United Utilities Water

Drainage and Wastewater Management Plan 2023

Tables – Commentary

Document Reference: P001

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United Utilities

Water for the North West

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Glossary

For the glossary, refer to document C003.

1. Outcomes table

1.1 Overarching Commentary

1.1.1 AMP8 to 12

- Unless otherwise stated, AMP8 to 12 forecasts are outputs from the DWMP modelling exercise. Where data for specific years was not available from the DWMP planning horizons of 2020 (baseline), 2030 and 2050, data has been interpolated for the intervening years. A year-by-year view of this data cannot be viewed as a delivery or performance programme.

1.1.2 All AMPs expenditure and output profiles

- Please note that it is not always possible to directly link benefits or outputs to expenditure as expenditure may occur over a number of preceding years before benefits are realised.
- The optimised element of our preferred plan covering flooding, pollution and sewer collapse shows costs only against the internal flooding and pollution planning objectives on the Outcomes set of tables. This is intended to demonstrate that firstly the optimiser was set up to select interventions to resolve primarily internal flooding and pollution, and secondly the synergies across planning objectives in this area and the residual benefits seen in external flooding, flooding of open spaces, risk of sewer flooding in a 1 in 50 year storm and sewer collapses.
- Many options included in our plan are providing benefits to multiple planning objectives. As such, the allocation of costs to individual planning objectives, as required by the tables, should not be viewed as representative unit cost versus performance ratios for those individual planning objectives.
- UUW's Event Duration Monitor (EDM) programme is due to be completed in 2023, therefore, the remaining few overflows to be monitored will require assessment and inclusion in DWMP cycle 2.
- Steps in the number of overflows between AMP7 and AMP8 are caused by the requirements of Storm Overflow Discharge Reduction Plan (SODRP) which affects AMP8 onwards and did not exist as a requirement for AMP7.
- Forecasts are not guarantees of future performance or cost. There are a number of factors, many of which are beyond reasonable management control that could cause performance and costs to differ materially. Please see the disclaimer tab in our data tables for fuller context.

1.1.3 WINEP and storm overflows

- Due to the nature of both the WINEP and the Government's SODRP, UUW has aligned DWMP to these two programmes of work within the preferred plan. Further optimisation will continue whilst WINEP is finalised by regulators and any changes will be included in the DWMP data table's resubmission at PR24.
- As detailed within the main DWMP documentation, the interventions for these areas have been chosen in order to fulfil legal and statutory requirements.
- UUW's January 2023 WINEP submission has been the basis for all costs related to storm overflows. Within that submission, 40 percent of the 419 overflows within AMP8 have a hybrid component. For AMP9-12 our ambition is to have a hybrid component within every storm overflow solution and this is reflected in the significant values reported within the 'green network' table on the Expenditure worksheet.
- AMP8 to AMP12 values may be updated between DWMP submission in May 2023 and the Price Review later in 2023 to reflect further work on other regulatory requirements.

- Interpolation of the storm overflows costs is prioritised as below to avoid duplication. The costs are assigned to the higher ranked driver, for example, there are ecological schemes with the costs already assigned under either bathing water or >10spa for that AMP or AMP year. The screen only costs and numbers are separate to this.
  - Bathing Water
  - >10 spa
  - Ecological harm
- Interpolation of the storm overflows numbers reports the actual number of schemes, however, some costs are already accounted for under other driver costs where schemes fall under multiple drivers.

1.1.4 Interpretation of data tables

- Please note that some areas needing interpretation have been found in the final version of the tables issued on 15 December 2022, version 3. UUW has therefore undertaken the following:

1.1.5 Totals in tables

- In reviewing the data UUW do not believe a 'total' to always be appropriate for the Outcomes table. UUW has therefore calculated 'totals' differently for some activities, i.e.:
  - Pollution (lines 1a, 1b and 1c) = total;
  - Compliance (lines 2a, 2b and 2c) = final year of AMP;
  - Risk of Sewer flooding in a 1 in 50 storm (lines 3a, 3b, and 3c) = final year of AMP;
  - Sewer overflows (lines 4a, 4b, 4c; 5a, 5b, 5c; 6a, 6b, 6c; and 7a, 7b, 7c) = final year of AMP;
  - Sewer collapses (line 8a, 8b) = total;
  - Internal flooding (lines 9a, 9b and 9c) = total;
  - External flooding (lines 11a, 11b, and 11c) = total; and
  - Flooding open spaces (lines 12a, 12b and 12c) = total.

1.1.6 Expenditure and cost indexation

- All financial numbers are presented in FY21 prices as per the reporting requirements.

1.2 Pollution Incidents

1.2.1 Section 1a -1ciii

1.2.1.1 AMP 7

- The 2024-25 position of 19.5 pollution incidents per 10,000 km of wastewater network is UUW's end of AMP7 performance commitment level as determined at PR19. We consider this performance commitment level to be achievable by the end of the AMP given our excellent pollution performance to date, driven by operational improvements and £230 million investment in environmental improvements as part of our Better Rivers: Better North West pledges.
- The 19.5 pollution incidents per 10,000 km of wastewater network was also taken as the baseline for our programme optimiser for the year 2025-26. As such, the apparent stabilisation in performance between 2024-25 and 2025-26 simply reflects that the end point of AMP7 is also the logical baseline for programme optimisation from 2025-26 onwards.
- The value remains the same across the 'baseline, base and enhancement' lines as the value is both the optimiser baseline and unaffected by any enhancement expenditure from AMP8 onwards.
- There is zero capital expenditure to be reported against line 1ci.

1.2.1.2 AMP 8-12

- The stable baseline profile of 150 annualised incidents (19.4 per 10,000km) is an output of the DWMP Baseline Risk and Vulnerability Assessment (BRAVA) modelling. The 19.4 value is aligned to the end of AMP7 performance commitment level with an allowance of expected improvement from UUW's intelligent sewer monitoring programme. The stability of the baseline across 2020-2050 is due to the relatively small impact on this metric from hydraulically driven pollution incidents (which are rare), and thus climate change and growth.
- All AMP8 to AMP 12 base and enhancement values are outputs from the DWMP modelling and are based upon the AMP8 to 12 baseline position and aligned with AMP7 performance commitments. The profiling of both investment and performance are derived from the decision support tool UUW have utilised to optimise the selection of interventions to resolve flooding, pollution and collapses. This cannot be viewed as a delivery profile as, in addition to the modelling horizons points above, it does not consider supply chain optimisation or location specific option design and implementation.
- It is a challenging task to determine the expenditure associated with a particular planning objective due to the selection of options for UUWs DWMP program, which have been carefully chosen to yield benefits across multiple planning objectives. To address this, UUW has developed and introduced a methodology that divides costs based on the various benefits achieved. The optimisation process focused on reducing pollution incidents and internal flooding, leading to the apportionment of costs per selected option by the normalised benefit of pollution and internal flooding, respectively. The pollution component of capital expenditure (capex), operational expenditure (opex), and subsequent total expenditure (totex) is presented on an annual basis.

1.3 Compliance at STW's

1.3.1 Section 2a – 2ciii

1.3.1.1 AMP 7

- To forecast the 2024-25 Wastewater Treatment Works (WwTW) discharge compliance UUW has used the EPA methodology[1] as a basis for the calculation, however, water treatment works have been excluded from the assessment. As a result this measure is not comparable to EPA or AMP7 discharge compliance performance assessments.
- Within 2a and 2b (baseline and base) no funding allowance has been assumed for treatment works that are at risk of compliance failure due to growth in the catchment.
- The 2024-25 baseline WwTW discharge compliance risk is calculated at 97.32%, this assumes a total of 10 failing works. Five of these sites have been identified for improvement in 2024-25 as a result of growth in the catchment, the baseline assumes that if investment does not occur then these sites will fail their final effluent consent.
- The 2024-25 base and enhancement WwTW discharge compliance is calculated at 98.66%, this assumes a total of 5 failing works. This is reflective of the asset base and the challenges that UUW face to maintain and improve these assets to deliver final effluent compliance throughout the year.

