WSX49 - Costs wholesale water tables commentary

Business plan
2025-2030

Wessex Water
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WSX49 - Costs wholesale water tables commentary

CONTENTS

This supporting document is part of Wessex Water's business plan for 2025-2030.

Please see 'WSX00 – Navigation document' for where this document sits within our business plan submission.

More information can be found at wessexwater.co.uk

1. CW1

Costs in Table CW1 reflect opex and capex post-frontier shift and real price effects. They therefore include the net impact of efficiencies / productivity gains and above inflationary increases in the price of inputs. Further information can be found in the commentary for SUP11.

1.1. Operating Expenditure – Line CW1.1-6

1.1.1. Operating expenditure 2022-23 – 2024-25 (Early submission AMP7)

1. Water resources

The base operating expenditure for Water resources from 2022-23 to 2023-24 has reduced by £2.1m. This mainly relates to a £0.8m reduction in energy costs. Enhanced OPEX has increased as an element of total OPEX, which has reduced the base OPEX by a further £0.4m.

From 2023-24 to 2024-25, the base operating expenditure reduces by £0.4m. The difference between the two final years is based on an expected reduction in power costs as the energy market settles. There is a £0.4m reduction in business rates due to the transition between the two years from PR14 based rates to PR19 where there is a lower level of profitability expected and hence a lower charge. £0.4m relates to missing infrastructure renewals compared to 2022-23.

Third-party services remain relatively consistent across the three remaining years of AMP7.

Principal Use recharges have increased OPEX by £0.2m in 2022-23 compared to £0.1m in 2023-24 and £0.1m in 2024-25 as the value of the assets on which the recharges are based also reduces due to depreciation. Please note this is a deviation from the APR 2022-23 table 4D.

2. Water treatment

Base operating expenditure for Water treatment has reduced by £1.3m from 2022-23 to 2023-24 and a further £1.0m from 2023-24 to 2024-25. Reductions in energy costs account for £0.7m and £1.0m respectively as per Water resources. The remainder between 2022-23 and 2023-24 relates to reduction in rates as these will be based on PR19 and hence a lower rate of profitability from 2023-24 onwards.

Third-party services remain relatively consistent across the three remaining years of AMP7.

Principal Use recharges have increased OPEX by £1.3m in 2022-23 compared to £0.8m in 2023-24 and £0.7m in 2024-25 as the value of the assets on which the recharges are based also reduces due to depreciation. Please note this is a deviation from the APR 2022-23 table 4D.

3. Treated Water Distribution

The base operating expenditure for Treated water distribution has reduced by £11.5m between 2022-23 and 2023-24 prior to infrastructure renewal data availability (£6.6m). £4.1m of the remaining variance relates to the reduction in rates, as noted in the water treatment section.

Energy costs have reduced by £0.4m between 2023-24 and 2024-25, offset by an increase in Other operating expenditure of £1.6m which is related to increases in expected salary costs in 2024-25.

Third-party services remain relatively consistent across the three remaining years of AMP7.

Developer services show a reduction across the 2 remaining years of AMP7 but this is relatively consistent and the biggest movement of £0.3m between 2022-23 and 2023-24 is down to a lower forecast of new connections compared to actuals delivered in 2022-23.

4. Equity Issuance costs

There are no equity issuance costs included in CW1 for the years 2022-23, 2023-24 or 2024-25.

5. Atypical expenditure

The atypical expenditure in the 2022-23 APR related to the relocation of several depots. However, this activity is on hold and no forward forecast is available at this time.

1.1.2. Operating expenditure 2025-26 – 2029-30

1. **Water Resources**

Base operating expenditure is forecast to fluctuate between £11.3m and £12.1m across AMP 8, with increases being incurred as a result of changes in business rates in 26-27, £0.2m increase, and 29-30, £0.2m increase.

These increases are offset by assumed efficiencies being achieved across the 5 years of AMP8, reducing other operating costs from £4.4m to £4.2m. Power costs are forecast to increase from £3.5m to £3.9m by the end of the AMP. Please see the commentary for SUPP11 for the basis of the calculation of these efficiencies and any real price effects.

Principal Usage Recharges are forecast to be less the £0.1m per annum throughout AMP8 as the value of the assets being recharged is expected to decrease across this period. These are increases in Other operating expenditure.

In AMP8 Enhancement opex will increase primarily due to ramping up of our catchment management activity.

2. **Water Treatment**

Base operating expenditure is only expected to increase by £0.9m across the 5 years of AMP 8, having increased by circa £6m between 24-25 and 25-26 as a result of forecast increases in expenditure relating to health and safety and pollution reduction which is expected to incur additional other operating costs.

The increases across AMP 8 are the result of business rates increases, as per Water resources, showing an increase in 26-27 of £0.5m and in 29-30 of £0.3m. Power costs are forecast to reduce by £0.2m and other operating costs by £1m across AMP8 as a result of efficiencies and RPEs as per Water resources. Again, please see the commentary for SUPP11 for the basis of the calculation of these efficiencies and any real price effects.

Principal Usage Recharges are forecast to be less the £0.1m per annum throughout AMP8 as the value of the assets being recharged is expected to decrease across this period. These are increases in Other operating expenditure.

3. **Treated Water Distribution**

Base operating expenditure is forecast to increase by £3.8m across the 5 years of AMP 8, having increased by circa £2.2m between 24-25 and 25-26 as a result of forecast increases in expenditure relating to health and safety and pollution reduction which is expected to incur additional other operating costs.

The increases across AMP 8 are the result of business rates increases, as per Water resources, showing an increase in 26-27 of £3.1m and in 29-30 of £1.5m. Power costs are forecast to reduce by £0.1m and other operating costs by £0.9m across AMP8 as a result of efficiencies and RPEs as per Water resources and Water Treatment. Again, please see the commentary for SUPP11 for the basis of the calculation of these efficiencies and any real price effects.

There are no Principal Usage recharges relating to Treated Water Distribution.

In AMP8 Enhancement opex will increase primarily due to:

- significant opex requirement as a rollout of smart metering
- leakage reduction (previously requested at PR19 but not allowed at final determination

4. **Third party costs**

Third party costs are expected to remain consistent across the entirety of the AMP.

5. Developer Services costs

Developer services are expected to reduce across the 5 years of the AMP from £2.4m down to £1.9m.

6. Equity Issuance costs

There are no equity issuance costs included in CW1 for AMP8.

7. Atypical expenditure

The atypical expenditure in the 2022-23 APR related to the relocation of several depots. However, this activity is on hold and no forward forecast is available at this time.

1.2. Capital Expenditure – Line CW1.8-1.13

1.2.1. Capital expenditure 2022-23 – 2024-25

1. Base capital expenditure

Our programme of planned annual maintenance to operational assets, strategic projects, proactive mains renewals and reactive repairs to address leaking mains makes up this expenditure.

Expenditure in 2023-24 is forecast to be greater than the previous year, mainly due to an increase in repairing leaks to meet more stringent targets in the summer of 2023. We are forecasting reduced expenditure in this area in 2024-25 on the assumption that a similar event will not occur in 2024.

2. Enhancement capital expenditure

Expenditure is forecast to increase in 2023-24 mainly due to projects related to strategic regional water resources planning and environmental studies in the water resources price controls. This is forecast to reduce in 2024-25 as projects are completed and any further investment above that agreed in the PR19 final determination in strategic regional water resource planning is considered to be PR24 expenditure. We have updated costs in this area since the early submission of CW1 as costs for Poole effluent recycling have been reallocated from Wastewater Network Plus to Water Resources.

Expenditure on water treatment is forecast to drop in 2024-25 as our major investment in nitrate blending schemes at Fonthill Bishop and Sturminster Marshall water treatment centres will have been mostly completed.

3. Developer services expenditure

Expenditure is forecast to be fairly constant each year based on current trends in the housing market.

4. Atypical capital expenditure

Planning work to relocate four operational depots and sell the land is on hold. These were previously reported as we thought they would be material, so we are continuing to report the projects for consistency. These costs are included in the base capital expenditure line.

5. Principle use recharges

PU recharges are for opex only.

1.2.2. Capital expenditure 2025-26 – 2029-30

1. Base capital expenditure

We are proposing a significant uplift in investment from AMP7 which is a combination of both increased infrastructure renewal expenditure to maintain long-term asset health of our water networks as well as a significant increase in non infrastructure mainly at our water treatment sites, primarily driven by DWI expectations to make disinfection improvements. See WSX14 our Water Network Plus strategy & investment document for further details.

With regard to the Water Resources price control we are proposing a significant increase in maintenance to our borehole assets. See WSX12 Water Resources strategy & investment document for further details.

2. Enhancement capital expenditure

We are proposing a very significant uplift in enhancement expenditure in AMP8 which is a consequence of a number of drivers:

- Smart Metering – AMP8 marks the start of our transition from basic metering to smart metering resulting a very significant uplift in expenditure in the metering area. For further details see our demand management strategy in WSX15.
- Leakage Improvements – we are proposing significant enhancement expenditure to deliver leakage reductions in the AMP8 period. This represents a significant change as although we requested £25m of enhancement expenditure for leakage reduction at PR19 we received no enhancement funding for leakage reduction in the PR19 final determination.
- SDB improvements starting from 2031 – as detailed in our Water Resources management plan and in WSX12 we are proposing significant investment in this area. We did not have any expenditure in this area in the previous price review and this change in our supply demand balance position is driven by the Environment Agency environmental destination sustainable abstraction.
- Strategic Resource Options – as the above, we have significant enhancement investment in this area also.

3. Developer services expenditure

New Appointees and Variations (NAVs) are year on year winning an increasing proportion of the New Connections market, specifically those sites requiring new mains distribution systems. We are therefore expecting our expenditure on constructing new mains to decrease throughout the AMP.

Our forecast expenditure is based on extrapolating from actual costs incurred in recent years with forecast development in our water supply area. Covid-19 had a significant impact on development and our analysis of historical expenditure has been corrected to represent a more long term average.

4. Atypical capital expenditure

No atypical expenditure in AMP8.

5. Principle use recharges

PU recharges are for opex only.

1.3. Developer Services revenue – Line CW1.7 & 14

For water supply the revenue received is expected to increase from 2022-23, mainly because the costs forecast for S-185 diversions and other developer services revenue are an average of historical revenue and 2022-23 was not an average year as less revenue received was.

We are expecting a slight reduction in developer services revenue due to the reductions in new connection overall. This is based on ONS population projections showing that while population in our region is growing, the rate of growth is slowing, reducing the demand and year on year build rate each year.

1.4. Cash expenditure – Line CW1.16 & 18

The pension deficit recovery payments are only forecast in 2023-24 and 2024-25 but as the recovery plan is due to end in 2024-25 there are no further payments subsequently forecast in AMP8. There are no ‘Other cash items’ forecast.

2. CW1a

2.1. Operating Expenditure - Lines 1a.1-6

2.1.1. Base operating expenditure

Please see the commentary for CW2, later in this document, for the detail supporting the variances in line 1.

2.1.2. Enhancement operating expenditure

In AMP8 Enhancement opex will increase primarily driven by three specific areas:

- further ramping up of our catchment management activity and a
- significant opex requirement as a rollout of smart metering.
- Leakage reduction (previously requested at PR19 but not allowed at final determination)

2.1.3. Developer services operating expenditure

We are expecting a slight reduction in developer services operating expenditure due to the reductions in new connections overall. This is based on ONS population projections showing that while population in our region is growing, the rate of growth is slowing, reducing the demand and year on year build rate each year. Market penetration by SLPs and NAVs is also reducing operating expenditure to a minor degree, the added complexity and duplication of effort evidenced in AMP 7 required to serve these service providers is offsetting reduction in expenditure.

2.1.4. Third party services

The third-party costs remain materially consistent throughout AMP7 and AMP8, ranging between £1.22m and £1.35m.

2.2. Developer services revenue – G&C opex

We are expecting a slight reduction in developer services revenue due to the reductions in new connections overall. This is based on ONS population projections showing that while population in our region is growing, the rate of growth is slowing, reducing the demand and year on year build rate each year

2.3. Capital expenditure

2.3.1. Base capital expenditure

Our AMP7 expenditure is our programme of planned annual maintenance to operational assets, strategic projects, proactive mains renewals and reactive repairs to address leaking main. Expenditure in 2023-24 is forecast to be greater than the previous year, mainly due to an increase in repairing leaks to meet more stringent targets in the summer of 2023. We are forecasting reduced expenditure in this area in 2024-25 on the assumption that a similar event will not occur in 2024.

In AMP8 we are proposing a significant uplift in investment from AMP7 which is a combination of both increased infrastructure renewal expenditure to maintain long-term asset health of our water networks as well as a significant increase in non-infrastructure mainly at our water treatment sites, primarily driven by DWI expectations to make disinfection improvements. See WSX14 our Water Network Plus strategy & investment document for further details.

With regard to the Water Resources price control we are proposing a significant increase in maintenance to our borehole assets. See WSX12 Water Resources strategy & investment document for further details.

2.3.2. Enhancement capital expenditure

Expenditure is forecast to increase in 2023-24 mainly due to projects related to strategic regional water resources planning and environmental studies in the water resources price controls. This is forecast to reduce in 2024-25 as projects are completed and any further investment above that agreed in the PR19 final determination in strategic regional water resource planning is considered to be PR24 expenditure. We have updated costs in this area since the early submission of CW1 as costs for Poole effluent recycling have been reallocated from Wastewater Network Plus to Water Resources.

Expenditure on water treatment is forecast to drop in 2024-25 as our major investment in nitrate blending schemes at Fonthill Bishop and Sturminster Marshall water treatment centres will have been mostly completed.

In AMP8 we are proposing a very significant uplift in enhancement expenditure in AMP8 which is a consequence of a number of drivers:

- Smart Metering – AMP8 marks the start of our transition from basic metering to smart metering resulting a very significant uplift in expenditure in the metering area. For further details see our demand management strategy in WSX15.
- Leakage Improvements – we are proposing significant enhancement expenditure to deliver leakage reductions in the AMP8 period. This represents a significant change as although we requested £25m of enhancement expenditure for leakage reduction at PR19 we received no enhancement funding for leakage reduction in the PR19 final determination.
- SDB improvements starting from 2031 – as detailed in our Water Resources management plan and in WSX12 we are proposing significant investment in this area. We did not have any expenditure in this area in the previous price review and this change in our supply demand balance position is driven by the Environment Agency environmental destination sustainable abstraction.
- Strategic Resource Options – as the above, we have significant enhancement investment in this area also.

2.3.3. Developer services capital expenditure

Expenditure for AMP7 is forecast to be fairly constant each year based on current trends in the housing market.

For AMP8, New Appointees and Variations (NAVs) are year on year winning an increasing proportion of the New Connections market, specifically those sites requiring new mains distribution systems. We are therefore expecting our expenditure on constructing new mains to decrease throughout the AMP.

Our AMP8 forecast expenditure is based on extrapolating from actual costs incurred in recent years with forecast development in our water supply area. Covid-19 had a significant impact on development and our analysis of historical expenditure has been corrected to represent a more long-term average.

MoD and Crown Estate reductions in water abstraction licensing will have an impact on our capital spend profile as they come into effect, these licence reductions will require substantial capital investment in order for Wessex to provide alternative supply to MoD establishments in area.

2.3.4. Third party services

We are not forecasting any third-party services capital expenditure.

2.4. Developer services revenue – G&C capex

For water supply, the revenue received is expected to increase from 2022/23, mainly because the costs forecast for S-185 diversions and other developer services revenue are an average of historical revenue and 2022/23 was not an average year as less revenue received was.

We are expecting a slight reduction in developer services revenue due to the reductions in new connection overall. This is based on ONS population projections showing that while population in our region is growing, the rate of growth is slowing, reducing the demand and year on year build rate each year.

2.5. Cash expenditure

The pension deficit costs are expected to cease after 2024-25. The payments in the final two years of the AMP align to statutory disclosures. There are not expected to be any other cash items.

2.6. Atypical Expenditure

The atypical expenditure in AMP7 relates to the relocation of depots, however this process in on hold and there are currently no forecast costs. There are no forecasts for any atypical expenditure in AMP8.

2.7. Principal Use Recharges

Principal use recharges have been applied for as noted in the commentary for CW2.

3. CW2

3.1. Lines 1-3, 6-13

The OPEX is consistent across AMP8, the only minor variance a result of the principal usage recharges which vary year on year to an immaterial extent.

Power costs in AMP7 reduce by £1.4m from 2022-23 to 2023-24 and then £2.1m between 2023-24 and 2024-25 as a result of the expected reduction and stabilisation of power costs.

Other operating expenditure is forecast to increase by £2.5m between 2023-24 and 2024-25 as a result of expected increases in labour, materials and contractor costs in the final year of the AMP, in line with the PR19 business plan.

Rates have decreased by £5m between 2022-23 and 2023-24 due to the change in process for assessment as this enters a new pricing period basis.

Most operating costs for the price controls presented here are forecast to remain consist across the remainder of AMP8 at 2022-23 prices with the exception of Other operating costs in Water Treatment, CW2.6, which shows £3.5m increase between 2025-26 and 2026-27 as a result of additional expected base expenditure costs to support leakage reduction which will primarily be related to increased detection. This is then expected to remain in place throughout the remaining years of AMP8.

Principal Use of Asset recharges have been applied here on the same basis as the APR and result in an increase in OPEX of an average of £0.5m per annum, although this decreases over time as the assets useful economic lives expire. Principal Use of Asset recharges are all included in Other operating expenditure.

No equity issuance costs are included in the forecasts presented.

3.2. Renewals expensed in year and maintaining the long term capability of the assets

AMP7

Infrastructure renewal opex and maintenance infrastructure capex is forecast to be greater in 2023/24 than 2022/23, mainly due to an increase in repairing leaks to meet more stringent targets in the summer of 2023. We are forecasting reduced expenditure in this area in 2024-25 on the assumption that a similar event will not occur in 2024.

Non infrastructure capital maintenance is forecasting to be greater in 2023/24 than 2022/23 and 2024/25 due to the phasing of strategic investments at some of our Water Treatment Centres.

AMP8

Renewals expensed in year infrastructure and capital maintenance infrastructure costs are consistent each year in AMP8 and are similar to 2022/23 and 2023/24. We plan to increase our Mains renewal rate to 0.4% and invest an additional £20m in Mains rehabilitation to improve Appearance, Taste and Odour. In AMP7, all leakage costs were accounted as base expenditure. For AMP8, our base expenditure is for maintaining leakage. Costs to further reduce leakage rates are captured in enhancement.

There are no Non-Infrastructure renewals as non-infrastructure maintenance are fully capitalised.

Non-Infrastructure capital maintenance costs are fairly consistent each year in AMP8 based on our phased approach to asset replacement and refurbishment to ensure plans are deliverable. It is noted the value of investment is a step change greater than AMP7 as many of these assets are reaching the end of their operating lives and we are planning on increasing our proactive asset replacement and refurbishment programme. This increase includes £50m of disinfection upgrades across 9 Water Treatment sites to meet DWI expectations and a further £7m step up from AMP7 as we look to implement a programme to investigate borehole yield and quality issues, utilise more intensive rehabilitation measures (e.g. acidisation), drill new production boreholes to replace redundant/damaged assets, and deal with legacy observation borehole issues.

4. CW3

The enhancement expenditure reported in this table does not agree to table CW1 as the figures exclude the impact of the real price effect and frontier shift assumptions. The table reconciles with table CW1a. More details on this can be found in the commentary for table SUP11.

4.1. EA/NRW environmental programme (WINEP/NEP) – Line CW3.1-40

4.1.1. Lines CW3.1 - 3.3 Biodiversity and conservation

This line includes expenditure associated with our tree planting commitment. As this is an M&G expenditure, we have assigned 50% of costs to water (CW3) and 50% to waste (CWW3).

This lines also summarise nine implementation schemes driven primarily by the NERC Act and the Habitats Directive. Six of these focus on catchment opportunity mapping for high biodiversity habitats. Minimum biodiversity targets will be developed with an aim to deliver 210Ha of improvements by 2030. The implementation of these schemes will include options such as nectar/seed rich areas to improve habitat for wild birds and pollinators.

The remaining three centre on actions with Wessex Water land holdings and implement actions to maintain and improve biodiversity on those holdings. These include actions to implement a Management Plan at lakes owned by Wessex Water within the Blashford Lakes SSSI.

Further detail on these can be found in WSX25 Improving Biodiversity document.

4.1.2. Lines CW3.4 - 3.6 Eels/fish entrainment screens

These lines summarise three implementation schemes driven primarily by the Eels Regulations. They refer to three WINEP outputs at North Somerset Reservoir, Currypool Weir and Bridgwater Reservoir. Modifications will be made to structures and flow arrangements at these sites to enable Eel migration past existing barriers. We have very limited investment in this area in the AMP8 period with a total of just over £1m, with the majority at the end of the 5 year period. Further detail on these can be found in WSX12 & WSX13 Water Resources Strategy Investment document and annex.

4.1.3. Lines CW3.7 - 3.9 Eels/fish passes

These lines include the costs for removing fish barriers at Knackers Hole gauging station. This was a recommendation from an AMP7 Water Framework Directive investigation into the effects of Otterhead Reservoir on local ecology. Further detail on these can be found in WSX12 & WSX13 Water Resources Strategy Investment document and annex.

4.1.4. Lines CW3.10 - 3.12 Invasive Non Native Species

These lines refer to three WINEP lines associated with the control of Invasive Non-Native Species (INNS). This includes supporting a national surveillance programme using eDNA to monitor for the presence and movement of INNS. Other measures include a partnership programme to deliver catchment-based control measures at Wessex Water owned sites and working with other water companies to address the risk of spreading INNS via raw water transfers. Further detail on these can be found in WSX12 & WSX13 Water Resources Strategy Investment document and annex.

4.1.5. Lines CW3.13 - 3.15 Drinking Water Protected Areas

As can be seen this is a significant uplift in expenditure compared to the remaining years in AMP7. Further detail on these can be found in WSX12 & WSX13 Water Resources Strategy Investment document and annex.

4.1.6. Lines CW3.16 - 3.18 Water Framework Directive

These lines cover costs associated with six WINEP lines driven by the Water Framework Directive. These implement recommendations from previous environmental investigations in AMP6 and AMP7 such as the recommendation to reduce abstraction licences at Dunkerton and Otterhead where these were found to constitute a potential risk of deterioration in water body status. Other lines refer to flow adaptations on the Sherston Avon and Cannington Brook as well as work to improve geomorphological processes down stream of Sutton Bingham and in tributaries to the Middle Bristol Avon. More detail of this work can be found in section WSX12 Water Resources Strategy Investment.

4.1.7. Lines CW3.19 - 3.21 Wetland creation

No investments within this category

4.1.8. Lines CW3.22 - 3.24 Trade effluent discharge flow monitoring

No investments within this category

4.1.9. Lines CW3.25 - 3.27 25 year environment plan

These lines refer to investments driven by the 25 Year Environment Plan. There are two partnership projects relating catchments in the Stour and the Dorset Frome.

The Frome Headwaters Flagship Chalk Stream Project concerns the operation of our wastewater and water supply assets on chalk stream health in Frome Headwaters, Dorset. For this reason, 50% of expenditure has been assigned to the Water Resources Price Control in CW3 and 50% to the Wastewater Networks Plus Price Control in CWW3. The Water Resources Price Control has been assigned as the primary price control and for this reason, the output has been included here and not in line CWW20.72.

