Anglian Water - May 2023
Additional Information Submission

DWMP Data Tables

All information within our DWMP data table is based on our assessed Best Value Plan, with prioritised solutions as per a realistic affordability discussion and as approved through our draft DWMP consultation. It relates to DWMP catchments only, unless noted otherwise.

Forecasting performance is challenging and allocating performance between performance delivered by base, enhancement and impacts of exogenous factors further complicates this. With this first DWMP we have completed the data tables based on the information gathered throughout the DWMP process. This means that our network modelling is based on a 1 in 5 year storm view of risk, which is a worse case view of actual performance and may exaggerate the risk of actual performance.

This table has been completed on a best endeavours basis.

1. Outcomes

Pollution incidents

The values for pollution incidents are based on our forecasted assessment of category 1-3 pollutions and are normalised per 10,000km of sewer. The assessments are based on our DWMP assessment of 388 water recycling catchments, highlighted during Risk Based Catchment Screening (RBCS) that there might be a network concern. Risk was modelled using the most recent catchment model, with 2D hydraulic modelling to understand the hydraulic overload risk of flooding and pollution. The FEH 2013 Design Rainfall storm scenarios were used, looking at M5-60, M5-240, and M5-480 duration. This is a pessimistic view of risk and performance.

Our 2024/25 numbers are forecasted for AMP end.

1a – Pollution incidents - baseline
This line takes our Baseline Risk and Vulnerability Assessment (BRAVA) assessment of forecasted modelled pollution incidents in a ‘do nothing’ scenario. BRAVA was completed at 2030, 2035 and 2050. Values for AMP10 and AMP11 have been interpolated between the two modelled values.

1b – Pollution incidents – base
Historically our performance has improved over time, although in recent years performance gains have slowed significantly. To represent the potential for future performance improvements through base cost allowances, we have assumed 0.5% performance improvement each year from the baseline.

1c – Pollution incidents – post enhancement

Our values take into account the normalised categories 1-3 pollutions, benefited by the solutions identified in the best value plan. This is based on modelled benefit and is the performance post base and enhancement expenditure.

1ci – 1ciii – Pollution incidents – enhancement cost
Our catchment solutions address internal and external flooding, pollutions, climate change and urban creep. It is not possible to split the solution costs accurately to identify which element of the solution addresses which benefit.

Compliance at WwTWs

The values for compliance at WwTW (or WRCs) are based on our forecasted assessment of performance on our 710 numerically permitted water recycling centres.

2a – Compliance at WwTWs - baseline
This line takes our BRAVA assessment of forecasted assessment of compliance at WwTWs in a 'do nothing' scenario. It is assuming that everything scoring a 2 in Biological Capacity at BRAVA is a risk. BRAVA was completed at 2030, 2035 and 2050 looking at the increase in population, it does not include climate change. We did not assess 2040, 2045, nor an annual risk, these values have been interpolated.

The assessment has been completed using the current compliance definition. If we were to additionally bring in the impact of DWF compliance then our baseline figures would change to: AMP8 – 77%
AMP9 – 76%
AMP10 – 73%
AMP11 – 70%
AMP12 – 67%

Our 2024/25 numbers are forecasted for AMP end.

2b – Compliance at WwTWs – base
Historically our performance has improved over time. We have assumed 0.5% performance improvement each year from the baseline. As the baseline does not currently include the impact of climate change, using historic improvement trend would not be appropriate.

2c – Compliance at WwTWs – post enhancement
Our values outline the forecasted WwTW compliance following the interventions. The percentage is across all our WwTWs and is the performance post base and enhancement expenditure.

2ci – 2ciii – Compliance at WwTWs – enhancement cost
Feasible solutions were costed for AMP8 and AMP9. Risks in later AMPs have been based on a unit rate for capex, with an allowance for opex.

Whilst this line is called enhancement cost, we have provided costs for investments which currently fall under Botex+. We have not provided any costs for AMP7, as excluding WINEP there are no enhancement WRC costs under the current definition.

Costs represent the expenditure required to meet both biological and DWF capacity.