1.3.1.2 AMP 8

- Baseline risk follows the EPA methodology as above.
- AMP 8 is aligned to the approach used for the submission of PR24 and is a continuation of the methodology for AMP7. UUW has used its upper quartile projection for compliance position in the post-enhancement expenditure line.

[1] Environment Agency water and sewerage company Environmental Performance Assessment (EPA) methodology (version 9) for 2021 to 2025, (2021) [https://www.ofwat.gov.uk/wp-content/uploads/2021/06/EPA-methodology-version-9-May-2021.pdf]

- Expenditure is based on the programmes of work at locations planned for AMP 8 with supply and demand drivers.

1.3.1.3 AMP 9-12

- WwTW are identified at risk for compliance due to potential exceedance of existing process design capacity which has been modelled across the 2020, 2030 and 2050 design horizons. Findings from the headroom capacity assessments undertaken to identify sites at risk of exceeding design capacity were identified as part of demand forecasting in BRAVA. An increasing number of WwTW are at risk of being unable to meet final effluent permit requirements at a linearly interpolated rate of 3.9 works per year, which is used to model the decline in baseline compliance.
- Expenditure from AMP9 to AMP12 has been derived from the outputs of the DWMP process, filtered to be specifically linked to increased treatment capacity. This excludes options derived from the WINEP, and options related to modification of permits. Options related to Dry Weather Flow (DWF) compliance in AMP 8 have also been excluded as they are regarded as 'betterment' costs of replacing life-expired assets with modern equivalent assets which comply with legally required minimum standards which are higher than those they replace rather than 'enhancement' expenditure.
- As the results of line 2a-2c are displayed as a percentage UUW feel the summation of these results per AMP as mathematically inappropriate and have therefore presented end of AMP positions for AMPs 8-12. The summed values for these cells are presented below in Table 1.

Table 1 Summed Compliance at WwTW

AMP	Baseline	Base	Enhancement
8	495	495	497.09
9	482.62	482.62	500
10	464.04	464.04	500
11	446.85	446.85	500
12	429.65	429.65	500
Total 25 yr	**2318.16**	**2318.16**	**2497.09**

1.4 Risk of Sewer Flooding in a 1 in 50 Storm

1.4.1 Section 3a – 3ciii

1.4.1.1 AMP 7

- The 2024-25 position of 15.02% of properties at risk of sewer flooding in a 1 in 50 storm is UUW's end of AMP7 performance commitment level as determined at PR19. UUW consider this performance commitment level to be achievable by the end of the AMP given the substantial investment in UUWs Hydraulic Flood Risk Resilience (HFRR) programme which has reduced the risk of flooding in severe weather at vulnerable properties through a combination of property-level mitigation and storage solutions.
- There is zero capital expenditure to be reported against line 3ci.

1.4.1.2 AMP 8-12

- The baseline profile starting in 2026 of 13.94% of properties at risk of flooding in a 1 in 50 year storm is an output of the DWMP BRAVA modelling carried out in 2020. The risk of flooding in a 1 in 50 year storm has been modelled across the 2020, 2030 and 2050 design horizons. This has been interpolated between these modelled years and normalised annually against the modelled growing population to display a percentage of the population at risk.

- All AMP8 to AMP12 base and enhancement values are outputs from the DWMP modelling and are based upon the AMP8 to AMP12 baseline position and aligned with AMP7 performance commitments. The profiling of performance is derived from the decision support tool UUW have utilised to optimise the selection of interventions to resolve flooding, pollution and collapses. This cannot be viewed as a delivery profile as, in addition to the modelling horizon points previously made, it does not consider supply chain optimisation or location specific option design and implementation. The risk reduction from the interventions selected have been normalised annually against the modelled growing population to display a percentage of the population at risk.
- Expenditure for this planning objective is zero as the target of the flooding, pollution and collapses optimisation process was to achieve reductions in pollution incidents and internal flooding from a sewer, with synergy of benefits against other planning objectives. Therefore, expenditure is divided as a proportion of benefit across the pollution and internal flooding planning objectives only.
- As the results of lines 3a-3c are displayed as a percentage UUW feel the summation of these results per AMP is mathematically inappropriate and have therefore presented end of AMP positions for AMPs 8-12. Summed values for these cells are presented below for context in Table 2:

Table 2 Summed 1 in 50 Year Storm Results

AMP	Baseline	Base	Enhancement
8	74.44	74.41	74.37
9	79.91	79.91	79.78
10	81.20	81.20	80.97
11	82.40	82.40	82.05
12	83.53	83.53	83.07
Total 25 yr	**401.48**	**401.45**	**400.24**

1.5 Storm Overflows – more than 10 spills per year

1.5.1 Section 4a – 4ciii

1.5.1.1 AMP 7

- In 2024-25 the number of storm overflows spilling greater than 10 times per annum has been identified in UUW's storm overflow database. A combination of EDM and modelled data has been used to identify these sites as we do not have full coverage of either model or EDM data, this approach has been agreed with the Environment Agency and used to inform AMP8 WINEP development.
- The 2024-25 baseline is 1403 and the base and enhancement is 1402, the difference is down to one shellfish water improvement scheme due to reduce spill frequency at one storm overflow in FY25.
- The methodology for assignment of capital expenditure associated with overflows is based on allocating the 2024/25 forecast capital expenditure for the named capital projects which form the performance metric for each of the reportable lines.
- The capital expenditure reported in lines 4ci reflects this capital project and performance metric reconciliation with all costs reported on a proportional basis reflecting the annual regulatory accounting guidelines. The proportional reporting is an established methodology which is subject to annual internal and external audit as part of the annual regulatory reporting return to Ofwat. There is no financial metric for comparison.

1.5.1.2 AMP 8-12

- AMP8-12 values are outputs from DWMP BRAVA hydraulic sewer models that include climate change and growth. Model outputs for 2050 have been used as the baseline in order to demonstrate a worse case position on the number of overflows requiring intervention. Values include: All overflows spilling >10 times per year; and Bathing water overflows, but excludes: Emergency Overflows (EOs).
- AMP8-12 values includes the regulatory requirements of the SODRP introduced since AMP7 for implementation from AMP8 onwards.
- Base values are identical to baseline as it is assumed that all interventions to reduce storm overflow spill performance will be via enhancement funding.
- Post enhancement values are profiled based on an assumption of steady investment in line with the SODRP targets for AMPs 9-12. All AMP8 interventions are aligned with the WINEP submission of January 2023 and are a mixture of Grey, Hybrid (grey plus blue/green) and Blue/green schemes.
- Opex for AMPs 9-12 has been calculated as a percentage factor from analysis of the WINEP data, and will be applied at the end of the AMP period onwards.
- UUW feel the summation of these lines per AMP is mathematically inappropriate and have therefore presented end of AMP positions for AMPs 8-12. To illustrate this, the summed values for these cells are presented below for context in Table 3:

Table 3 Summed More Than 10 Spills per Year

AMP	Baseline	Base	Enhancement
8	7005	7005	6286
9	7005	7005	4883
10	1401	1401	608
11	1401	1401	313
12	1401	8401	0
Total 25 yr	**18213**	**18213**	**12090**

1.6 Storm Overflows – high priority ecological harm

1.6.1 Section 5a – 5ciii

1.6.1.1 AMP 7

- The SODRP published in August 2022 sets out specific targets and principles for storm overflows. The definition of high-priority as defined within this document includes any water currently failing to meet good ecological status due to storm overflows. The Environment Agency have given these sites an EnvAct_IMP2 driver for PR24:

EnvAct_IMP2	Improvements to reduce storm overflow spills to protect the environment so that they have no local adverse ecological impact.