The Stour Chalk Streams & Clay Vales partnership project represents both Wessex Water and Bournemouth Water's preferred best value approach to deliver statutory and statutory plus WINEP drivers in the River Stour catchment, primarily focussed on Drinking Water Protected Areas, and supporting NERC, SSSI and Environmental Destination drivers.

4.1.10. Lines CW3.28 - 3.30 Investigations – Desk based

These lines refer to costs associated with nine WINEP investigations. They are driven by a number of areas of legislation such as the Habitats Directive and those relating to INNS. Investigation topics vary widely from a study to produce a rapid response plans to emergent INNS risks to contributing to a region wide plan to support Environmental Destination. All investigations are desk based. Detail on these can be found in WSX12 & WSX13 Water Resources Strategy Investment document and annex.

4.1.11. Lines CW3.31 - 3.33 Investigations – survey, monitoring or simple modelling

These lines refer to costs associated with 13 WINEP investigations many of which are driven by the Water Framework Directive. Four investigations refer to abstraction locations where the licence has been unused for

several years. These sites present a risk to the environment if abstraction were to resume and so the investigations will seek to quantify the extent of this risk.

Three investigations look to assess the impact of climate change on the availability of water resources as well as the potential impact of changing the operation usage of an abstraction site within the confines of its current abstraction licence.

Three investigations look at either fish or sediment impacts from impounding reservoirs, two consider the impact of groundwater augmentation as stream support on dissolved oxygen levels with the remaining investigation assessing the potential deterioration to ecology which could be caused by increasing abstraction within the existing licence at Friar Waddon. All investigations within this category will use a combination of desk work, basic field observations and analysis and modelling to draw conclusions. These are explored further in WSX12 & WSX13 Water Resources Strategy Investment document and annex.

4.1.12. Lines CW3.33 - 3.36 Investigations – multiple surveys, and/or monitoring locations, and/or complex modelling

These lines refer to costs associated with 25 WINEP investigations, many of which are driven by the Water Framework Directive. These investigations will require more significant data collection with costs in some investigations including new boreholes and complex modelling e.g. the Hampshire Avon resource relocation investigation where complex groundwater modelling will need to be calibrated by observations from several new observation boreholes.

18 investigations in this category are driven by either the Water Framework Directive and/or no deterioration drivers and aim to assess the current or potential impact of abstraction on the Water Framework Directive classification. Four look to assess the impact of climate change on the availability of water resources as well as the potential impact of changing the operation usage of an abstraction site within the confines of its current abstraction licence. Three relate to specific protected sites such as the Hampshire Avon or Somerset Levels and Moors SSSI.

4.2. Supply-demand balance – Line CW3.41-59

4.2.1. Lines Supply-side improvements delivering benefits in 2025-2030

No investments within this category.

4.2.2. Demand-side improvements delivering benefits in 2025-2030 (excl leakage and metering)

This expenditure is for water efficiency work as detailed in our Demand Management Strategy, included in document WSX15.

4.2.3. Leakage improvements delivering benefits in 2025-2030

This expenditure is for leakage reduction work as detailed in WSX14 our Water Network Plus Strategy & Investment document and in our Demand Management Strategy which is included in document WSX15.

4.2.4. Interconnectors delivering benefits in 2025-2030

No investments within this category.

4.2.5. Supply demand balance improvements delivering benefits starting from 2031

As detailed in WSX12 & WSX13 our Water Resources Strategy & Investment document and annex we are proposing a modest level of investment in AMP8 to develop the design of schemes to be implemented in AMP9.

4.2.6. Strategic regional resource solutions

As detailed in the table we are proposing significant investment in this area which comprises 3 primary new source development schemes.

The three schemes now progressing towards gate three are:

- **Cheddar two source and transfer**, comprising construction of the second reservoir at Cheddar, water treatment and transfers south to provide resilience to Wessex Water in Somerset and enable a bulk transfer to South West Water's Devon area.
- **Poole water recycling and transfer**. This scheme includes effluent recycling from Poole wastewater treatment works, and diversion of flow to the River Stour after advanced treatment and subsequent re-abstraction to provide a shared resource between Wessex Water and Bournemouth Water.
- **Mendip quarries**, an innovative solution to repurpose a quarry in the Mendips at the end of its mineral extraction life as a water storage reservoir. Associated infrastructure includes water abstraction from the River Avon downstream of Bath and water treatment. Two conveyance transfers have been investigated to date with refinements expected following the development of an integrated regional water resources simulator.

All costs are for the development of schemes which will be delivered after AMP8. For further details refer to WSX12 and WSX13 documents.

The two solution partners that will be delivering the Strategic Regional Resource Solutions together (In AMP8) with Wessex Water (WSX) are South West Water (SWB) and Bristol Water (BRL). The agreed funding split between our solution partners for the strategic regional resource solutions agreed at PR19 is detailed below:

Table 1 - Agreed funding split between our solution partners for the strategic regional resource solutions agreed at PR19

Solution	WSX	SWB	BRL*

Cheddar two source and transfer	42%		58%
Poole water recycling and transfer	41.8%	58.2%	
Mendip quarries	50%	50%	

*We are proposing to change this to SWB as a result of Pennon's acquisition of Bristol Water.

4.3. Metering – Line CW3.60-90

We are proposing a significant uplift in expenditure in this category as initiate our move from basic to smart metering as detailed in WSX14 our Water Network Plus Strategy & Investment document and in our Demand Management Strategy which is included in document WSX15.

4.4. Water quality improvements – Line CW3.91-117

4.4.1. Lines CW3.91 to 96 - Improvements to taste, odour and colour

We have no enhancement expenditure proposed in this area as our proposed activity to improve Appearance Taste and Odour is funded from base maintenance. We are proposing an uplift in base maintenance in perpetuity to undertake more work in this area in the future but think long term asset heath improvement should be allowed for in future base maintenance allowances and not from enhancement.

4.4.2. Lines CW3.97 to 99 - Addressing raw water quality deterioration (grey solutions)

In AMP7 we have two water quality enhancement improvements in this category, both being nitrate blending solutions. The remaining expenditure in 2023/24 and 2024/25 will see they projects completed ahead of the start of AMP8.

In AMP8 we have one water quality enhancement improvement in this category, the construction of a new nitrate treatment plant at site WxW_SS131 for which we have a DWI letter of support and will be entering into a regulation 28(4) undertaking.

4.4.3. Lines CW3.100 to 102 - Addressing raw water quality deterioration (green solutions)

In AMP7 we have been working in 24 drinking water source catchments (21 groundwater and 3 surface water) to attempt to improve raw water quality for nitrate and pesticides. The cost of the AMP7 programme will be £3million split between £1.3million enhancement opex (new schemes) and £1.7million in base opex (continuation schemes).

In AMP8 we will be working in the same number of catchments but will be including customer campaigns to tackle domestic oil storage and domestic septic tanks. The cost of the AMP8 programme will be £13million, split between £11million enhancement opex and £2million base opex. The reason for the significant uplift in enhancement is due to a revised 'enhanced' approach to catchment management in higher risk nitrate source catchments, where previous approaches and levels of expenditure have failed to secure nitrate reductions. This will see greater funding of farm infrastructure improvements and point source issues. Significant cost uplifts are also due to world commodity prices affecting agriculture and competition for nutrient and biodiversity offsets driving up compensation costs.

The enhanced catchment management schemes for nitrate and domestic oil customer campaigns are included in AMP8 WINEP, so are described in detail in WINEP support documentation (ODRs, OARs and ASFs).

4.4.4. Lines CW3.103 to 105 - Conditioning water to reduce plumbosolvency for water quality

We have no enhancement expenditure in this area in AMP7 nor are we proposing any in AMP8.

4.4.5. Lines CW3.106 to 108 - Lead communication pipes replaced or relined

We are proposing to replace 6,000 lead communication pipes in the AMP8 period. The total enhancement cost of our proactive and reactive lead replacement programme in AMP8 is broadly the same as AMP7. Further detail is in WSX14 our Water Network Plus Strategy & Investment document.

4.4.6. Lines CW3.109 to 111 - External lead supply pipes replaced or relined

We anticipate that for every lead communication pipe we replace, we will also replace the external lead supply pipe in 50% of cases. The total enhancement cost of our proactive and reactive lead replacement programme in AMP8 is broadly the same as AMP7. Further detail is in WSX14 our Water Network Plus Strategy & Investment document.

In AMP7 we allocated expenditure in this category to opex, in AMP8 we have allocated it to capex primarily to make it clear this is not a normal ongoing opex but rather a one-off activity.

4.4.7. Lines CW3.112 to 114 - Internal lead supply pipes replaced or relined

Our policy is not to undertake any internal lead replacement work. We have no expenditure in this category in AMP7 not forecasting any in AMP8.

4.4.8. Lines CW3.115 to 117 - Other lead reduction related activity

We have no enhancement expenditure in this area in AMP7 nor are we proposing any in AMP8.

4.5. Water resilience and security – Line CW3.118-126

4.5.1. Resilience

AMP8 expenditure on resilience is in two areas. The cost split is shown in the table below.

Table 2 – Water resilience and security expenditure

Investment	Capex £m	Opex £m
Cellular service communication	0.21	0
Supporting additional sampling and analytics due to legislative changes	1.45	0

Cellular service communication

The lines under this category look to manage the end of cellular services and are reported as resilience enhancement. It looks to manage increasing risks from cascading failures of supporting systems beyond the company's control and is not covered by other enhancement areas.

All cellular communication companies have signed up to the Government target of switching off 2G and 3G by 2033 - A joint statement on the sunsetting of 2G and 3G networks and public ambition for Open RAN rollout as part of the Telecoms Supply Chain Diversification Strategy - GOV.UK (www.gov.uk). This approach will see a phasing out of the infrastructure that supports the 2G and 3G networks over the next ten years.

We are proposing a programme of change to meet the 2033 deadline for the end of 2G services. We are expecting the current devices to fall back to 2G operation as the 3G network gets shut down. This enables investment to span AMP8 and AMP9. Further details of this programme can be found in WSX14 and WSX15.

The split of investment for the communications connectivity resilience is 50% waste (CWW3) and 50% supply (CW3) as this represents the breakdown of our customer contact approach for supply interruptions and sewer flooding, and our rural sites where communications will be restricted.

Supporting additional sampling and analytics due to legislative changes

Our Saltford analytical laboratory is adequately sized to meet the current business sampling needs for wastewater and water supply. With changes in legislation led by our regulators we will see a significant increase in the sampling requirements across the business.

To meet this enhanced sampling requirement, and subject to suitable planning requirements, we will need to expand our laboratories capacity. This would include the overall footprint of the building. Laboratory investment sits within M&G that is traditionally spread across price controls. Further details of this programme can be found in WSX15 & 17. This investment is categorised as resilience to reduce reliance on third party providers which we have no control over. This ensures we can manage analysis for the growth in regulatory requirements including PFAS.

The split of investment for the lab expansion is 50% waste (CWW3) and 50% supply (CW3) as this represents the breakdown of our wastewater and supply assets and the changing sample requirements.

4.5.2. Security – SEMD

No expenditure in this category.

4.5.3. Security – Cyber

✂

4.6. Net zero – Line CW3.127-129

4.6.1. Greenhouse gas reduction (net zero)

The enhancement expenditure in this line includes our plan to enhance our transport by the installation of EV charging infrastructure.

The national policy is for the phase-out of new petrol and diesel cars and vans by 2030, and new diesel HGVs by 2040. In our management and general (M&G) capital maintenance plan, we have proposed approximately 60% of our small van fleet and 19% of our large van fleet will be upgraded and updated to EV.

By installing EV chargers across our region, we propose that more than 70% of the EV fleet will have access to charging infrastructure, which will lead to an impact of higher productivity. This assumes a 20-minute diversion each way to a charger. Further details of this programme can be found in WSX23.

The project to provide fleet charging infrastructure reflects the make-up of our fleet and the breakdown of our assets. We have split the investment 30% to water supply (CW3) and 70% to wastewater (CWW3). Of our sites, around 80% are waste and 20% are supply, and the percentages represent the breakdown of our small van fleet servicing those sites.

4.7. Other enhancement (Freeform lines – by exception) – Line CW3.130-140

Due to a shortage of space in the table we have bundled all the AMP7 costs assigned to AMP7 freeform lines into single capex and opex lines. Freeform lines have been used for this expenditure as there were no appropriate standard categories, and for the reporting to be consistent with APR reporting of costs against PR19 allowed expenditure.

4.7.1. AMP7 Additional line comprises:

Integrated Supply Grid

We incurred minimal costs relating to the Corfe Mullen to Salisbury transfer scheme. Although the scheme is complete, there were some outstanding costs for land compensation. This relates to an AMP6 enhancement where the full costs were not in the 2019/20 baseline as new costs are still being incurred.

Partnership Working

Capitalised costs associated to improving access to Sutton Poyntz SSSI.

The operating expenditure is for undertaking condition reviews, land management plan reviews and connected improvements to a number of SSSI sites such as the Monkswood Valley, Poole Harbour, Nutscale Reservoir in Exmoor and other water sources.

NEP - Local priority

Minimal capital costs associated with a completed project which had an AMP6 output.

Security - Non SEMD

Replacement of the public switched telephone network (PSTN) which has a phased delivery through AMP7. OpenReach will be ceasing operation of their PSTN network from 2025. As they move toward an internet-based

network in the next five years they will stop selling new PSTN lines from 2023. Our outstations currently using analogue PSTN communications as the only way to connect information back to our central systems requires to be switched to an alternative communications method such as Internet Protocol (IP).

Demand-side improvements delivering benefits in 2020-2025 (excl leakage and metering):

Operating expenditure relate to initiatives working with customers to improve water efficiency and provide immediate demand side improvements.

1.7.2 eCAF

e-CAF requirements relating to cyber security improvements. Refer to commentary for line Security Cyber.

1.7.3 Data and AI

With the growing interest in producing a 'data driven company', we need to ensure that we have skills to develop data led solutions. We need to prepare the technical capabilities to be able to efficiently develop and deploy these solutions along with being able to maintain them in the future. This does not sit within other investment lines due to IT investment falling within the boundary of M&G. Further details of this programme can be found in WSX15.

Data and AI can be used to predict issues in both the supply of clean water and to prevent pollutions from happening in waste networks. We will be collecting data from various sources, and we will use machine learning and AI techniques to analyse the data and identify patterns, trends, anomalies, or risks that may affect the water supply or cause environmental damage. With an increase to the number of sensors being installed on the waste network, 56% of the investment has been assigned to waste. The remaining budget will used on the supply network to support sustainable abstraction initiatives.

1.7.4 Customer Access, Recreation, Education

Investment will continue to improve signage interpretation to enhance greater understanding of the function of the sites and promote water saving along with educational, leisure and engagement activities at each site to promote higher levels of engagement with local customers and communities. Additionally, stronger links will be made between the reservoir sites and our education offering, to expand the ability to engage young people and future customers in greater understanding of water supply and conservation.

1.7.5 New meters for new customers

These costs are for installing AMI meters at new properties constructed in the AMP8 period.

5. CW4 - Raw water transport, raw water storage and water treatment data

5.1. Lines 1 to 12 - Raw water transport and storage

5.1.1. Lines 1 & 2 – balancing reservoirs

We don’t have any of these assets at present, nor do we forecast any new assets in this category by 2029-30.

5.1.2. Lines 3 & 4 – raw water transport stations

For APR23 we updated our asset inventory following our Average Pumping Head (APH) data improvement project, we do not forecast any change in this asset category from 2022-23 up to and including 2029-30.

5.1.3. Lines 5 & 12 – raw water transport mains

We are forecasting that the length of raw water mains reported in Line 5 will increase by 0.1km/y following the trend reported in the APR over the last three years, mainly as a result of result of treatment improvement projects.

Line 12 is our one raw water transport, Cowbridge (Wessex Water) to Shipton Moyne (Bristol Water), and we do not forecast any change by 2029-30.

5.1.4. Lines 6 to 7 – raw water transport APH and energy

For Line 6 we are not forecasting any changes from the 2022-23 reported data over the forecast period.

In preparation for PR24 we have undertaken a major review of our APH calculation, with the data for all +400 pumping stations being validated, checking the operational status and categorisation. Where suction and delivery pressure was available on telemetry this has been used for calculating the lift, and all flow meter references have also been checked. This has resulted in a significant change from last year's reported numbers, but we are confident that this year's numbers are more accurate and best used for forecasting in the PR24 tables. This APH data review also fed into our pumping station asset inventory.

Table 3 – Average Pumping Head changes from Data Improvement Project

APR and PR24 Lines	Line Description	2022-23	2021-22
5A.23 = RES1.23	Average pumping head – raw water abstraction	30.03	35.10
6A.6 = CW4.6	Average pumping head – raw water transport	95.76	0.07
6A.34 = CW4.49	Average pumping head – treatment	17.48	10.36
6B.24 = CW5.24	Average pumping head – distribution	81.40	95.82

We have used the three year average for line 7 as there has been no change in the underlying data or methodology and therefore this is a more accurate forecast of BAU activity over the forecast planning period. The are a number of explanatory factors and exogenous variables the could impact this forecast but these are all within the C3 confidence grade attached to this data set.

5.1.5. Lines 8 and 9 – raw water transport imports

We don't have any raw water transport imports at present, nor do we forecast any new assets in this category by 2029-30.

5.1.6. Lines 10 and 11 – raw water transport exports

We have one raw water transport export, Cowbridge to Shipton Moyne, and we do not forecast any change by 2029-30. This utilisation of this export is normally only a sweetening flow as it is only required at full capacity under drought conditions, the forecast is based on the previous three year average.

5.2. Lines 13 to 42 – Water treatment type & size

We are not forecasting any water treatment works that have not been decommissioned remaining unused for the whole of any report year during the forecast period.

Unless stated otherwise all asset information is assigned a B2 confidence grade and operational data is assigned a C3 confidence grade.

5.2.1. Lines 13 to 26 – treatment type analysis

We have 64 WTCs in use, and this total number will not change over the forecast period. We established a baseline forecast based on the average utilisation at each site over the last three years as reported in the APR and used the business plan version WRMP24 DI forecast to populate future years proportionally. We have a planned programme of treatment improvements, and we have applied the three-year average utilisation to those sites where improvements are planned and adjusted categorisation of those sites accordingly.

The consequence of our planned disinfection improvement programme the number of SD sites reduces from 26 to 20 and W1 sites from 10 to 9 and W2 sites from 5 to 4; and the number of W4 sites increases from 15 to 23.

5.2.2. Lines 27 to 42 – treatment size analysis

We have 64 WTCs in use, and this total number will not change over the forecast period. We have no plans to increase capacity that result in a change in WTW size band within the forecast period, therefore the number of works remains static from 2022-23.

5.3. Lines 43 to 55 – Water treatment other

5.3.1. Line 43 - peak week production capacity

Our PWPC is updated annually before the start of each new financial year based on the latest data from maximum flow trials to be carried out. We carried out this review in March 2023 and calculated 574.44 Ml/d for 2023/24. As this value is based on an annual review of site production, which is often influenced by unplanned events and does not follow a typical growth factor. Our forecast for 2024/25 to 2029/30 is the three-year average of the period 2021/22 to 2023/24.

5.3.2. Line 44 - peak week production capacity grey solutions

We only have two schemes in AMP7 in this category, Fonthill Bishop and Sturminster Marshall nitrate blending solutions, both will be completed in 24/25 with a peak week production capacity of 6.8Ml/d and 27Ml/d respectively. In AMP8 we are proposing one scheme in our PR24 plan, site WxW_SS131 nitrate treatment which it is assumed will be delivered in 2029/30.

5.3.3. Line 45 - peak week production capacity green solutions

Our forecast is based on our current and proposed expenditure on catchment management to protect sources and their respective peak week production capacity. Although the level of activity and expenditure will vary across the

forecast period the number of catchment and sources does not change nor does the peak week production capacity as reported in the APR.

5.3.4. Line 46 - Total water treated at more than one type of works

We don't have any sites in this category, nor are we planning to have any during the forecast period.

5.3.5. Line 47 - Works requiring remedial action because of raw water deterioration

We are not forecasting any change from the 21 sites reported in APR23 over the forecast period.

5.3.6. Line 48 - Zonal population receiving water treated with orthophosphate

We are not planning any new installations over the forecast period, and therefore have applied the regional average population forecast from our WRMP to the zones reported in 22/23 over the forecast period.

5.3.7. Lines 49 & 50 - Average Pumping Head & Energy Consumption

We are not forecasting any change from 2022-23 reported data for Line 49 over the forecast period.

As detailed in our APR23 commentary and in preparation for PR24 we have undertaken a major review of our APH calculation, with the data for all +400 pumping stations being validated, checking the operational status and price review allocation. Where suction and delivery pressure were available on telemetry this has been used for calculating the lift, and all flow meter references have also been checked. This has resulted in a significant change from last years reported numbers, but we are confident that this year's numbers are more accurate and best used for forecasting in PR24. This APH data review also fed into our pumping station asset inventory.

We have used the three year average for line 50 as there has been no change in the underlying data or methodology and therefore this is a more accurate forecast of BAU activity over the forecast planning period

5.3.8. Lines 51 to 54 - Water Treatment Imports and Exports

We don't have any imports or exports sites in this category, nor are we planning to have any during the forecast period.

5.3.9. Line 55 - new MCERTS flow monitoring

We have one AMP7 WINEP scheme; 7WW200514 MCERTS flow monitoring at Lake WTW under the WINEP driver EPR_MON1 with a 31/03/2025 target date. At present our AMP8 WINEP does not have any sites under the "Monitoring for flow compliance" EPR_MON1 driver.

However, the EA are in the process of producing an interim Regulatory Position Statement (RPS) to authorise run to waste discharge prior to full permitting. The planned new permits for the run to waste at water treatment works are outside of the WINEP/NEP, and it is not yet clear how the new permits are to be applied, and hence how many new MCERTS flow monitoring will be required. We have assumed that we need to install one new MCERTS flow monitor for each of the last four years of AMP8 to meet the requirements of the new run to waste permitting process.

5.4. CW4 – Commentary requirements cross check

We provide the following confirmation on the CW4 Commentary requirements in the guidance.

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

Under the section 1.2 header we have confirmed that we are not forecasting any water treatment works that have not been decommissioned remaining unused for the whole of any report year during the forecast period. We think this question relates more to APR reporting rather than business plan forecasts.

5.4.2. An explanation of any material year-on-year variations

We have included commentary on this for each line where appropriate.

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

The only material change in reported figures is for Average Pumping Head (APH) as detailed in the commentary for these lines.

5.4.4. An indication of the quality of data provided

Almost all of the data in this table is reported in the APR Table 6A and therefore we have a solid foundation of data on which to forecast forward and compare with historical trends As noted, we have made a significant improvement in the APH data. The asset based data changes incrementally over time, and we can correlate this to historic activity and future plans and therefore can forecast forward with a high degree of confidence.

Forecast volume data is taken from the business plan version of our Water Resource Management Plan final planning scenario demand forecasts. The business plan forecasts differ to the submitted revised draft WRMP24 due to adjustments that have been made to our demand management strategy in response to the July 2023 EA Information Letter 12/2023 which asks to consider phasing activities from PR24 into future price review periods. Our adjusted demand management strategy includes a reduction in our AMP8 smart metering programme, reducing target smart meter penetration for HH and NHH from 75% to 40% and a reduction in our Leakage activity, reducing our target leakage reduction from 7.7Ml/d to 3.5 Ml/d. Although these elements of our demand management strategy have now been phased to deliver less in AMP8, we still remain committed to achieving the same targets as proposed in WRMP24 by the end of AMP9. Due to this change in phasing of demand management activities, the distribution input, volumes of water delivered to customers and leakage data used in the population of table CW4 differs from that in our revised draft WRMP24.

