

DWMP 28



Our Drainage and Wastewater Management Plan 2030-2055

Delivering for customers, communities and the environment

Performance Indicator Methodology - Storm Overflow Performance (England)

March 2026





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This methodology document is a working draft based on the requirements of the published DWMP guidance and informed by agreements made through the Water Industry Task and Finish Groups for each Performance Indicator (PI). As the DWMP stages for each PI progress, this methodology will be refined to reflect the practicalities of deployment and feedback from stakeholders. A final published methodology document will describe the detailed approach followed.



1. Introduction

- 1.1. This document provides a detailed description of the **Storm Overflow Performance Indicator** and its purpose and contribution to forming our Drainage and Wastewater Management Plan (DWMP).

Purpose of this document

- 1.2. The purpose of this document is to outline the methodology that will be used to establish the base year and future baseline forecasts for the **Storm Overflow Performance Indicator**, as part of our DWMP for the 2030-2055 planning period. The base year is 2030 and it is our best estimate of expected performance for this indicator at the end of the current investment period (2025-2030) and reflects the outcome of schemes and maintenance activities planned for this period. We then forecast what is expected to happen to the indicator at baseline points in the future if no change in investment is made. These future points are set in the short term (2035), the medium term (2045) and the long term (2055).
- 1.3. In addition, it sets out threshold values that will be used to summarise the level of risk and guide the development of options for the 2030-2055 planning period.
- 1.4. The requirements for Performance Indicators are set out in Government guidance for DWMPs¹ and subsequent clarifications by the Environment Agency (EA)². To understand the general approach to our DWMP please also refer to our Strategic Context document on our website³.
- 1.5. Assessment of the base year (2030) and future risks for each of our Performance Indicators is an important step in the development of our DWMP. It informs our understanding of how the drainage and wastewater system is able to meet legal obligations and meet the needs of customers and the environment. The DWMP approach requires completion of a risk assessment for the following Performance Indicators for each future planning horizon at the wastewater catchment scale:
- Internal flooding
 - External (curtilage) flooding
 - **Storm overflow performance (England)**[§]
 - Treatment works compliance (numeric)[§]
 - Treatment works compliance (descriptive at numeric sites)[§]
 - Treatment works compliance (Dry Weather Flow (DWF))
 - Treatment works compliance (Flow to Full Treatment (FFT))
 - Good Ecological and/or Chemical status: Public sewerage

¹ [Guidelines for Statutory Drainage and Wastewater Management Plans \(DWMPs\) - GOV.UK](#)

² EA letters to water companies with feedback on performance indicators (02/10/2025), (23/03/2026) and reporting thresholds (17/10/2025).

³ [DWMP28 | Drainage and wastewater | Thames Water](#)



- Pollution incidents: serious^{\$}
- Pollution incidents: total
- Bathing water quality
- Shellfish water quality
- Surface water flooding (Shared responsibility)^β
- Good Ecological and/or Chemical Status: Urban and transport (Shared responsibility)^β
- Emergency overflow performance^{\$β}
- Treatment Works Compliance (descriptive)^β
- Groundwater pollution^β
- Groundwater infiltration^β

1.6. Performance Indicators marked \$ will use a nationally consistent suite of thresholds to describe the general level of risk^{1,2}. Performance Indicators marked β are considered more experimental in nature and are recognised as inherently difficult to forecast and will hence be trialled in DWMP28 as emerging Performance Indicators and then possibly refined for subsequent DWMPs¹.

Key definitions

1.7. The DWMP guidance provides the following definition for this Performance Indicator:

Table 1. Extract from Table 2 of Defra guidance

Category	Metric	Details
Water environment	Storm Overflow performance (England)	<p>Number of Storm Overflows predicted to be at risk of not meeting Storm Overflow Discharge Reduction Plan (SODRP) targets and/or permit non-compliance for the relevant planning horizon.</p> <p>Baseline of spills is based on a minimum of 10 years' worth of time series rainfall data (2014-2024). 10-year dataset needs to be uplifted to recognise baseline and future pressures.</p>

1.8. **Storm Overflow discharge reduction plan (SODRP) target:** this includes spill frequency targets and delivery requirements associated with the 2021 Environment Act.⁴

1.9. **Permit compliance:** whether the Storm Overflow is at risk of breaching key elements of the permit, for the relevant planning horizon, driven by legislation or regulations such as the Environment Act 2021 and the Urban Wastewater Treatment Regulations 1994. For example, on criteria including such as pass forward flow, screening and storage provision requirements.