Opex continues throughout each AMP, therefore AMP12 figures include the opex spent in AMP8.

Risk of sewer flooding in a 1 in 50 year storm

The values for risk of sewer flooding in a 1 in 50 year storm are based on our forecasted assessment and assessed against % properties at risk. The assessments are based on our DWMP assessment of 388 water recycling catchments, highlighted during Risk Based Catchment Screening (RBCS) that there might be a network concern.

Our 2024/25 numbers are our performance commitment for the end of AMP7.

3a – Risk of sewer flooding in a 1 in 50 year storm - baseline
This line takes our BRAVA assessment of modelled forecasted risk of sewer flooding in a 1 in 50 year storm in a 'do nothing' scenario. BRAVA was completed at 2030, 2035 and 2050. We did not assess 2040, 2045, nor an annual risk, these values have been interpolated.

3b – Risk of sewer flooding in a 1 in 50 year storm – base
As per the baseline. We would not expect base cost allowances to fund significant improvements in resilience to extreme weather events.

3c – Risk of sewer flooding in a 1 in 50 year storm – post enhancement
Based on the performance commitment trigger limits used within BRAVA, the assessment did not highlight any catchment concerns. No investment was put into the DWMP to deal with the risk of sewer flooding in a 1 in 50 year storm and therefore these numbers match baseline.

3ci – 3ciii – Risk of sewer flooding in a 1 in 50 year storm – enhancement cost No investment was proposed to address risk of 1 in 50 year storm.

Storm overflows - more than 10 spills per year

Our assessment considers both modelled data and EDM data, counting spills using the 12/24 method, where available. We are due full EDM data coverage by the end of 2023. Our overflow assessment is based on our current understanding of risk. The numbers within the table exclude the allowance additionally made within the DWMP for investigations into root cause, and excludes the expected investment in a number of overflows where no data currently exists.

Note this assessment includes all overflows, including those which may also fall within lines 7.

4a – Storm overflows more than 10 spills per year – baseline
Our values are based on a current day assessment and assumed to remain constant through the AMPs. This line includes all overflows with modelled or EDM spills greater than 10, from both inland and bathing waters.

We have excluded the numbers for those where we need to investigate further.

4b – Storm overflows more than 10 spills per year – base
These are enhancement solutions.

4c – Storm overflows more than 10 spills per year – post enhancement
Our AMP8 figures reflect the current view of WINEP. AMP9 onwards identifies the current expected schemes on those sites where there are known risks.

4ci - 4ciii - Storm overflows more than 10 spills per year – enhancement cost
Costs for AMP8 match the current view of WINEP. AMP9 onward costs are based on modelled storage and interpolated values from AMP8 costing, based on average costs for a green infrastructure solution.

Opex continues throughout each AMP, therefore AMP12 figures include the opex spent in AMP8.

Storm overflows - high priority (ecological harm)

Our assessments of ecological harm will not be concluded until the end of 2027. It would not be appropriate to pre-empt the number of overflows in this category.

5a – Storm overflows high priority ecological harm –
baseline No data provided.

5b – Storm overflows high priority ecological harm –
base No data provided.

5c – Storm overflows high priority ecological harm – post
enhancement No data provided.

5ci - 5ciii - Storm overflows high priority ecological harm – enhancement
cost No data provided.

Storm overflows - all ecological harm

As per Environment Agency guidance any storm overflow deemed to cause ecological harm is seen to be high priority and is therefore covered in lines 5. As outlined we have not provided information for this category.

Storm overflows - designated bathing waters (coastal and inland)

Our assessment considers both modelled data and EDM data, counting spills using the 12/24 method, where available. We are due full EDM data coverage by the end of 2023. Our overflow assessment is based on our current understanding of risk.

7a – Storm overflows designated bathing waters – baseline
Our values are based on a current day assessment and assumed to remain constant through the AMPs.

We have excluded the numbers for those where we need to investigate further. These will be investigated and invested in during AMP9 to meet the Storm Overflow Discharge Reduction Plan targets.

7b – Storm overflows designated bathing waters – base
These are enhancement solutions.