5.4.5. 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) and water treatment (CW4.34)
See individual line commentary, significant changes have occurred as a result of a major data improvement project.

Water treatment type analysis (CW4.13 to CW4.19);
See individual line commentary for the consequence of our planned disinfection improvement programme.

5.4.6. This should include a comparison of forecasts with historical growth rates

See individual line commentary, in general we have not used historical growth rates for forecasting. Asset data forecasts are generally based on planned changes and operational data either on three year average or the last

years data if thought a better base point plus corrections for Water Resource Management Plan final planning scenario demand forecasts.

6. CW4a

This table is intentionally blank therefore not commentary has been submitted.

7. CW5 - Treated water distribution - assets and operations

7.1. Line 1 & 16 to 20 – potable water pumping stations

We undertook an Average Pumping Head (APH) data quality improvement project for APR23 ahead of PR24 which led to a number of changes to our pumping station asset inventory. Hence we are confident that our data for 22/23 represents the best possible starting point for forecasting these lines.

Based on our known capital programme for the remainder of AMP7 and in AMP8 we can be confident that we do not expect any change to the number of pumping stations in lines 17 and 18 relating to our water treatment centres.

Based on activity in recent years we forecast an additional 1 pumping station per year in line 19 as a consequence of new development with an average increase in total installed power of 25kW per station. This feeds into our forecast for Line 1.

We do not anticipate any other changes to this asset inventory over the planning period based on our knowledge of our capital programme.

7.2. Line 2 & 3 and 21 & 22 – service reservoirs and water towers

Based on historic activity and current planning we anticipate the number of service reservoir will reduce by 1 site 0.1Ml in 23/24, no change in 24/25, and then in the AMP8 period it is assumed that 3 sites will be abandoned each with a capacity of 0.1Ml.

We have 11 Water Towers left in service with a total capacity of 9.0Ml. We have no plans to build any new Towers or to abandon any of our remaining Towers over the forecast period.

We do not anticipate any other changes to this asset inventory over the planning period based on our knowledge of our capital programme.

7.3. Lines 4 to 7 – water delivered

We have used the business plan version of the WRMP24 forecast Normal Year Annual Average (NYAA) demand balance model values and the same methodology as used in APR Table 6B reporting Line 4 is zero as we don't supply any water in this category nor plan to over the forecast period.

7.4. Lines 8 to 15 – proportion of DI by source

This is the same data reported in Table RES1 Lines 1 to 8 but expressed as proportion of business plan WRMP24 NYAA DI. The percentage remains static as it is based on the average proportion of the last three years APR reported data.

7.5. Lines 23 and 24 – Energy consumption and APH

For Line 23 we are not forecasting any change from the 2022-23 reported data over the forecast period.

In preparation for PR24 we have undertaken a major review of our APH calculation, with the data for all +400 pumping stations being validated, checking the operational status and categorisation. Where suction and delivery pressure was available on telemetry this has been used for calculating the lift, and all flow meter references have also been checked. This has resulted in a significant change from last year's reported numbers, but we are confident that this year's numbers are more accurate and best used for forecasting in the PR24 tables. This APH data review also fed into our pumping station asset inventory.

Table 4 - Average Pumping Head changes from Data Improvement Project

APR and PR24 Lines	Line Description	2022-23	2021-22
5A.23 = RES1.23	Average pumping head – raw water abstraction	30.03	35.10
6A.6 = CW4.6	Average pumping head – raw water transport	95.76	0.07
6A.34 = CW4.49	Average pumping head – treatment	17.48	10.36
6B.24 = CW5.24	Average pumping head – distribution	81.40	95.82

We have used the three year average for line 24 as there has been no change in the underlying data or methodology and therefore this is a more accurate forecast of BAU activity over the forecast planning period.

7.6. Lines 25 to 28 – treated water imports and exports

For the remainder of AMP7 we have used the forecasted values submitted in the Water trading ('Bulk supplies') register 2022-23 with the addition of an updated NAVs forecast. There is then a step change as our methodology changes to reflect the assumed volumes in our WRMP24 as agreed with neighbouring companies.

For AMP8 we have taken the WRMP24 forecast which includes our NAV demand forecasts which are calculated based on the build rates provided to us by the developers, with adjustments made where necessary, and multiplied by Wessex Water's measured PHC, adjusted for headroom and a reduced leakage per property estimate, as per WRMP24. There is inherently greater degree of uncertainty over the volumes that will actually be delivered to NAVs over the forecast period. As these sites are treated as exports, this will impact our potable water delivered.

7.7. Lines 29 & 30 – Peak 7 day rolling average distribution input

Our data for these lines has come directly from the business plan version of the WRMP24 planning tables, with the peak 7 day numbers taken from the WRMP24 Dry Year Critical Period distribution input forecast.

The calculation in Line 30 of the data table is assumed to be an error. It is using CW5.39 (Distribution input pre-MLE) as the denominator but we believe this should be using the post-MLE DI figure, line CW5.38, as per the written guidance. We have left the table calculation as is.

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

The peak 7-day period in 2022-23 was the week commencing 8th August 2022. Previous years peak weeks have fallen between May to August, the peak week in May 2020 was a result of the hot weather during the Covid-19 lockdown.

Even prior to recent unpredictability of weather patterns due to climate change, the peak week demand could occur anytime between June and August, but going forward this may increase to from May to September.

7.8. Lines 31 to 39 – Water balance - Company level

Our data for these lines has come directly from the business plan version of the WRMP24 planning tables adjusted to the NYAA scenario.

7.9. Lines 40 to 57 – Water balance - Regions

These lines have not been populated as we operate as one water resource zone in our WRMP24.

7.10. Lines 58 to 67 – Components of total leakage (post MLE) - Company level

Our data for these lines has come directly from the business plan version of the WRMP24 planning tables, adjusted for the NYAA scenario.

7.11. Lines 68 to 87 – Components of total leakage (post MLE) - Regions

These lines have not been populated as we operate as one water resource zone in our WRMP24.

7.12. CW5 Commentary requirement cross check

We provide the following confirmation on the CW5 Commentary requirements in the guidance.

7.12.1. An explanation of any material year-on-year variations

As detailed in the individual line commentaries we are not reporting material year-on-year variations other than those arising from our Water Resource Management Plan final planning scenario demand forecasts. In particular our ambitious proposed leakage and PCC reductions, as detailed in our WRMP24.

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

The only material change in reported figures from changes to methods / assumptions is for Average Pumping Head (APH) which has arisen from a data improvement project as detailed in the commentary for this line.

7.12.3. An indication of the quality of data provided

All of the data in this table is reported in the APR Table 6B and therefore we have a solid foundation of data on which to forecast forward and compare with historical trends. As noted, we have made a significant improvement in the APH data. The asset based data changes incrementally over time, and we can correlate this to historic activity and future plans and therefore can forecast forward with a high degree of confidence.

Most of the forecast operational data is taken from the business plan version of our Water Resource Management Plan final planning scenario demand forecasts. The business plan forecasts differ to the submitted revised draft WRMP24 due to adjustments that have been made to our demand management strategy in response to the July 2023 EA Information Letter 12/2023 which asks to consider phasing activities from PR24 into future price review periods. Our adjusted demand management strategy includes a reduction in our AMP8 smart metering programme, reducing target smart meter penetration for HH and NHH from 75% to 40% and a reduction in our Leakage activity, reducing our target leakage reduction from 7.7Ml/d to 3.5 Ml/d. Although these elements of our demand management strategy have now been phased to deliver less in AMP8, we still remain committed to achieving the same targets as proposed in WRMP24 by the end of AMP9. Due to this change in phasing of demand management activities, the distribution input, volumes of water delivered to customers and leakage data used in the population of table CW5 differs from that in our revised draft WRMP24.

7.12.4. 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);
See individual line commentary, no significant changes are forecast in the plan period, just business as usual incremental growth due to new development.

Average pumping head – treated water distribution (CW5.24).
See individual line commentary, significant changes have occurred as a result of a major data improvement project.

7.12.5. This should include a comparison of forecasts with historical growth rates.

See individual line commentary, in general we have not used historical growth rates for forecasting. Asset data forecasts are generally based on planned changes and operational data either on three year average or the last years data if thought a better base point plus corrections for Water Resource Management Plan final planning scenario demand forecasts.

7.12.6. 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

The peak 7-day period in 2022-23 was the week commencing 8th August 2022. Previous year's peak weeks have fallen between May to August, the peak week in May 2020 was a result of the hot weather during the Covid-19 lockdown.

See individual line commentary, even prior to recent unpredictability of weather patterns due to climate change, the peak week demand can occur anytime between June and August, but going forward this may increase to from May to September.

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

8.1. Lines 1 to 4 – mains length and activity

As reported in the APR in recent years our Line 1 total mains length has increased by around 30km per year, which is less than historically due to the impact of NAVs on new mains from new development, and we have not had any significant new mains from other drivers. We anticipate this pattern to continue for the forecast period and therefore have added 30km per year to the total mains length from the 22/23 reported number for Line 1.

As reported in the APR we have not undertaken any mains relining in recent years, nor do we expect to undertake any mains relining during the forecast period. Mains relining was previously used for water quality driven rehabilitation works where a large amount of mains were targeted in a relatively small area where economic. Although we are forecasting an increase in water quality driven rehabilitation works, this will be on a small number of targeted mains in a variety of locations and it's very unlikely that mains relining would be cost effective or preferred given our approach of avoiding planned supply interruptions where proportionate.

The length of mains renewed for the remainder of AMP7 is assumed to be the average of the previous three years.

The length of mains renewed in AMP8 has been set to achieve 0.4 % mains replaced per year.

The length of new mains for the planning period is assumed to be 30km per year, equivalent to the average of the last 3 years rounded up to make a small allowance for Covid related underachievement in 2020/21.

8.2. Lines 5 to 8 – mains by size bands

We anticipate that all new mains laid during the forecast period will be in the Line 5 size band (≤320mm) and hence forecast no change in the data in lines 6 to 8 over the planning period.

8.3. Lines 9 to 17 – mains length by age bands

The forecast change in the length of mains reported in lines 9 to 16 is based on the proportion of replacement over the last three years of replacement activity, multiplied by the forecast level of replacement activity (Line 3). The Line 17 is forecast based on the forecast replacement and new mains activity forecast in lines 3 and 4.

8.4. Lines 18 to 20 – Communication pipes asset inventory

In preparation for PR24 we undertook a data improvement exercise which resulted in a significant change to our estimate of the number of lead and galvanised iron communication pipes as detailed in our APR23 commentary. The revised data for 2022/23 has been used as the base year for our forecast.

For line 18 our forecast activity is based on taking the previous year's number and subtracting the number of reactive and proactive lead pipe replacements each year based on our AMP7 bespoke PC target and our proposed AMP8 target with analysis of the last three years data for the breakdown by individual materials. Our AMP8 target is to replace 6,000 communication pipes in AMP8.

For line 19 our forecast activity is based on the average number of reactive replacements in recent years continuing through the planning period. For Line 20 our forecast is based on subtracting the above two lines from our forecast for the total connected properties with an allowance for shared services separated each year.

8.5. Lines 21 to 27 – Communication pipe activity

We have forecast activity for the remainder or AMP7 using our current bespoke PC definition, ie counting all metallic pipes (lead, galvanised iron and copper pipes where there is enough lead solder to fail the lead standard), and based on average activities across work types in the previous three years. We are planning to achieve our bespoke lead and metallic pipe replacement Performance Commitment target of 9,000 pipes over the five year period.

Our AMP8 forecast is based on our targets to replace lead pipes (lead only, not including galvanised iron or copper), and based on average activities across work types from the last three years. Our AMP8 activity levels are based on a target to replace 6,000 communication pipes in the AMP8 five year period with 50% of customer supply pipes being replaced at our cost at the same time and a grant scheme to help customers who do not qualify for free customer supply pipe replacement under our proactive programme.

We collect detailed information on actual pipe lengths replaced in AMP7 and these have been used to forecast our AMP8 activity levels.

8.6. Lines 28 to 30 – Company Area, CRI & ERI

8.6.1. Line - Company area

As per the APR Table 6C reporting the definition is clear that no adjustment should be made to take account of areas supplied by NAVs. Similarly as per our APR reporting small changes can occur in some years as new information comes to light on farms close to our boundaries with neighbouring companies. However as the number is reported to nearest square km in most years the reported number does not change. Hence we are forecasting no change to our company area in the forecast period.

8.6.2. Line 29 - CRI

It is not possible to forecast CRI with any certainty, for consistency we are forecasting 1.50 for the whole planning period for this common performance commitments.

8.6.3. Line 30 Event Risk Index

It is not possible to forecast ERI with any certainty, we are forecasting 100 for the whole planning period based on rounding down our average over the last three years to the nearest 100 based on performance in 22/23 being atypical.

8.7. CW6 Commentary requirement cross check

We provide the following confirmation on the CW6 Commentary requirements in the guidance.

8.7.1. An explanation of any material year-on-year variations

As detailed in the individual line commentaries. In general our forecasts are a continuation of our business as usual activities. The two items of note are the increase in our proactive mains replacement activity from 0.23% per year in AMP7 to 0.4% per year in AMP8 and the further increase in our proactive lead replacement programme from 9,000 pipes in AMP7 to 12,000 pipes in AMP8.

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

As detailed in the Lines 18 to 20 communication pipes commentary in preparation for PR24 we undertook a data improvement exercise which resulted in a significant change to our estimate of the number of lead and galvanised iron communication pipes in 2022/23 which is the base year for our forecast.

8.7.3. An indication of the quality of data provided

All of the data in this table is reported in the APR Table 6C, except for lines 22 to 27 which we collect for our bespoke AMP7 lead replacement Performance Commitment. Hence we have a high degree of confidence of the data for the base year, except for lines 18 and 19 the number of lead and galvanised iron communication pipes, which even though we have completed a data improvement project still retain a higher level of uncertainty.

Given the nature of this asset inventory data, and our relative certainty of future changes from historical trends and known investment plans, we can have a high degree of confidence in the forecast changes in this table.

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

Total length of potable mains as at 31 March (CW6.1).
As detailed in the individual line commentary and note on impact of NAVs and future investment programme.

Number and length of lead communication and supply pipes replaced or relined (CW6.21 to CW.27)
As detailed in the individual line commentary our AMP8 activity is based on a further increase in our proactive lead replacement programme to deliver a total of 12,000 lead pipes replaced in AMP8 over the 9,000 pipes to be replaced in our AMP7 bespoke PC. We collect detailed information on actual pipe lengths replaced in AMP7 and these have been used to forecast our AMP8 activity levels.

8.7.5. This should include a comparison of forecasts with historical growth rates. In addition, companies should explain how forecast population growth across their areas impacts expected mains length growth.

As detailed in the individual line commentary our forecast mains length growth is based on actual trends in recent years which have been impacted by the sudden take up of NAVs, and our forward investment programme, and not modelled on forecast population growth.

9. CW6a

We do not need to submit a copy of this table.

10. CW7 Demand management – metering activities

10.1. 2022/23 Data

All 2022/23 data is taken from Table 6D. Table (6D.xlsx) and commentary (6D Data Table Commentary - 2023.docx) were audited as part of APR.

10.2. Explanation of material year on year variation

10.2.1. Lines CW7.9 to CW7.14

The meter replacement activity is primarily a reactive driven activity through failure, these activities are difficult to forecast due to fluctuations in external factors, therefore we have utilised the latest outturn from 2022/23 to account for the remainder of AMP7 activities. The proactive element is an annualised budget targets activity, around circa £590k and therefore has been forecast at similar levels as 2022/23, this is in line with no anticipated change in age related replacements currently.

For AMP8, we have used the WRMP24 forecasts with the business plan strategy applied. We forecast all meter renewals will be replacements to AMI meters therefore Line CW7.9 is the sum of CW7.11-CW7.12 and Line CW7.10 is the sum of CW7.13-C7.14, as the table guidance for lines 9 and 10 states that *this includes both meter installations renewed with the same type of meter (basic, AMR, AMI) on a like for like basis and replacement of an existing meter with a different type of meter.* The costs in CW7.4 (residential) and CW7.5 (business) are those associated with the renewals in lines CW7.9 and CW7.10, respectively.

10.3. Explanation of any changes in reporting methods/assumptions that have led to a material change

10.3.1. Lines CW7.1 to CW7.8 and CW7.21

As per WRMP24, all AMR meters from 2023-24 onwards have been accounted for under basic meters due to the way we use our existing AMR meters. The AMR meters installed are currently read on a six-monthly basis and therefore don't have any behavioural or consumption changes associated with AMR meters.

10.3.2. Cost adjustments

All costs have been taken from WRMP24 and have been adjusted to the 2022-23 cost base using CPIH financial year average indices. Cost figures have also been adjusted to account for corporate overhead and Pre-RPE/Frontier shift adjustment. The corporate overhead adjustment of 3.62% has been applied to AMP8 capex figures only as the adjustment is already applied to AMP7 figures. The pre-RPE/frontier shift adjustment has been applied to both capex and opex for AMP8. This is calculated at 0.5% compounding with 2022/23 as the base year.

10.3.3. Alignment with WRMP24

The metering strategy set out in the business plan and thus CW7 differs from that proposed in WRMP24. As noted previously in our revised Water Resources Management Plan (WRMP) we proposed 75% of properties (HH & NHH) smart metered by 2030. However, in response to the July 2023 EA Information Letter 17/2023 to consider phasing activities from PR24 into future price review periods, we have significantly reduced our smart metering programmes to 40% resulting in a net saving. Therefore, the values populated in CW7 will differ to those proposed in the WRMP24 planning tables.

10.3.4. Alignment with CW3

Metering totex in lines CW7.1 – CW7.5 is derived from the capex and opex split of costs in CW3. However, CW7 does not included the number of meters installed at new properties, or the costs associated. This is something that is included in CW3 under the costs associated with new meters for new customers and these lines are therefore not comparable with the information provided in CW7.

10.4. Quality of data provided

For forecasted data, all values related to costs have been given the confidence grade B3 to account for any uncertainties in financial forecasting. All values related to the number of meters installed have been given the confidence grade B2 as we have more control over operational procedures. All values related to supply demand benefit and per capita consumption are given the confidence grade B3 to account for any uncertainties in demand reductions on the customer side.

Table 5 – Data quality

Lines	Line description	Quality of data
CW7.1 to CW7.5	Metering activities – Totex expenditure	2022/23 data – Confidence grade A.2 for totex, but allocating costs between categories is B.4 Forecast data – Confidence grade: B3
CW7.6 to CW7.21	Metering activities – Explanatory variables	2022/23 data – Confidence grades:

Lines	Line description	Quality of data
		CW7.6 – B2 (as 6D.2) CW7.15 – C2 (as 6D.15) CW7.16 – A2 (as 6D.16) Forecast data – Confidence grade: CW7.6 to CW7.14 – B2 CW7.15 to CW7.20 – B3 CW7.21 – B2
CW7.22 to CW7.23	Per capita consumption (excluding supply pipe leakage)	2022/23 data – Confidence grades: CW7.22 to CW7.23 – A2 (as 6D.24 to 6D.25) Forecast data – Confidence grades: B3
CW7.24 to CW7.25	Average cost of typical metering activities – new meter installation	Forecast data – Confidence grade: B3
CW7.26 to CW7.33	Average cost of typical metering activities – meter replacement	Forecast data – Confidence grade: B3
CW7.34 to CW7.41	Average unit cost of typical metering activities – meter upgrade	Forecast data – Confidence grade: B3
CW7.42 to CW7.43	Average benefits of typical metering activities – new meter installations	Forecast data – Confidence grade: B3
CW7.44 to CW7.47	Average benefits of typical metering activities – meter replacement	Forecast data – Confidence grade: B3
CW7.48 to CW7.51	Average benefits of typical metering activities – meter upgrade	Forecast data – Confidence grade: B3

10.5. Lines CW7.6 to CW7.23

10.5.1. Lines CW7.6 to CW7.14 Meters installed, renewed, and replaced.

The total number of meters installed in lines CW7.6 to CW7.14 are forecasted using the same methodology as WRMP24, but an alternative business plan strategy has been applied, as discussed in Section 10.3.3.

For the remainder of AMP7, we will continue our optant metering strategy as set out in WRMP19 with new meter installations and meter renewals and replacement being basic meters. From AMP8, all new meters installed and replaced will be with smart-AMI meters, as per WRMP24. We don not forecast any meter renewals from AMP8 as meter replacement will remove the existing asset and replace it with a new one.

10.5.2. Lines CW7.15 to CW7.21 Supply-demand balance benefit and meter penetration

In addition to the reduction in the number of meters installed compared to the strategy outlined in WRMP24, the business plan strategy will not impose compulsory measured charges on customers that receive a compulsory meter install. Customers with compulsorily installed smart meters will move to a measured charge at their own discretion. Therefore, the supply-demand balance benefits presented in lines CW7.15 to CW7.20 for AMP8 are reflective of the savings achieved when the customers opt to be charged at a measured rate. The consumption

saving for each meter type and meter switch type in AMP8 is a proportion of the total measured household consumption saving staggered to reflect in year savings, less the water efficiency reduction.

For the remainder of AMP7, supply-demand balance benefits are scaled from the 2022-23 savings according to the forecasted new optants meters installed (Line 7.6) and selective meters installed (Line 7.7). As all meters installed in AMP7 are basic meters, we do not forecast the same consumption or leakage savings here as generated by smart meters.

In line with the table guidance, line CW7.21 shows the percentage of total residential properties that are measured with a water meter is reflective of the number of existing measured properties and those that have opted to a measured charge following the compulsory installation of a smart AMI meter. This therefore does not include all of the selective meters installed outlined in Line CW7.7 as a proportion of these properties will remain unmeasured with a meter. The total meter penetration is equal to Line 43FP in the business plan version of WRMP24 Planning Table 3c: DYAA – Final Plan.

10.5.3. Lines CW7.22 to CW7.23 Per capita consumption

Per capita consumption values presented in these lines have been calculated in line with the methodology used in the PCC OUT1-5 tables, this is the forecasted PCC as per the normal year annual average scenario. The weighted average of these lines is equal to the average PCC reported in the OUT tables. As per lines CW7.15 to CW7.20, the split between measured and unmeasured properties here is reflective of the number of measured customers rather than the total number of meters installed.

10.6. Lines CW7.24 to CW7.51

10.6.1. Line CW7.24 – CW7.25 Average unit cost of typical metering activities – new meter installation

The metering costs used in WRMP24 are based on an assumption of a larger roll out above 10k a year to achieve efficiency savings. Although we have reduced the metering strategy for the business plan, we are still forecasting a rollout greater than 10k a year. We will only be installing smart-AMI meters between 2025-2030 so costs for new basic and AMR meters are zero.

The cost per property is the sum of the unit cost of the smart AMI meter and the unit rate for meter installation that requires new meter pit, R&M excavation. This is purely the costs of the meter and its installation and excludes any costs associated with smart mater infrastructure assets such as telemetry. The costs per property are those used in WRMP24 but they have been adjusted for the following factors:

- Adjusted to the 2022-23 cost base using CPIH.
- Adjusted for optimism bias (10%) and 50%ile risk (1.49%)
- Adjusted for corporate overhead and pre-RPE/frontier shift.

The cost per property is the total cost over the 2025-2030 period, divided by the cumulative number of new meters installed in the 5 year period.

