PR24

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WHOLESALE WATER COSTS TABLE COMMENTARY

NES_COM3

1. CW1 AND CW1A

Summary of our methodology:

Numbers for 2023-24 and 2024-25 align with table PD8.

For AMP8, we have the upper quartile allowances from the proposed base models. We then added to these allowances the energy uplift and AMP7 enhancement opex to get the total modelled costs. These are then split into different cost lines between price controls using the average shares of the last 3 years.

Further detail is provided in appendix A3 - Costs (NES04) section 3.4. Detail on the energy uplift is in Annex 2 of appendix A3 - Costs.

We have added data for 2022-23 from all companies' APR tables to Ofwat's cost assessment datasets. For external variables, we have made some assumptions to get an estimate of 2022-23 value:

- Urban rainfall: average of the last 5 years.
- Weighted average densities, % of households with default, average number of Partial Insight accounts or county court judgements per household and combined income score (interpolated): we assumed they stayed at 2021-22 levels.

To go from CW1a to CW1, we have applied frontier shift (FS) and real price effects (RPE) to all costs but business rates, abstraction charges and pension deficit recovery payments.

For developer services, grants & contributions and third-party services, we have used cumulative net price change of wholesale water base.

For 2022-23, we have taken the numbers from APR 2023 table 4D. For the forecast years, developer services expenditure lines for CW1 are taken from DS2e, grants and contributions are taken from DS1e. Third party services lines in CW1a are taken from CW11.

• *An explanation of any costs categorised as atypical, and which cost line(s) they are included in (e.g. atypical cost item 1 is included in CW1.1).*

We do not forecast any atypical costs.

• *An explanation of the nature and extent of 'principal use' recharges between business units.*

Recharges between business units relate to fixed assets used by more than one business unit. The asset value and depreciation for these assets have been recorded in the business unit of principal use, in accordance with the RAGs. Recharges have been made to the other units using the assets based upon the annual depreciation charge and proportion of use.

Shared assets primarily comprise offices and IT systems.

- The principal use of our Northumbria House Customer Centre is the Household retail service.
- The principal use of offices at Howdon is sewage treatment.
- Other shared assets have multiple users and no single dominant user. In these cases, the largest single user has been determined as treated water distribution.

All operating costs are reported net of principal use recharges. There is no change to what is reported in 2022-23.

An explanation for any significant changes in costs over the period.

For AMP8, we have used the allowance for pension deficit repair costs in IN13/17, uplifted to 2022-23 prices (this is lower than AMP7).

There is a big increase in third party capital expenditure from 2024-25 to 2025-26: for 2025-26 only, we have included £71m in CW1a for the capital costs of connecting large new non potable water customers. We recover these third-party costs from these third party customers over AMP8 (see RRR9.215). More details are set out in the commentary to Table RR9.

This accounting treatment follows Ofwat email 25/7/23*: For the **non potable** revenue and costs - these should be classed as 'third party' in line with RAG4 appendix 1. Where there are payments from developers/customers in respect of capital contributions to the non-potable network, then these should be classed as 'revenues' rather than 'grants and contributions'.*

A breakdown of which lines and business units any equity issuance costs (from table RR4 line 72) have been included in.

For 2025-26 only, lines CW1.3, CWW1.3 which are the developer services operating expenditure, we have added the £8m costs of raising £400m of equity, per Table RR2.13-16. We used this line as it was a line that otherwise zero values for most sub services, so the values are visible. We allocated them to water resources (£0.523m), water treatment (£3.455m), sewage treatment (£3.775m) and sludge treatment (£0.246m).

2. CW2

• *An explanation for any significant changes between actual and forecast costs.*

• *An explanation of any material year-on-year variations in costs.*

Decrease in power cost from 2022-23 to 2023-24: we expect next year's power cost to reduce compared to last year and it will gradually increase as we go into AMP8.

Big decrease in capital expenditure, bulk supply, renewals (non-infrastructure) and other operating expenditure from AMP7 to AMP8: there's a gap between current spend and UQ allowance. We aim to be more efficient and close this gap in the future. For AMP8 spend, we've used the proposed UQ allowance which means a decrease in costs.

Big increase in capital expenditure from 2022-23 to 2023-24: we have a large project which is the Tees Central Strategic Mains project phase 2. This is a resilience scheme but included in base capital maintenance, not enhancement.

Wholesale water business rates in CW2 are consistent with table CW10.

Decrease in business rates from 2022-23 to 2023-24: the Valuation Office caried out a full revaluation of all business rates which took effect from April 2023, replacing the previous valuation effective from April 2017. We have a single rateable value for our water asset base, known as water cumulo, which is calculated on a receipts and expenditure basis. The cumulo RV was reduced significantly at April 23 reflecting the significant reduction in the WACC, and therefore profits, in PR19.

The increase in business rates from 2025-26 to 2026-27 and from 2028-29 to 2029-30: the rating valuation cycle has been reduced by government to three years so the next revaluation will take effect from April 2026 with a further revaluation from April 2029. We have assumed that the VOA will apply the same methodology and model used for the 2023 valuation in the future revaluations in 2026 and 2029. The combined impact of increased revenue and growth in RCV will therefore lead to a significant increase in the cumulo at the next revaluations. This is a mechanistic application of the formula and does not involve any subjective judgement.

The increase in abstraction charges from 23/24 to 24/25: the Environment Agency has informed us that it is intending to consult on an increase in our Kielder Supported Source Supplementary Charge in quarter 4 of 2023, with a potential charge increase being implemented from April 2024. This charge increase is required to ensure that the Environment Agency fully recovers its costs in relation to the Water Resource Operating Agreement for the Kielder Transfer Scheme, increased asset financing charges following a correction to its Fixed Asset Register required by the National Audit Office, and the costs to comply with the improved health and safety standards for the draw-down of Kielder Reservoir under the Reservoirs Act (1975). We expect costs to increase by £11.5m per annum (22/23 prices) as a result of this consultation and have included this cost in our forecasts. Note – some of this is treated as third party costs.

• *An explanation of any changes in reporting methods / assumptions that have led to a material change in reported figures from previous reporting years.*

No change in reporting methods.

• *A breakdown of which lines and business units any equity issuance costs (from table RR4 line 72) have been included in.]*

We have included equity issuance costs in CW1 and CW1a, see above.

3. CW3

We have not allocated costs proportionately between expenditure categories in table CW3, or between base and enhancement expenditure. We explain our approach to implicit allowances and how we determined whether expenditure should be base or enhancement in each of our cases.

We have used **three** additional lines for CW3:

- Line 1 – our asset health enhancement case (NES35). This includes the investments in mains replacement and civil assets at water treatment works as described in this case. This does not meet the definition of resilience expenditure or a cost adjustment claim.
- Line 2 – our cyber security enhancement case (NES23). This includes only the cyber security requirements to meet the new eCAF standard, as described in the enhancement case. We have included this here as per Ofwat's letter in August 2023. Other elements of this case are included under SEMD in water and wastewater (as they are physical security).
- Line 3 – our reservoir safety case (NES22). This does not meet the definition of resilience expenditure, but does not have a separate line available.