7c – Storm overflows designated bathing waters – post enhancement
Our AMP8 figures reflect the current view of WINEP. AMP9 onwards identifies the current expected schemes on those sites where there are known risks.

7ci - 5ciii - Storm overflows designated bathing waters – enhancement cost
Costs for AMP8 match the current view of WINEP. AMP9 onward costs are based on modelled storage and interpolated values from AMP8 costing, based on green infrastructure.

Opex continues throughout each AMP, therefore AMP12 figures include the opex spent in AMP8.

Sewer collapses

8a Sewer collapses – baseline
Number is projected for the whole region using our predictive analytics asset deterioration modelling tool. By adding in cost constraints, predictive analytics uses the value function to evaluate the Optimal Intervention Date for each asset. If there is not enough money to do all the work at the Optimal Intervention Date, Predictive Analytics will find the highest value intervention date that allow the asset strategy to meet the constraint. This assessment does not include the impact of growth, urban creep or climate change on the performance of the assets.

8b Sewer collapses – base
Historically our performance has improved over time. We have assumed 0.5% performance improvement each year from the baseline, although as noted above performance in the future may be under additional pressure from growth, urban creep and climate change to the impact noted here. As such this figure should be treated with caution.

8ci – 8ciii – Sewer collapses – base costs

Projected costs are based on our predictive analytics tool which identifies cost required to maintain current performance. These costs are not included in our overall DWMP summary.

Internal sewer flooding

The values for internal sewer flooding are based on our forecasted assessment and are normalised per 10,000 sewer connections. The assessments are based on our DWMP assessment of 388 water recycling catchments, highlighted during Risk Based Catchment Screening (RBCS) that there might be a network concern. Risk was modelled using the most recent catchment model, with 2D hydraulic modelling to understand the hydraulic overload risk of flooding and pollution. The FEH 2013 Design Rainfall storm scenarios were used, looking at M5-60, M5-240, and M5-480 duration. This is a pessimistic view of risk and performance.

Our 2024/25 numbers are forecasted for AMP end.

9a – Internal sewer flooding - baseline
This line takes our BRAVA assessment of forecasted modelled internal sewer flooding in a 'do nothing' scenario. BRAVA was completed at 2030, 2035 and 2050. We did not assess 2040, 2045, nor an annual pollution count. Values for AMP10 and AMP11 have been interpolated between the two modelled values.

The BRAVA assessment was completed on 388 water recycling catchments. These catchments had been highlighted in the previous Risk Based Catchment Screening (RBCS) stage that there may be a network concern.

9b – Internal sewer flooding – base
Historically our performance has improved over time. We have assumed 0.5% performance improvement each year from the baseline. As the baseline does not currently include the impact of climate change, using historic improvement trend would not be appropriate.

9c – Internal sewer flooding – post enhancement
Our values take into account the normalised internal flooding, benefited by the solutions identified in the best value plan. This is based on modelled benefit and is the performance post base and enhancement expenditure.

9ci – 9ciii – Internal sewer flooding – enhancement cost
Our catchment solutions address internal and external flooding, pollutions, climate change and urban creep. It is not possible to split the solution costs accurately to identify which element of the solution addresses which benefit.

Screening storm overflows

10a – Screening storm overflows – baseline
The number of overflows identified as either not meeting screening requirements, or with a current unknown screen status.

10b – Screening storm overflows – base
These are enhancement solutions and so no allowance from base is made.

10c – Screening storm overflows – post enhancement
Our AMP8 figures reflect the current view of WINEP. AMP9 onwards identifies the current expected schemes on those sites where there are known or potential risks.

10ci – 10 ciii – Screening storm overflows – enhancement cost
Costs for AMP8 match the current view of WINEP. AMP9 onward costs are based on average screen costs.

2. Expenditure (A)

Expenditure (A) is our best value plan prior to the addition of the extra expected investment required to meeting the Storm Overflow Discharge Reduction Plan.

Network

1a – Additional network storage / conveyance / containment
1ai – Storage volume
This outlines the amount of offline storage required within the network to reduce risk. This does not account for new sewers as our costing tool does not provide a volume for these assets.

