMAs" – the average number of properties per DMA is taken and multiplied by the number of new schemes.
CW19.39	DMA availability in CAM for 22/23 and 23/24 – highly impacted from Cyber attack impacted availability in 22/23 and this has been audited. Expected some impact still in 23/24 and full improvement back to average in 24/25 Apart from 22/23 and 23/24 – availability worked out using averages of previous years because DMA Availability (not including cyber-attack issues) already in a good place and therefore plan is to maintain this.
CW19.40 to CW19.48	SST reported Leakage is not done on a DMA or zonal level, it is done from DI meters. Meaning every single main (Trunk and distribution) is included in the calculation. Therefore will always report on 100% of trunk mains. CAM reported leakage is done on a DMA level with Trunk mains in balance or Babe. Most of the Trunk Mains in Balance, and the aim is to devise balances for the rest and build during AMP8, however in order to be consistent through the AMP, these will only be used in AMP9. Some data challenges due to cyber attack, however systems are recovering. Therefore meaning Trunk Main % on balances will be lower than previously again.
CW19.52 to CW19.54	Big increase in ALC hours for SST due to recruiting Lift and shift technicians and equipment to drive down leakage. Linked with decrease in Aware costs and increase in locate costs – due to funding lift and shift and less permanent

CW19.49 to CW19.51	Smart network coverage increases yearly estimated on planned number of loggers purchased against difference and therefore properties this is likely to cover. Unknown at this time exact DMAs they will go into, therefore estimated property counts.
CW19.55 to CW19.111	Expected Mains repairs taken from forecasting done for rest of AMP7 and AMP8. No such forecast for mains fittings/CPs and CSL – therefore for mains fittings and CPs we have taken the same percentage difference between mains and MF/CPs in this AMP and applied it forward into next AMP. For CSL, a large portion of funding is going towards improving CSL in the future, repairing slightly more but also aiming on bringing the average time down, this is reflected in CSL repair numbers and average run times.
CW19.112, CW19.114, CW19.116	Historic lows for each future year worked out by averaging the percentage difference between the AMP7s historic minimum and reported leakage pre year and then applying average this percentage to AMP8 yearly targets
CW19.113, CW19.115, CW19.117	Volume saved to maintain – this is the volume of leakage fixed in 22/23 minus actual reduction from 21/22 to 22/23 in leakage (as this is the reduction saved and not maintain). In CAM leakage increased – therefore volume to maintain would be the volume of leaks repaired plus the increase volume in leakage. For future years the volume to maintain is based off the total forecasted “leakage fixed” plus any savings from new pressure management.

CW20

Line Reference	Commentary
CW20.12	The average burst number over the last 5 years is 1107.2 (based on figures reported in the APR). The figure in this line reconcile with that number. There are 15 bursts that took place on the new mains that replaced the now decommissioned ones. When considering the guidance on how to complete this table it was decided that there was no place to account for these. If we take the value in the table and add the average of the 15 bursts that the number matches exactly with the APR data.

Specific Ofwat request	Commentary
PR24 Final Methodology submission table guidance – section 3: Costs (wholesale) – water , P.123 requested commentary	Reference table containing all of the cohorts used within the analysis along with the requested cumulative average bursts and mains length graph. There were a lot of cohorts where it was not possible to fit their size within the tolerance. Even at the top cohort level, including the primary attributes only they were zero. A process of cohort optimisation was undertaken using programming code that looked for the optimal combination of secondary attributes to get as close as possible to the nominal annual average burst numbers provided. This worked by looping through all possible combinations of secondary attributes to find the mean value of primary cohorts that were not already within the tolerance or zero. There are still a number of cohorts that have a zero annual average burst rate. It will need more time and resource to be able to look across the hundreds of cohorts to work out where best to place the lengths associated with these cohorts which could potentially improve the grading of some of the other cohorts. No previous data was available to compare the outputs of the analysis too. All burst data is validated before each of the annual reports and the GIS system is well maintained in terms of the levels of renewal that are updated onto the GIS each year. It is felt that the quality of the underlying data is mature and of a good standard. The cohort analysis was generated in line with the guidance but it is felt that further improvements could be made in terms od generating the cohorts but this is a very resource heavy intensive exercise and needs more investigation. The cohort optimisation script considers all of the possible combinations of the secondary attributes being bolted onto the primary attributes. All combination are processed and the mean annual burst rate is recorded. The combination with the closest mean to the nominal burst rate is selected as the final cohort. Overall annual burst rate of cohorts is within 50% of the nominal annual burst rate. We have included a supporting data file with the data tables submissions, named "CW20 supporting data Excel.xlsx".