The cost is the same for non-household (business) properties as households for AMP8 as all business property meters installed will be the same as a domestic meter. From 2030-31 onwards, we forecast the installation of data loggers with a higher cost at any non-household properties which cannot be fitted with a domestic meter. These costs are post 2030 and are therefore not reflected in the CW7 table.

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10.6.2. Line CW7.26 to CW7.33 Average unit cost of typical metering activities – meter replacement

Forecast values for costs per property and enhancement elements for replacement of existing meters in both residential and business properties are calculated using the costs in the WRMP24 supply-demand balance model, adjusted for the 2022-23 cost base, optimism bias and 50%ile risk, and corporate overhead and pre-RPE/frontier shift, as per lines CW7.24 and CW7.25.

The metering costs used in WRMP24 are based on an assumption of a larger roll out above 10k a year to achieve efficiency savings. Although we have reduced the metering strategy for the business plan, we are still forecasting a rollout greater than 10k a year. The cost per property is the total cost over the 5-year period divided by the cumulative number of new meters installed, therefore reflecting an average cost over the 2025-30 period.

The cost is calculated using the following formula and using values in Table1-2 (pre-adjustments):

$$\left(\begin{array}{c}\boldsymbol{Unit\ rate\ for\ meter\ installation\ that\ requires\ new\ meter\ pit,\ RM\ excavation}\\ \times\\ \boldsymbol{proportion\ \ of\ new\ meter\ installations\ that\ require\ new\ meter\ pit\ excavation}\end{array}\right)$$

$$+$$

$$\left(\begin{array}{c}\boldsymbol{Unit\ rate\ for\ meter\ installation\ that\ requires\ internal\ plumbing\ installation}\\ \times\\ \boldsymbol{proportion\ \ of\ new\ meter\ installations\ that\ require\ internal\ plumbing}\end{array}\right)$$

$$+$$

$$\left(\begin{array}{c}\boldsymbol{Unit\ rate\ for\ meter\ installation\ that\ requires\ screw\ in\ (with\ or\ without\ Melco\ device)}\\ \times\\ \boldsymbol{proportion\ \ of\ new\ meter\ installations\ that\ require\ crew\ in/melco}\end{array}\right)$$

$$+$$

$$\boldsymbol{Unit\ cost\ of\ smart\ AMI + average\ baseline\ cost\ of\ installation}$$

Table 6 - Metering costs taken from WRMP24 supply-demand balance model. Note that these are in 2022-23 cost base but have not been adjusted for optimism bias, 50%ile risk, corporate overhead or Pre-RPE/Frontier shift.

	Component	Units	Value	Source
Smart metering – AMI	Unit cost of smart meter - AMI	£/u	75	Estimate based on Severn Trent
	Unit rate to swap standard meter for smart.	£/u	15	Proposal to replace meter and AMI in one hit, screw out then screw in
	Unit rate for meter installation that requires new meter pit, R&M excavation	£/u	300	With a large scale deployment efficiencies could be achieved

	Component	Units	Value	Source
	Unit rate for meter installation that requires internal plumbing installation	£/u	346.18	As per current estimates
	Unit rate for meter installation that requires screw in (with or without Melco device)	£/u	15	Substituted for standard swap out when compared to Severn Trent costings
	Proportion of new meter installations that require new meter pit excavation	%	51.45%	Based on the majority of our meters being installed prior to GRP meter boxes
	Proportion of new meter installations that require internal plumbing	%	8.55%	Likely that Flats etc without meters will be older
	Proportion of new meter installations that require screw in / melco	%	40.00%	Proportion of new meter installations that require screw in / melco
	Weighted average unit rate for new AMI smart meter installation - basic to smart	£/u	264.94	Formula
Standard Basic metering	Unit rate for meter installation that requires new meter pit, R&M excavation	£/u	541.00	Information from Ops Commercial
	Unit rate for meter installation that requires internal plumbing installation	£/u	301.00	Information from Ops Commercial
	Unit rate for meter installation that requires screw in (with or without Melco device)	£/u	201.00	Information from Ops Commercial
	Proportion of new meter installations that require new meter pit excavation	%	33.60%	Information from Ops Commercial
	Proportion of new meter installations that require internal plumbing	%	8.55%	Information from Ops Commercial
	Proportion of new meter installations that require screw in / melco	%	57.85%	Information from Ops Commercial

All AMI metering is an enhancement, so the total cost of meter replacement is therefore the sum of the costs for an AMI meter install and the average baseline cost per installation of a smart meter for the 5-year period. The average baseline cost accounts for the costs to replace the basic meter with a like for like basic meter, the additional enhancement incorporates costs associated with the installation of smart-AMI meters.

For non-household properties, the costs are the same as households for AMP8 as all business property meters installed will be the same as a domestic meter. From 2030-31 onwards, we forecast the installation of data loggers with a higher cost at any non-household properties which cannot be fitted with a domestic meter. These costs are post 2030 and are therefore not reflected in the CW7 table.

All meter replacements in AMP8 will be to AMI meters. We do not forecast any replacements of AMR meters as these are accounted for under basic meters in the WRMP, as detailed in Section 10.3.1.

Line CW7.34 to CW7.41 Average unit cost of typical metering activities – meter upgrade

We do not forecast any meter upgrades in AMP8, all will be replacements.

Line CW7.42 to CW7.43 Average benefits of typical metering activities – new meter installations

Forecast values are calculated based on saving generated in the business plan version of the WRMP24 supply-demand balance model. All new meters installed in AMP8 will be AMI meters. We do not forecast any new installations of basic or AMR meters.

Savings from reduced leakage are calculated by multiplying the cumulative respective property type supply pipe leakage (SPL) savings for properties moving from no meter to an AMI meter, by the cumulative total number of such meter installations in the 5-year period.

Savings from reduced wastage are calculated by multiplying the cumulative consumption savings for the respective property type (Lines CW7.15 – CW7.16) by the cumulative total number of meter installations in the 5-year period.

10.6.3. Line CW7.44 to CW7.47 Average benefits of typical metering activities – meter replacement

Forecast values are calculated based on saving generated in the business plan version of the WRMP24 supply-demand balance model. All new meters installed in AMP8 will be AMI meters. We do not forecast any new installations of basic or AMR meters.

Savings from reduced leakage are calculated by multiplying the cumulative respective property type supply pipe leakage (SPL) savings for properties moving from a basic meter to an AMI meter, by the cumulative total number of such meter installations in the 5-year period.

Savings from reduced wastage are calculated by multiplying the cumulative consumption savings for the respective property type (Lines 7.17 and 7.19) by the cumulative total number of meter installations in the 5-year period.

We do not forecast any replacements of AMR meters as these are accounted for in the basic meters in the WRMP.

10.6.4. Line CW7.48 to CW7.51 Average benefits of typical metering activities – meter upgrade

We do not forecast any meter upgrades in AMP8, all will be replacements.

11. CW7a

We do not need to submit a copy of this table.

12. CW8

12.1. Alignment with WRMP24

The WRMP schemes included in CW8 are from the Ofwat Core and Preferred (most likely) Programmes identified in the revised draft WRMP24 planning table 4: Options Appraisal Summary A: the scheme name and reference are consistent with that used in the revised draft WRMP24. These are those that fall under one of the following categories:

- Supply-side improvements delivering benefits in 2025-2030
- Demand-side improvements delivering benefits in 2025-2030 (excluding leakage and metering)
- Interconnectors delivering benefits in 2025-2030
- Supply-demand balance improvements delivering benefits starting from 2031.

We carried out a thorough options appraisal for our WRMP24 which was based on the planning stages described by the Environment Agency's planning guidelines. This consisted of the following four key stages:

- Stage 1: Development of the Unconstrained Options list.
- Stage 2: Screening of the Unconstrained Options to produce a list of Feasible Options.
- Stage 3: Technical review and analysis of the Feasible Options, reviewing the risks and benefits to produce a Constrained Option list (including the environmental and social assessment metrics).
- Stage 4: Constrained Options and environmental and social metrics are inputted into the EBSD model to generate a preferred programme per scenario which is then reviewed as part of the options appraisal process.

The final stage produced our preferred programmes of options to ensure our forecasted supply-demand balance is not in deficit.

12.1.1. WRMP24 Ofwat core and Preferred (most likely) programme

The WRMP24 schemes populated in CW8 reflect the activities included in both the Ofwat Core Programme and the Preferred (most likely) programme. The WRMP is an adaptive plan that has been developed based on scenario analysis and accounts for Ofwat's PR24 and beyond – Final guidance on long term delivery strategies.

A significant need that must be met in 2035 and key uncertainties that need to be resolved in the next planning period are the key reasons for needing to take a range of options forwards in AMP8 through the Ofwat Core Programme. This programme contains activities which are selected under all scenarios and are considered no- and low-regret options. These options need to be undertaken in AMP8 to be ready for all plausible future scenarios. They will be taken forwards through the design and development phases (enabling work) towards the date of the next WRMP and towards the trigger point for determining which future pathway to follow in 2030. Of the supply schemes being taken forward in AMP8, a number of the schemes have common source and transfer elements – for example there are several schemes that utilise an import from Bristol Water and onwards transfer to different parts of the supply system. The costs included in the plan under the core pathway for scheme design and development do not duplicate these elements.

This work undertaken in AMP8 through the core programmes will help inform:

- a decision point in 2027-28, aligned and informed by the next WRMP as to whether alternative schemes need to progress for design and development from 2028 towards the trigger point in 2030,
- a trigger point in 2030 where one of the alternative pathways will be followed.

More information detailing the adaptive pathways and plan development can be found in our WRMP24 main technical document and the Long Term Delivery Strategy document.

For the purpose of populating CW8, it is assumed that the Preferred (most likely) programme will then be followed from 2030 and so the schemes populated in this table are those in the both the Ofwat Core and Preferred Programme.

12.1.2. Variation in schemes from WRMP24

All supply-side schemes populated in CW8 (CW8.2 – CW8.15) align with their descriptions, costs (adjusted for the different cost base), and benefits in WRMP24.

Demand Strategy 7 (CW8.1) varies from that in the WRMP due to the exclusion of leakage and metering activities in CW8. The WRMP scheme is a combination of leakage, metering, household and non-household water efficiency, and water efficiency labelling activities. The costs and benefits populated in CW8 therefore only reflect the water efficiency elements of the strategy.

12.1.3. Delivery year

As per the table guidance, the delivery year is the first year in which the scheme is due to provide water resource benefits. This is the ‘First year of option use in preferred programme’ and is taken from WRMP24 planning table 4 and is the year that the option is selected by the decision-making model plus the option lead time.

Each option has a lead-in-time which is the time it takes before the option supplies water, or before the option enables a reduction in demand. The option lead-in-times have been developed by our consultants and subsequently reviewed, accounting for the numerous stages of an option, from the planning phase to completion. These include feasibility studies, environmental assessments, planning applications, procurement, construction, and commissioning. The options lead times were reviewed independently and externally by consultants.

12.2. Costing methodology

12.2.1. Capital expenditure

The capital expenditure incurred each year for each scheme aligns with the methodology used in our WRMP24 but costs have been adjusted to the 2022-23 cost base. These are annual forecast costs, not cumulative, and are the costs incurred prior to the scheme entering use.

For supply-side schemes, option capex estimates had originally been derived using the ChandlerKBS Cost Intelligence Database (CID) which normalises capex model to a consistent base date by using the BCIS Civil Engineering Index 1191 (CivEng) – one of the few indices that are regularly published with a forecast forward. At the beginning of the WRMP24 estimating project, the costing base date was set as September 2022 (Q3 2022), but during the period of the WRMP24 estimates, significant volatility of construction costs in the market caused the September 2022 CivEng index to vary between 198.6 and 209.5. The BCIS June 2022 forecast of the CivEng September 2022 index was 202.3 which is the CivEng index value used to normalise the CID capex estimates to

September 2022. Since March 2023, the BCIS have recorded the CivEng index for September 2022 consistently as 205.6 but this value had not been applied to WRMP estimates. The CivEng index value for September 2020 (Q3 2020) is 161.6. Using the CivEng index, adjustment of Capex between September 2020 and September 2022 is +25.19% (202.3/161.6 = 1.2519). For comparison, the ONS CPIH index adjustment for the same period is only +12.00% (122.3/109.2 = 1.11996).

However, in line with the table guidance, all supply side capex values in CW8 have been inflated from WRMP24 costs using CPIH financial-year average indices. The costs produced by the above methodology have therefore been deflated by such indices (multiplied by 161.6/202.3) and then reflated to 2022-23 prices using FYA CPIH (multiplied by 123.04/109.11). The resultant adjustment is 90.08%. Costs have then been additionally adjusted for optimism bias (10%), 50%ile risk (1.49%), corporate overhead and are Pre-RPE/Frontier shift.

We have assumed that the capex for the first 3 years following the option being selected will account only for design and development costs and has therefore been split equally over the first 3 years. Any land purchase costs have been attributed have been allotted to the final design and development year for each scheme. Any additional years before 2030 have assumed a capex in line with the solution spend profile used in WRMP24.

For demand side water efficiency schemes (excluding leakage and metering), there is no capital expenditure, so all costs are attributed to operational expenditure and the methodology is outlined in Section 12.2.2.

Capital expenditure after 2029-30 is the remaining total capex.

12.2.2. Opex costs

The operational expenditure incurred each year for each scheme aligns with our WRMP24 once the cost base has been adjusted.

For supply side schemes, our original cost base adjustment from the WRMP normalised CID Opex models to the same base dates as Capex models using the ONS Retail Price Index (RPI). September 2022 normalising was not necessary for chemicals and electricity as actual rates were provided. The CID traditionally uses RPI to normalise Opex which between September 2020 and September 2022 would be +18.11% (347.6/294.3=1.1811). However, as per the table guidance, we have inflated costs to 2022-23 prices using financial-year average CPIH. This involved an adjustment from the WRMP figures of 112.8% (multiplied by 123.04/109.11).

All supply-side schemes will deliver benefits after 2031. The in-year opex costs are the sum of the Fixed Opex costs and the Variable Opex costs. The variable opex costs are the costs per Ml, therefore these have been calculated as follows:

$$Variable\ Opex\ costs = (Cost\ per\ Ml\ \times\ Scheme\ yield\ \times opex\ utilisation\ factor)\ \times 365$$

The scheme yield is the annual average yield (the peak yield has been used when there is no annual average yield), the opex utilisation factor is 0.44, and 365 has been used to turn this into an annual figure.

All costs have then been adjusted for optimism bias (10%), 50%ile risk (1.49%), and are Pre-RPE/Frontier shift.

All demand side water efficiency scheme costs are attributed to operational expenditure only. The costs calculated in the WRMP24 supply-demand balance model use a 2022-23 cost base and were deflated in WRMP24 using CPIH. The total costs have been adjusted for optimism bias (10%), 50%ile risk (1.49%), and are pre-RPE/Frontier shift for use in CW8. For years 2025-2030, opex costs are the in-year costs as calculated. The opex costs after 2090-30 is the average in year cost from 2031-32 to 2079-2080.

12.2.3. Operating costs prior to 2029-30

The only scheme entering use before 2029-30 is Demand Strategy 7 (CW8.1). The scheme is to be delivered from the start of the 2025-26 financial year and therefore the operating costs are reflective of the 12-month period each year.

12.2.4. Operating costs after 2029-30

For all supply-side schemes, operating costs are not forecasted to begin until the scheme's first year of delivery, i.e. after the final year of capex spend. The in year opex costs are calculated based on the average option utilisation for the period. This figure is included in the calculation for the variable opex cost for each scheme, as detailed in Section 12.2.2.

12.2.5. Totex alignment with CW3

Table CW3 reflects the enhancement expenditure for water resources and water network+. All supply-demand balance improvements in WRMP24 are enhancement, therefore costs outlined in CW8 will align with those in CW3.

We do not forecast any supply-side improvements delivering benefits in 2025-2030, therefore lines CW3.41 – CW3.43 are zero. Lines CW3.44 – CW3.46 (Demand-side side improvements delivering benefits in 2025-30 (excl. leakage and metering)) align with the capex and opex values populated in Line CW8.1 for Demand Strategy 7. Capex and opex values in Lines CW3.53 – CW3.55 (Supply demand balance improvements delivering benefits starting from 2031) align with the sum of the respective expenditure in CW8.2 – CW8.15.

12.3. Programme specific delivery of schemes

12.3.1. Schemes delivered as part of the green recovery programme

None of the WRMP schemes in CW8 are to be delivered as part of the green recovery programme.

12.3.2. Schemes commenced as part of the accelerated infrastructure delivery programme

None of the WRMP schemes in CW8 are to be delivered as part of the accelerated infrastructure delivery programme.

12.4. Supply-demand balance benefits

12.4.1. Benefits before 2029-30

The only scheme providing a benefit prior to 2030 is a Demand-side improvement scheme – Demand Strategy 7 (water efficiency only). The benefits displayed are the forecast cumulative benefits delivered in each year. These benefits have been staggered in each year to reflect the varying rate of implementation and delay in benefit seen post implementation.

12.4.2. Benefits after 2029-30

For demand-side schemes, the benefit after 2029-30 is the cumulative benefit achieved in 2079-80 – the final year forecasted to in WRMP24.

For supply-side schemes, all will be delivered after 2031 and therefore the benefit indicates the scheme's annual average deployable output, or peak deployable output where no annual average benefit is to be delivered. The following schemes do not deliver an annual average benefit and therefore the peak benefit has been used:

- Sutton Bingham increased peak capacity.
- Increased Reservoir Capacity and East Transfer.

As mentioned in Section 12.1.1, CW8 reflects the schemes selected in the Ofwat Core programme up to 2030, and then those in the Preferred (most likely) programme from 2030 onwards. The benefits presented in CW8 reflect the benefit each scheme would provide regardless of whether they are delivered after 2030. The following schemes form the Preferred programme and are therefore most likely to deliver their benefits from their delivery year:

- Friar Waddon GAC and Upwey improvements
- Sutton Bingham increased peak capacity
- Mere Stream Support
- Bristol Import and onwards transfer I
- Increased Reservoir Capacity and East Transfer
- Underutilised licence due to water quality: Upton Scudamore
- Underutilised licence due to water quality/hydraulic/low flow issues: North East Bath Reservoir and Spring Source

12.5. Interconnector information

Interconnector information has been provided for one scheme (Summerslade to Sturminster reinforcements - 5.5Ml/d pt 1) even though it has been classified as a Supply-demand balance improvement delivering benefit starting from 2031. Although benefit is not provided until post 2030, the scheme itself is still an internal interconnector so the information has been provided as requested.

13. CW9

13.1. Enhancement expenditure analysis (cumulative)

This table includes the cumulative expenditure on schemes completed in the year. Our totex programme is a combination of programmes of work and individual projects.

Schemes are reported as completed when they come into beneficial use, the summary of these assumptions are that:

- For individual projects, beneficial use is in the first year of operation (when opex costs are incurred).
- For programmes of activity (capital &/or opex) beneficial use is in the first year of expenditure
- For investigatory works, such as feasibility studies there are no benefits as such as their purpose is to inform PR29 or other decisions.

For costs reported in 2022/23, we have directly taken the cumulative expenditure reported in our APR table 4L where the regulatory drivers are the same as the ones used in CW9.

This table includes costs for AMP7 projects which will be completed by 2024/25, and costs for AMP8 projects completing either within the transition period or AMP8 period. This table does not include costs of AMP7 projects which will be completed in AMP8.

AMP7 Additional line

Due to a shortage of space in the table we have bundled all the AMP7 costs assigned to AMP7 freeform lines into single capex and opex lines. Freeform lines have been used for this expenditure as there were no appropriate standard categories, and for the reporting to be consistent with APR reporting of costs against PR19 allowed expenditure.

The costs reported against this line are for completion of projects in the categories of Partnership Working, Security - Non SEMD and Demand-side improvements delivering benefits in 2020-2025 (excl leakage and metering). See the commentary for table CW3 for further information about these investments.

14. CW10

14.1. Overall Approach to business rates for Wholesale Water.

Actual rateable values as issued by the Valuation Office Agency have been reflected at CW10.1 for 2022/23 and 2023/24.

Current legislation has determined that revaluations should take place every 3 years. This means that a new rateable value is expected to be determined at 1 April 2026 and 1 April 2029. To determine the relevant values, the company has used the simplified methodology used by the Valuation Office in Agency for the delayed 2021 rating list.

This method consists of applying the WACC to the relevant RCV to determine the divisible balance. To that figure, the company has used the current percentage share of tenant's assets and incorporated a 15% risk premium to the tenant. These steps are in line with the 2017 and 2023 valuation as set out by the Valuation Office Agency.

The company has used a constant UBR of 51.2 which is the currently published UBR.

Applying the above figures results in increases to the rateable values at 2026 and 2029 as reflected at CW10.11.

15. CW11

15.1. Lines 1-15

The third party operating expenditure for Water resources and Water network plus are expected to remain materially consistent across the entirety of AMP7 and AMP8, with no anticipated changes in activity that would generate material variances.

15.2. Lines 16-30

There is no capital expenditure forecast for AMP7 or AMP8.

16. CW12

16.1. Transition investment proposals

Wessex Water with our in-house management and blended in-house and external design and construction teams has always needed to minimise the boom-bust profile from the end of one periodic cycle and the start of another. We have been very effective in bridging these periods through a combination of early start, transition investment and overlap programme.

The significant step up in the scale of the investment programme required for AMP8 means this is even more important and this has been recognised by Ofwat in extending the transition investment period to cover 2023-24 as well as 2024-25. Nevertheless, given the significant preparatory work required we have already incurred some costs in 2022-23 but we have not included them in this submission.

The uncertainty surrounding some of the key programmes of work has made it particularly difficult to allocate the transition investment to specific projects and activities, however, we have done so ad the information in the following sections reflects our current thinking, but we ask Ofwat to recognise that there may be small variations in the exact regulatory drivers where transition investment is allocated as the current uncertainties reduce. Any such movements we will report in our APR submissions and would not expect the total amount of transition investment in the Water Resource and Water Network Plus price controls to be more than that being proposed now.

We have only tagged activities as transition investment if they are enhancement capex in nature and all the proposals relate to statutory requirements.

Each specific statement explains why we believe the investment meets the criteria for transition investment as defined in ‘Appendix 9 – Setting expenditure allowances’ of the PR24 final methodology (referenced below as ‘Ofwat’s Appendix 9’).

16.1.1. Water resource price control

The transition investment proposed for the Water Resource price control is summarised in the following table using the regulatory driver coding.

Table 7 - Transition investment proposed for the Water Resource price control

Water Resource Price Control (Capex £ms)	2023-24	2024-25	AMP7 Total
Investigations WINEP/NEP desk based study only water	0.0	0.3	0.3
25 Year Environment Plan	0.1	0.1	0.1
Biodiversity and conservation	0.0	0.1	0.1

WINEP Invasive non native species	0.0	0.1	0.1
Eels/fish entrainment screens	0.0	0.0	0.0
WINEP Water Framework Directive measures	0.0	0.0	0.0
PR24 NEW Eels/fish passes	0.0	0.0	0.0
Totals	**0.1**	**0.5**	**0.6**

The justification for the proposed transition investment can be aligned to the drivers as follows:

- Investigations – the remainder of the proposed transition investment reflects the need to commence investigations of various types in order to confirm detailed scoping with the Environment Agency, to collect field data to inform modelling and overall to ensure the efficiency delivery of these activities. Most investigations have an early completion date as they are expected after some period of data collection and modelling to be completed in time to inform the PR29 Final Business Plan submission and therefore are required to be substantially complete in 2026-27. In addition, we also need to spread the substantial investigation workload over a number of years to achieve effective use of specialist resources to ensure that the overall programme is delivered most efficiently. Under Ofwat's Appendix 9 criteria we believe these proposals for minor expenditure meets the criteria for transition investment as this work is necessary to meet a combination of early completion dates and to enable the efficient delivery of statutory requirements.