AMP8 and AMP9 volumes have been spread with an indicative spread across the AMP to match the Outcomes tab.

1aii – Number of schemes
Network schemes are catchment wide and contain both grey and green solutions.

1aiii – Network storage cost
These costs are the asset costs for offline storage only, not total scheme costs, for assets within schemes as profiled in the best value plan assessment. AMP8 and AMP9 costs have been spread with an indicative spread across the AMP to match the Outcomes tab.

As outlined above this does not account for the additional cost required for new sewers. For transparency the totex cost of offline storage and new sewers (not full schemes, but asset costs) are identified below in (£M):
AMP8 - 137.07
AMP9 - 150.28
AMP10 - 80.19
AMP11 - 84.26
AMP12 – 64.99

Opex continues throughout each AMP, therefore AMP12 figures include the opex spent in AMP8.

1b – Upstream surface water separation / removal or other network storage

1bi - Permeable area inflow removed from entering the network or stored in environment (enhancement)
This outlines the combined hectarage of storage and removal for SuDS, for assets within schemes as profiles in the best value plan assessment. AMP8 and AMP9 volumes have been spread with an indicative spread across the AMP to match the Outcomes tab.

1bii – Number of schemes
Network schemes are catchment wide and contain both grey and green solutions.

1biii – Green network scheme cost
These costs are the asset costs for offline storage only, not total scheme costs, for assets within schemes as profiled in the best value plan assessment. AMP8 and AMP9 costs have been spread with an indicative spread across the AMP to match the Outcomes tab.

Opex continues throughout each AMP, therefore AMP12 figures include the opex spent in AMP8.
Planning objectives
Benefits are based on an indicative spread of schemes across the AMP using normalised figures, matching the Outcomes tab. Whilst there may be improvements to storm overflow spills, the schemes outlined in this tab are not intentionally targeting spill reduction.

WwTW (WRC)

It has been assumed that both grey and green lines are referring to storage for storm tanks, as per description in the green line 2bi. This excludes a significant amount of cost for wider WwTW investments within the DWMP.

2a – Additional WwTW storage – grey interventions
2ai – Storage volume
This outlines the increase in grey storage storm tanks. AMP8 and AMP9 are based on an even split of investments across the AMP.

We did not complete detailed optioneering for WwTW investments in AMP10-12. For these AMPs we have assumed that all sites which are identified as requiring a new DWF, will also require a new FFT. Increase in volume is based on an average storm tank scheme.

2aii – Number of schemes
The number of schemes in the AMP where additional storm storage is required. AMP8 and AMP9 are based on an even split of investments across the AMP.

2aiii – WwTW grey storage cost
These costs are the asset costs for storm storage only, not total scheme costs, for assets within schemes as profiled in the best value plan assessment. AMP8 and AMP9 are based on an even split of investments across the AMP.

We did not complete detailed costing for WRC investments in AMP10-12. Costs are based on an average storm tank scheme.

2b – Blue/green interventions at WwTW

2bi – Storage volume
No schemes use green solutions for additional storm storage.

2bii – Number of schemes
No schemes use green solutions for additional storm storage.

2biii – WwTW green storage cost
No schemes use green solutions for additional storm storage.

Planning objectives
Due to the small proportion of the storm tank investment vs the overall planned spend on WwTWs it is not possible to quantify the impact of this level of investment against the benefits.

3a – Interventions at WwTWs - additional treatment capacity to increase FFT capacity
3ai - Additional FFT treatment capacity required at WwTWs
AMP8 shows a mixture of WINEP UIMP5 schemes and growth schemes, with AMP9 onward growth only. Growth solutions have been included where an increased DWF leads to an increase in FFT. The growth solutions show the difference between current consented FFT and future FFT.

3aii – Number of schemes
Schemes are a count of UIMP5 and growth schemes.

3aiii – Additional WwTW capacity cost
Schemes are for the UIMP5 storm increases, plus the full cost of any schemes which increase FFT to address growth.