Our related enhancement cases are: NES14 to NES24, NES32, NES35, and NES36. We also note that there is a small amount of water expenditure included in the 25 YEP enhancement case (NES29) and WINEP monitoring case (NES30) – these are mostly wastewater cases, but there is some water expenditure too.

We note that our resilience enhancement expenditure relates to both natural hazards and cascading failures (NES24 on the impacts of extreme heat on our water treatment processes; and NES32 on flooding and power resilience).

Each of these enhancement cases explains how the costs have been allocated to the appropriate lines in CW3. We do not provide a separate line commentary here. We also provide the evidence of customer support for non-statutory WINEP lines within the enhancement cases (in the case of water, this is just the Bluespaces expenditure in NES29).

4. CW4 AND 4A

An explanation of instances where water treatment works have not been used in the year but have not been decommissioned:

- Linford WTW is located in our Essex water resource zone and comprises one onsite well and disinfection only (i.e. no treatment). The well has not been in use due to elevated manganese and bacteria and the lack of treatment. Our WRMP24 includes a new 10Ml/d Linford WTW, to be delivered by 2027/28, which will treat groundwater from the existing well and one or more of the proposed new wide diameter boreholes. This scheme has now moved to detailed design with funding allowed for in Ofwat's final decision on Accelerated Infrastructure delivery.

- Alder Carr WTW is located in our Suffolk Blyth water resource zone and is a backup supply only to the town of Southwold – its primary supply is from our Barsham WTW in the Northern Central water resource zone. The site comprises one onsite well and disinfection only (i.e. no treatment). Alder Carr well is currently not in use due to elevated coliform. The source of coliform continues to be investigated with the next step being to block one of the radial collectors in the well and to undertake a programme of test pumping and water quality analysis. If asset upgrades are required, these will be considered as part of our base planning process.
- Saxmundham WTW is located in the Blyth water resource zone and comprises two onsite boreholes, filtration and disinfection. Asset upgrades are required which are currently being confirmed through our base planning process. In the meantime, other WTWs within the water resource zone have sufficient capacity to meet demand.
- Stonehaugh WTW is a rural site in our Kielder water resource zone. It has water quality concerns associated with the source. Whilst this is being investigated, demand is being maintained through tankering into Stonehaugh Shield service reservoir.

An explanation of any material year-on-year variations:

- Linford WTW will increase from 0 Ml/d to 6.6 Ml/d in 2027/28 pending the new WTW being commissioned.
- Barsham WTW output is expected to increase to its maximum 36.72 Ml/d deployable output by 2025/26 pending the completion of the new Bores WTW and contact tank upgrade project.
- Rickinghall WTW output is expected to increase to its maximum 2.16 Ml/d deployable output by 2024/25 pending the completion of the WTW upgrade project being complete.
- Fulwell WTW output will reduce from 4.94 Ml/d (2022/23) to 4.5 Ml/d (2023/24) to reflect a small hydraulic constraint associated with new filters that have been installed to enhance the treatment process.
- North Dalton WTW output will reduce from 10.19 Ml/d (2022/23) to 7.57 Ml/d (2023/24) to manage water quality risks in the aquifer associated with rising minewater and reduced abstraction being agreed with the Environment Agency.
- Peterlee WTW output will reduce from 2.75 Ml/d (2022/23) to 2.58 Ml/d (2023/24) due to the borehole pump being fixed speed so unable to fluctuate with the aquifer level.
- Horsley WTW output is expected to increase to its maximum 150 Ml/d deployable output by 2027/28 pending the WTW upgrade project being complete.

An explanation of any changes in reporting methods / assumptions that have led to a material change in reported figures. An indication of the quality of data provided.

- No change in reporting methods have occurred. Future forecasts associated with PWPC have assumed the maximum deployable output will be required upon completion of ongoing investment, however actual PWPC will be dependent on peak week demand during each financial year.

Companies should also include more detailed evidence in relation to line items that are used as cost drivers in PR24 cost assessment including:

Average pumping head – raw water transport (CW4.6);

- Forecast has remained consistent with 2022/23 APR actuals as no new raw water transport pumping stations are included in the data count. Potentially two new raw water transport pumping stations will be commissioned in the Teesside Industrial system (NSZ17), however the design and operation of NSZ17 is still under investigation and the future demand from industrial customers is uncertain, so the asset numbers and impact to average pumping head have not been included in the PR24 tables.
- The forecast reduction in distribution input, taken from the WRMP24 which accounts for leakage and PCC targets have been analysed against raw water transport average pumping head. No significant change has been observed.

Water treatment type analysis (CW4.13 to CW4.19);

- The proportion of distribution input from WTWs categorised between W3 and W6 has been reflected on lines CW4.13 to CW4.26.
- There is a gradual reduction in WTW volumetric contributions which coincides with the reduced WRMP24 distribution input forecast.
- The only change that affects the proportions and classifications is from 2027/28 when Linford WTW is commissioned. This increases the number of groundwater sources on line CW4.19, the distribution contributions from W3 groundwater sources (CW4.20) and W5 surface water sources (CW4.24). Please note that the number of W5 WTWs remains the same once Linford WTW is commissioned as the overall number of WTWs increase. It is only the volume of distribution input that reduces, as the W3 groundwater source is substituted from a W5 surface water site (Hanningfield WTW).

Average pumping head – water treatment (CW4.34). This should include a comparison of forecasts with historical growth rates.

- Forecast has remained consistent with 2022/23 APR actuals as no new treatment pumping stations are included in the data count. Linford WTW will potentially have interstage pumping but the design is not complete yet so not included in the data calculations until certainty has been obtained.
- The forecast reduction in distribution input has been taken into consideration, but the changes were insignificant, so the forecast average pumping head remains unchanged.

Table 4a **has intentionally been left blank.** The guidance states 4a relates to transitional and accelerated expenditure between 2023-24 and 2024-25. Accelerated investment was to complete the investigate and define for Linford WTW and Borehole, Suffolk Strategic Network and Storage Enhancements, North Suffolk Winter Storage Reservoir and Lowestoft Reuse. There will be no change to the asset numbers or DI until construction is complete, which will not start until AMP8 or beyond.

Assumptions for lines within CW4 are documented below.