⁴ Each Water Company through their Water Industry National Environmental Programme (WINEP) will be undertaking overflow investigation activities to determine the appropriate spill frequency target to meet the objectives of addressing the risk of ecological harm.

2. Key assumptions

2.1. This section contains a description of the assumptions we will make in reporting the Performance Indicator and provides a commentary on alignment with the DWMP guidelines.

Assumptions

2.2. **Spill counting:** the basis of spill counting is the standard 12/24 methodology commonly applied across England and Wales.

- Spill counting starts when the first discharge occurs. A discharge occurs when the sewer level exceeds the threshold level e.g. weir level.
- Any discharge(s) in the first 12-hour block is counted as 1 spill.
- Any discharge(s) in the next and subsequent 24-hour blocks are each counted as 1 additional spill per block.
- This counting continues until there is a 24-hour block with no discharge.

2.3. **Spill target:** while the general SODRP (Storm Overflow Discharge Reduction Plan) requirement is to investigate moving to a ten-year average of 10 spills per year target, Water Quality investigations, as part of WINEP (Water Industry National Improvement Programme) are being undertaken to determine if a lower threshold should be applied to achieve good river water quality status, if these revised targets are available in time for DWMP28 then will be incorporated into the plan. Lower thresholds are applied where this is deemed necessary to prevent local ecological harm and / or protect bathing waters.

2.4. **Enhancement delivery programme:** the prioritisation of Storm Overflow improvements until 2050 will be developed through the risk assessment and optioneering phase to align with the delivery requirements of the Storm Overflow Discharge Reduction Plan⁵. This will include the requirement of screens.

2.5. We recognise that the Department for Environment, Food & Rural Affairs outlines in their 'A new vision for water' White Paper⁶ the Governments ambition is to set new targets for water environment, also inclusive of potential updates to the Urban Wastewater Treatment Regulations (UWWTR). We will continue working on our DWMP28 based on the existing framework, intending to incorporate new legislative or regulatory requirements when available.

2.6. **Storm Overflows:** the number of Storm Overflows assessed for DWMP28 will be the published list as of 1st April 2025 and as submitted as part of our annual Event Duration Monitoring (EDM) return dataset (2024)⁷. For clarity this included sites listed that have a

⁵ [Storm overflows discharge reduction plan - GOV.UK](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/101111/storm-overflow-discharge-reduction-plan.pdf)

⁶ [A new vision for water: white paper - GOV.UK](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/101111/a-new-vision-for-water-white-paper.pdf)

⁷ Downloadable here <https://environment.data.gov.uk/defra/21e15f12-0df8-4bfc-b763-45226c16a8ac/files>.



current permit as well as sites that are in progress of having a permit agreed / updated. All considered sites will have a functioning EDM as of 1st April 2025. The total number of Storm Overflows for Thames Water is 590.

- 2.7. **Performance:** measurement of Storm Overflow spills is based on a predicted average annual performance over ten years; this is to account for annual variation in rainfall and to facilitate convergence on a 'baseline' level of performance. This approach is consistent with guidance presented by our environmental regulators reflecting how Storm Overflow performance will be monitored and permit compliance tested⁸.
- 2.8. **Baseline performance:** for assessing overflow discharges our baseline will be based on a 10-year time series rainfall sequence (2015-2024). This 10-year dataset is perturbed to recognise future pressures, using time geographically appropriate time series rainfall, adhering to section 7.2 'Develop your rainfall model' of the DWMP Guidance. This approach is consistent with the approach taken in the Storm Overflow Assessment Framework (SOAF).
- 2.9. **Dual function overflows:** some overflows are designated both as 'emergency' and 'storm', for clarification this metric only considers the storm element of performance⁹.
- 2.10. **Normalisation:** whilst the indicator counts the total number of overflows meeting the requirements, a secondary 'average number of spills' value is calculated for each wastewater catchment (level 3), river basin management catchment (level 2) and at the company level (level 1). This is calculated by summing the total number of spills in the area and dividing by the number of overflows.
- 2.11. The denominator (number of overflows) will be fixed over the planning horizons for DWMP28, even if we choose to remove/abandon some overflow sites as part of our strategic plan. We believe this to be appropriate to present a true picture of the environmental improvements we intend to make.
- 2.12. **Asset Management Period 8 (AMP8) improvements:** we assume that all planned AMP8 spill reduction improvements will be completed as per our Delivery Plan, submitted to Ofwat, and their effect included in the 2030 base year assessment. Similarly, any ongoing operational or asset health improvements will be accommodated within our establishment of base year performance.
- 2.13. **Hydraulic modelling:** with few exceptions, all Thames Water's predicted Storm Overflow performance will be assessed through hydraulic modelling. We will report on the models' accuracy in representing current and recent spills performance.