Planning objectives
We cannot equate UIMP5 improvements to a benefit. For growth, the main benefit from these solutions is to address WRC compliance. There may be wider benefits but these would be negligible.

Storm overflow screening interventions

4ai – Total number of storm overflows
This line shows the total count of our permitted storm overflows.

4aii – Number of replacement screens
This line shows the number of screens requiring replacement, reducing over the 25 years with expected investment.

4aiii – Number of new screens

This line shows the number of new screens required, reducing over the 25 years with expected investment. An assumption is made that any overflows with unknown screen status will require a new screen.

4aiv – Storm screen cost
Our AMP8 figures reflect the current view of WINEP. AMP9 onwards identifies the current expected schemes on those sites where there are known or potential risks, based on average costs.

Reduction in GHG emissions

The data within this table refers to the DMWP best value plan only. It does not include WINEP or the investments required to meet the Storm Overflow Discharge Reduction Plan.

5 – Reduction in operational GHG emissions
The sum of the operational carbon from building the schemes, as profiled in the best value plan. Operational carbon is assumed to continue throughout the 25 years. Annual figures in AMPs8-9 are profiled linearly. AMPs10-12 exclude WwTW due to not having detailed design solutions beyond AMP9.

6 – Reduction in embodied GHG emissions
The sum of the embodied carbon from building the schemes, as profiled in the best value plan. Annual figures in AMPs8-9 are profiled linearly. AMPs10-12 exclude WwTW due to not having detailed design solutions beyond AMP9.

Significant DWMP and PR24 schemes

7 – Significant DWMP and PR24 schemes

We have not identified any schemes to be more significant than others within the DWMP or PR24.

Key partnership schemes

8 – Key partnership schemes
We have identified over 150 partnership opportunities across flooding and storm overflows from AMP8. Confidence in delivery varies, and it's likely that opportunities to work with partners will change over the course of the AMP/DWMP as their and our priorities change.

We have listed the top 10 with the highest confidence, as well as a number of more strategic partnership opportunities (i.e. working with the Defra Innovation projects, the Department of Education and the Norfolk Strategic Flood Alliance).

It is not possible to project partnership opportunities beyond the next AMP due to the uncertainties that our partners have and the fact that they do not undertake long term planning.

2. Expenditure (B)

Expenditure (B) is our best value plan plus an additional view of the extra expected investment required to meeting the Storm Overflow Discharge Reduction Plan. We have only kept sections 1 and 2 as they are impacted by the additional storm overflow storage information, whereas the rest match Expenditure (A).

For storm overflows, our assessment considers both modelled data and EDM data, counting spills using the 12/24 method, where available. We are due full EDM data coverage by the end of 2023. Our overflow assessment is based on our current understanding of risk but we will need to complete further modelling and have more years EDM data to have a more complete view of risk. Because of this, the investment requirement for storm overflows beyond AMP9 are more uncertain and often based on unit rate costs. To meet stakeholders expectations in creating green solutions where possible, and to prevent underestimating cost, beyond AMP8 all storm overflow solutions are assumed to be green. This will be reviewed at detailed optioneering stage, once there is confirmation of need and size.

The numbers within the table exclude the allowance additionally made within the DWMP for investigations, but does include the expected investment in a number of overflows where no data currently exists. This therefore does not match the Outcomes tab.

Network

1a – Additional network storage / conveyance / containment
1ai – Storage volume
This outlines the amount of offline storage required within the network to reduce risk. This does not account for new sewers as our costing tool does not provide a volume for these assets.

AMP8 schemes addressing storm overflows are aligned with our current view of WINEP.

AMP8 and AMP9 volumes have been spread with an indicative spread across the AMP to match the Outcomes tab.

No additional volume is included for AMPs9-12 to address storm overflows as it was assumed all were green solutions.

1aii – Number of schemes
Network schemes are catchment wide and contain both grey and green solutions.

1aiii – Network storage cost
These costs are the asset costs for offline storage only, not total scheme costs, for assets within schemes as profiled in the best value plan assessment. AMP8 and AMP9 costs have been spread with an indicative spread across the AMP to match the Outcomes tab and, for AMP8 storm overflow schemes, the current view of WINEP.