- CW4.3 – excluded Lowestoft Reuse as not in commission until 2032/33. Gateley Moor and Long Newton RWPSs in NSZ17 have been excluded from the count until the design and operation of the industrial system zone is confirmed.
- CW4.5 – additional 20 Km in 2025/26 pending Abberton to Langford completion in March 25. Abstraction mains are included on RES1.22.
- CW4.6 – remained consistent. Excluded Abberton to Langford and Linford as included on RES1.23.
- CW4.7 - estimating based on high level drivers (pcc/leakage etc).
- CW4.9 – quota for abstraction is 91 Ml/d which should be maximised to manage resources in Hanningfield Reservoir, so forecast 91 Ml/d from 2023/24 to 2029/30.
- CW4.12 – Additional 20Km in 2025/26 (Abberton – Langford); 6.06 Km in 2027/28 (Linford). Excluded Bungay / Broome to Barsham and Lowestoft Reuse as not in use until 2030/31 and 2032/33 respectively.
- CW4.13 to CW4.26 – new Linford WTW introduced from 2027/28 which has altered W3 number of works to 6. This has increased the volume supplied from W3 groundwater sites and reduced the volume from W5 surface water sites.
- CW4.27 – Band 1 – Stonehaugh retained as a WTW. Rickinghall transferred from 2024/25 as output is expected to increase to Band 2 upon completion of WTW upgrade.
- CW4.29 – Band 2 – Rickinghall added as per above.
- CW4.31 – Band 3 – North Dalton added from 2023/24. Linford added from 2027/28.
- CW4.33 – Band 4 – North Dalton transferred to Band 3 as per above.
- CW4.35 – Band 5 – Barsham transferred to Band 6 from 2025/26 as output is expected to increase upon completion of WTW upgrade.
- CW4.37 – Band 6 – Barsham added as per above.
- CW4.39 – Band 7 – Horsley transferred to CW4.41 from 2027/28 pending contact tank being complete.
- CW4.41 – Band 8 – Horsley added as per above.
- CW4.43 - This data is the company total for PWPC, consistent with the estimates in OUT4.97.
- CW4.44 - The data in this line is the sum of the individual works PWPC for each works affected by a raw water deterioration scheme in the year the scheme is predicted to be underway.
- CW4.45 - There are no green solutions for raw water deterioration.
- CW4.47 – APR data related to Mosswood UV, Lumley UV and Rickinghall Nickel. All will be complete by 2024/25 so reduced to 0 from 2025/26. 2x raw water deterioration schemes for AMP8 at Warkworth and Broken Scar. Funding is forecast for year 1 and year 2 but guidance is for substantive spend so assumed 2026/27 for both.
- CW4.48 – assumed calendar year 2023 as financial year 2023/24.
- CW4.49 – remained as consistent as design of Linford is not complete so interstage pumping is unknown.
- CW4.50 – estimating based on high level drivers (pcc/leakage etc).

- CW4.51 – remain consistent with APR data which was 0. Do not have any WTW which imports directly from a 3rd party WTW. Network imports (x5) excluded as documented on CW5.
- CW4.53 – No exports direct from WTWs. All imports and exports occur at the boundaries or within our distribution networks. Network exports excluded as documented on CW5.
- CW4.55 – Lartington due to be complete 2024/25 so reduced to 11 outstanding from 2025/26. 11 are due to be complete in 2025/26; Fontburn, Honeyhill, Mosswood, Warkworth, Wear Valley, Broken Scar, Broome, Holton, Mendlesham, Benhall and Barsham (WINEP driver). Reduced to 0 from 2026/27 to reflect our business plan.

5. CW5

An explanation of any material year-on-year variations:

Lines CW5.4-7, 29, 31-87:

Start year 2021/22 for forecasts. APR data included for 2022/23.

Water delivered non-potable: This includes non-potable water accounting for raw water imports and exports as forecast in our WRMP24. Our largest non-potable water consumption occurs in our Teesside area for industrial use. The140Ml/d in this area alone is based on available assets and licences in normal year conditions and increases are derived from detailed discussions with Teesside Industrial Customers.

Decreases in our total water delivered (potable) and DI over the forecast are due to the impact of our demand management options on consumption and leakage.

Increases in consumption to measured households and non-households (and subsequent decrease to unmeasured household and non-household consumption) is due to the increase in measured customers over the forecast under our metering programme of compulsory metering in ESW and enhanced optant metering in NW.

Total annual leakage (including distribution losses) decreases over the forecast due to our leakage demand management option activity which aims to reduce leakage by 40% in ESW and 55% in NW by 2049/50. As the number of metered customers increases over the forecast measured supply pipe loss also increases and unmeasured supply pipe loss decreases.

An explanation of any changes in reporting methods / assumptions that have led to a material change in reported figures.

Lines CW5.4-7,29,31-87:

Data is derived from our WRMP24 demand forecast under a PR24 Business Plan growth scenario.

Start year is 2021/22 data for forecasts. APR data is included for 2022/23, but the forecasts have not been rebased to 22/23 as the start year, this is because the 22/23 APR results were not available in time for producing forecasts for WRMP24

revised draft. Underlying data therefore uses 21/22 results as the start point for the forecasts. For example, the unmeasured non-household consumption rate (l/p/d) and operational use forecasts use 21/22 data as the start point and basis of the forecast.

Please refer to WRMP24 Technical Reports: NW Demand Forecast WRMP24 Revised draft Technical Report and ESW Demand Forecast Revised WRMP24 Technical Report for more detailed information on how we have forecast the separate components of DI including the assumptions employed in the forecasts.

Please see NW_Supply Forecasting WRMP24 Technical Report – Revised Section 6 for information on non-potable forecasts.

We have assumed Distribution Input (pre-MLE) will be the same as our forecasted DI. We recognise this is will not be the reality when reporting the data year on year but without knowing the difference in advance we have selected to use the same DI in this row as our best estimate.

The final demand (DI) forecast follows the WRMP24 and PR24 guidelines. In summary it incorporates the following conditions:

- Customer demand including medium enhanced level water efficiency activity from 2025/26 onwards.
- Our metering programme with enhanced optant metering in NW area and a compulsory metering programme in ESW area.
- Our leakage programme with a reduction of 55% (NW) and 40% (ESW) leakage by 2050.
- Population growth forecast using ONS-18 growth medium scenario.
- Property growth forecast using ONS-18 growth medium scenario.
- NHH growth forecast using ONS-18 growth medium scenario with service industries driven by LA Housing Planned growth and new large users requested volumes.
- The impact of climate change on customers' behaviour
- The impact of Covid recovery on PCC and NHH demand
- Government led interventions applied to household consumption.

Our property and population growth forecasts are different between the WRMP24 and the PR24 Business Plan. This is to follow the separate guideline requirements for the WRMP and the Business Plan with regards to population and property forecasting.

All other inputs in the demand forecast are the same as WRMP24. However, the difference in the population and property growth forecasts results in a different demand forecast.

For the PR24 Business Plan an ONS trend population and property growth scenario has been selected in line with PR24 guidance. We have selected a ONS 2018 scenario with medium growth. This is an ONS 2018-based Principal sub-national projection (SNPP) using updated mid-year estimates from 2021 Census data, with a five-year history (2013–2018) to derive

local fertility and mortality assumptions and a medium long-term UK net international migration assumption of +150k p.a. for the UK in total.