- The number of high priority storm overflows in 2024-25 includes any site identified for a future EnvAct_IMP2 driver and any site with an AMP7 WINEP driver for environmental improvements.
- A total of 460 storm overflows have been identified for an EnvAct_IMP2 driver, this has been shared with the Environment Agency and can be found in the UUW's storm overflow database.
- A total of 23 storm overflows have been identified for an AMP7 improvement. These sites are listed within the AMP7 WINEP.

- The methodology for assignment of capital expenditure associated with overflows is based on allocating the 2024/25 forecast capital expenditure for the named capital projects which form the performance metric for each of the reportable lines.
- The capital expenditure reported in lines 5ci reflect this capital project and performance metric reconciliation with all costs reported on a proportional basis reflecting the annual regulatory accounting guidelines. The proportional reporting is an established methodology which is subject to annual internal and external audit as part of the annual regulatory reporting return to Ofwat. There is no financial metric for comparison.

1.6.1.2 AMP 8-12

- AMP8-12 values are outputs from DWMP BRAVA hydraulic sewer models that include climate change and growth. Model outputs for 2050 have been used as the baseline in order to demonstrate a worse case position on the number of overflows requiring intervention.
- AMP8-12 values includes the regulatory requirements of the SODRP introduced since AMP7 for implementation from AMP8 onwards.
- Values based on previously identified WINEP schemes and AMP7 Storm Overflow Assessment Framework) SOAF investigations to date identifying overflows causing severe impact through water quality modelling. The SOAF number will likely increase as investigations continue. The observed step change between AMP7 and AMP8 is due to already committed schemes in AMP7 that will be delivered in year 5.
- Base values are identical to baseline as it is assumed that all interventions to reduce storm overflow activation will be via enhancement funding.
- Post enhancement values are profiled based on an assumption of steady investment in-line with the SODRP targets for AMPs 9-12. All AMP8 interventions are aligned with the WINEP submission of January 2023 and are a mixture of Grey, Hybrid (grey plus blue/green) and Blue/green schemes.
- Opex for AMPs 9-12 has been calculated as a percentage factor from analysis of the WINEP data, and will be applied at the end of the AMP period onwards.
- UUW feel the summation of these lines per AMP is mathematically inappropriate and have therefore presented end of AMP positions for AMPs 8-12. To illustrate this, the summed values for these cells are presented below for context in Table 4:

Table 4 Summed Ecological Harm (high priority)

AMP	Baseline	Base	Enhancement
8	2295	2295	1969
9	2295	2295	1204
10	459	459	60
11	459	459	0
12	459	459	0
Total 25 yr	**5967**	**5967**	**3233**

1.7 Storm Overflows – all ecological harm

1.7.1 Section 6a – 6ciii

1.7.1.1 AMP 7 - 12

- The SODRP published in August 2022 defines any water failing to meet good ecological status as a high priority, therefore, the data for lines 6a-c is a duplicate of lines 5a-c. See above commentary.

- UUW feel the summation of these lines per AMP is mathematically inappropriate and have therefore presented end of AMP positions for AMPs 8-12. To illustrate this, the summed values for these cells are presented below for context in Table 5:

Table 5 Summed Ecological Harm (all)

AMP	Baseline	Base	Enhancement
8	2295	2295	1969
9	2295	2295	1204
10	459	459	60
11	459	459	0
12	459	459	0
Total 25 yr	5967	5967	3233

1.8 Storm Overflows – designated bathing waters (coastal and inland)

1.8.1 Section 7a – 7ciii

1.8.1.1 AMP 7

- There are no AMP7 bathing water improvements due to complete in FY25 and, therefore, the reported figure will be the same in 7a, 7b and 7c. Please note, Planning Classification 2022 has been used to identify bathing waters classifications for this line.

1.8.1.2 AMP 8-12

- AMP8-12 values are outputs from DWMP BRAVA hydraulic sewer models that include climate change and growth. Model outputs for 2050 have been used as the baseline in order to demonstrate a worse case position on the number of overflows requiring intervention.
- AMP8-12 values includes the regulatory requirements of the SODRP introduced since AMP7 for implementation from AMP8 onwards.
- Base values are identical to baseline as it is assumed that all interventions to reduce storm overflow spill performance will be via enhancement funding.
- Post enhancement values are profiled based on an assumption of steady investment in line with the SODRP targets for AMPs 9-12. All AMP8 interventions are aligned with the WINEP submission of January 2023 and are a mixture of Grey, Hybrid (grey plus blue/green) and Blue/green schemes.
- Opex for AMPs 9-12 has been calculated as a percentage factor from analysis of the WINEP data, and will be applied at the end of the AMP period onwards.
- UUW feel the summation of these lines per AMP is mathematically inappropriate and have therefore presented end of AMP positions for AMPs 8-12. To illustrate this, the summed values for these cells are presented below for context in Table 6:

Table 6 Summed Designated Bathing Waters (coastal and inland)

AMP	Baseline	Base	Enhancement
8	515	515	475
9	515	515	312
10	103	103	0
11	103	103	0
12	103	103	0

AMP	Baseline	Base	Enhancement
Total 25 yr	**1339**	**1339**	**787**

1.9 Sewer Collapses

1.9.1 Section 8a – 8ciii

1.9.1.1 AMP 7

- The 2024-25 position of 13.1 sewer collapses per 1000 km of sewer is UUW's end of AMP7 performance commitment level as determined at PR19. UUW consider this performance commitment level to be achievable by the end of the AMP, enabled by the installation of nearly 20,000 in-sewer monitors, which have improved our ability to proactively detect sewer defects (DNM).
- The 13.1 sewer collapses per 1000 km of sewer was also taken as the baseline for the programme optimiser for the year 2025-26. As such, the apparent stabilisation in performance between 2024-25 and 2025-26 simply reflects that the end point of AMP7 is also the logical baseline for programme optimisation from 2025-26 onwards.
- There is zero capital expenditure to be reported against line 8ci.

1.9.1.2 AMP 8-12

- The baseline profile starting in 2026 with 12.9 sewer collapses per 1000km is an output of the DWMP BRAVA modelling. The risk of sewer collapse has been modelled across the 2020, 2030 and 2050 design horizons. This has been interpolated between these modelled years. From 2025 to 2030, the baseline displays a decline in the risk of sewer collapse. This is a result of benefit associated with AMP7 investment and delivery of DNM being factored into the baseline reducing the modelled baseline sewer collapses risk.
- All AMP8 to AMP 12 base and enhancement values are outputs from the DWMP modelling and are based upon the AMP8 to AMP12 baseline position. The profiling of both investment and performance are derived from the decision support tool UUW have utilised to optimise the selection of interventions to resolved flooding, pollution and collapses. This cannot be viewed as a delivery profile as, in addition to the modelling horizons points mentioned previously, it does not consider supply chain optimisation or location specific option design and implementation.
- Expenditure for this planning objective is zero as the target of the flooding, pollution and collapses optimisation process was to achieve reductions in pollution incidents and internal flooding from a sewer - with synergy of benefits against other planning objectives. Therefore, expenditure is divided as a proportion of benefit across the pollution and internal flooding planning objectives only.