16.1.2. Water network plus price control

There is no transition investment proposed for the Water Network Plus price control at this time. Once more detailed assessments have been made it is possible that small values of transition investment will be reported under this price control, but the total transition investment across Water Resources and Water Network plus is not anticipated to be greater than the total value proposed now.

17. CW13 – 16

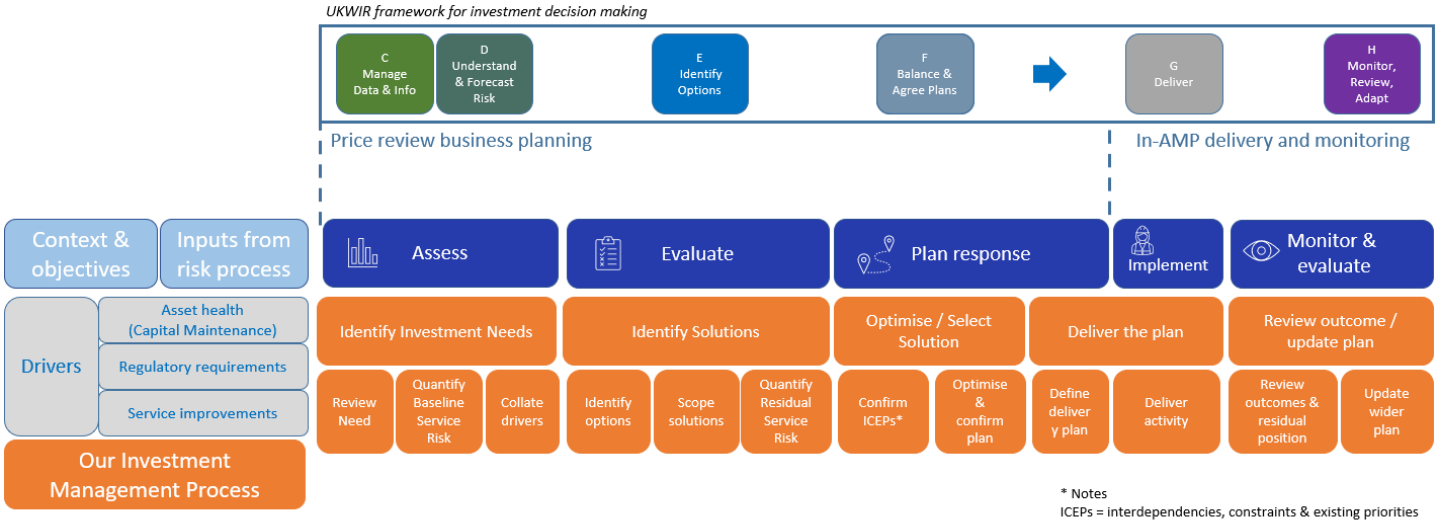
This commentary covers tables CW13, CWW13, CW14, CWW14, CW15, CWW15, CW16 and CWW16. These are the Best Value analysis and alternative option cost and benefit tables for supply and waste. Some of the overarching detail in this commentary is included for context but is a repeat of information in document WSX37 and 38 - Resilience, risk management and decision making (and annexes).

17.1. Our overarching approach to investment decision-making

As outlined in WSX38, we recognise effective decision-making is essential for us to provide greater public value - delivering more for customers, society and the environment – and maintaining efficient investment programmes. Our approach to investment management and decision making, outlined in Figure 1, is aligned with the UK Water

Industry Research (UKWIR) framework for expenditure decision making (FEDM) and is consistent with the Ofwat Price Review (PR) 24 Methodology. It is designed to enable a consistent approach across the business in terms of how we plan, manage and make-decisions on our investments and is framed around the following key steps: identifying risks & defining needs, identifying solutions, optimising & selecting solutions, and delivering the plan & reviewing outcomes. Utilising our framework allows us to make better decisions around our strategic, tactical, and operational-level expenditure and ensures a line of sight from risk identification to the development and optimisation of solutions.

Figure 1: Investment planning steps and alignment to UKWIR FEDM



17.1.1. Key drivers

Our investment decision-making framework is primarily driven by our Strategic Delivery Statement (SDS) which sets our overarching priorities and outcomes and underpins our commitment to achieving best value for our customers and the environment. Alongside the SDS, we consider our legislative requirements and drivers, our asset health & capital maintenance needs, service improvement needs and stakeholder commitments to develop a holistic portfolio of expenditure. This includes our statutory plans – i.e. Water Resource Management Plan (WRMP), Drinking Water Management Plan (DWMP), and the Water Industry National Environment Plan (WINEP); each of the overarching processes integrate into our business plan investment decision-making process - whereby interim Best Value Portfolios are iteratively developed and subsequently optimised within the wider business plan, then updated to reflect broader organisation drivers and constraints.

17.1.2. Supporting tools and frameworks

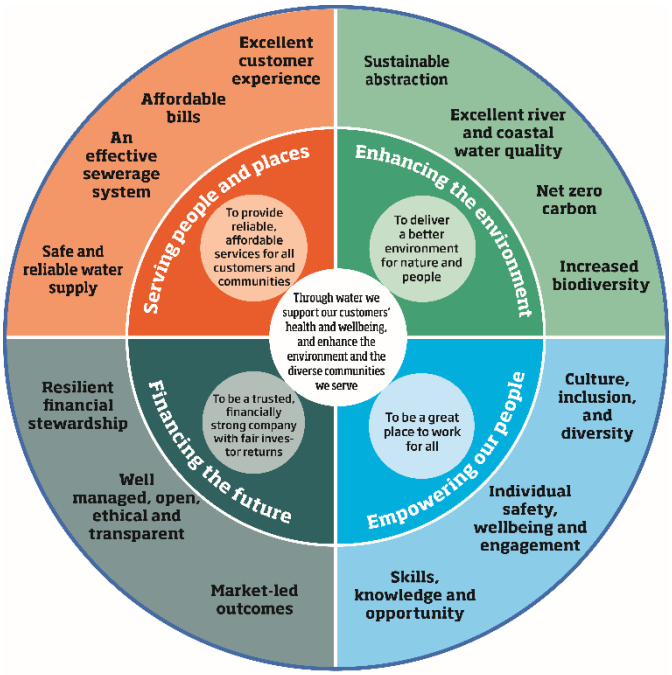
Within our investment decision-making framework, we utilise a number of decision-support frameworks and tools to inform our decision-making. Their use across the business enables a consistent and auditable approach to investment planning and decision making. These include:

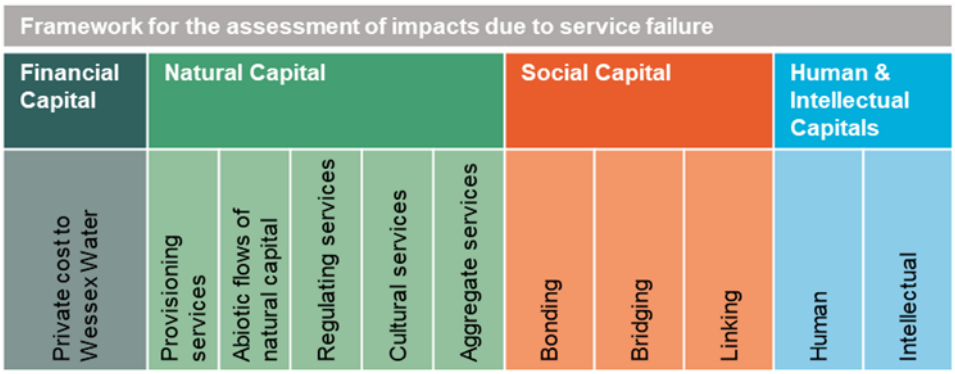
- **Our Multi-Capitals Value Framework:**

  We use a risk and value decision-support approach (i.e. the Value Framework) to enable objective comparisons of investment options across business areas, drawing on common valuation criteria to support investment decision making. This common language is used to help us in quantifying risks to service and opportunities from investment, undertake expenditure planning, decision-making, asset operation and stakeholder conversations (including customers). It supports meaningful comparison and facilitation of prioritisation in expenditure selection.

Our Value Framework utilises a capitals framework mapped across our four sustainability principles: Natural, Social, Human and Financial/Built, as described in Figure 2. Our framework is based on the International Integrated Reporting Framework (2021) and aligns with good practice in the industry as well as other UK water utilities' approaches to investment planning. This approach aims to identify, measure and report on both financial and non-financial impacts and dependencies (often referred to as 'sustainability accounting') in monetary terms to enable holistic investment decision making. As such, our multi-capitals approach supports us to make more informed, sustainable investment decisions that provide the best balance of public value to customers, society and the wider environment.

Figure 2 – Wessex Water value framework





- **Enterprise Decision Analytics (EDA):**

EDA is our decision support tool to support optimal, data-driven decisions that balance complex factors on a portfolio of interventions. The tool operationalises our Value Framework to enable a consistent approach across the business for how we plan, manage and make-decisions on our investments. We use EDA to capture the detail for our investment plan for PR24 and assess the impact of different service targets & constraints over the short, medium and long-term horizon. EDA allows us to apply constraints and scenarios (e.g. what happens if I have a set budget & want to drive improved performance?) to optimise our portfolio of interventions. This process is undertaken iteratively and allows us to compare options & timeframes for implementation to generate a preferred investment programme. We use the outputs of EDA to determine the optimal investment plan for our customers and other stakeholders.

17.2. Defining our expenditure portfolio

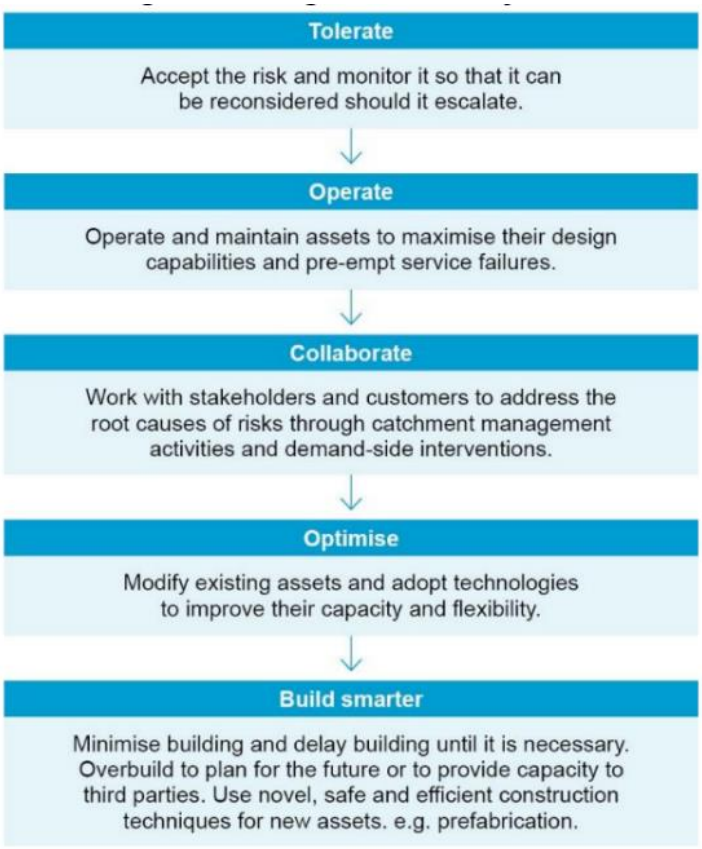
Identify risks & define investment needs

We define needs for investment by considering the failure mechanism (i.e. what would occur if an intervention wasn't undertaken), in-tandem with broader strategic, regulatory, customer or environmental requirements. Primarily, our investment needs are identified through a combination of our risk assessment process, asset health modelling, and regulatory requirements.

Once risks have been identified, these are assessed and those that lie beyond our risk appetite are confirmed as needs. Those that lie below our thresholds are tolerated and managed. This approach enables us to be efficient with our investment.

Identifying solutions

Figure 3 – Mitigation hierarchy



Once a need is confirmed, it is captured in the EDA Tool and articulated using the relevant service measures (within the Value Framework) to represent the risks to Wessex Water, customers and the environment. Needs with legal obligations and regulatory commitments are identified as mandatory or 'must-do'. Our investment planners identify feasible options to address the root cause of the need. This involves identifying:

- Unconstrained options: Longlisting of all possible options.
- Constrained options: Coarse screening of options
- Feasible options: Fine screening of options to determine a preferred shortlist of interventions

When identifying and screening options, we utilise a mitigation hierarchy to systematically encourage the development of mitigations which (1) tolerate the risk, (2) improve operations, (3) collaborate with stakeholders and customers to address the root causes (4) optimise existing assets using new technologies or (5) build smarter solutions (TOCOB). It defines building new manufactured capital solutions as the 'last resort' to be considered and helps us to direct our interventions closer to the root causes of issues and identify the more sustainable, effective expenditure decisions.

Evaluating and selecting solutions (incl. our benefit impacts)

Once a shortlist of interventions is identified, they are captured within the EDA Tool and evaluated using the Value Framework. Using the Value Framework, for each feasible option we detail:

- Costs: Identifying the TOTEX (including capital and operational expenditure) for each intervention for each year of the planning horizon. To inform our costing we utilise standardised cost databases & curves captured in EDA.

- Benefits: Understanding the benefit (or value) of the investment, based upon the change in risk over a 30 year planning horizon (i.e. the post-intervention value minus the pre-intervention value). For each option, we identify any further service measures affected by the intervention. In-depth or bespoke assessments are captured utilising our 'avoidable costs' service measure.

To inform the assessment of benefits (i.e. the Value Framework inputs), we have clearly defined data sources, methods and assign confidence levels (considering information source reliability and accuracy) for service risk. Notably, the data sources for each of Wessex Water's investment streams have been mapped and captured within our overarching Investment Process guidance. Please refer to document WSX37 for further detail.

EDA then defines a Benefit Cost Ratio (BCR) and Net Present Value (NPV) in accordance with UKWIR's 2010 CBA guidance (where the sector agreed the use of the Spackman approach) and Ofwat's Price Review 24 (PR24) guidance. Our preferred plan is the plan with the best BCR, and our alternative plan is lowest whole life cost within performance target constraints.

Developing our plan

We use EDA to capture the detail for our investment plan for PR24, assess the impact of different service targets & constraints over the short, medium and long-term horizon and to optimise our portfolio of interventions. This process is undertaken iteratively and allows us to compare options & timeframes for implementation to generate a preferred investment programme.

We use the outputs of EDA to determine the optimal investment plan for our customers and other stakeholders. The final decision making considers the risk of each need and the BCR and/or the NPV for the associated interventions, alongside broader organisational objectives, customer preferences and legal obligations and regulatory commitments. This includes consideration of the Long-Term Delivery Strategy (LTDS) which integrated adaptive capacity into our decision-making – enabling long-term resilience through a core pathway of low-regrets interventions and enabling activities.

17.3. Our unit benefit valuations evidence sources

For each of the identified service measures (SMs), monetised valuations reflecting the impacts of service failures (or Wessex Water activities) bearing on the capitals were defined using financial, customer, social, environmental, human and intellectual valuations. Each unit of measure is valued against the value metrics they have a material impact. Collectively these values act as the basis for common comparisons across diverse SMs. This allows Wessex Water to better represent risks and opportunities, link expenditure to service and understand the benefits of a series of interventions or programme in a more holistic manner. The SMs were typically valued using a mixture of sources, as outlined in Table 8.

Table 8 – Service measure valuations and their sources

Valuation Type	Definition	Approach
Private Costs	'Private costs' which the business incurs in responding to failures of services	Developed through analysis and by consultation with members of staff from across Wessex Water various functions
Customers' valuations	Customers' Stated Preference values for changes in service	Derived from Wessex Waters Willingness to Pay evidence from 2022 Customer Valuation Research.
Social, human, Intellectual and	Social: Relationships between an organisation and communities, local government etc.	Consideration of social, human, environmental and intellectual values across the industry and broader

Valuation Type	Definition	Approach
environmental capital valuations	Human: Includes trust, skills, well-being and safety of personnel.	literature/research at regional to global levels following good practice guidance, including: • Ofwat PR24 Methodology – including the WINEP Wider Environmental Outcomes Metrics • HM Treasury Green Book and supplementary guidance.
	Environmental: Ecosystem services that are relevant to Wessex Water's activities.	
	Intellectual: Includes routines, practises and structural resources	

For the identification of each of the valuations within the Capitals-based Value Framework, the following approach has been implemented to support robust data selection:

6. Review of data sources, including valuations defined or referenced by the UK Government, specific research undertaken by Wessex Water (i.e. customer surveys), valuations identified in industry best practice toolkits and broader published literature sources. From each of these sources, the valuations representative of the applicable service failure or added benefit have been identified.

Table 9 - Service measure valuation data sources

Valuation data sources
Customer Valuations Wessex Waters Willingness to Pay evidence from 2022 Customer Valuation Research.
Social, human and environmental Valuations • Guidance and studies from UK Government and associated department, bodies and agencies: − HM Treasury - Green Book − Department for Environment, Food & Rural Affairs (DEFRA) - Enabling a Natural Capital Approach (ENCA) − Environment Agency (EA) - WRMP Supplementary Guidance for Environmental & Social Decision Making − EA - WINEP wider environmental outcome metrics − EA - National Water Environment Benefits Study − Department for Transport (DfT)– e.g. WebTAG − Department for Business, Energy & Industrial Strategy (BEIS) - Toolkits and appraisal guidance for valuing energy use and greenhouse gas (GHG) emissions − Office of National Statistics (ONS) − Health and Safety Executive (HSE) • The UK National Ecosystem Assessment (UK NEA) • CIRIA – SuDS - B£ST (Benefits Estimation Tool) • HACT UK Social Value Bank Calculator (V4.0) • The National TOMs Framework (V1.3) • Environmental Valuation Reference Inventory (EVRI)* • University of Exeter: ORVal – Outdoor Recreation Valuation Tool (V2) & NEVO – Natural Environment Valuation Online* • Woodland Scottish Forestry: Woodland Valuation Tool* **Tools referenced by DEFRA and the EA to support the valuation of natural capital*

7. Against each of the valuations a confidence grade has been applied which considers its source, age, location, valuation method, robustness and alignment with the outcome being valued.

8. Based upon this, for each of the valuations a justification for their inclusion or exclusion from the framework is provided. In each instance:
   - We have utilised a hierarchy of decision-making to prioritise the selection of values Ofwat and UK Government define or reference before utilising broader evidence bases.
   - In tandem, the confidence grade, including the economic valuation method, has been considered to identify the most representative value.

   In instances where no appropriate valuation can be defined, this has been left as a gap for further review in the future as more evidence becomes available.

Please refer to Section 17.6 for a list of Wessex Water SMF measures (benefits) with impact data sources.

17.4. Uncertainty and sensitivity

17.4.1. Benefit impact data confidence

For each of Wessex Water's investment streams a data reliability grade has been identified based on Ofwat's Confidence Grades – expanding on the reliability bands based on typical characteristics of data confidence. This has involved the:

- Identification of a minimum data reliability requirement for each investment process, against which there is an ambition for each data source to achieve. The assessment of the minimum data reliability requirement is based on the materiality of the investment (classified based on the AMP6 level of investment); for example where the materiality of a process is higher, it requires a higher level of data confidence - High to Very High materiality requires a Grade A, Medium materiality requires a Grade B and Low to Very Low materiality requires a Grade C. Notably, where there are key regulatory or legislative requirements (such as reservoirs, WRMP, DWMP and WINEP) a higher data reliability (Grade A) is required.

- An assessment the reliability of the information utilised within decision making process – both for identifying needs and forecasting risk (i.e. through the service measures).

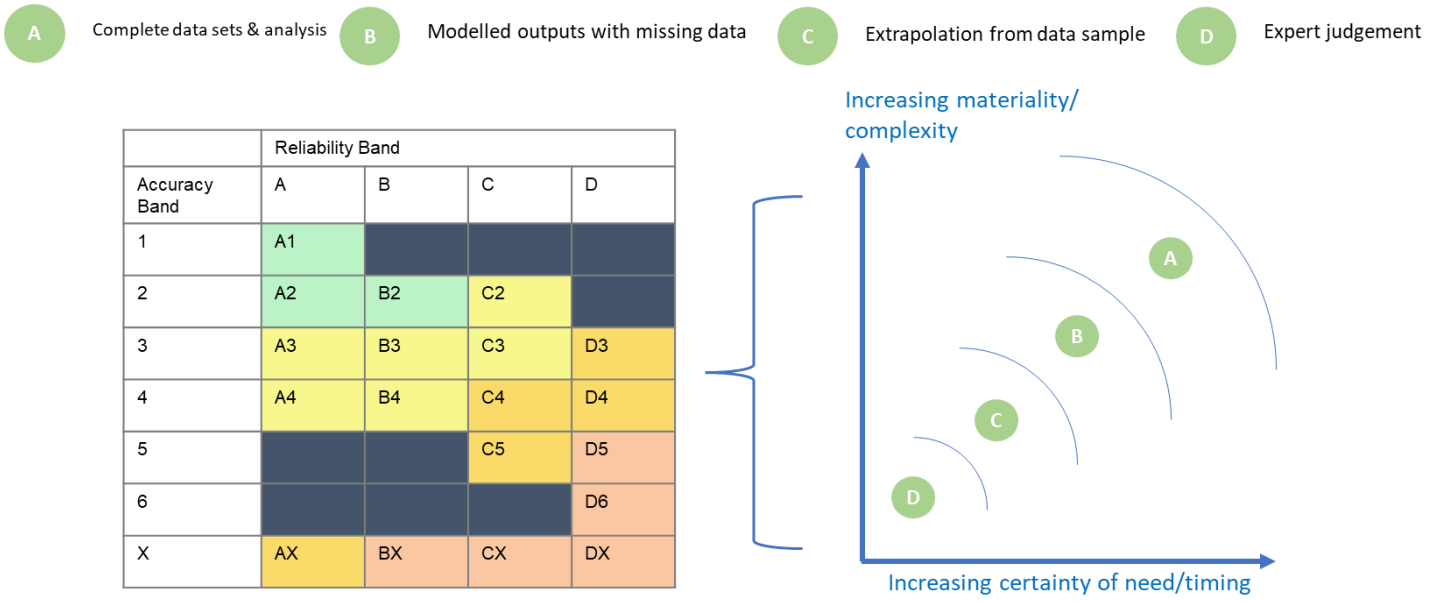
Based upon the above, for each of the Value Framework inputs into EDA, users are required to identify an Ofwat confidence grade which considers the reliability and accuracy of information being entered. The reliability of information can then be considered as part of our decision-making process and is consistently tracked throughout the decision-making process.

17.4.2. Uncertainty

There is an inherent level of uncertainty in every possible scheme that could be delivered throughout the AMP, whether that be leakage control, metering, or a large capital investment. A project may cost more, it may take longer to deliver, and it might not deliver the benefit you expected in the strategic planning. Within EDA Portfolio, we capture this information within the repository against each combination of service measure and investment need/solution giving a granular view of data sensitivity which can then be used in EDA models and visualisations.