For the WRMP24 guidance requires plans to be underpinned by evidence on Local Plan housing growth for those Local Planning Authorities (LPA). The Housing Plan scenario is a housing-led scenario, with growth underpinned by each local authority's Local Plan housing growth trajectory. Following the final year of local authority data, projected housing growth in non-London areas returns to the ONS-14 & ONS-16 long-term annual growth average by 2050. For London Boroughs, housing growth returns to the GLA Central scenario long-term annual average by 2050.

An indication of the quality of data provided.

Lines CW5.4-7,29,31-87: RAG: GREEN

Confidence Grades as follows:

1. Non-household consumption: B2
2. Per capita consumption: B2
3. Total leakage including SPL: B2
4. Water taken unbilled and operational use: B3
5. Distribution Input: B2
6. Water Balance: A2

Companies should also include more detailed evidence in relation to line items that are used as cost drivers in PR24 cost assessment including:

Number of potable water pumping stations (CW5.16 to CW.20);

There are four new pumping stations due to be delivered for the remainder of AMP7 with growth drivers. These include Goodwill Yard and Cushy Cow planned for completion by 2023/24 and Fenother and Wynard planned for completion by 2024/25. Stainton is also due for completion in 2024/25 and is being delivered as part of the Tees Pipeline project. A new growth pumping station is planned for 2025/26 at Boreham. There are a further three pumping stations that will be commissioned under the WRMP24 best value plan. These include offsite pumping at the new Linford WTW which will be commissioned by 2027/28 and two new pumping stations included in the Suffolk Transfers scheme which be situated at Holton and Eye Airfield to pump water out of the newly constructed service reservoirs into the network. These will both be in commission by 2029/30.

Average pumping head – treated water distribution (CW5.24). This should include a comparison of forecasts with historical growth rates.

Below is historical APH treated water distribution data and the forecast for 2023-24 onwards which is the average of the last 5 years' data.

	Historical data						Forecast
	2017-18	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
APH twd	55.06	60.73	59.66	54.41	51.92	55.09	56.36
growth rates		10.3%	-1.8%	-8.8%	-4.6%	6.1%	2.3%

Historical growth rates of APR – twd vary from 10.3% in 2018-19 to –8.8% in 2020-21 and then back to 6.1% in 2022-23. We have taken into account historical data by taking the average of the last 5 years for our forecast.

Companies should include appropriate commentary for Peak 7 day rolling average distribution input in line CW5.29 identifying the 7 day period when the peak 7 day rolling average occurred.

2022/23:

Data for 2022/23 is as reported in APR. The results for 2022/23 and historic years along with the date that the peak occurred are shown below, separated into Northumbrian Water and Essex & Suffolk Water areas. Due to the different locations within the UK these areas experience largely different weather systems so presenting results separately adds clarity to the peaks in demand seen. The overall results for NES are given in the table. In summary, the majority of the peaks in demand occur when there are high temperatures and low rainfall. We know that demand for water increases under these conditions. Peaks in demand can also occur due to leakage (predominantly bursts) happening when large changes in temperature or prolonged cold conditions are experienced. These have only been experienced in our Northumbrian Water region.

Northumbrian Water:

Reporting year	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Max 7 day rolling average DI (Peak)	730.47	720.66	739.57	716.81	711.80	694.30	734.81	769.76	704.05	783.81	754.01	775.17
Date of Peak	08/06/11	29/05/12	20/07/13	13/02/15	05/07/15	31/01/17	10/03/18	04/07/18	10/03/20	03/06/20	24/07/21	24/12/22

- 2011/12 - Peak demand followed a week of no rainfall and high temperatures during the half term school holiday week. High temperatures and low rainfall are synonymous with peaks in demands and occurring during a school holiday week when people are at home more increases demand more than normal.
- 2012/13 - The peak in demand followed 10 days on no rainfall and high temperatures ending with the late May bank holiday weekend. High temperatures and low rainfall are synonymous with peaks in demands and with a bank holiday weekend when people are at home more will increase demand as well.
- 2013/14 - The peak in demand followed a period of 17 consecutive days with no rainfall and high temperatures, during a heat wave which effected the UK between 3-23rd July 2013.
- 2014/15 - The peak in demand followed a winter period where temperatures jumped by 5oC within 24 hrs. Large increases and decreases in temperatures in a short period of time are known to increase the potential for bursts to occur. 2014/15 was classed as a 'wet' year therefore peaks in the summer period were not as large as normal.
- 2015/16 - The peak demand followed a week which included the hottest July temperature on record for the UK at the time. In the north-east this saw temperatures above 31oC.
- 2016/17 - Leakage caused the peak demand for this year with a winter seeing five named storms occurring in succession between January and March. The year also saw a wet June therefore peaks during part of the summer period were lessened.
- 2017/18 - Leakage once again caused the peak demand in the Northumbrian Water area due to the 'Beast from the East' which saw very cold prolonged conditions hitting the UK.
- 2018/19 - This was classed as a dry year in the North East. The peak in demand followed a period of two weeks with extremely small rainfall combined with high temperatures.
- 2019/20 - The lowest peak in demand was seen for this year. A 'wet' year was experienced in the North East of England albeit a warmer 'wet' year than previously recorded 'wet' years. The peak in demand occurred in March due to a spike in leakage at this point.
- 2020/21 - The peak in demand occurred during June for this year and followed a period of 10 days with very little rainfall and warm temperatures. However this was also coupled with lockdowns due to the Covid pandemic which also increased demand over and above what would normal be expected for the time of year. This is predominantly due to more people being at home all the time, not being able to travel for holidays either and increased hand-washing, cleaning activities.
- 2021/22 - The end of July saw the peak in demand for this year. This followed a period of no rainfall (12 days) and high temperatures (six days in a row of temperatures of 25oC and above). The Covid pandemic is still found to be impacting demand for water causing a further increase. This is predominantly due to people working from home more and staycations being the holiday of choice for the year1.

[1] Staycations.pdf (accumulatecapital.co.uk)

- 2022/23 - Although the warmest year on record for the UK with all months except December being warmer than average, it was in December due to most likely leakage and in parts Christmas household demand which drove the peak in demand for this year. The Met Office reported it was the UK's coldest December since 2010.