1.10 Internal Flooding

1.10.1 Section 9a – 9ciii

1.10.1.1 AMP7

- Due to the unique operating circumstances in the North West, including a 40% higher than average urban rainfall and the highest percentage of combined sewers in the industry, UUW considers that its' end of AMP7 performance commitment level for internal sewer flooding (1.34 incidents per 10,000 sewer connections) is unattainable.
- Therefore, the specified 2024-2025 baseline reflects a more realistic performance forecast of 2.9 internal sewer flooding incidents per 10,000 sewer connections. We recognise that the previous 2 years have been atypically dry and therefore it is unlikely that the FY22 and FY23 levels of performance can be sustained. Thus, whilst UUW has made significant reductions in 'Flooding Other Causes' flooding, primarily through deployment of our industry-leading DNM initiative, UUW remain disproportionately susceptible to severe weather. We therefore consider that a forecast of 2.9

incidents per 10,000 sewer connections appropriately reflects the balance between predicted performance improvements and the ongoing risk of severe weather.

- For 2024-25, the input value remains the same across the 'baseline, base and enhancement' lines as the value is both the optimiser baseline and unaffected by any enhancement expenditure from AMP8 onwards.
- There is zero capital expenditure to be reported against line 9ci.

1.10.1.2 AMP 8-12

- The baseline profile starting in 2026 with 2.17 internal sewer flooding incidents / escapes per 10,000 sewer connections is an output of the DWMP BRAVA modelling. This aligned with the expected performance in 2026. The risk of internal flooding has been modelled across the 2020, 2030 and 2050 design horizons. This has been interpolated in between these modelled years and from 2020 to 2030 the baseline displays a decline in the internal flooding risk. This is a result of benefit associated with AMP7 investment and the delivery of Dynamic Network Monitoring (DBM) being factored into the baseline, reducing the modelled baseline internal flooding risk.
- All AMP9 to AMP 12 base and enhancement values are outputs from the DWMP modelling and are based upon the AMP8 to 12 baseline position and aligned with AMP7 performance commitments and our current view of AMP8. The profiling of both investment and performance are derived from the decision support tool UUW have utilised to optimise the selection of interventions to resolve flooding, pollution and collapses. This cannot be viewed as a delivery profile as, in addition to the modelling horizons points above, it does not consider supply chain optimisation or location specific option design and implementation.
- It is a challenging task to determine the expenditure associated with a particular planning objective due to the selection of options for the UUW DWMP program, which have been carefully chosen to yield benefits across multiple planning objectives. To address this, UUW has developed and introduced a methodology that divides costs based on the various benefits achieved. The optimisation process focused on reducing pollution incidents and internal flooding, leading to the apportionment of costs per selected option by the normalised benefit of pollution and internal flooding, respectively. The internal sewer flooding component of capital expenditure, operational expenditure, and subsequent total expenditure is presented on an annual basis.

1.11 Storm Overflows – screening

1.11.1 Section 10a – 10ciii

1.11.1.1 AMP 7

- The table definition refers to the Wastewater Planning Users Group (WAPUG) guidance, however, UUW believe that this has been superseded by the Environment Act.

EnvAct_IMP5	Improvements to reduce storm overflow aesthetic impacts by installation of screens.

- The requirement for screening under the Environment Act only comes into force in the next business planning cycle as indicated though the Environment Agency's WINEP driver guidance and therefore sites with EnvAct_IMP5 drivers will only be considered a requirement from AMP8 onwards.
- In FY25 a site can be identified for an aesthetic requirement by the Environment Agency via an agreed aesthetic programme or the WINEP.
- Four sites have been identified for a March 2025 completion date. One site is still under discussion and therefore has been excluded from this table whilst discussions are ongoing with the Environment Agency, this site is BOL0039. One site is not due to complete in AMP7 and this is OLD0100 Snipe Clough.

1.11.1.2 AMP 8-12

- The 421 number of sites identified within the baseline, are storm overflows that require an aesthetic solution only (no spill frequency reduction).
- AMP8-12 values includes the regulatory requirements of the SODRP introduced since AMP7 for implementation from AMP8 onwards.
- Base values are identical to baseline as it is assumed that all interventions to address aesthetic drivers will be via enhancement funding, as they are a new obligation from the Environment Act.
- Post enhancement values are profiled based on an assumption of steady investment in line with the SODRP targets for AMPs 9-12.
- UUW feel the summation of these lines per AMP is mathematically inappropriate and have therefore presented end of AMP positions for AMPs 8-12. To illustrate this, the summed values for these cells are presented below for context in Table 7:

Table 7 Summed Screening only (aesthetic)

AMP	Baseline	Base	Enhancement
8	2105	2105	2105
9	2105	2105	2000
10	421	421	211
11	421	421	106
12	421	421	0
Total 25 yr	**5473**	**5473**	**4422**

1.12 External sewer flooding

1.12.1 Section 11a – 11ciii

1.12.1.1 AMP 7

- The 2024-2025 position of 16.4 incidents per 10,000 sewer connections represents a highly stretching and ambitious performance forecast for the end of AMP7.
- For 2024-25, the input value remains the same across the 'baseline, base and enhancement' lines as the value is both the optimiser baseline and unaffected by any enhancement expenditure from AMP8 onwards.

1.12.1.2 AMP 8-12

- The baseline profile starting in 2026 with 16.8 external sewer flooding incidents / escapes per 10,000 sewer connections is an output of the DWMP BRAVA modelling. The risk of external flooding has been modelled across the 2020, 2030 and 2050 design horizons. This has been interpolated between these modelled years and from 2020 to 2030 the baseline displays a decline in the external flooding risk. This is a result of benefit associated with AMP7 investment and the delivery of DNM being factored into the baseline, reducing the modelled baseline external flooding risk.
- All AMP9 to AMP12 base and enhancement values are outputs from the DWMP modelling and are based upon the AMP8 to 12 baseline position and aligned with AMP7 performance commitments and our current view of AMP8. The profiling of both investment and performance are derived from the decision support tool UUW have utilised to optimise the selection of interventions to resolve flooding, pollution and collapses. This cannot be viewed as a delivery profile as, in addition to the modelling horizons points above, it does not consider supply chain optimisation or location specific option design and implementation.

- It is a challenging task to determine the expenditure associated with a particular planning objective due to the selection of options for the UUWs DWMP program, which have been carefully chosen to yield benefits across multiple planning objectives. To address this, UUW has developed and introduced a methodology that divides costs based on the various benefits achieved. The optimisation process focused on reducing pollution incidents and internal flooding, leading to the apportionment of costs per selected option by the normalized benefit of pollution and internal flooding, respectively.
- Expenditure for this planning objective is zero as the target of the flooding, pollution and collapses optimisation process was to achieve reductions in pollution incidents and internal flooding from a sewer, with synergy of benefits against other planning objectives. Therefore, expenditure is divided as a proportion of benefit across the pollution and internal flooding planning objectives only.

1.13 Open spaces flooding

1.13.1 Section 12a – 12ciii

1.13.1.1 AMP 7

- As UUW does not have a PCL for this measure, the forecast for 2024-25 has been derived from actual performance for 2020-21 and 2021-22. An average of performance for these two years has been calculated and taken as the performance level for 2024-25, assuming a flat profile for the remainder of the AMP.
- For 2024-25, the input value remains the same across the 'baseline, base and enhancement' lines as the value is both the optimiser baseline and unaffected by any enhancement expenditure from AMP8 onwards.