We have collated this data when collecting the other data against the investment need or solution to understand uncertainty and for all inputs into EDA, using Ofwat's grading for data confidence throughout. As illustrated in the figure below, we have used graded confidence of the base risk or performance data used to inform the service risk and/or benefit used in the decision-making process, informed by the different scales of materiality and complexity of the decision. We have used the most likely outcomes to inform the appropriate type of service measure (service risk or opportunity) used in decision-making, using consistent service measures across similar investment types (purposes).

Figure 4 – Data confidence grades



	Reliability Band			
Accuracy Band	A	B	C	D
1	A1			
2	A2	B2	C2	
3	A3	B3	C3	D3
4	A4	B4	C4	D4
5			C5	D5
6				D6
X	AX	BX	CX	DX

17.4.3. Sensitivity analysis

Due to performance and financial constraints the best value plan is largely similar to the alternative (i.e. lowest cost) overall, but in some instances (e.g. wastewater WINEP schemes) the best value schemes promote solutions to start sooner than in the lower cost alternative.

There are very few drivers which have both alternative schemes in the lowest cost option tables (CW/WW16) and where the present value of benefits using ODI values are different from Wessex Water's SMF present value of benefits. One such example is Growth at sewage treatment works where use of the ODI values in calculating PV would affect scheme selection for a few sites only. If we were to select schemes using the PV of benefits with ODI values it would in fact make the green solutions at these sites less favourable than the lowest cost alternative. This is because the benefit type affected by the ODI values relates to treatment compliance (by a factor of c.200 times per failure higher than Wessex Water's SMF), meaning the benefit value for other benefits (i.e. biodiversity etc.) become far less material with respect to cost in decision which option to select. As such we believe using the benefit values in Wessex Water's SMF better promotes the selection of more nature-based and/or environmentally friendly schemes than the collaborative research ODI values.

We have not undertaken a sensitivity test utilising our service measure valuations with Ofwat's collaborative outcome delivery incentive (ODI) rates research due to the timing of these rates being provided being post optimisation of the full business plan. Where alternative unit values have been used to optimise our plan, we have presented the PV benefit impacts of the scheme using standardised unit values for comparison, reported in free-form column under "Present Value of Benefits".

17.5. Specific commentary on tables

17.5.1. General comments on CW/WW13-16 tables' objective

For detail on how costs have been apportioned to lines, and explanations of activities included in each line, please refer to CW3/CWW3 as appropriate.

With both the draft and final methodologies, we raised concerns over these tables in terms of their ability to meet Ofwat's objectives. i.e. "*to compare the benefits and costs between different scheme options companies should examine the benefit to cost ratio of each option. This ratio should be calculated by dividing the present value of the stream of scheme benefits by the present value of the stream of scheme costs over the appraisal period. This is the approach we have taken when optimising our scheme options to select the best-value options for our plan.*"[1]

We highlighted the selection of the best value option (i.e. highest BCR) may not be evident in these tables due to Simpsons paradox. These tables aggregate benefit values by driver rather than by scheme, so when apportioning and aggregating benefits of multiple schemes by driver, the PV benefit vs PV cost of proposed plan may not evidently be greater than the low-cost alternative.

The methodology recognises that to compare options, a scheme must compare present value of a "stream" of benefits for each option, however in the data tables it asks for the present value of each benefit type, aggregated by enhancement driver.

The present value of an aggregated single benefit-type is a different value to that used in actually calculating the present value of a stream of benefits for a single option (in alignment with the Ofwat final methodology) and hence the calculation used in determining the benefit cost ratio of each single option to determine the best-value option to include in our plan.

To allow Ofwat to use these tables for their stated purpose, i.e. to calculate the benefit to cost ratios for proposed enhancement schemes (CW15/CW16 and CWW15/CWW1 to be used with CW13/CW14 and CWW13/CWW14 respectively), a single programme of work must be 100% allocated to a single driver and all scheme options for that programme must all have the same benefit-types used. In addition, each option would require the same unit cost per benefit quantity provided (i.e. Benefit Q/£ totex).

If the above were true, it therefore does not allow multi-driver schemes, which is often the most efficient way to deliver drivers where the opportunity allows (i.e. single sites with multiple drivers) and also does not take into account different methods of delivering benefits, each with unique unit costs.

Furthermore, to complete the benefits tables requires re-calculation of the summarised outputs from the BCR assessment (which aligns with Ofwat's PR24 methodology), and hence will not provide the data that enables Ofwat to achieve their goal stated for those tables.

17.5.2. CWW13-16: Grouping of prior year expenditure and benefits into 2025

Under *CWW13 Additional guidance*[2] it states:

- Expenditure and third-party contribution figures presented in this table should only refer to those enhancement projects which are expected to start in AMP8.
- Cost figures presented for AMP8 period should align with costs presented in table CWW3.
- Any expenditure relating to accelerated and transition schemes in 2023-24 and 2024-25 should be included in 2025-26.

Under *CWW15 Additional guidance*[3] it states:

[1] PR24 Final Methodology - Appendix 9 Setting expenditure allowances, section 6.4.1. Ofwat, December 2022.
[2] PR24 business plan table guidance part 4; Costs (wholesale) – wastewater, Ofwat, August 2023
[3] PR24 business plan table guidance part 4; Costs (wholesale) – wastewater, Ofwat, August 2023

- The benefits presented should refer to those enhancement projects which are expected to start in AMP8.
- These are the benefits associated with the expenditure figures presented in table CW13.

Discharge compliance:

The benefit type for WRC compliance with respect to site failure relates to the performance commitment (PC) for numeric consents. To convert this to the correct PC units it should be converted to a percentage (i.e. % discharge compliance, see Section 17.5.4 for more detail) however in order for it to represent the net change attributed to the enhancement investment and for it to pull through to the OUT3 table correctly, for each purpose line with this benefit type, it has been converted to represent the net effect on % of failing sites (rather than % of sites compliant). As most schemes included in CWW15/16 are reducing the risk of compliance failure, the net benefit of doing these schemes is represented as a negative in the context of % of failing sites (i.e. site failures avoided).

Treatment of expenditure and benefits for Growth at sewage treatment works (excluding sludge treatment):

For WRC Growth schemes that straddle AMP7/8, we are not including the 23-24 & 24-25 expenditure in table CWW12 as "transition schemes", given this expenditure forms part of our PR19 FD allowance. Based on the guidance above we should exclude those schemes entirely from CWW13-16.

However those scheme benefits relate to the Discharge permit compliance Performance Commitment, and hence if we were to exclude them from CWW15/16 they would not align with the OUT4 table. To ensure consistency and all benefits realised in AMP8 are included, we have included the expenditure for WRC Growth schemes that start in 2023-24 and 2024-25 in CWW13/14 and associated benefits.

Variance of expenditure and benefits for Customer Access, Recreation, Education:

In tables CW13/CW15, there is expenditure and benefits for the Customer Access, Recreation, Education purpose, however there is zero expenditure and benefits in tables CW14/CW16. Whilst this expenditure is something we would like to implement, given the benefits it provides, it is not a statutory requirement and hence is not included in the lowest cost alternative. It is included in the “discretionary” line in table SUM4.

As stated in CW3 commentary, this investment will continue to improve signage interpretation to enhance greater understanding of the function of the sites and promote water saving along with educational, leisure and engagement activities at each site to promote higher levels of engagement with local customers and communities. Additionally, stronger links will be made between the reservoir sites and our education offering, to expand the ability to engage young people and future customers in greater understanding of water supply and conservation.

17.5.3. Alignment between cost and benefit

Due to the nature of the tables aggregating schemes by driver, and in some instances portions of schemes per driver due to mixed purpose schemes, the corresponding benefits do not necessarily appear to align as expected, particularly when reviewing the “Units of benefit created…” columns. The timing of benefit realisation is also different dependant on the “benefit”, with some being dis-benefits added and being incurred as soon as, or soon after, the scheme commences.

Some purpose lines do not have any benefits associated due to the nature of the investment, e.g. investigations, 25 Year environment plan, catchment management etc. These are WINEP schemes which have been informed by previous investigations and therefore options appraisals as part of those investigations covered this requirement for decision-making purposes.

First time sewerage does not have benefits associated either as, similar to developer services (excluded from these tables) this expenditure is an allowance for third party activity. This allowance is based on recent historical levels of activity, but we have no predefined FTS schemes for AMP8. This expenditure is subject to applications in process which are required to determine if the schemes submitted by external parties are viable. A full cost benefit assessment is undertaken for each submission (i.e. a viability assessment which is done in conjunction with the EA).

17.5.4. Benefit units and PCs

Our Service Measure Framework has high level service measures and lower level impact categories per service measure, to enable assigning benefit values to different scales of impact, location, risk types etc. as this allows the decision-making to discern the relative importance of similar scheme types (i.e. using similar benefits or service risk mitigation) using specific, more granular circumstantial detail to inform the differences.

In the CW/WW15/16 tables we have presented benefits at the service measure level only, aggregating all impact categories into single lines for the relevant schemes against the investment lines. This may result in an apparent lack of benefit shown in the “units of benefit” columns but with a value in the corresponding “Total benefit value” columns. For example, as some schemes are changing the same land use type from one to another, and it’s measure in the same units, it appears that there is no net change, however as each land-type has a different value it has a net change in total value.

The service measures used in our decision-making have been designed to enable the ability to quantify units of step-change per scheme, and so for any that align to PCs, the units often don’t align.

To complete the benefits tables, where a PC is related to a benefit, the “Units of benefit created…” has been converted to the relevant PC units (see summary table below). However, the data in the “Total benefit value generated…” columns, are monetised values using the original service measure benefit unit, as with the “Present Value of Benefits”.

For some benefits that align to PCs, we have not converted units in the table to align with PCs, because the basis of the unit of measure does not align with the approach Ofwat has set out in their PC. These are highlighted in the table in Section 17.7 with further explanation following for the PCs that were not converted. These have been kept as “Other” in the table to show the benefit value contributed but do not pull through into OUT3.

Against various Storm Overflow lines in CWW15 For the purposes of the storm overflow PC, we have captured the Storm Overflow reduction benefit impacts, however there is no benefit unit value or PV for these lines. This is because quantity of storm spills reduced does not represent the true benefit value of the solution as it is different for each site dependant on the volume and concentration of the storm spill, the sensitivity of the receiving environment etc, hence this value is captured in the other benefits against this line.

For the purposes of the correct PC figures populating OUT3, under Resilience, line CWW15.604 we have added an additional line for Total Pollutions, to capture the Serious Pollutions in row CWW16.597 but converted to the same units as required for the Total Pollutions PC. This line does not have benefit unit values or PV values to avoid double counting of the benefit. This has not been done in CWW16 as it does not populate OUT3 and is only necessary for this purpose.

- River water quality (phos):
  - For decision-making purposes, i.e. in the SMF/optimisations (EDA), we have optimised P removal schemes based on the EA's approach.
    - This means for all sites where we could implement improvement schemes, we have included options in the optimisation that, where applicable, are able to meet the site-specific permit as a minimum (i,e. for WFD, NN etc site targets) plus more stringent removal permits. These are then optimised to be the wider sub or catchment targets for Env. Act etc.

    - To align with the EA's approach, the service measure for phosphorous removal is in kg removed, based on the existing permit flow and concentration only with the quantified solution kg removed representing the permit flow times the P concentration for new permit.
- Operational GHG:
  - To quantify Operational GHG emissions for solutions used in decision-making we have used BEIS 2030, which is considered appropriate from an optioneering and decision-making point of view and doesn't necessarily need to align with the operational performance PC.
  - The Operational GHG PC is being used to report performance against a fixed grid carbon intensity, whereas the PR24 decision making process is aiming to make the right decision based on current government forecast on likely grid carbon intensities.
  - If we were to fix the grid carbon factor to the CAW v17 we would be making power heavy options less favourable even if the grid decarbonises.
- Access, recreation and amenity:
  - This benefit type has not been used as we already account for the value-added in these areas in our metrics for land use change and river water quality etc.

17.5.5. Benefit cost ratio

As per Ofwat's guidance, we have used a comparison of benefits and costs between different schemes to select the most scheme option with the best Benefit-cost ratio (BCR). This ratio has been calculated by dividing the present value of the stream of scheme benefits by the net present value of the stream of scheme costs (to account for residual asset value post the appraisal period and not skew decisions to shorter-life assets) across the 30 year appraisal period.

The benefit cost ratios are calculated across time using the Arcadis Gen optimiser tool, Enterprise Decision Analytics (EDA), to determine the most beneficial timing of scheme selection as well as options, where flexibility is allowed in order to achieve the target performance levels and in alignment with other regulatory dates (i.e. WINEP).

EDA has been used to run the following optimisations for Wessex Water:

- Best BCR – a simple goal where the benefit cost ratio (BCR) is maximised as the only goal of the optimisation. The BCR is calculated as follows:

  (Pre Risk NPV – Post Risk NPV) / (CAPEX NPV + OPEX NPV)

  Pre Risk NPV is the total risk based on the need and Post Risk NPV is the total risk of the solution, both across the NPV period. Pre Risk NPV – Post Risk NPV therefore provides the benefit over the NPV period. OPEX and CAPEX NPV are described in more detail under *Net Present Value Calculations*.

- Least Cost – two goals are applied where the OPEX NPV and CAPEX NPV are added together with equal weights. The objective of the optimisation is to minimise the total of these values.

Constraints have been added where required on CAPEX and to optimise our plans to meet various performance profiles, regulatory targets and commitments.

17.5.6. Presentation of benefit quantities and values in CW15, CWW15, CW16, CWW16

The metrics included in our service measure framework (SMF) include both opportunities and risks and both of these types of metrics are captured in the benefit tables. The need (or pre-intervention position) defines the "do-nothing" quantities, Q_{pre}, and likelihood represented as an annual frequency, F_{pre}, for the relevant performance metrics. The solution (or post-intervention position) defines the resulting quantities, Q_{post}, and likelihood, F_{post}, for the performance metrics defined in the need, plus any added benefits or disbenefits for additional metrics. The net

change between pre and post is equivalent to the terminology in the CW/CWW15/16 data tables of “units of benefit created”.

For each year, this then provides the intervention impact value by multiplying Q by F by the associated unit value in £, i.e. per service measure/”benefit” the equation is:

$$\text{Pre-Intervention Service Impact Value (£)}, SV_{pre} = Q_{pre} \times F_{pre} \times \text{Unit Value (£)}$$

The net change between pre and post service impact value is equivalent to the terminology in the CW/CWW15/16 data tables of “total benefit value generated”.

The ***unit value*** of each SMF measure is then either positive (+ve) or negative (-ve) to reflect if the measure is a service risk (+ve) or a benefit (-ve) and to algin with the calculation of PV Benefits.

As the data tables entries for units of benefit created requires the benefit quantities to be input to show the net change, this does not take into account the sign of the unit value (i.e. if it’s a service risk or benefit metric). As such, the net change in these figures will be negative for providing a benefit or negative if the solution increases risk.

Likewise an increase in a dis-benefit (e.g. a solution that introduces new operational carbon emissions) will be presented in the “units of benefit” section of the tables as a positive, however when the “total benefit value” is presented this will be a negative value. This is summarised in a table below, with a list of the benefit types used in Section 17.8 with flags to identify whether they are measures that capture opportunities or risks.

Table 10 – Benefit quantities

Risk/opportunity	Net change for "Units of benefits created"		Unit value sign	Total benefit value generated	
	Negative Q	**Positive Q**	**£/unit**	**Positive £**	**Negative £**
Opportunity	Adding benefit	Introducing dis-benefit	-ve	Adding benefit	Introducing dis-benefit
Risk	Increasing risk	Decreasing risk^	+ve	Decreasing risk	Increasing risk

^ Note: *For Wessex Water SMF, discharge compliance is a risk, however, to convert it the correct units for the PC unit (% compliance) to align with OUT3 (i.e. to be deducted from 100% compliance/ baseline performance) it has been converted such that a failing site (increasing risk) is a positive figure, and the reduction of risk (i.e. avoidance of a failing site) is a negative figure.*

17.5.7. Capex uplifting

The CAPEX and Cost Index for Inflation (Financial Year) are filled in by the user when they create an investment solution. The model then calculates the project price base CPIH based on the Cost Index for Inflation (Financial Year) specified.

The base CPIH is what all projects should be at and that is editable by change to the **Financial Year for Cost Uplifts.** This inflates all the CAPEX values to the same price base

17.5.8. PV approach for costs and benefits

In order to calculate the total risk associated with a need or solution, the five capitals (Financial, Natural, Social and Human & Intellectual, with Natural split between Carbon and Other) are then calculated for each impact category by multiplying their associated monetary weighting with the product of the associated frequency of failure and quantity values. An example expression for an individual impact category and an individual capital (i.e. financial) is as follows:

$$Service\ Value\ (SV) = FoF * Q * £$$

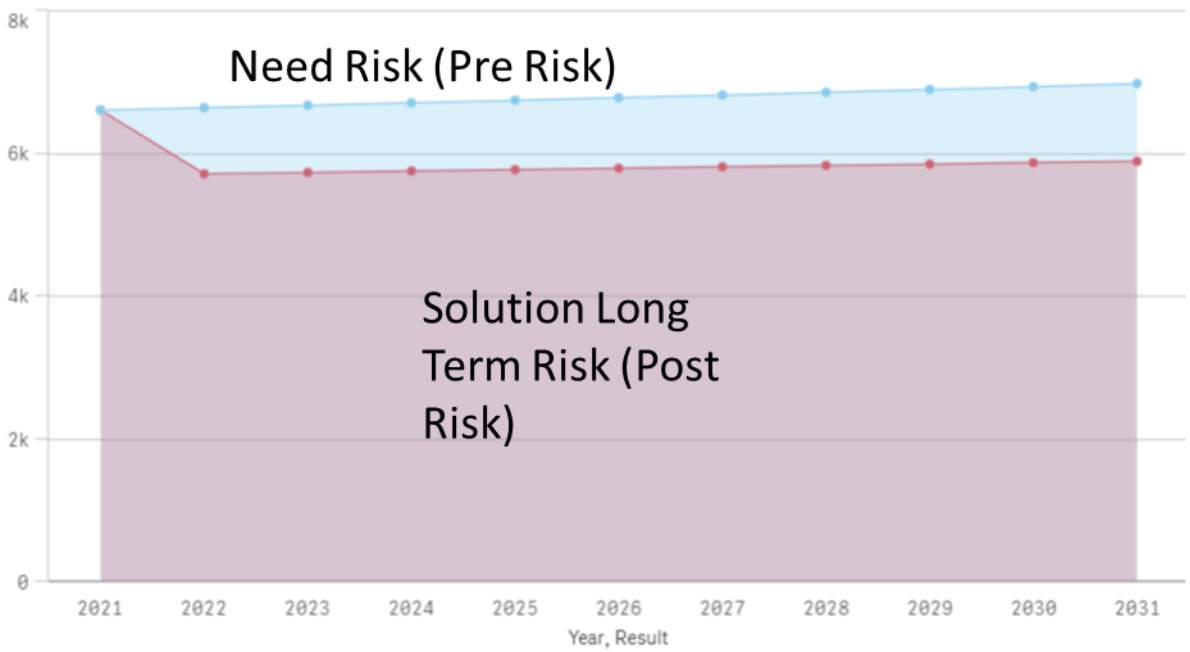
Where:

- Capital Value is the total risk / value associated with one of the capitals (i.e. financial) for the impact category
- FoF is the frequency of failure allocated to the need / solution
- Q is the quantity allocated to the to the need / solution
- £ is the monetary weighting applied to the capital for the impact category.

This calculation is replicated for each combination of impact category and capital.

The calculation of net benefit is prepared by, for each year, subtracting the post-intervention service impact value from the pre-intervention service impact value (SV) per service measure across the time period of the assessment (30 years) for years in which the benefit is maintained from the investment. This is then discounted back to 2025 using the discount rate as per the HM Treasury Green Book.($SV_{\mathbf{A}pre} – SV_{\mathbf{A}post}$) + ($SV_{\mathbf{B}pre} – SV_{\mathbf{B}post}$) + ($SV_{\mathbf{C}pre} – SV_{\mathbf{C}post}$)…

Figure 5 – Example net benefit calculation profile



Net Present Value applies discount rate to the above values.

$$\mathrm{NPV}(i, N) = \sum_{t=0}^{N} \frac{R_t}{(1+i)^t}$$

Where:

t = timestep / year
i = discount rate (3.5% used)
R = cash flow (i.e. OPEX/Risk + Annualised CAPEX) at time t
N = length of assessment (economic period to be assessed, 30 years used)

We have calculated the present value of the stream of capex for the proposed enhancement projects by using the capital costs reported to calculate the cashflow that the investment would require from customers. We have calculated returns based on the gross asset value and assumed straight line depreciation over the life of the asset assuming full replacement costs at end of life. This ensures that we are calculating the full economic impact of this enhancement, even though the replacement may, at the time of investment, be deemed maintenance expenditure. This enables a full comparison of whole life costs to ensure that efficient decision making occurs. We have then discounted this cashflow by the STPR to calculate the present value of costs.

We have calculated the present value of the stream of opex for the proposed enhancement projects by discounting the opex profiles of the projects over the 30-year appraisal period.

The STPR used to calculate PV is 3.50% as per page 119 of The Green Book - The Green Book (publishing.service.gov.uk), and the WACC rate used is 4.39% as per the PR24 data table RR25.21. There were no DPC costs calculated in the present value figures, but we have reported them in the non-present value figures in this table.