CW21

<table>
<tr><th>Line Reference</th><th>Commentary</th></tr>
<tr><td>CW21.1</td><td>
SSC_CW21_1 refers to our enhancement case appendix SSC36.
The project is to deliver ground mounted solar PV at four key sites including 2 water treatment works. The case has been submitted as one scheme as this delivered best value when engaging the supply chain. Costs align to CW3.127 and total £7.237m.
Benefits are assumed for year after expenditure. Y4 benefits from some of the solar being delivered by end of Y3 to deliver a saving of 297 tCO_2e, and the rest by end of Y4. Total carbon saving 1254 tCO_2e per year on completion. Therefore, the benefits cumulatively total 1551 tCO_2e by the end of the AMP. These savings will continue to accumulate into future AMPs but there is no opportunity to include this.
Negative values entered represent reductions against the baseline.
</td></tr>
<tr><td>CW21.2-CW21.10</td><td>
We have not submitted any additional feasible schemes for inclusion in the Net Zero Challenge.
Why our enhancement case is the only feasible best-value option:
When developing our Net Zero roadmap, we considered many options to deliver carbon savings within our business. This included a full review of all our sites, and their capacity for renewable generation completed by Aqua Consulting. Our cost benefit analysis concluded that the four sites selected for renewables were the best value solution for our AMP8 ambitions.
Our selection criteria consider the following:
<table>
<tr><th>Boundary condition</th><th>Notes</th></tr>
<tr><td>Baseline energy use</td><td>Consistent 24/7 365 energy demand is binary for selection criteria.
Renewable capability (MWp) will not exceed energy demand onsite.</td></tr>
<tr><td>Long term appraisal</td><td>Energy consumption is not expected to decrease over the life of the renewable asset installed.
Example, forecasted abstraction volume (licence) to remain unchanged</td></tr>
<tr><td>Company owned land</td><td>Maximise company owned land adjacent or within feasible proximity to grid connection point.</td></tr>
<tr><td>Complexity</td><td>Grid connection already establish and planning obligations likely to be unchallenged.</td></tr>
</table>
Upon filtering the final opportunities further analysis to maximise investment were modelled using the following scenarios:

SIMPLE - Direct energy displacement (behind the meter) with asset company owned a maximising ROI.
COMPLEX – Direct energy displacement (behind the meter) oversized in conjunction with battery storage and alternative financing arrangements.

The financial risk profile associated with National Grid export connections coupled with the uncertainty and longevity of balancing revenue mechanism contract firmly discounted COMPLEX business cases in relation to the SIMPLE installation plans. Therefore, this was the clear best value solution for our business.
Why other net zero expenditure has not been included:
This does not represent our full net zero ambitions for AMP8. The rest of our carbon reduction activity has not been included, as it does not meet the criteria for the enhancement competition.
In August 2022, Ofwat commissioned a report by Jacobs on the possible technology solutions for delivering carbon reductions in the water industry in AMP8. They only identified 3 scalable options for Water Only Companies:

Demand savings- we have set ambitious leakage, PCC and business demand reductions as part of our AMP8 plans, and stretched our leakage target to go beyond our statutory targets. The primary driver is supply-demand balance, and therefore not suitable for the competition.

</td></tr>
</table>

	• **Pump Efficiency**- With the highest average pumping head in the industry, pump efficiency has always been critical to our business. We have been running our Pump Efficiency Programme since 2005. It has delivered both cost savings to ensure we keep bills low for our customers, and environmental benefit by reducing energy use. We will continue to run this programme into AMP8, but consider this base expenditure activity. • **PPAs**- corporate PPAs are at the centre of our Net Zero strategy. We are already engaging with the market on their implementation across our sites and land near to them. They can deliver significant carbon savings at limited cost to our customers. As we will not but the assets ourselves, this is also not considered enhancement investment. We will not hold ourselves to these 3 areas in the long term. We want to explore innovative options to deliver our net zero ambitions too. As new technology emerges, such as [hydrogen, biofuel etc.] become available and scalable, we will include these in our long-term plans and future net zero challenges.