1.13.1.2 AMP 8-12

- The baseline profile starting in 2026 with 3.7 open spaces sewer flooding incidents / escapes per 10,000 sewer connections is an output of the DWMP BRAVA modelling. The risk of open spaces flooding has been modelled across the 2020, 2030 and 2050 design horizons. This has been interpolated between these modelled years and from 2020 to 2030 the baseline displays a decline in the open spaces flooding risk. This is a result of benefit associated with AMP7 investment and the delivery of DNM being factored into the baseline, reducing the modelled baseline open spaces flooding risk.
- All AMP9 to AMP12 base and enhancement values are outputs from the DWMP modelling and are based upon the AMP8 to 12 baseline position and aligned with AMP7 performance commitments and our current view of AMP8. The profiling of both investment and performance are derived from the decision support tool UUW have utilised to optimise the selection of interventions to resolve flooding, pollution and collapses. This cannot be viewed as a delivery profile as, in addition to the modelling horizons points above, it does not consider supply chain optimisation or location specific option design and implementation.
- It is a challenging task to determine the expenditure associated with a particular planning objective due to the selection of options for the UUWs DWMP program, which have been carefully chosen to yield benefits across multiple planning objectives. To address this, UUW has developed and introduced a methodology that divides costs based on the various benefits achieved. The optimisation process focused on reducing pollution incidents and internal flooding, leading to the apportionment of costs per selected option by the normalized benefit of pollution and internal flooding, respectively.
- Expenditure for this planning objective is zero as the target of the flooding, pollution and collapses optimisation process was to achieve reductions in pollution incidents and internal flooding from a sewer, with synergy of benefits against other planning objectives. Therefore, expenditure is divided as a proportion of benefit across the pollution and internal flooding planning objectives only.

2. Expenditure table

2.1 Overarching Commentary

2.1.1 AMP8 to 12

- Unless otherwise stated AMP8 to 12 forecasts are outputs from the DWMP modelling exercise. Where data for specific years was not available from the DWMP planning horizons of 2020 (baseline), 2030 and 2050, data has been interpolated for the intervening years. A year-by-year view of this data cannot be viewed as a delivery or performance programme.
- AMP8 is assigned across the 5 years of AMP8 and the first 3 years of AMP9 based on the submitted WINEP schedule as of January 2023.
- AMP9-12 are assigned at year 5 of each AMP, as these are, neither engineered, nor costed values. It is anticipated delivery will be throughout each of the AMP's.
- Forecasts are not guarantees of future performance or cost. There are a number of factors, many of which are beyond reasonable management control that could cause performance and costs to differ materially. Please see the disclaimer tab in our data tables for fuller context.

2.1.2 All AMPs expenditure and output profiles

- Please note that it is not always possible to directly link benefits or outputs to expenditure as expenditure may occur over a number of preceding years before benefits are realised.
- Many options included in our plan are providing benefits to multiple planning objectives. As such, the allocation of costs to individual planning objectives, as required by the tables, will be based on a simple split and therefore may be imprecise in some circumstances. These allocations should not be viewed as representative unit cost versus performance ratios for those individual planning objectives.

2.1.3 Optimisation

- Draft DWMP included high level costs, based on grey storage only, for storm overflows and the Government's Storm Overflows Discharge Reduction Plan (SODPR). Since that time further work has been done to look at the AMP8 programme and include blue-green and hybrid options. This learning has been applied to the AMP9-12 period for overflows in terms of costs and solutions blends, but this is of course subject to change with better information on-site specific requirements, limitations and opportunities to increase blue-green solutions etc. Additionally, the WINEP has not been finalised at this time so it is likely DWMP data tables will need to be resubmitted at PR24 to reflect any changes.

2.1.4 Interpretation of data tables

- Please note that some areas needing interpretation have been found in the final version of the tables issued on 12/07/22 version C. UUW has therefore undertaken the following:

2.1.4.1 Decimal points

- The data tables do not specify decimal places. UUW are therefore submitting data on a consistent basis to previous regulatory submissions, i.e.:
  - Three decimal places for monetary cells which are in £m;
  - Two decimal places for percentages; and
  - One decimal places for counts and numbers.

2.1.4.2 Totals in tables

- Totals are not always appropriate so in some circumstances we have changed this to better reflect the line and denominator. This has been done in relation to: Table 1A and 1B Benefits - Percentage

of properties at risk of sewer flooding in a 1 in 50 storm. For this metric, UUW have used the end of AMP performance instead of total.

2.1.4.3 Assumptions

- Opex is derived from the WINEP data as a percentage of capex cost to be applied on an annual basis.
- Opex costs start in year 5 of the implementation AMP.
- All opex is classified as enhancement, to identify the costs within DWMP, but once schemes are commissioned will become base in later DWMP cycles.
- UUW's overflow investment means that we UUW will be retaining flow in the sewerage system through additional storage and removing flow from the system through rainwater management. There will be operating costs associated with maintaining both these additional and new assets. Operating expenditure as a result of overflow investment includes: on-going costs for pumping more flow through the system; treating the additional flow; and maintenance of the UUW nature based solutions and mechanical assets. Building new infrastructure also requires UUW to pay business rates, which represents a significant proportion of UUW's additional operational costs. Business rates only apply to non-network assets.
- Capex in AMP9 to AMP12, is neither fully engineered, fully costed, nor scheduled, and it is anticipated some delivery will be earlier throughout each of the relevant AMP's and not all in year 5 of the AMP. For AMP8 UUW will continue to review solutions to seek more blue-green components where possible and cost efficient.

2.1.5 Expenditure and cost indexation

- All financial numbers are presented in FY21 prices as per the reporting requirements.

2.1.6 Reduction in GHG emissions

- Please note that the profiles for carbon are developed from the investment profiles generated from the optimised output. These are based on an optimised plan, rather than a delivery / implementation plan which will follow the submission of the DWMP.
- The 'reduction in GHG emissions' lines have been completed against a baseline of 'do nothing', consequently all options lead to some increase in operational GHG emissions and thus negative values are presented.
- GHG emissions have been calculated for the DWMP programme only, and do not include other aspects of business growth which are assessed through other programmes or other centralised business forecasting.
- The approach implemented to select options for the preferred plan has supported lower carbon options amongst other decision factors, these have reduced since our draft submission. UUW has sought to reduce and avoid emissions through the options hierarchy implemented in the DWMP.

2.2 Table 1A - Additional Network Storage – GREY

- The completion of this table is the combination of two distinct methodologies derived from UUW options development and appraisal routes. Options development to resolve flooding, pollution and collapse events has been completed using a decision support tool to aid strategic programme development. Whereas UUW DWMP overflow programme has been developed by UUW DWMP engineers combining Our Better Rivers Plan, WINEP and on-going commitments to achieve the government's Storm Overflows Discharge Reduction Plan.

2.2.1 Flooding, Pollution and Collapses Outputs

- All AMP8 to AMP12 performance values are outputs from the DWMP modelling and are based upon the AMP8 to AMP12 baseline position and aligned with AMP7 performance commitments. The

profiling of both investment and performance are derived from the decision support tool UUW have utilised to optimise the selection of interventions to resolved flooding, pollution and collapses. This cannot be viewed as a delivery profile as, in addition the modelling horizons points above, it does not consider supply chain optimisation or location specific option design and implementation. Option types selected by the decision support tool were filtered by those applicable to network storage (grey) and the results were displayed annually.

- The permeable area inflow removed from entering the network or stored in the environment was derived from the summation of the options selected per annum.

2.2.2 Storm Overflows

- All AMP8 to AMP12 values are derived from the UUW overflows database and WINEP submission and are based upon the AMP8 to AMP12 baseline position and aligned with both AMP7 and WINEP commitments. The profiling of both investment and performance are derived from alignment with WINEP for AMP8 and end of AMP for AMP9 to AMP12.
- This cannot be viewed as a delivery profile as, in addition to the WINEP alignment point above, it does not consider supply chain optimisation or location specific option design and implementation.
- The WINEP analysis to determine the target hybrid scheme split between the grey and blue/green storage was 70% grey and 30% Blue/Green (SuDS). Based on the WINEP alignment and general limited space available at Wastewater treatment Works (WwTW's), only grey storage elements are located at WwTW and the blue/green storage elements are all located within the network.

2.3 Table 1B – Upstream surface water separation/removal – Blue/Green

- The completion of this table is the combination of two distinct methodologies derived from UUW options development and appraisal routes. Options development to resolve flooding, pollution and collapse events has been completed using a decision support tool to aid strategic programme development. Whereas UUW DWMP overflow programme has been developed by our DWMP engineers combining Our Better Rivers Plan, WINEP and ongoing commitments to achieve the government's SODRP.