17.6. Wessex Water SMF - unit value evidence sources

Table 11 - Unit value evidence sources

			Valuation Source							
Measure	**Impact Categories (IC)**	**Wessex Water SMF Proposed Units of Measure (UoM)**	**Wessex Water Private Costs - Internally developed (2022)**	**Wessex Water Customer Willingness to Pay Research - PR24 NERA Economic Consulting (2022) or PR19 Research Accent (2019)**	**Ofwat PR24 Collaborative Customer Research - *utilised as part of a sensitivity test replacing**	**Ofwat PR24 Guidance - EA WINEP Wider Environmental Outcomes Metrics (2021)**	**UK Government / Agency / Department Defined Valuation Source (i.e. BEIS, DEFRA, DfT, HSE, ONS)**	**Valuation referenced by UK Government / Department / Agency funded guidance or toolkits (e.g. DEFRA ENCA, Multi-Coloured Manual, WEBTAG etc.)**	**Valuation referenced by other best-practice toolkits (e.g. HACT, Social Value Toolkit, CIRIA BEST)**	**Valuation sourced from literature / research**
Customer financial support	Number of successful applications to receive financial assistance	Nr of applications (per household)	x	x						
	Number of additional households now receiving social tariffs		x	x						
Customer billing	Reduction in the number of properties receiving services but not being billed	Nr of properties								
	Reduction in the number of properties receiving services that we don't know about									
Customer satisfaction and brand reputation	Complaint (CMEX related)	Nr of complaints	x		x*		x			
	Complaint (DMEX related)		x				x			
	Average contact resolution time (residential)	Nr of hours	x				x			
	Average contact resolution time (commercial)		x				x			
	Number of constrained properties now un-constrained	Nr of properties								x
Priority & Vulnerable customers	Number of customers added to the Priority Services Register	Nr of customers added	x							
	Number of customers in vulnerable circumstances supported	Nr of customers supported								
Engagement with the community and partnership working	Engaging and educating young people (e.g. school engagement)	Number of young people engaged				x				
	Engaging and educating adults (e.g. community training)	Number of adults engaged				x				

			Valuation Source							
Measure	**Impact Categories (IC)**	**Wessex Water SMF Proposed Units of Measure (UoM)**	Wessex Water Private Costs - Internally developed (2022)	Wessex Water Customer Willingness to Pay Research - PR24 NERA Economic Consulting (2022) or PR19 Research Accent (2019)	Ofwat PR24 Collaborative Customer Research - *utilised as part of a sensitivity test replacing	Ofwat PR24 Guidance - EA WINEP Wider Environmental Outcomes Metrics (2021)	UK Government / Agency / Department Defined Valuation Source (i.e. BEIS, DEFRA, DfT, HSE, ONS)	Valuation referenced by UK Government / Department / Agency funded guidance or toolkits (e.g. DEFRA ENCA, Multi-Coloured Manual, WEBTAG etc.)	Valuation referenced by other best-practice toolkits (e.g. HACT, Social Value Toolkit, CIRIA BEST)	Valuation sourced from literature / research
	Investment leveraged	£s	x							
	Time leveraged from other organisations	Hrs					x			
Leakage	Volume of water leaked	Ml/d	x		x*	x	x			
	Customer reported leaks	Nr of reports		x						
Water use	Change in per capita consumption (PCC) (reduction)	l/person/day	x		x*	x	x			
	Water recycling / harvesting	Ml	x			x	x			
Drinking water quality (biological & chemical)	Trivial/ threshold sample failure	Nr of samples	x							
	WQ parameter sample exceeds PCV at WTW, SRE & Customer property – health / no health impact	Nr of samples	x	x						
	Protective advice required / Health impact due to PCV exceedance	Nr of properties impacted	x							
Drinking water quality (appearance, taste and odour)	Taste and smell/odour	Nr of properties	x	x	x*					
	Discolouration		x	x	x*					
Water Pressure	Low pressure within guidelines	Nr of properties	x	x						
	Low pressure below standards of Ofwat DG2		x	x						
Water resource licence/permit failure	Conditions of licence breached	Non-compliance event	x							
Reservoir act compliance	Reservoir act compliance failure	Non-compliance event	x							
Sewer flooding internal	Internal flooding of residential basement / cellar	Nr of properties	x	x	x*					

			Valuation Source							
Measure	**Impact Categories (IC)**	**Wessex Water SMF Proposed Units of Measure (UoM)**	Wessex Water Private Costs - Internally developed (2022)	Wessex Water Customer Willingness to Pay Research - PR24 NERA Economic Consulting (2022) or PR19 Research Accent (2019)	Ofwat PR24 Collaborative Customer Research - *utilised as part of a sensitivity test replacing	Ofwat PR24 Guidance - EA WINEP Wider Environmental Outcomes Metrics (2021)	UK Government / Agency / Department Defined Valuation Source (i.e. BEIS, DEFRA, DfT, HSE, ONS)	Valuation referenced by UK Government / Department / Agency funded guidance or toolkits (e.g. DEFRA ENCA, Multi-Coloured Manual, WEBTAG etc.)	Valuation referenced by other best-practice toolkits (e.g. HACT, Social Value Toolkit, CIRIA BEST)	Valuation sourced from literature / research
(hydraulic or other causes)	Internal flooding of residential property		x	x	x*					
	Internal flooding of social infrastructure (e.g. schools, hospitals)		x	x	x*					
	Internal flooding of commercial and industrial properties (e.g. businesses and industry)		x	x	x*					
Sewer flooding external (hydraulic or other causes)	External flooding within residential property boundary (e.g. garden)	Nr of properties	x	x	x*					
	External flooding of social infrastructure (e.g. schools, hospitals)		x	x	x*					
	External flooding of commercial and industrial properties (e.g. businesses and industry)		x	x	x*					
	External flooding of roads/highways	Nr of incidents	x	x	x*					
Unplanned network interruptions	Customer minutes lost (3-6 hours)	Nr of properties	x	x	x*					
	Customer minutes lost (6-12 hours)		x	x	x*					
	Customer minutes lost (12-24 hours)		x	x	x*					
	Customer minutes lost (24+ hours)		x	x	x*					
Planned network interruptions	Customer minutes lost (3-6 hours)	Nr of properties	x	x	x*					
	Customer minutes lost (6-12 hours)		x	x	x*					
	Customer minutes lost (12-24 hours)		x	x	x*					
	Customer minutes lost (24+ hours)		x	x	x*					

			Valuation Source							
Measure	**Impact Categories (IC)**	**Wessex Water SMF Proposed Units of Measure (UoM)**	**Wessex Water Private Costs - Internally developed (2022)**	**Wessex Water Customer Willingness to Pay Research - PR24 NERA Economic Consulting (2022) or PR19 Research Accent (2019)**	**Ofwat PR24 Collaborative Customer Research - *utilised as part of a sensitivity test replacing**	**Ofwat PR24 Guidance - EA WINEP Wider Environmental Outcomes Metrics (2021)**	**UK Government / Agency / Department Defined Valuation Source (i.e. BEIS, DEFRA, DfT, HSE, ONS)**	**Valuation referenced by UK Government / Department / Agency funded guidance or toolkits (e.g. DEFRA ENCA, Multi-Coloured Manual, WEBTAG etc.)**	**Valuation referenced by other best-practice toolkits (e.g. HACT, Social Value Toolkit, CIRIA BEST)**	**Valuation sourced from literature / research**
Water availability and supply restriction	Loss of resource yield / WAFU (water resources)	Ml	x							
	Drought management level 1 (1 in 10 years)	Number of properties at	x							
	Drought management level 2 (1 in 30 years)		x	x						
	Drought management level 3 (1 in 100 years)		x	x						
	Drought management level 4 (1 in 200 years)		x	x						
	Drought management level 4 (1 in 500 years)		x	x						
WRC compliance - numeric effluent - internal threshold	Internal threshold failure or Near Miss [<1000 – 50,000+ PE]	Nr of incidents	x							
WRC compliance - numeric effluent - Permit Condition Compliance	PPC Compliance failure [<1000-50,000+ PE]	Nr of site failures	x		x*					
WRC compliance - numeric effluent - LUT	Compliance failure (LUT consent standard exceedance) [<1000-50,000+ PE]	Nr of site failures	x		x*					
WRC compliance - numeric effluent - Upper Tier (Sanitary, Iron)	Compliance failure (Upper Tier compliance failure (sanitary determinants)) [<1000-50,000+ PE]	Nr of site failures	x		x*					
WRC compliance - numeric effluent - UV	Compliance failure (UV disinfection) [<1000-50,000+ PE]	Nr of site failures	x		x*					
WRC compliance - numeric effluent - Nutrients / Hazardous	Sample failure (Nutrients / Hazardous pollutants) [<1000-50,000+ PE]	Nr of site failures	x		x*					

			Valuation Source							
Measure	**Impact Categories (IC)**	**Wessex Water SMF Proposed Units of Measure (UoM)**	**Wessex Water Private Costs - Internally developed (2022)**	**Wessex Water Customer Willingness to Pay Research - PR24 NERA Economic Consulting (2022) or PR19 Research Accent (2019)**	**Ofwat PR24 Collaborative Customer Research - *utilised as part of a sensitivity test replacing**	**Ofwat PR24 Guidance - EA WINEP Wider Environmental Outcomes Metrics (2021)**	**UK Government / Agency / Department Defined Valuation Source (i.e. BEIS, DEFRA, DfT, HSE, ONS)**	**Valuation referenced by UK Government / Department / Agency funded guidance or toolkits (e.g. DEFRA ENCA, Multi-Coloured Manual, WEBTAG etc.)**	**Valuation referenced by other best-practice toolkits (e.g. HACT, Social Value Toolkit, CIRIA BEST)**	**Valuation sourced from literature / research**
WRC compliance - descriptive	Non-compliance with descriptive consent	Nr of site failures	x							
WRC compliance - numeric flow - DWF	Failing Dry Weather Flow (DWF) [<1000-50,000+ PE]	Nr of site failures	x							
WRC compliance - numeric flow - FFT - intermittent	Failing Full Flow to Treatment (FFT) (intermittent) [<1000-50,000+ PE]	Nr of site failures	x							
WRC compliance - numeric flow - FFT - hydraulic	Failing Full Flow to Treatment (FFT) (hydraulic incapacity) [<1000-50,000+ PE]	Nr of site failures	x							
WRC compliance - numeric flow - reporting/sample	Failure to record/report flow/sample correctly [<1000-50,000+ PE]	Nr of site failures	x							
Pollution incidents	Category 1 pollution incident - Major incident	Nr of incidents	x	x	x*					
	Category 2 pollution incident - Significant impact	Nr of incidents	x	x	x*					
	Category 3 pollution incident - Minor impact	Nr of incidents	x	x	x*					
	Category 4 pollution incident - No impact	Nr of incidents	x	x						
Land-use	Area of coniferous woodland	Total area (ha)				x		x		x
	Area of broadleaved (deciduous) woodland					x		x		x
	Area of semi-natural grassland					x	x	x		
	Area of farmland					x	x	x		
	Area of wetlands and floodplains					x		x		

			Valuation Source							
Measure	**Impact Categories (IC)**	**Wessex Water SMF Proposed Units of Measure (UoM)**	**Wessex Water Private Costs - Internally developed (2022)**	**Wessex Water Customer Willingness to Pay Research - PR24 NERA Economic Consulting (2022) or PR19 Research Accent (2019)**	**Ofwat PR24 Collaborative Customer Research - *utilised as part of a sensitivity test replacing**	**Ofwat PR24 Guidance - EA WINEP Wider Environmental Outcomes Metrics (2021)**	**UK Government / Agency / Department Defined Valuation Source (i.e. BEIS, DEFRA, DfT, HSE, ONS)**	**Valuation referenced by UK Government / Department / Agency funded guidance or toolkits (e.g. DEFRA ENCA, Multi-Coloured Manual, WEBTAG etc.)**	**Valuation referenced by other best-practice toolkits (e.g. HACT, Social Value Toolkit, CIRIA BEST)**	**Valuation sourced from literature / research**
	Area of mountains, moors, and heaths					x		x		
	Area of coastal margins					x		x		
	Area of urban greenspace: greenspace / grassland					x	x	x		
	Area of water bodies (fresh or marine)					x		x		
	Area of hedge-rows					x		x		
	Area of bare ground							x		
	Area of urban greenspace: woodland					x	x	x		
	Area of urban greenspace: wetland / pond					x	x	x		
	Area of SuDS (impermeable area managed using SuDS)							x		
River quality	Length of river improved (WINEP)	km/yr.				x				
	Length of river improved (Non-WINEP)	km/yr.				x				
Greenhouse gas emissions	Change in greenhouse gas emissions from our activities (embodied)	tCO2e				x				
	Change in greenhouse gas emissions from our activities (operational)	tCO2e				x				
Bathing water	Shellfish water deterioration in classification	Nr of shellfish water	x			x				
	Bathing water deterioration in classification (excellent to good)	Nr of bathing water	x	x	x*					
	Bathing water deterioration in classification (good to less than good)	Nr of bathing water	x	x	x*					

			Valuation Source							
Measure	**Impact Categories (IC)**	**Wessex Water SMF Proposed Units of Measure (UoM)**	**Wessex Water Private Costs - Internally developed (2022)**	**Wessex Water Customer Willingness to Pay Research - PR24 NERA Economic Consulting (2022) or PR19 Research Accent (2019)**	**Ofwat PR24 Collaborative Customer Research - *utilised as part of a sensitivity test replacing**	**Ofwat PR24 Guidance - EA WINEP Wider Environmental Outcomes Metrics (2021)**	**UK Government / Agency / Department Defined Valuation Source (i.e. BEIS, DEFRA, DfT, HSE, ONS)**	**Valuation referenced by UK Government / Department / Agency funded guidance or toolkits (e.g. DEFRA ENCA, Multi-Coloured Manual, WEBTAG etc.)**	**Valuation referenced by other best-practice toolkits (e.g. HACT, Social Value Toolkit, CIRIA BEST)**	**Valuation sourced from literature / research**
	Blue Flag Beach	Number of beaches	x							
Sludge treatment and disposal	Sludge regulation compliance failure leading to retreatment	TDS	x							
	Sludge to landfill or other non-agricultural outlets (land reclamation)	TDS	x							
	Additional sludge transport required	Km	x				x			
Intermittent Discharge Compliance	Non-compliance with consent conditions	Nr of failures								
Health and Safety (Public & Employees)	Near miss / minor injury no loss of working time	Nr of incidents	x							
	Minor injury (Up to 6 days absence)	Nr of people	x				x			
	Serious injury (7 or more days absence)		x				x			
	Permanently incapacitating injury		x				x			
	Loss of Life		x				x			
	Minor illness (Up to 6 days absence)		x				x			
	Serious work related illness (7 or more days absence)		x				x			
	Permanently incapacitating illness		x				x			
	Failure to comply with HSE legislation	Nr of failures	x							
Nuisance - Odour, Noise, Flies	Basic customer complaint (Odour, Noise, Flies)	Nr of complaints	x							
	Escalated customer complaint (Odour/Flies)	Nr of incidents	x							

			Valuation Source							
Measure	**Impact Categories (IC)**	**Wessex Water SMF Proposed Units of Measure (UoM)**	**Wessex Water Private Costs - Internally developed (2022)**	**Wessex Water Customer Willingness to Pay Research - PR24 NERA Economic Consulting (2022) or PR19 Research Accent (2019)**	**Ofwat PR24 Collaborative Customer Research - *utilised as part of a sensitivity test replacing**	**Ofwat PR24 Guidance - EA WINEP Wider Environmental Outcomes Metrics (2021)**	**UK Government / Agency / Department Defined Valuation Source (i.e. BEIS, DEFRA, DfT, HSE, ONS)**	**Valuation referenced by UK Government / Department / Agency funded guidance or toolkits (e.g. DEFRA ENCA, Multi-Coloured Manual, WEBTAG etc.)**	**Valuation referenced by other best-practice toolkits (e.g. HACT, Social Value Toolkit, CIRIA BEST)**	**Valuation sourced from literature / research**
	Escalated customer complaint (Noise)	Nr of incidents	x							
	Properties subjected to chronic (seasonal) intolerable odour	Property days impacted	x							
	Properties subjected to transient intolerable odour	Nr of properties	x							
	Properties subjected to transient intolerable noise	Nr of properties	x							
Security	CNI Breach	Nr of incidents	x				x			
	SEMD Breach (e.g. Company Premises)		x				x			
	Other premise breach		x				x			
	Major terrorist incident		x				x			
	IT System Incident (CIA)		x				x			x
	OT System Incident (loss of essential service)		x				x			x
	Ransom ware		x							
	Compromise of customer data		x				x			
	Company data breach (unauthorised disclosure or loss)		x							
Human resources management	Employee absence	Total nr of hours of absences	x							
	Employee retention	Number of employees	x						x	
	Employee volunteering	Nr of volunteering days	x			x			x	

			Valuation Source							
Measure	**Impact Categories (IC)**	**Wessex Water SMF Proposed Units of Measure (UoM)**	**Wessex Water Private Costs - Internally developed (2022)**	**Wessex Water Customer Willingness to Pay Research - PR24 NERA Economic Consulting (2022) or PR19 Research Accent (2019)**	**Ofwat PR24 Collaborative Customer Research - *utilised as part of a sensitivity test replacing**	**Ofwat PR24 Guidance - EA WINEP Wider Environmental Outcomes Metrics (2021)**	**UK Government / Agency / Department Defined Valuation Source (i.e. BEIS, DEFRA, DfT, HSE, ONS)**	**Valuation referenced by UK Government / Department / Agency funded guidance or toolkits (e.g. DEFRA ENCA, Multi-Coloured Manual, WEBTAG etc.)**	**Valuation referenced by other best-practice toolkits (e.g. HACT, Social Value Toolkit, CIRIA BEST)**	**Valuation sourced from literature / research**
Productivity	Employee productivity	Number of Employee Hours (i.e. lost)	x							
Transport disruption	B-Road	Duration (hr)					x	x		
	A-Road						x	x		
	Motorway						x	x		
	Railway							x		
Recreation	Visitor numbers	Nr of visitors				x				x
Waste	Waste diverted from landfill	Tonnes	x							
Avoidable costs	Annual avoidable costs(incls. income (i.e. funding from a 3rd party))	£000s	x							
WTC compliance - numeric effluent (waste) - internal threshold	Internal threshold failure or Near Miss [<10-30+ML/d]	Nr of incidents	x							
WTC compliance - numeric effluent (waste) - Upper Tier	Compliance failure (Upper Tier compliance failure) [<10-30+ ML/d]	Nr of failures	x		x*					
WTC compliance - numeric flow - exceeding permit to water course	Exceeding permit to water course [<10 -30+ML/d]	Nr of failures	x		x*					
Nutrient Removal (Water Quality)	Removal of nitrates	Kg						x		
	Removal of phosphorus				x*			x		

			Valuation Source							
Measure	**Impact Categories (IC)**	**Wessex Water SMF Proposed Units of Measure (UoM)**	**Wessex Water Private Costs - Internally developed (2022)**	**Wessex Water Customer Willingness to Pay Research - PR24 NERA Economic Consulting (2022) or PR19 Research Accent (2019)**	**Ofwat PR24 Collaborative Customer Research - *utilised as part of a sensitivity test replacing**	**Ofwat PR24 Guidance - EA WINEP Wider Environmental Outcomes Metrics (2021)**	**UK Government / Agency / Department Defined Valuation Source (i.e. BEIS, DEFRA, DfT, HSE, ONS)**	**Valuation referenced by UK Government / Department / Agency funded guidance or toolkits (e.g. DEFRA ENCA, Multi-Coloured Manual, WEBTAG etc.)**	**Valuation referenced by other best-practice toolkits (e.g. HACT, Social Value Toolkit, CIRIA BEST)**	**Valuation sourced from literature / research**
	Removal of sediment							x		
Customers with bills >5% of disposable income	Number of customers with bills >5% of disposable income	Nr of households								
Water regulation	Increased flows to the environment (e.g. as a result of reduced abstraction)	Ml				x				
SPS Permit Compliance	Non-compliance with flow consent (PFF)	Nr of site failures								
	Non-compliance with consent conditions (exl PFF)									
Network / Storm Storage Consent Compliance	Spills Outside of Consent (Breach)	Nr of incidents			x*					

*Not used in Wessex Water SMF (i.e. optimisations to select preferred best value plan) however used to calculate the alternative PV of benefits in tables CW/WW15-16.

17.7. Wessex Water SMF - benefit conversions to PC units

Table 12 - Benefit conversions to PC units

Benefit	PC Units	PC Calculation	Service Measures	Unit	Conversion to PC
Operational GHG	%	Greenhouse gas emissions expressed in tonnes CO2e (carbon dioxide equivalent) and the percentage change since 2021-22	Greenhouse gas emissions - operational	tCO2e per Year	**Not converted - captured as "other benefit"**
Internal sewer flooding	Number	No. of incidents per 10,000 sewer connections	Sewer flooding - internal	Nr of properties per Event	1 property = 1 incident Therefore: X incidents / (000s sewerage connections)
External sewer flooding	Number	No. of incidents per 10,000 sewer connections	Sewer flooding - external	Nr of properties per Event	
Total pollution incidents	Number	Total pollution incidents per 10,000km of sewer length. Category 1 to 3 from sewerage assets as normalised.	Pollution incidents - Cat 1 - 3	Frequency per Year	Sewer length (km) = same for Cat 1 - 3 Therefore: X incidents / (sewer km / 10,000)
Serious pollution incidents	Number	Number of serious pollution incidents. Category 1 and 2 from sewerage and water supply assets.	Pollution incidents - Cat 1	Frequency per Year	Units are the same
Serious pollution incidents	Number		Pollution incidents - Cat 2	Frequency per Year	Units are the same

Benefit	PC Units	PC Calculation	Service Measures	Unit	Conversion to PC
Discharge permit compliance ^	Percentage compliance	(Number of numeric discharge permits - Number of sites with failed discharges) / Number of numeric discharge permits	WRC Compliance - Numeric effluent - Upper tier sanitary	Failing sites per Year	1 WRC compliance failure = 1 site failure Therefore, X site failure to % discharge compliance equates to: -1*(Total numeric discharge permits - X) / Total numeric discharge permits
River water quality (phos)	Number	The performance measure is the percentage reduction in phosphorus emissions to river catchments as a result of water company activities. Phosphorus emitted by relevant discharges from treatment works in 2020 minus phosphorus emitted by relevant discharges in the year) **+** (Phosphorus prevented from entering rivers from partnership working in the year minus phosphorus prevented from entering rivers from partnership working in 2020) / The 2020 baseline	Water quality: Nutrient Removal	Kg per year	**Not converted - captured as "other benefit"**
Storm overflows	Average number of spills per overflow	Total number of monitored spills / Total number of storm overflows	CSO Spills	Nr of spills	X nr of CSO spills beyond on consent = Number of monitored spills Therefore: X nr of spills / total number of storm overflows

Benefit	PC Units	PC Calculation	Service Measures	Unit	Conversion to PC
Leakage	% reduction in Ml/d for a three year average from 2019-20	% reduction = (Baseline - prior three year average (incl. year being considered)) / Baseline	Leakage	Ml/day per Year	Volume of water leaked = Total Ml/d per year Therefore: (Baseline - Average: Volume of water leaked over 3 years) / Baseline
PCC	% reduction in litres/ person/day for a three year average from 2019-20	% reduction = (Baseline - prior three year average (incl. year being considered)) / Baseline	Water use	l/person/day per Year	Water use = Annual l/person/day Therefore: (Baseline - Average: PPC over 3 years) / Baseline
CRI	Numerical score		Drinking water quality (biological & chemical)	Nr of samples per Event	**Not converted - captured as "other benefit"**
CRI	Numerical score		Drinking water quality (appearance & odour)	Nr of properties per Event	**Not converted - captured as "other benefit"**

^ Note: For Wessex Water SMF, discharge compliance is a risk, however in order to convert it the correct units and quantity for the PC unit (% compliance) to align with OUT3 (i.e. to be deducted from 100% compliance/ baseline performance) it has been converted such that a failing site is a positive figure

17.8. Wessex Water SMF - benefit types

Table 13 – Benefit types

Table set	Benefit/PC name	SMF units	Risk/ opportunity	Unit value (£)
CW	Land-use	Total area (ha)	Opportunity	-ve
CW	Embodied greenhouse gas emissions	tCO2e	Opportunity	-ve
CW	Operational GHG	tCO2e	Opportunity	-ve
CW	Nutrient Removal (Water Quality)	Kg	Opportunity	-ve
CW	PCC	l/person/day	Opportunity	-ve
CW	Leakage	Ml/d	Risk	+ve
CW	Water availability and supply restriction	Ml	Risk	+ve
CW	Drinking water quality (biological & chemical)	Nr of samples	Risk	+ve
CW	Health and Safety (Public & Employees)	Nr of incidents	Risk	+ve
CW	Avoidable costs/(added revenue, -ve)	£000s	Risk	+ve
CW	Serious pollution incidents	Nr of incidents	Risk	+ve
CW	Cat 4 Pollution Incidents	Nr of incidents	Risk	+ve
CW	Security	Nr of incidents	Risk	+ve
CW	Productivity	Number of Employee Hours (i.e. lost)	Risk	+ve
CW	Human resources management	Total nr of hours of absences	Risk	+ve
CW	Engagement with the community	Number of young people engaged	Opportunity	-ve
CW	Partnership working	Number of young people engaged	Opportunity	-ve
CW	Recreation	Nr of visitors	Opportunity	-ve
CWW	Embodied greenhouse gas emissions	tCO2e	Opportunity	-ve
CWW	Operational GHG	tCO2e	Opportunity	-ve
CWW	WRC compliance - numeric flow - reporting/sample	Nr of site failures	Risk	+ve
CWW	DWF compliance failure	Nr of site failures	Risk	+ve

Table set	Benefit/PC name	SMF units	Risk/ opportunity	Unit value (£)
CWW	FFT compliance failure	Nr of site failures	Risk	+ve
CWW	River quality	km/yr.	Opportunity	-ve
CWW	Storm overflows	Average number spills per storm overflow	Reporting only	n/a
CWW	Land-use	Total area (ha)	Opportunity	-ve
CWW	WRC compliance - numeric effluent - Nutrients / Hazardous	Nr of site failures	Risk	+ve
CWW	WRC compliance - numeric effluent - internal threshold	Nr of incidents	Risk	+ve
CWW	Discharge permit compliance	Nr of site failures	Risk^	+ve
CWW	River water quality (phos)	Kg removed	Opportunity	-ve
CWW	WRC compliance - descriptive	Nr of site failures	Risk	+ve
CWW	Sludge treatment and disposal	TDS non-compliant/diverted to landfill	Risk	+ve
CWW	Health and Safety (Public & Employees)	Nr of incidents	Risk	+ve
CWW	Cat 4 Pollution Incidents	Nr of incidents	Risk	+ve
CWW	WRC compliance - numeric effluent - LUT	Nr of site failures	Risk	+ve
CWW	Discharge permit compliance	Nr of site failures (PC = % failing sites)	Risk	+ve
CWW	WRC compliance - numeric effluent - Permit Condition Compliance	Nr of site failures	Risk	+ve
CWW	External sewer flooding	Nr of properties	Risk	+ve
CWW	Internal sewer flooding	Nr of properties	Risk	+ve
CWW	Serious pollution incidents	Nr of incidents	Risk	+ve
CWW	Total pollution incidents	Nr of incidents (PC = number per 10,000km of sewerage)	Risk	+ve
CWW	Avoidable costs/(added revenue, -ve)	£000s	Risk	+ve
CWW	Productivity	Number of Employee Hours (i.e. lost)	Risk	+ve

^ Note: For Wessex Water SMF, discharge compliance is a risk, however in order to convert it the correct units and quantity for the PC unit (% compliance) to align with OUT3 (i.e. to be deducted from 100% compliance/ baseline

performance) it has been converted such that a failing site is a positive figure, and the reduction of risk is a negative figure

18. CW17

We do not need to submit a copy of this table.