Essex & Suffolk Water:

Reporting year	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Max 7 day rolling average DI (Peak)	507.15	510.13	556.12	476.79	511.51	502.73	540.33	562.31	517.09	596.63	544.13	587.88
Date of Peak	26/05/11	10/09/12	21/07/13	25/06/14	05/07/15	25/07/16	22/06/17	27/07/18	27/07/19	13/08/20	15/06/21	20/07/22

- 2011/12 - Peak demand followed a period of nine days with no rainfall and high temperatures. High temperatures and low rainfall are synonymous with peaks in demands and occurring during a school holiday week when people are at home more increases demand more than normal.
- 2012/13 - The peak in demand followed 13 days on no rainfall and high temperatures (including three days directly before of temperatures above 26oC) in September in our southern region.
- 2013/14 - The peak in demand followed a period of 17 consecutive days with no rainfall and high temperatures, during a heat wave which effected the UK between 3-23rd July 2013.
- 2014/15 - The peak in demand followed a period on 31 days with no rainfall in June 2014, and high temperatures.
- 2015/16 - The peak demand followed a week which included the hottest July temperature on record for the UK at the time. In Essex this saw temperatures above 31oC.
- 2016/17 - The peak in demand for this year occurred during a July period of high temperatures (reaching above 30oC) and no rainfall (13 consecutive days).
- 2017/18 - Similar to the previous year, the peak in demand for this year occurred during a period of high temperatures (reaching 30oC) and no rainfall (12 consecutive days).
- 2018/19 - This was classed as a dry year in the Southeast region. On this particular day temperatures soared to 34oC and followed a period of 55 days of no rainfall.
- 2019/20 - The peak demand followed a week of high temperatures including one day of nearly 38oC.
- 2020/21 - The peak in demand occurred during August for this year and followed a period of 16 days with very little rainfall. Temperatures of greater than 27oC where seen in the week before the peak demand. However this was also coupled with lockdowns due to the Covid pandemic which also increased demand over and above what would normal

be expected for the time of year. This is predominantly due to more people being at home all the time, not being able to travel for holidays either and increased hand-washing, cleaning activities.

- 2021/22 - The middle of June saw the peak in demand for this year. This followed a period of no rainfall (10 days) and high temperatures. The Covid pandemic is still found to be impacting demand for water causing a further increase. This is predominantly due to people working from home more and staycations being the holiday of choice for the year2.
- 2022/23 - The warmest year on record for the UK with all months except December being warmer than average. Rainfall was below average for the entire year, and it was sunnier than average especially in Eastern England. Extreme heatwaves in the summer months included temperatures in excess of 40 °C being recorded in the UK for the first time.

Forecast:

Data is derived from our WRMP24 critical period DI forecast for Peak 7 day rolling average DI forecast. As we do not know in advance when the peak 7-day period will be for future years we have used our critical period DI forecast from our WRMP24 under a PR24 Business Plan Scenario. Please refer to WRMP24 Technical Reports NW Demand Forecast WRMP24 Revised draft Technical Report and ESW Demand Forecast Revised WRMP24 Technical Report Section 10.2 on detailed information on critical period uplift.

A critical period (CP) planning scenario is included within our WRMP24 demand forecast to account for a period of peak strain on our system as a result of high demand. For example, high demand because of; prolonged dry weather, high seasonal demand from holidaymakers, heatwaves and winter leakage. We have therefore considered a critical period impact using a combination of these pressures.

To ascertain the uplift to demand due to a critical period (CP) we have followed the methodology from the UKWIR Peak demand forecasting report[3] and the Artesia Water demand insights report[4] using a model supplied by our regional group. We have calculated separate CP uplifts for unmeasured and measured households and non-households. The critical period method of calculation follows this process:

- Collation of weather and demand data – historic PCC and DI data and weather data (including max temp, sunshine and rainfall)
- Determination of the peak period as 7-day
- Normalisation of the DI peak factor
- Calculation of the PCC peak factor for each WRZ and estimate implied non-household peak factor.

The normalisation process produces a separate PCC peak uplift for measured and unmeasured PCC's. It is also estimated that a critical period of high demand may also impact non-household (NHH) demand as well as household demand.

[2] Staycations.pdf (accumulatecapital.co.uk)
[3] UKWIR (2006) Peak Demand Forecasting Methodology report 06/WR/01/7.
[4] Artesia Consulting (2020) Water demand insights from 2018.

The non-household peak demand is implied by subtracting the household critical period demand from the peak week DI. This will obviously include demand not from NHH's (i.e. leakage). However, if this result is lower than the base year NHH demand including leakage, then we can assume there has been no critical period impact for NHH's in that water resource zone (WRZ). Depending on the type of NHH's within a WRZ affects whether there is a critical period impact for NHH's. If the result is higher than the base year NHH demand including leakage, then it is assumed the difference is a result of the critical period. This is then converted into a factor for critical period uplift for NHH's. Only Suffolk NHH demand showed to be impacted by critical period.

The resulting critical period percentage increases for each WRZ split by unmeasured PCC, measured PCC and NHH demand are shown in table below. The critical period dry year DI is calculated by applying the critical period percentage increase to measured and unmeasured household consumption and where applicable the NHH demand for the forecast, therefore giving an increase to DI. The critical period uplift remains the same for the planning horizon.

Water Resource Zone: Critical period uplift (%)	Unmeasured HH	Measured HH	NHH
Berwick	24.8%	23.0%	0% (N/A)
Kielder	24.8%	23.0%	0% (N/A)
Essex	38.2%	35.0%	0% (N/A)
Blyth	36.9%	8.6%	23.5%
Hartismere	36.9%	8.6%	23.5%
Northern Central	36.9%	8.6%	23.5%

Assumptions for lines 1-3, 8-22 and 24 within CW5 are documented below.

- CW5.1 – flow and lift high level assumptions based on existing similar pumping stations in the absence of designs being complete. Stainton PS 272kW (2024/25), Linford 150kW (2027/28); Suffolk Transfers (2029/30) include Barsham 330kW, Holton-Eye 110kW, Holton-Saxmundham 300kw, Eye-Finningham 110kW and Eye-Brome 150kW. 80% pumping efficiency assumed. Growth schemes have not been included in the calculation due to flows and lifts being uncertain.
- CW5.2 – Springwell 24/25 (43 Ml), Holton (13 Ml) 2029/30, Eye (12 Ml) 2029/30. Future abandonments will not be confirmed until the base plan is finalised.
- CW5.3 – No change. Future abandonments are unknown at present.

- CW5.8 to CW5.11 – proportions alter once the new Linford groundwater source is commissioned in 2027/28. 6.6Ml/d has been added onto CW5.11 groundwater works percentage and removed from CW5.9 pumped reservoir source.
- CW5.15 – reuse schemes remain as 0 as Lowestoft Reuse will not be commissioned until 2032/33. Langford Reuse excluded from APR data as does not directly discharge into the WTW.
- CW5.16 – 2x growth schemes in 2023/24 (Goodwill Yard, Cushy Cow), 2x growth schemes in 2024/25 (Fenother, Wynard), Stainton 2024/25, 1x growth scheme in 2025/26 (Boreham), Linford WTW in 2027/28, Holton and Eye both in 2029/30.
- CW5.17 – Linford from 2027/28.
- CW5.18 – remain unchanged as Barsham pumps will be contained within an existing pumping station.
- CW5.19 – as per CW5.16 excluding Linford WTW as this is not located within the network.
- CW5.21 – Springwell (2024/25), Holton (2029/30) and Eye (2029/30). Assumed none will be abandoned pending base plan being confirmed.
- CW5.22 – remain unchanged. Assumed none are abandoned pending the base plan being confirmed.