As outlined above this does not account for the additional cost required for new sewers, the additional cost for this is outlined in section 2. Expenditure (A)– 1aiii above.

1b – Upstream surface water separation / removal or other network storage
1bi - Permeable area inflow removed from entering the network or stored in environment (enhancement)
This outlines the combined hectarage of storage and removal for SuDS, for assets within schemes as profiles in the best value plan assessment. AMP8 and AMP9 volumes have been spread with an indicative spread across the AMP to match the Outcomes tab, and, for AMP8 storm overflow schemes with the current view of WINEP.

Additional volume based on modelled required volume is included for AMPs9-12 to address storm overflows. It was assumed all were green solutions.

1bii – Number of schemes
Network schemes are catchment wide and contain both grey and green solutions.

1biii – Green network scheme cost
These costs are the asset costs for offline storage only, not total scheme costs, for assets within schemes as profiled in the best value plan assessment. AMP8 and AMP9 costs have been spread with an indicative spread across the AMP to match the Outcomes tab, and, for AMP8 storm overflow schemes with the current view of WINEP.

Additional cost based on average unit rate is included for AMPs9-12 to address storm overflows. It was assumed all were green solutions.

Planning objectives
Benefits are based on an indicative spread of schemes across the AMP, matching the Outcomes tab.

WwTW (WRC)

2a – Additional WwTW storage – grey interventions
2ai – Storage volume
This outlines the increase in grey storage storm tanks. AMP8 and AMP9 are based on an even split of investments across the AMP.

We did not complete detailed optioneering for WwTW investments in AMP10-12. For these AMPs we have assumed that all sites which are identified as requiring a new DWF, will also require a new FFT. Increase in volume is based on an average storm tank scheme.

AMP8 schemes addressing storm overflows are aligned with our current view of WINEP.

No additional volume is included for AMPs9-12 to address storm overflows as it was assumed all were green solutions.

2aii – Number of schemes

The number of schemes in the AMP where additional storm storage is required. AMP8 and AMP9 are based on an even split of investments across the AMP.

2aiii – WwTW grey storage cost
These costs are the asset costs for storm storage only, not total scheme costs, for assets within schemes as profiled in the best value plan assessment. AMP8 and AMP9 are based on an even split of investments across the AMP.

We did not complete detailed costing for WRC investments in AMP10-12. Costs are based on an average storm tank scheme.

2b – Blue/green interventions at WwTW

2bi – Number of schemes
The number of schemes currently expected in WINEP have been included.

2bii – WwTW green storage cost
Costs match current view of
WINEP.

Additional cost based on average unit rate is included for AMPs9-12 to address storm overflows. It was assumed all were green solutions.

Planning objectives
Due to the small proportion of the storm tank investment vs the overall planned spend on WwTWs it is not possible to quantify the impact of this level of investment against the benefits.

3. Adaptive plans

DWMP Best Value Plan

This outlines the totex per AMP for our best value plan which considers a medium risk view of growth, 2 degree climate change and our response to the Storm Overflow Discharge Reduction Plan. It provides a balanced view of risk acceptability. It excludes the investment for sewer collapses.

High climate change (4 degrees)

This uplifts network costs using an average based on modelling completed on a sample of DWMP solutions. It is a risk adverse view of the future. It excludes the investment for sewer collapses.

High demand

This uplifts all costs to a higher growth projection based on unit cost, looking at Local Authority forecast figures. The assumption on 2 degree climate change remains. It is a risk adverse view of the future. It excludes the investment for sewer collapses.

Low demand

This reduces all costs to a lower growth projection based on unit cost, looking at ONS forecast figures. The assumption on 2 degree climate change remains. This scenario is a riskier view of the future based on historic experience. It excludes the investment for sewer collapses.

Least cost

This uses our least cost optimisation run from our Best Value Planning, plus assuming our response to the Storm Overflow Discharge Reduction Plan will be grey infrastructure only. This scenario is a riskier view of the future and would leave a greater risk to our customers. It excludes the investment for sewer collapses.