19. CW18

We have submitted six wholesale cost adjustment claims. Those that relate to wholesale water and detailed in this table are:

- CAC1 – Increases to efficient costs over time
- CAC2 – Mains replacement costs
- CAC4 – Catchment and nature-based solutions
- CAC6 – Energy costs

Further information on the cost adjustment claims can be found in WSX09 – Annex A1-A6 Cost adjustment claims.

20. CW19

All data is reported at Company level as we operate as one water resource zone for regulatory reporting. The expenditure and activities forecast in this table are to designed to achieve end of AMP7 leakage target and our AMP8 leakage reduction forecast in the final planning scenario of our revised WRMP24 submission.

All data lines in this table were reported to Ofwat previously for the five years 2017/18 to 2021/22 inclusive in the IN-2202-Cost-assessment-data-requests 2022 Leakage cost assessment (LK) submission to Ofwat. The calculation methodology for the historic data is detailed in our 2022 PR24 Leakage cost assessment data request Commentary which was issued to Ofwat and has not changed for the data in these tables.

There are a number of explanatory factors and exogenous variables that make forecasting cost and activity through to 2029/30 challenging and hence a lower level of confidence is assigned to this data.

20.1. Lines 1 to 3 and 10 - Leakage Expenditure

Forecast expenditure for the remaining two years of AMP7 have been developed by reviewing historic expenditure and internal budget allowances but come with considerable uncertainty. 2022/23 was a difficult year due to both the extreme heat (ground shrinkage) in the summer and a significant freeze-thaw event in the winter. Alongside other water companies in the south of England, our in year leakage rate increased in 2022/23, despite continued enhancement of our active leakage control activities and pressure management.

Forecasts for the AMP8 period are not based on the revised WRMP24 total leakage final planning scenario profile. In response to the July 2023 EA Information Letter 17/2023 to consider phasing activities from PR24 into future

price review periods we have scaled back our proposed leakage reduction and smart metering programmes from our revised WRMP. Our forecast leakage reduction in AMP8 has reduced from 7.7Ml/d to 3.5Ml/d, and our smart metering target from 75% of properties (HH & NHH) smart metered by 2030 to 40%. Our proposed expenditure reflects this change.

Forecasts for the AMP8 period are based on the best value mix of activities developed from the WRMP option analysis translated into the CW19 categories. For the WRMP we developed best value options for a range of leakage reduction scenarios so could utilise this work to populate CW19 with the expenditure for this revised target.

The significant increase in the reduce costs in AMP primarily relates to the increase in our proactive mains replacement. Whilst this activity is primarily directed to maintaining asset health over the longer term the guidance stipulates that we include all of the cost in reducing leakage in CW19.

20.2. Lines 13 to 19 - Prevent activities and attributes

Pressure management will always be a keystone of our leakage management strategy, and our forecasts for the remaining two years of AMP7 have been developed by reviewing historic activities and internal plans and budget allowances.

Our pressure management is very mature, with all the low hanging fruit having been picked many years ago. We are close to the technical limit of what is achievable given our network configuration.

Ongoing new pressure management schemes are generally subdivision of existing areas, and all new pressure control type is assumed to be fixed outlet as all areas where flow modulation is appropriate have already been implemented.

20.3. Lines 25 to 29 - DMA characteristics

Our DMA structure is very well established and mature. The forecast is based on our continual improvement programme which is based mainly on subdivision of existing larger DMAs to aid leakage awareness and detection times.

20.4. Lines 40 to 42 - Trunk main balances

Leakage from trunk mains is currently estimated using a background and burst estimation (BABE) component approach, hence zeros entered for lines 6 and 8. We project a continued gradual reduction in the length of our trunk main network as targeted flow metering investments result in more mains coverage within DMA measurements.

20.5. Line 49 - Smart networks

As shown below this is a new area for us with significant improvements made in recent years.

Table 14 – Historic Smart network coverage

	17/18	18/19	19/20	20/21	21/22	22/23
Smart network coverage	0.00%	1.05%	3.66%	6.38%	8.48%	8.81%

Over the next 7 years we plan to almost double the number of permanent loggers installed in our network to achieve over 15% coverage by the end of AMP8.

20.6. Line 52 - Active leakage control

We forecast a further significant increase in ALC activity to achieve AMP8 leakage reduction targets which will be challenging given the scarcity of human resources and are enhancing our internal “Wessex Water Academy” to meet this challenge.

20.7. Lines 55 to 97 – Repairs

20.7.1. The Lines 55 to 94 - Repairs

Leakage breakout rates are intrinsically linked to the weather and difficult to predict, and we have certainly seen significant variations over the last five years. Forecasts are based on historical averages with increases in line with above increased ALC activity to meet our proposed leakage reduction target.

We have forecast a significant change in the split between detected and reported repairs on customer supply pipes as a result of our smart metering strategy.

Average Repair Run Times (as defined in the table) are set at the average of the last 3 years as we believe there are a number of constraints which will limit significant further reductions. The focus will be given to reducing Awareness time through our investment in smart networks.

20.7.2. Lines 95 to 97 - Supply pipe repairs financial assistance

At Wessex we undertake free supply pipes in almost all circumstances and therefore line 95 is calculated by summing lines 91 and 92. We do not provide “financial assistance” so line 96 remains zero. The “other support” relates to free detection and advice to customers and we forecast that this will not materially change during the planning period.

20.8. Lines 112 to 113 - Leakage levels - company level

20.8.1. Line 112 - Historical minimum achieved level of leakage

We have applied the current reporting guidance methodology for bottom-up leakage estimation. Our forecast MAL methodology assumes a gradual tailing off of further reductions in the latter part of AMP8, as we near background leakage levels in many DMAs. We believe we will need to achieve future leakage reduction targets through a combination of reaching historically low levels in DMAs and by intervening earlier to stop area levels increasing.

20.8.2. Line 113 - Volume of leakage that needs to be saved to maintain current level

The guidance provides the more detailed definition of “Calculation of the volume of leakage that needs to be saved in order to maintain the previous reporting year level”.

We applied “Option A” to derive the NRR taking data from our leakage management software system (Waternet) which uses the UKWIR analytical nightline approach and includes more than 50% of all DMAs.

Historical data from the previous four report years has been used to ensure the impact of weather and other explanatory factors and exogenous variables are accounted for. Weather has the potential biggest impact, with a circa one in five event potentially impacting NRR in any one year by up to 15Ml/d.

20.9. CW18 Commentary requirement cross check

The guidance included the following commentary requirements.

20.9.1. Expenditure

As detailed in the beginning of this commentary our methodology for this PR24 table data has not changed from that detailed in the commentary to our 2022 cost assessment submission and follows the same approach as the reported leakage expenditure in APR23 Table 6D which can be summarised as follows:

- We have one financial reporting system for the whole company, which includes all costs, Opex and Capex, internal and external. All costs are allocated to “blocks” in the finance system, these blocks groups projects and cost centres with similar outputs and outcomes, i.e. managing leakage, supply interruptions, supply network operation, supply network maintenance etc.
- At year end we have summated all the expenditure on all relevant blocks proportioning some costs which deliver multiple benefits and allocating some supporting costs across activities.
- Whilst our proactive mains replacement programme will provide a small leakage benefit, this is not the primary driver for this investment and therefore the costs were not previously reported in APR22 Table 6D. Our proactive mains replacement programme is directed to maintaining long term stable asset health as measured by mains repairs and customer contacts about water quality. We do not have a leakage driven mains replacement programme in this AMP as our leakage reduction options analysis clearly showed this was not the most cost beneficial strategy to reduce leakage using the agreed water resource management plan methodology. We have included these costs in this PR24 data return as specified in the reporting guidance.

20.9.2. Allocation of costs between maintain and reduce

Our approach to separate the costs between maintain and reduce is based on cost information from internal budgets and actual spend from our financial accounting system, and not derived from any activity or volumetric analysis.

Our finance system is not designed to capture activity-based costing and hence unable to identify marginal increase in operating costs for reducing leakage, therefore it has been assumed the budgeted operating expenditure for reducing leakage is the actual expenditure incurred in the report year.

There is an inherent uncertainty in estimating the split between maintaining and reducing leakage costs for a large number of reasons, and the approach we have adopted is in line with the guidance and the best option given our existing reporting systems.

20.9.3. Weather and other impacts - explanatory factors and exogenous variables

There are a number of explanatory factors and exogenous variables that impact on the variation in volumes and costs to maintain and reduce leakage. The level of ALC activity to achieve in year internal targets is probably the dominant explanatory factor, and the weather the dominant exogenous variable. The interactions are complex, not least because the impact of weather and ALC activity in the preceding year may impact on the level of performance and cost in the following year. And similarly costs incurred in one year may deliver benefits in future years. We provided a qualitative assessment in our 2022 submission.

Historical data from the previous four report years has been used to ensure the impact of weather and other explanatory factors and exogenous variables are accounted for in this data submission. Weather has the potential biggest impact, with a circa one in five event potentially impacting NRR in any one year by up to 15Ml/d.

21. CW20

21.1. CW20 Commentary requirement cross check

We provide the following responses to the commentary requirement in the guidance.

21.1.1. 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

The length in each grade reconciles with the number of repairs reported in the APR Table 3A/3F for the mains repairs common PC for the five years 2018/19 to 2022/23 to less than 1%. The CW20.12 five year average annual bursts on all potable mains is 1,941 against the average reported APR 2019-2023 of 1,924.

This condition grading analysis is based on spatial data from our GIS system, whereas our mains repairs reporting is taken from our work management system, this small discrepancy is well within the B2 confidence grade (accuracy within ±5% but outside ±1%) assigned to our APR mains repairs PC reporting, however we assign a B3 confidence grade (Accuracy within ±10% but outside ±5%.) to this condition grading data set given the inherent additional uncertainty from the cohort analysis.

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

We have not applied any sub-division to the grading reported in this table. Cohorts were created using specialist software using:

- Primary Material Groups - AC (Asbestos Cement), CI (Cast Iron), DI (Ductile Iron), GRP (Glass Reinforced Plastic), PE (Polyethylene), PVC (Plastic), ST (Steel) and Other
- Age – 20 year bands from pre-1880, 1881-1900 etc to 2001-2020 and 2021 onwards
- Diameter - ≤320mm, >320mm and ≤450mm and >610mm
- Network density (m length pipe per connected property) – pipes with the same above attributes (Material, Age and Size) were collated using network density bands to achieve optimal cohort sizing
- This analysis resulted in 804 cohorts of which 48 were unable to meet the ± 50% tolerance range

For the avoidance of doubt no secondary age (10 year banding) or secondary size banding were used, nor was corrosivity or fracture potential. We were supported by an external Consultant familiar with the guidance and expertise in cohort analysis and their experience guided us to use network density to optimise cohort sizing.

21.1.3. Commentary on any cohort where it is not considered practical to arrange its size to fall within the defined tolerance

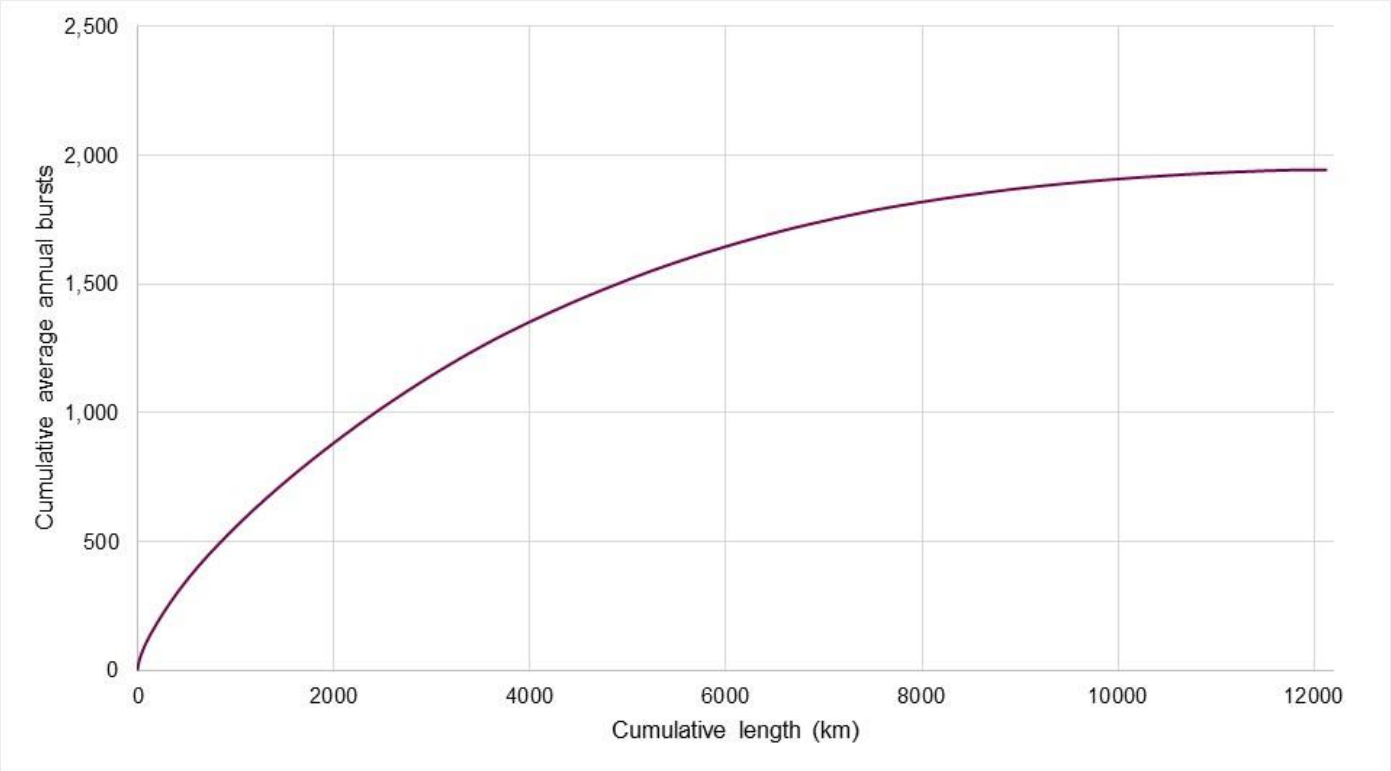
Some of the created cohorts were below the required number of bursts after the application of primary attributes only and, as these are required to be applied per the guidance, the cohorts cannot be increased to the desired range. Other cohorts contained too large a number of bursts after primary attribute splitting, but any secondary splits would mean the cohorts contain too few bursts and so were also not able to meet the desired burst tolerance range. However with just under 50 cohorts unable to meet the ± 50% tolerance range out of just over 800 we are confident this approach is fit for purpose.

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

Period longer than five years not used.

21.1.5. A graph of cumulative annual average bursts (y-axis) versus cumulative mains length (x axis)

Figure 6 – Cumulative repairs versus cumulative mains length



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

The PR09 data below is taken from Chapter C3 Asset Inventory of our PR09 final business plan which used a similar but not identical cohort approach to the PR24 data.

Table 15 – Comparison between PR24 and PR09

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Total
PR24 Potable mains ≤ 320mm (km)	5,564.0	2,891.8	2,250.2	405.9	34.3	11,146.1

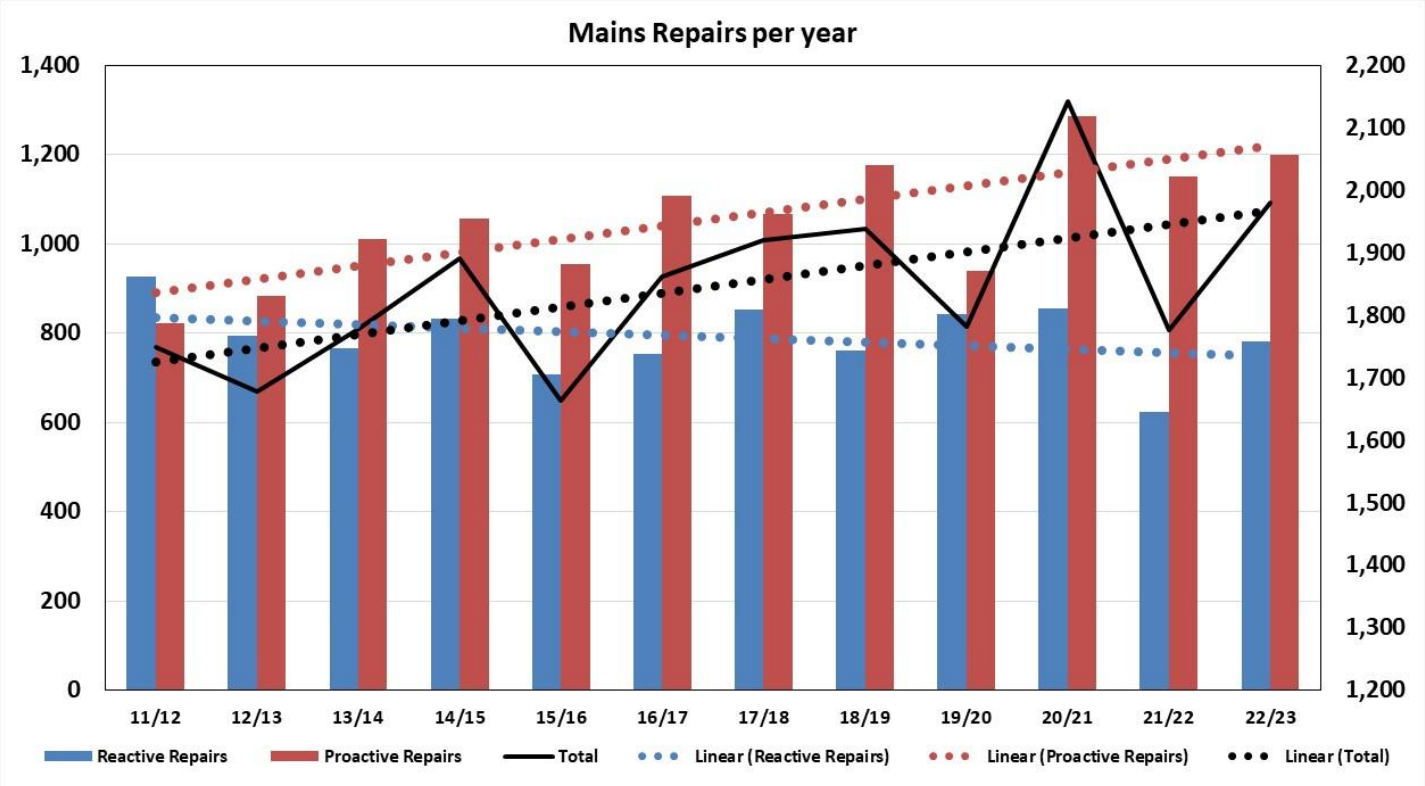
PR24 Potable mains > 320mm (km)	920.6	31.8	13.8	3.2	0.7	970.2
PR24 Potable mains total (km)	6,484.6	2,923.6	2,264.0	409.1	35.0	12,116.3
PR24 Potable mains total (%)	53.5%	24.1%	18.7%	3.4%	0.3%	100%
PR09 Potable mains total (%)	57.0%	31.6%	10.0%	1.3%	0.1%	100%

In Appendix 14 of our PR19 business plan submission we provided information on the link between leakage and mains repairs.

We have driven down the three year average leakage from 79.3Ml/d in 2011/12 to 66.5Ml/d in 2022/23.

Our historic mains repair data below shows that as we have reduced leakage over the years the number of reactive repairs has reduced and the number of proactive repairs has increased as have the total number of repairs. Leakage has been driven down lower and lower through a number of policies and strategies; of which increased Active Leakage Control (ALC) has been central, ie employing more and more leakage inspectors to go out and detect more and more leaks.

Figure 7 – Proactive and Reactive mains repairs over time



Hence this increase in repairs is partly as a direct result of the least cost short term actions to meet short term leakage reduction targets and not solely indicative of an underlying deterioration of asset health.

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

No changes have been made to the raw GIS data on mains repairs which are within 1% of the APR reported numbers. A number of small changes were made to the lengths to correlate with APR reported numbers.

21.1.8. An indication of the quality of data provided

We assign a B3 confidence grade (Accuracy within ±10% but outside ±5%) to this data set as a whole, as although based on sound records, a number of assumptions have been made, and even following the cohort guidance there remains significant uncertainty. As noted previously the 0.8% difference in five year average repair numbers between this analysis and the PC reported number is well within the B2 confidence grade (accuracy within ±5% but outside ±1%) assigned to our APR mains repairs PC reporting.

21.1.9. 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

The grading used for this PR24 submission has been prepared in line with the guidance; and similar but not identical to the cohort approach used at PR09.

As detailed in PR09 FBP WSX - C3 - Asset Inventory, the previous cohort approach used material, age and size similar to PR24, but used soil type, surface use and land use for cohort optimisation rather than network density which has been used for PR24.

21.1.10. 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

We did not use soil corrosivity or fracture potential as secondary variables, we used network density banding mapping connected properties to mains.

22. CW21 Water supply – greenhouse gas emissions enhancement schemes

We are not proposing any greenhouse gas reduction schemes for water supply from enhancement funding at PR24.

This commentary is intentionally blank for this reason.