6. CW6

We completed a bottom-up build to calculate the total length of potable water mains. The foundation for this was the forecast of New Development requisitioned and self-lay new mains schemes reported in data tables.

There are two major AMP8 schemes that have a material impact on the total length of new mains. Our WRMP enhancement case includes laying 76.2km of strategic mains to connect new water assets. Further information can be found in A3-01 WRMP Supply Options (NES14). Our PR19 scheme to replace strategic mains is classed as a mains renewal scheme, however, the programme creates fluctuation in the annual total length of mains reported figures due to the phased schedule for connection of new water mains and abandonment of existing mains. The table below shows how we have calculated the total length of potable water mains.

	23/24	24/25	25/26	26/27	27/28	28/29	29/30
New Development + NW Capital Projects	64.8	64.8	64.8	64.8	64.8	64.8	64.8
New Dev (Self Lay)	25.0	28.0	28.0	28.0	28.0	28.0	28.0
WRMP – Suffolk Strategic Network (New)	0.0	0.0	25.4	25.4	25.4	0.0	0.0
Tees Pipeline (New)	0.0	39.5	6.0	10.4	27.1	0.0	0.0
Tees	0.0	-0.1	-23.0	-0.1	-59.8	0.0	0.0

Pipeline (Abandoned)							
Total	**26,540.4**	**26,672.6**	**26,773.8**	**26,902.3**	**26,987.8**	**27,080.6**	**27,173.4**

New Development Self-Lay

The New Development forecast for self lay directly corresponds to information provided within the data tables.

New Development Requisitioned Mains + NWL Capital Schemes

We have reviewed the last two year of APR data to provide the total of requisitioned New Development mains and water mains laid as part of NW capital schemes. An average of the two years has been included.

Tees Pipeline

A schedule of main laying work has been provided by the Project Manager responsible for the Tees Pipeline.

Suffolk Strategic Network

The forecast assumes liner spend / mains laid within the first 3 years of AMP8.

CW6.18 Contains our estimate of the number of lead communication pipes adjusted down by the sum of lines 18 and 22

CW6.19 Contains our estimate of galvanised iron pipes removed, based on a typical annual trend.

CW6.20 Contains the predicted number of other material communication pipes is the total predicted communication pipes (all materials, with the lead and galvanised iron numbers removed. The number of total communication pipes is predicted from the number of connections.

CW6.21 Contains the number of lead communication pipes replaced for water quality in AMP7, for this period the only replacement carried out are those requested by customers or by failure to achieve our 4µg/l lead standard as set out in out Lead Asset Strategy submitted to DWI. For the AMP8 period, the estimated numbers of communication pipes replaced for water quality is comprised of those requested by customers, an estimation of those likely to fail our 4µg/l standard and those targeted by the AMP8 Meeting Lead Standard business case.

CW6.22 Contains the estimated annual number of supply pipes that will be opportunistically replaced as part of our mains renewal program and enhanced mains renewal business case.

CW6.24 and 26 contains current predicted outturn for the AMP7 lead enhancement project and for AMP8 period the service pipe numbers to be targeted.

CW6.23, 25 and 27 Contains the total estimated lengths of the communication, external and internal supply pipes. This is estimated from the number of communication, external and internal supply pipes in Lines 21, 22, 24 and 26 to be addressed, multiplied by average lengths derived from the set of properties used to cost the AMP8 Meeting Lead Standards project.

CW6a.18 to CW6a.27 Lines were not completed as there is no transitional spend associated with lead service pipes.

Table 6a has been left blank as there is no impact from transitional or accelerated expenditure.

7. CW7

An explanation of any material year-on-year variations:

Lines CW7.6-14

Start year 2021/22 for forecasts. APR data included for 2022/23.

For the remainder of AMP7 our optant metering increases to reach our agreed WRMP19 commitments which had been delayed due to the impact of Covid. From 2025-26 our WRMP24 metering strategy begins which sees a lower level of total optants as our compulsory metering programme begins in ESW region.

Selective metering increases during the last couple of years of AMP7 due to an accelerated metering programme in our Suffolk region. From 2025/26 selective metering (compulsory) then increases from a 2021/22 base year due to our compulsory metering programme in ESW region.

As part of our WRMP24 metering programme we are aiming to replace all meters with smart meters (AMI) by 2035 which accounts for the significant growth in meter replacements with smart and AMI meters. We will not be installing any basic or AMR meters from now on.

Lines CW7.15-21

Start year 2021/22 for forecasts. APR data included for 2022/23.

Supply-demand balance benefit data has been taken directly from our WRMP24 (Table 8). The benefit values increase over the forecast as our WRMP24 metering programme progresses. Optant and compulsory customers use less water than unmeasured customers therefore this produces an increasing benefit as more customers become metered. We also gain a benefit from replacing and installing smart meters, as easier and regular access to consumption information promotes a behavioural change to reduce consumption in our customers. We do not assume any savings associated with the installation of business meters (both replacements and new installs). It is assumed the savings from these meters is entirely from a leakage reduction and therefore not included in this table.

Meter penetration of our households increases to 69% by 2029/30 as our metering programme progresses. As we are only installing smart meters, percentages of basic and AMR meters gradually decrease.

Lines CW7.22-23

Start year 2021/22 for forecasts. APR data included for 2022/23.

The decreases in measured and unmeasured PCC are due to the impact of our demand management options of metering and water efficiency activity on consumption.

An explanation of any changes in reporting methods / assumptions that have led to a material change in reported figures:

Lines CW7.6-23 and 44-51

Lines CW7.6-14 and 21-23: Data is derived from our WRMP24 demand forecast under a PR24 Business Plan growth scenario.

Lines CW7.15-21 and 44-51: Data is derived from our WRMP24 demand forecast.

Start year 2021/22 for forecasts. APR data included for 2022/23.

Please refer to WRMP24 Technical Reports: NW Metering WRMP24 Revised draft Technical Report and ESW Metering Revised WRMP24 Technical Report for more detailed information on how we have developed our metering strategy.

NW Demand Forecast WRMP24 Revised draft Technical Report and ESW Demand Forecast Revised WRMP24 Technical Report for more detailed information on how we have forecast our properties, PCC and meter savings.

NW Leakage WRMP24 Revised draft Technical Report and ESW Leakage WRMP24 Revised draft Technical Report for information on how we have developed our leakage strategy.