2.3.1 Flooding, Pollution and Collapses Outputs

- All AMP8 to AMP12 performance values are outputs from the DWMP modelling and are based upon the AMP8 to AMP12 baseline position and aligned with AMP7 performance commitments. The profiling of both investment and performance are derived from the decision support tool UUW have utilised to optimise the selection of interventions to resolved flooding, pollution and collapses. This cannot be viewed as a delivery profile as, in addition to the modelling horizons points above, it does not consider supply chain optimisation or location specific option design and implementation. Option types selected by the decision support tool were filtered by those applicable to upstream surface water separation / removal or other network storage blue / green separation & storage and the results were displayed annually.
- As part of the option development process UUW created numerous surface water separation / removal engineering options for each Tactical Planning Unit (TPU) of differing permeable area. The decision support tool had license to select the most optimal option for the risks present in each TPU. The total permeable area inflow removed from entering the network or stored in environment was generated for each of the options in the development phase and those selected in the DWMP are summed per annum.
- As the results of line "Percentage of properties at risk of sewer flooding in a 1 in 50 storm" are displayed as a percentage UUW believes the summation of these results per AMP is mathematically inappropriate and have therefore presented end of AMP positions for AMPs 8-12. The summed values for these cells are presented below in Table 8:

Table 8 Percentage of properties at risk of sewer flooding in a 1 in 50 storm summed

AMP	Enhancement
8	74.40%
9	79.79%
10	97.29%
11	82.05%
12	83.07%
Total 25 yr	**400.28%**

2.3.2 Storm Overflows

- All AMP8 to AMP12 values are derived from the UUW overflows database and WINEP submission and are based upon the AMP8 to AMP12 baseline position and aligned with both AMP7 and WINEP commitments. The profiling of both investment and performance are derived from alignment with WINEP for AMP8 and end of AMP for AMP9 to AMP12.
- This cannot be viewed as a delivery profile as, in addition to the WINEP alignment point above, it does not consider supply chain optimisation or location specific option design and implementation.
- The WINEP analysis to determine the target hybrid scheme split between the grey and blue/green storage was 70% grey and 30% Blue/Green (SuDS). Based on the WINEP alignment and general limited space available at WwTW's, only grey storage elements are located at WwTW and the blue/green storage elements are all located within the network. It is noted Southwaite WwTW recently included blue/green solutions on site, and during future engineering and costing some blue/green may be located at the WwTW sites. DWMP cycle 2 onwards will account for any of these types of optimisation on a site specific basis.

2.4 Table 2A - Additional WwTW storage - GREY

2.4.1 Storm Overflows

- All AMP8 to AMP12 values are derived from the UUW overflows database and WINEP submission and are based upon the AMP8 to AMP12 baseline position and aligned with both AMP7 and WINEP commitments. The profiling of both investment and performance are derived from alignment with WINEP for AMP8 and end of AMP for AMP9 to AMP12.
- This cannot be viewed as a delivery profile as, in addition to the WINEP alignment point above, it does not consider supply chain optimisation or location specific option design and implementation.
- The WINEP analysis to determine the target hybrid scheme split between the grey and blue/green storage was 70% grey and 30% Blue/Green (SuDS). Based on the WINEP alignment and general limited space available at WwTW's, only grey storage elements are located at WwTW and the blue/green storage elements are all located within the network.

2.5 Table 2B - BLUE/GREEN Interventions at WwTWs

- As part of the high-level planning process of the DWMP, no surface water separation or blue/green solutions have been identified at WwTWs where the impact of these solutions will be minimal on the volume of surface water entering the system.

2.6 Table 3 - Interventions at WwTWs – additional treatment capacity

- As part of the BRAVA process, Pass Forward Flow (PFF) flow has been modelled based on predicted population growth and climate change in each of the DWMP TPUs. AMP8 flow data has been derived from WwTWs where an assumed theoretical multiple of flow (3 Dry Weather Flow (DWF)) exceeds the current PFF permit. The difference between the modelled PFF based on 3DWF has been subtracted from the current PFF permit then 10% has been added to the total. This is because any required capacity would be expected to enable PFF to be below the numeric permit not equalling it. Some WwTW have agreed flow limits above permitted values agreed by the EA which have been excluded from calculations. This table doesn't represent the level of investment we have identified in Table 1 Outcomes, lines 2ci -2ciii. Many of our WwTW are designed to treat more than 3DWF already (often as a resolution to Unsatisfactory Intermittent Discharges (UIDs)), so this may not be comparable to other water companies where a solution to increase PFF may be implemented to ensure at least the minimum multiple of flow is treated and to mitigate compliance (and CSO activation) risk.
- It should be noted that investment at UUW wastewater treatment works to accommodate growth does not always lead to increasing the pass forward flow (PFF) through the works. Investment often includes enhancement (or addition) of individual process units to treat the additional loads within the permitted PFF. AMP8 expenditure presented is from UUW's supply and demand programme for AMP8. Expenditure from AMP9 to AMP12 has been derived from the outputs of the DWMP programme process, filtered to be specifically linked to increased treatment capacity. Furthermore, the sites identified as likely to exceed PFF permit due to growth and climate change. This excludes options derived from the WINEP, and options related to modification of permits. Options related to DWF compliance in AMP8 have also been excluded as they are regarded as 'betterment' costs of replacing life-expired assets with modern equivalent assets which comply with legally required minimum standards which are higher than those they replace, rather than 'enhancement' expenditure.
- It should be noted that there are a number of cells which have expenditure, but no corresponding outputs. This is because project expenditure will often span a period of years during construction, yet the output will not be delivered until a future year.
- As the results of line "Interventions at WwTWs – additional treatment capacity" are displayed as a cumulative value increasing with time. UUW feel the summation of these results per AMP is mathematically inappropriate and have therefore presented end of AMP positions for AMPs 8-12. The summed values for these cells are presented below in Table 9:

Table 9 Summed Additional Treatment Capacity at WwTW

AMP	Summed Ml/d
8	17.22
9	48.64
10	79.38
11	86.37
12	93.78
Total 25 yr	**325.39**

2.7 Table 4 - Interventions at storm overflows - screening

2.7.1 Storm Overflows

- All AMP8 to AMP12 values are derived from the UUW overflows database and WINEP submission and are based upon the AMP8 to AMP12 baseline position and aligned with both AMP7 and WINEP commitments. The profiling of both investment and performance are derived from alignment with WINEP for AMP8 and end of AMP for AMP9 to AMP12. AMP9 to AMP12 are neither engineered, nor costed values, and it is anticipated delivery will be throughout each of the relevant AMP's.
- This cannot be viewed as a delivery profile as, in addition to WINEP alignment point above, it does not consider supply chain optimisation or location specific option design and implementation.
- The screen only solutions are all considered as "not had a screen installed previously", and have been assigned evenly across AMP9 to AMP12. As these schemes are engineered and costed they will be optimised to align with other works.

2.8 Table 5 - Reduction in Operational GHG emissions

- UUW recognises that there are some cases where operational processes will increase efficiency e.g. where a scheme replaces an asset and consequently improves asset health, this could reduce operational GHG emissions. These efficiencies have not been calculated within the scope of the DWMP.
- To calculate operational GHG emissions, the emissions associated with repair, maintenance and replacement have been incorporated as well as the on-going operational energy (location-based, based on current emission factors), water and chemicals over the lifecycle of the scheme up to 2050. This is aligned to the 'use stage' emissions outlined in BS EN 15978:2011
- The benefits / dis-benefits of land-use change, as a result of DWMP interventions, have not been included within this assessment.