The final demand (DI) forecast follows the WRMP24 and PR24 guidelines. In summary it incorporates the following conditions:

- Customer demand including medium enhanced level water efficiency activity from 2025/26 onwards.
- Our metering programme with enhanced optant metering in NW area and a compulsory metering programme in ESW area.
- Our leakage programme with a reduction of 55% (NW) and 40% (ESW) leakage by 2050.
- Population growth forecast using ONS-18 growth medium scenario.
- Property growth forecast using ONS-18 growth medium scenario.
- NHH growth forecast using ONS-18 growth medium scenario with service industries driven by LA Housing Planned growth and new large users requested volumes.
- The impact of climate change on customers' behaviour
- The impact of Covid recovery on PCC and NHH demand
- Government led interventions applied to household consumption.

Our property and population growth forecasts are different between the WRMP24 and the PR24 Business Plan. This is to follow the separate guideline requirements for the WRMP and the Business Plan with regards to population and property forecasting.

All other inputs in the demand forecast are the same as WRMP24. However, the difference in the population and property growth forecasts results in a different demand forecast.

For the PR24 Business Plan an ONS trend population and property growth scenario has been selected in line with PR24 guidance. We have selected a ONS 2018 scenario with medium growth. This is an ONS 2018-based Principal sub-national projection (SNPP) using updated mid-year estimates from 2021 Census data, with a five-year history (2013–2018) to derive local fertility and mortality assumptions and a medium long-term UK net international migration assumption of +150k p.a. for the UK in total.

For the WRMP24 guidance requires plans to be underpinned by evidence on Local Plan housing growth for those Local Planning Authorities (LPA). The Housing Plan scenario is a housing-led scenario, with growth underpinned by each local authority's Local Plan housing growth trajectory. Following the final year of local authority data, projected housing growth in non-London areas returns to the ONS-14 & ONS-16 long-term annual growth average by 2050. For London Boroughs, housing growth returns to the GLA Central scenario long-term annual average by 2050.

An indication of the quality of data provided:

Lines CW7.6-23 and 44-51

RAG: GREEN

Confidence Grades as follows:

- Non-household consumption: B2
- Per capita consumption: B2
- Distribution Input: B2
- Property forecast: B2

The company should provide details of how the figures in lines CW7.24 to CW7.51 have been calculated and clearly reference where these figures have been derived using figures reported in other lines of the business plan tables:

Lines CW7.44-51

Start year 2021/22 for forecasts. We will not be installing any basic or AMR meters from now on therefore no benefits per meter installation have been included for those categories. 'Savings from reduced leakage' is calculated from our total supply pipe loss benefit achieved as reported in our WRMP24 (Table 5, Options LEAK8 (NW) and LEAK4 (ESW)) divided

by the total number of meters installed (CW7 Lines 6-14). We assume the same savings for supply pipe losses for all smart (AMI) meters installed (both new and replacement) from 2025 onwards.

The savings from reduced consumption is calculated from our total consumption benefit as a result of our metering as reported in our WRMP24 (Table 8e and Table 5, Options DMO5 (ESW) and DMO2 (NW)) divided by the total number of meters installed for each category (CW7 Lines 6-14). The largest savings per meter installation are from new installations of optant and compulsory meters. Replacement meters see a smaller saving as a result of smart metering influencing customer behaviour to reduce consumption.

We have left **table 7a blank** as there is no impact from transition or accelerated expenditure.

8. CW8

Our schemes in this table match the WRMP, using the same reference numbers. These are uplifted from 2021/22 price base (in WRMP) to 2022/23 price base (in the business plan) using the CPIH set out in Table PD1.

These are otherwise identical to WRMP. We do not have any green recovery schemes, and our accelerated delivery schemes match those set out in Ofwat's determination for accelerated delivery. No schemes will be completed in 2023-24 or 2024-25.

9. CW10

CW10.1 Rateable value

2022/23

The Rateable Value (RV) of £60.905m reflects actual values from the 2017 Rating Lists published by the Valuation Office Agency (VOA). Of this, £60.500m is the water cumulo from the Central Rating List, the remainder being non-domestic rates for offices and depots used by the wholesale water business.

The actual RV published on the Central List is £77.500m, however, £17.000m of this relates to the Kielder Transfer Scheme which is part of our non-appointed business and therefore excluded.

2023/24 - 2025/26

The RV of £43.033m reflects actual values from the 2023 Rating Lists. Of this, £42.628m is the water cumulo. The actual RV on the Central List is £63.100m but £20.472m of this relates to the Kielder Transfer Scheme which is part of our non-appointed business and therefore excluded.

2026/27 – 2028/29

The government has reduced the rating valuation cycle to three years so the next revaluation will take effect from April 2026 with a further revaluation from April 2029. The RV of £81.405m is a forecast of the RV to be published in the 2026 Rating List. This has been calculated by applying the methodology used by the VOA at the 2023 revaluation, using the forecasts in our PR24 Financial Model. Under this approach, the combined impact of increased revenue and growth in RCV leads to a significant increase in the cumulo RV to £81.000m (excluding the Kielder Transfer Scheme).

2029/30

The RV of £124.005m in 2029/30 is a forecast of the RV to be published in the 2029 Rating List. This has been calculated by applying the methodology used by the VOA at the 2023 revaluation, using the forecasts in our PR24 Financial Model. Under this approach, the combined impact of increased revenue and growth in RCV leads to a further significant increase in the cumulo RV to £123.600m (excluding the Kielder Transfer Scheme).

Please note that the RVs have not been deflated to 2022/23 price base as they are absolute values. The impact of inflation is dealt with through changes in the unit rate applied to the RV, which we have assumed to remain flat in real terms in future years.

CW10.3 Transitional Relief

We have not made any assumption for potential Transitional Relief. These arrangements are typically reviewed and revised at each valuation.

CW10.11 Change in business rates costs due to the impact of revaluation

The unit rate has been assumed to remain flat in real terms in future years therefore all changes in costs have been attributed to the impact of revaluation.

10. CW11

There is a large increase in non-potable water in 2025-26 (for one year only) – see our commentary for CW1 and CW1a for an explanation of this.

11. CW12

Water supply schemes

In addition to our accelerated spend programme, we propose transition spend for two schemes:

- Our nitrate schemes (ESW-NIT-006, ESW-NIT-005, and ESW-NIT-001).
- Our Bungay to Barsham Pipeline (ESW-TRA-023).

We explain why these schemes need an early start in our enhancement case (NES14).

CW12.16-CW12.18 - Water Framework Directive –

Transitional capex (£0.047m) and opex (£0.005m) spend is planned for 2024/25 for the EDWRMP_IMP scheme 'Contribution to WRE stakeholder Strategic Plans for water resources and nature conservation (08ES100102)'. The EDWRMP driver is new for PR24, designed to address the long-term environmental destination aspirations with the National Framework for Water Resources, so it was not part of the outcomes and long-term planning in PR19. Spend on the EDWRMP_IMP 'Contribution to WRE stakeholder Strategic Plans for water resources and nature conservation (08ES100102)' scheme is planned for every year of AMP8 and also for 2024/25 in order to align with the expected publishing of the Strategic Plans for water resources and nature conservation within the eastern region and the need to get staff and schemes in place in time to be in a position to deliver benefits alongside other (as yet unidentified) partner organisations. The EDWRMP driver is a new driver for PR24 and was not part of our PR19 enhancement programme.