2.9 Table 6 - Reduction in Embodied GHG emissions

- UUW is committed to carbon reduction activity as set out in the carbon pledges. The DWMP has not considered specific carbon sequestration schemes (e.g. tree planting and peatland restoration), as this activity is not directly driven by DWMP planning objectives.
- To calculate embodied emissions, UUW have incorporated the emissions associated with the construction of a scheme type aligned to the 'before use stage' emissions outlined in BS EN 15978:2011, using current emission factor data sets for these activities as appropriate.

2.10 Table 7 - Significant DWMP & PR24 schemes

- UUW has identified all schemes that will potentially cost more than £200 million (totex) over 25 years. The number and location(s) of the projects could change following PR24 solution development and updated WINEP guidance. Total cost is difficult to define with adaptive plans and includes multiple assets.
- UUW have submitted based on an estimated cost of greater than £200 million (totex) for all schemes identified until better definition of cost and scope is available.
- A delivery date of 2035 has been selected for all locations as the solution will be part of an adaptive plan over multiple AMPs, but the environmental requirements will drive a delivery timescale that is sooner than 2050. There may be additional investment required between 2035 and 2050 as part of these solutions, but this depends on the outcomes of the initial interventions.

- All locations have had significant environmental primary planning objectives and drivers identified, the extent of these is to be established as the WINEP is further defined with the Environment Agency.
- Additionally, other planning objectives may arise as locations identified may require interventions to accommodate growth to ensure compliance with current and future permit limits. They will include interventions to mitigate upstream network risk if appropriate (such as storm overflow spill reduction).
- All solutions will be developed to include: Updated WINEP requirements as they are made available; Enhancement interventions to accommodate growth and achieve compliance; and Enhancement of the network to mitigate risk from overflow spills and flooding where appropriate. The solutions will be developed as part of an adaptive plan, so allocations for cost and timescales will change as the plans are developed. AMP8 solutions will be better developed between final DWMP submission and final PR24 business plan submission.

2.11 Table 8 - Key Partnership schemes

2.11.1 Overview

- The partnership expenditure reported in Table 8 includes potential partnership opportunities included in the UUW DWMP, including relevant schemes in the WINEP. In addition, UUW have included potential Advanced WINEP opportunities, which, at the time of writing, are still to be finalised and are therefore subject to change. UUW have excluded partnership schemes associated with other plans and areas of activity such as water catchment schemes.
- In summary, the table illustrates UUWs latest understanding of how partnerships can support the delivery of the DWMP, and is an indicator of our bold ambitions to further grow and mature the ways we work in partnership to deliver more benefits for customers and the wider society. The partnerships table is a forecast based on a combination of scheme level detail and top down estimates. All of the figures are forecast estimates and will be subject to change as UUW continues to develop the business plan and investment decisions. UUW have identified the potential of £302m forecast expenditure associated with an estimated potential partner forecast input of £61m.
- The partner input totals reported in the data table represent funding which provides direct benefits to the service outcomes being delivered by the DWMP. UUW have excluded additional leveraged funding to deliver wider social and environmental benefits to the North West. UUW has taken this approach to enable clarity and avoid confusion or potential double counting. In the PR24 business plan, UUW will provide a full partnerships plan, including for areas outside the DWMP, and this will explore the potential wider contributions for wider benefits.

2.11.2 Development of our partnership approach within the DWMP

- UUW has built on a strong legacy of advanced partnership working to stretch UUW thinking for the best approach to the DWMP. Following extensive stakeholder engagement activities and development of a rich partnership opportunities pipeline, UUW continue to actively work with a range of partners to pursue partnership project opportunities (both existing and new). UUW are working collaboratively with the aim to co-design, co-develop and investigate co-funding to jointly assess the feasibility of these opportunities and support them along the partnership maturity journey towards formal project delivery. Through UUWs long history of partnership working, UUW has experience of co-designing, co-delivering and co-funding partnership projects with a range of different organisations.
- UUW has completed the partner details cells as ‘various’ as the schemes continue to develop and are at potential/scoping or feasibility testing stage and UUW will provide further details as UUW moves towards delivery.

- UUW are working to refine and develop partnership scheme plans in-line with the business plan timescales and look forward to sharing more details on the schemes and the overarching partnership ambition.

2.11.3 Managing uncertainties in working in partnership

- Partnerships have unique features that are not easily aligned to the traditional regulatory framework. Delivering projects with multiple drivers through different partnerships takes time to explore and establish, and requires flexibility. The UUW business processes and culture reduces barriers to partnership working, however, due to the inherent uncertainty associated with partnerships there are still challenges to overcome:
  - Partnership schemes take longer to develop due to the engagement and coordination required among multiple third parties that have different goals and values;
  - A level of certainty (both in terms of funding and objectives) is often required before potential partners will engage with us to explore opportunities;
  - Partners' funding arrangements may be time sensitive or subject to internal budget arrangements/changes, which may not align to the five-yearly price review cycle; and
  - Partnership schemes are reliant upon all parties being able to progress to partnership delivery. If there are obstacles to this, a partnership may not be able to progress and schemes may not advance due to reasons outside of any partner's direct control.
- To secure the full benefits of partnerships, and manage the inherent risks and challenges, it is essential that UUW remain flexible and agile to enable timely and responsive action as partnership opportunities emerge and evolve. This is also key to adapting to the unique nature of all partnerships and incorporating elements of flexibility.

2.11.4 Scope of partnership expenditure

- UUW expect schemes associated with catchment management, Sustainable Drainage Solutions (SuDS) and Natural Flood Management (NFM) to provide most of the opportunities for delivering in partnership to meet DWMP plans. UUW has used a combination of source data to provide forecast expenditure associated with the SuDS and NFM schemes. The catchment management schemes are based on individual scheme costings in-line with the WINEP submission.
- The data table provides a list of key schemes associated with delivering the DWMP. There may be additional opportunities for partnership working associated with other schemes.

2.11.4.1 Line 1 – SuDS and NFM to reduce storm overflow operation

- The ambition for SuDS and NFM potential partnership opportunities is based upon the UUW Advanced WINEP proposal, to create the flexibility to unlock greater partnership delivery of rainwater management solutions with a particular focus on Greater Manchester. The proposal is at draft stage and subject to approval from regulators, therefore, will be subject to change. The expenditure is based upon the latest costed proposal.
- The cells for AMP9-12 have been left intentionally blank as the planning for AMP9-12 will be informed through AMP8 delivery.

2.11.4.2 Line 2 - SuDS hybrid solutions to address storm overflows

- The level of SuDS partnership funding is based on the current view of investment for AMP8 as part of the WINEP submission to meet regulatory requirements for storm overflows. The expenditure forecast is based upon a programme of hybrid schemes submitted in the January 2023 WINEP.
- The ability to deliver schemes in partnership is challenging due to the accelerated pace of delivery required for the storm overflow programme. Partnerships take time to develop, objectives to be aligned and the technical suitability and stakeholder acceptability can also be challenging for delivery. UUW has an aspiration to deliver through partnership solutions, however, there are key

challenges which mean UUW has applied a modest assumption for delivery. Through the Advanced WINEP proposal UUW aim to remove conventional barriers to allow to flexibly co-plan and co-deliver with partners to access a combination of funding streams.

- UUW has assumed [✂]delivery through partnership with a leverage funding ratio of [✂] to build an estimate for partnership expenditure. The estimate assumptions reflect the uncertainty and some of the barriers associated with delivering these schemes.
- The cells AMP9-12 have been left intentionally blank due to the level of uncertainty of future WINEP drivers over this timescale.