12. CW13

We explain our approach in appendix A3 – costs (NES04). The present value of costs has been estimated over a 30 year period, with no alternative presented.

13. CW14

We explain our approach in appendix A3 – costs (NES04). The present value of costs has been estimated over a 30 year period, with no alternative presented.

14. CW15

We explain our approach in appendix A3 – costs (NES04). The present value of costs has been estimated over a 30 year period, with no alternative presented.

15. CW16

We explain our approach in appendix A3 – costs (NES04). The present value of costs has been estimated over a 30 year period, with no alternative presented.

16. CW17

These costs are identical to our WRMP schemes from the Ofwat accelerated delivery determinations, with costs only in the "supply side improvements" and "interconnectors" lines. These costs have been inflated from 2021/22 to 2022/23 using the same CPIH as in PD1.

17. CW20

Confirmation that the profile of mains length in each grade reconciles with the average number of bursts per annum repaired over the past five years:

Yes. Where there were any differences, lines were pro-rated / normalised to match annual return values for lengths and number of bursts.

Sub-division of grading, together with the approach and cohort and grading criteria used to derive it.

The OFWAT guidance was followed for cohorting and grading our water mains. A process was written in R to group assets into cohorts.

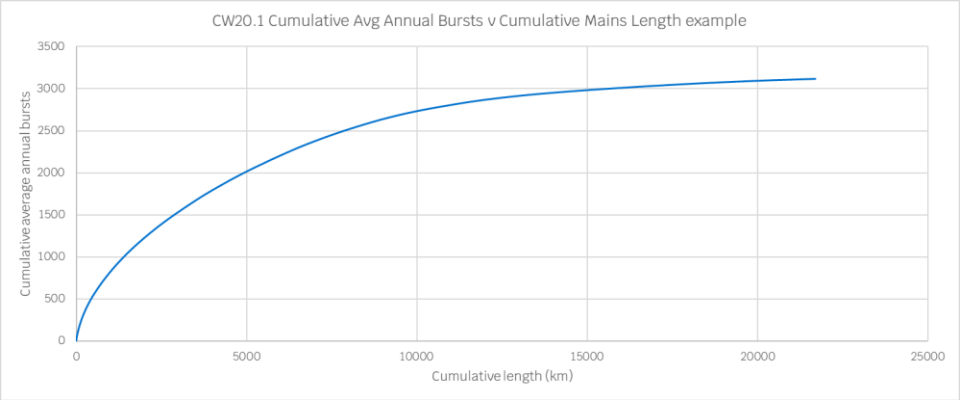
1. Primary cohort features and region (NW and ESW) were always used.
2. Additional cohort features were added, singly, in pairs and in groups of three. Cohort groups were kept if it passed the burst rate tolerance of ±50% criteria.
3. All remaining pipes, not in a tolerance passing cohort, were grouped by primary cohorts and included in the analysis.

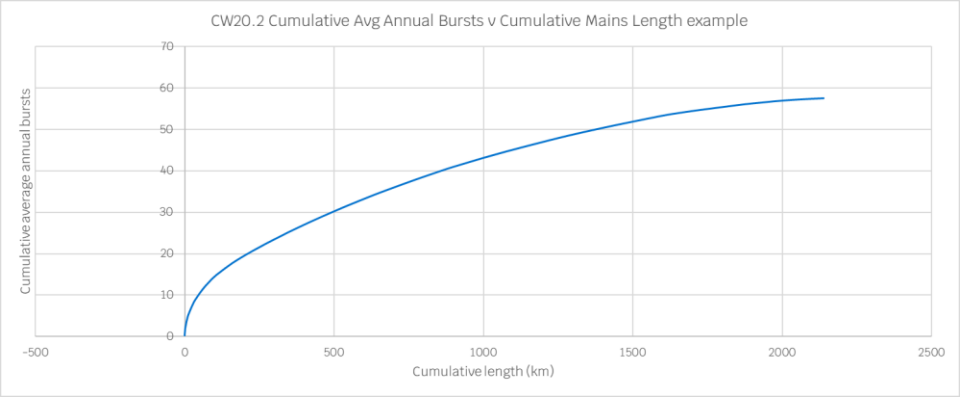
Commentary on any cohort where it is not considered practical to arrange its size to fall within the defined tolerance
There are some cohorts without any history of bursts in the past 5 years. These will never pass the tolerance test set out in the guidance. For CW20.1 this represented <0.1% pipes, by length and for CW20.2, approximately 13%, by length. This makes sense as larger diameter pipes have a lower failure rate.

Companies approach if they have used a period longer than five years.

We have only used the information from April 2018 to March 2023

Graph of cumulative annual average bursts (y-axis) versus cumulative mains length (x-axis):





An explanation of any material variations between current and previous percentages of assets in each condition grade (e.g. PR09 data where available).

The CW20 table has not been calculated before and cannot therefore be compared against previous submissions.

An explanation of any changes in reporting methods / assumptions that have led to a material change in reported figures.

None

An indication of the quality of data provided.

Asset base

Where there are gaps in the data held in our corporate systems (GIS), we follow an established process to infill any missing data. The table below shows the scale of core missing pipe characteristic data.

Pipe Characteristic	Percentage missing data by length (before infill)
Material	1.9%

Diameter	0.6%
Year Laid	29.4%

Burst Records

Where burst records are not linked to a main in our corporate system, we follow an established process to link them to the most likely main. In 2022/2023 this accounted for approx. 12.5% of bursts.

Confirm that the condition grading system (set out in the guidance above) used for this submission has been prepared in line with the guidance and explain differences where they are not on the same basis as that used historically.

They have been prepared in line with the guidance.

Confirmation of any data mapping undertaken to align with the primary or secondary variables of the cohort table. This is particularly relevant to soil corrosivity and/or soil fracture potential.]

The asset base used for this analysis has been cleansed for modelling purposes. Missing pipe attributes have been infilled according to an established process.

This infilling process assigns diameters to pipes in bands. There is no band with a 320mm boundary. The nearest boundaries are 300mm and 355mm, so there may be some pipes between 300mm and 320mm that are included in the >=320mm band. This may affect up to 90km of pipes. This affects the primary and secondary pipe diameter categories.

There were four pipes where we could not assign a diameter. These were assigned to the “other” category. The total length of these pipes was 170m.

The National Soil map from Cranfield University was used to determine the soil corrosivity that a pipe is subjected to. A geospatial query was used to map the soil type and corrosivity to a pipe. Where a pipe crossed more than one category of soil or soil corrosivity, the value was taken to be where the majority of the pipe was situated.

For soil corrosivity, we use a high and low banding only, not high, medium, low.