2.11.4.3 Line 3 details the SuDS to address flooding and pollution AMP8 - AMP12

- The level of SuDS partnership funding is based on the current view of investment for AMP8 and beyond. SuDS investment has been modelled to identify the scale of work required to meet UUW's planning objectives. The modelled output includes forecast data for AMP8-12 and the partnership expenditure forecast has been derived using a top down estimate.
- A valuation of natural capital has been included in the current programme build to promote sustainable solutions. The modelling gives an initial view of the scale of investment and potential geographic areas to target to deliver the required improvement. This may change as part of the further detailed design of solutions and engagement with customers and stakeholders. UUW are collectively exploring opportunities to deliver SuDS with partners. UUW has identified a number of priority areas.
- UUW has an ambition to deliver [✂]of the DWMP SuDS (flooding and pollution) expenditure through partnerships, however, the pace of delivery, land requirement, technical suitability and stakeholder acceptability of SuDS solutions can impact our ability to deliver schemes and leverage funding from partners.
- UUW has used a leverage funding ratio of [✂] to build the estimate for partnership expenditure. The estimate of leveraged funding reflects the uncertainty and some of the barriers associated to delivering these schemes.
- As UUW progress delivery of these SuDS schemes and gain more experience, UUW aims to increase stakeholder acceptance of the efficacy of solutions therefore maximising the opportunity to deliver SuDS through partnerships.

2.11.4.4 Lines 4-12 UUW catchment interventions

- As part of the UUW WINEP submission, UUW has identified nine catchment schemes which have the potential to be delivered through partnership. They are hybrid solutions that include a WwTW intervention along with a catchment management intervention to deliver catchment nutrient balancing. UUW has a long history of catchment management experience and a large range of well-developed relationships. Through this long history of catchment management experience, and relationships with the key stakeholders in the geographic area, these schemes have higher confidence of progressing to partnership delivery.
- The partnership expenditure forecast has been derived from scheme specific costings using the UUW catchment intervention estimation model. Each scheme has a unique split of UUW contribution and partnership contribution.
- The identified catchment schemes will be further developed through detailed design. Based on UUW past experience of catchment scheme delivery in partnership, the ambition is to deliver 100% of the defined catchment expenditure through partnerships.
- UUW has excluded forecast data for AMP9 and beyond due to the level of uncertainty of the WINEP drivers over this timescale.
- Whilst UUW are confident of partnership delivery, it's too early to finalise which specific partners UUW will be working with on the catchment schemes. However, from experience and existing

established relationships within Cumbria, UUW are able to identify a range of potential partners we will engage with, and already are. This forms part of the scoping phase of the project development.

3. Adaptive plans table

3.1 Overarching assumptions

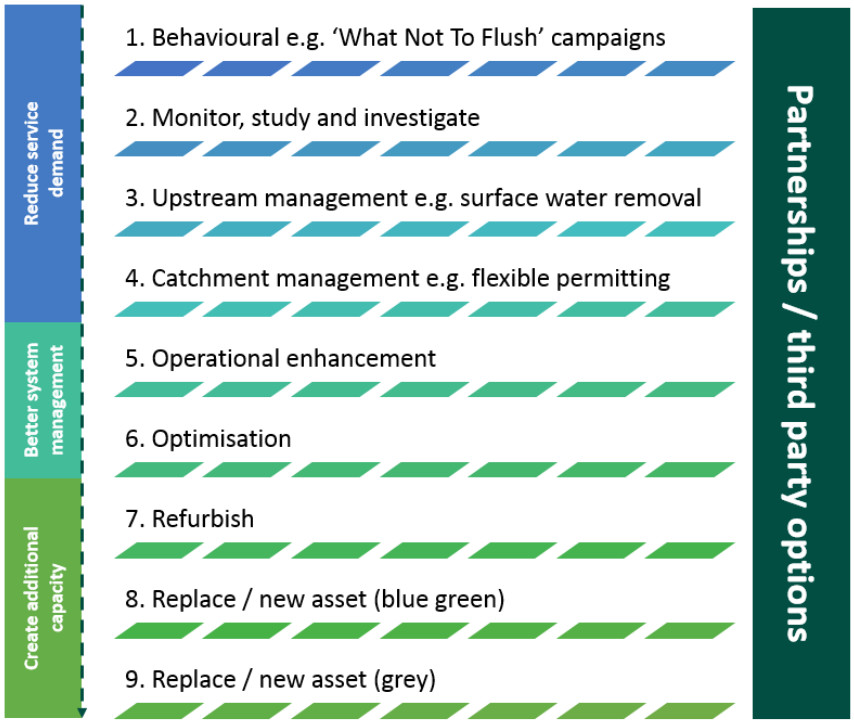
- UUW have completed the adaptive plans tables with reference to the discretionary components of the DWMP preferred plan. Due to the statutory nature of both the WINEP and Storm Overflows Discharge Reduction Plan (SODPR), these have been excluded.
- The results included in these lines, therefore, only relate to the optimised components of flooding, pollution and sewer collapses.

3.2 Core pathway

3.2.1 Best value, low climate change scenario

- UUW used a decision support tool to model a low climate change scenario from 2025 to 2050 against our DWMP planning objectives. The option hierarchy (Figure 1) selection philosophy used for this scenario was established from customer research (as detailed in DP1, the UUW DWMP Main Document). This best value approach has been used irrespective of climate and population growth risk.
- To emulate a benign climate change scenario UUW assumed no increase in risk associated with the hydraulic components for flooding, pollution and collapse risk after 2030 (i.e. stable climate change to 2050). Baseline performance is aligned with forecasted performance predictions at the end of AMP8. The difference in scale and nature of the baseline risk between 2030 and 2050 impacts the blend and number of options selected to meet the DWMP planning objectives. The total expenditure associated with the options selected is presented in Table AP0.
- Tables AP1 and AP2 represent the breakdown of investment required to meet UUW's internal flooding and pollution planning objectives respectively.

Figure 1 UUW DWMP Options Hierarchy



- The interventions associated with this scenario are seen to be the 'no regrets' options of the DWMP due to the very unlikely scenario that the rate of climate change will be benign or low between present day and 2050.

3.3 Preferred Plan

3.3.1 Best value, high climate change

- UUW's preferred plan is as described in the core pathway scenario with one key change in assumption; that future climate change is in-line with RCP8.5 (high climate change).
- The optimised output contained within the preferred plan lines in tables A0-A2 is as described in the UUW DWMP Main Document (DP1) preferred plan narrative.
- UUW used a decision support tool to model a high climate change scenario from 2025 to 2050 against our DWMP planning objectives.
- The total expenditure associated with the options selected is presented in table AP0.
- Tables AP1 and AP2 represent the breakdown of investment required to meet UUW's internal flooding and pollution planning objectives respectively.
- The interventions associated with this scenario are seen to be the preferred options of the DWMP due to the likely scenario that the rate of climate change will be high between present-day and 2050. Equally, these options have been chosen based upon our DWMP options hierarchy (Figure 1).
- The interventions chosen within the preferred plan have a combination of short, medium and long-term asset lives. Those options with medium and long-term asset lives will continue to operate past the 2050 planning horizon of the DWMP.

3.4 Alternative Pathway 1

3.4.1 Lowest Whole Life Cost

- UUW's lowest whole life cost scenario uses the same most likely climate change and population growth rates for baseline risk as the preferred plan scenario. The decision support tool has based option selection philosophy solely on cost benefit ratio of options rather than options hierarchy. Prioritising meeting planning objective targets in the most cost effective way irrespective of option type selected to achieve this; ignoring wider multi-capital benefits. Starting performance is aligned with forecast performance predictions at the end of the AMP8.
- The total expenditure associated with the options selected is presented in table AP0.
- Tables AP1 and AP2 represent the breakdown of investment required to meet UUW's internal flooding and pollution planning objectives respectively.

United Utilities Water Limited
Haweswater House
Lingley Mere Business Park
Lingley Green Avenue
Great Sankey
Warrington
WA5 3LP

United Utilities

Water for the North West