⁸ Consultation on Spill Frequency Threshold Permitting. Environment Agency, March 2025

⁹ Emergency Overflows have a separate Performance Indicator. [DWMP28 documents | DWMP | Thames Water](#)



- 2.14. **Current observed overflow performance:** this will be reported alongside base year assessments with no adjustment for monitor down-time. It should be noted that the modelling is able to assess full year performance i.e. would not have gaps in performance due to monitoring outage, and hence the results represent actual expected annual performance.
- 2.15. **Temporary or abandoned overflows:** these may be implemented as a mitigation for managing an event (e.g. Infiltration Reduction Plan actions during high groundwater levels) and are excluded from this Performance Indicator assessment.
- 2.16. **Asset health:** spills caused by asset health issues (e.g. blockages, excessive siltation of storm tanks, etc.) will not be considered. We will also not account for the effects of river flooding, land drainage and burst water mains. This is due to the absence of a robust methodology for modelling random asset health influence, something we will look to improve upon in DWMP33. It should therefore be noted that historically reported EDM performance data may include incidents triggered by or influenced by asset health.
- 2.17. **Groundwater infiltration:** whilst system models can account for the influence of groundwater infiltration on spills, the assessment of changes in duration of spills and risk of prolonged / dry day spills is deemed not to be sufficiently robust in planning type models. This element of the analysis will be undertaken using a separate statistically based approach employing its own 3rd party assessment and be in line with the emerging Performance Indicators relating to groundwater infiltration.
- 2.18. **Tide levels:** average tide levels will be applied for tidally influenced outfalls.
- 2.19. **Manually controlled assets:** where overflows are manually operated such as at pumping stations, Real Time Control scripts will be developed; these will replicate operator 'Standard Operating Manual' approaches. With storm tanks that have manual drain down operation, the same approach will be adopted.



3. Data sources

3.1. This section includes a brief description of the key datasets required to generate forecasts and report on this Performance Indicator. We also outline the process of assuring the accuracy of these sources used to calculate the Performance Indicator.

Table 2. Data sources

Source	Application	Assurance	Comments
EDM return data	Defines the number of sites considered under the DWMP and forms a record of actual spill counts over previous years	Thames Water assured as part of Annual Return	Confirms details and historic performance of Storm Overflows as a reference point. Provides base number of overflows for normalisation
Rainfall (Time Series)	Applied to level 3 system models (where available) to forecast the number of spills at each Storm Overflow using level 3 hydraulic system models. The time series are perturbed for climate change using UKWIR's RedUp4 tool	Rainfall data series are acquired from specialist providers and assured at source	Generation of rainfall time series will be developed in accordance with section 7.2 of the DWMP Guidelines - 'develop your rainfall model'
System models	DWMP Level 3 systems models are used (where available) to forecast the number of spills at each Storm Overflow. The models are updated to reflect system state in 2030 (base year) and for subsequent base years	Thames Water is ISO9001 accredited, which is independently assured. Industry expert appointed specifically to DWMP system modelling to assure on alignment with the framework	Scope covers Hydraulic (ICM) system models, process models, River models and groundwater models as applied to DWMP
Permit data	Provides performance data to ensure assets are appropriately accounted for in analysis e.g. sizing of storm tanks	Assured by permitting team, held on national database jointly managed with environmental regulator	Required to ensure correctness of data utilised in analysis of overflows. Provides details of storm and/or emergency overflow application
Asset data	Corporate GIS system provides details of location of overflows as well as some key data such as overflow physical spill threshold	Maintained and assured by Technical Records	Data used to inform models
AMP8 (WINEP) investigations and improvements delivery team	New or improved data sets to support understanding of overflow structures	Technical Records or Permitting as appropriate	Provides current view of state of overflows such as condition of screens, weirs, flow control devices etc



4. Reporting thresholds and outputs

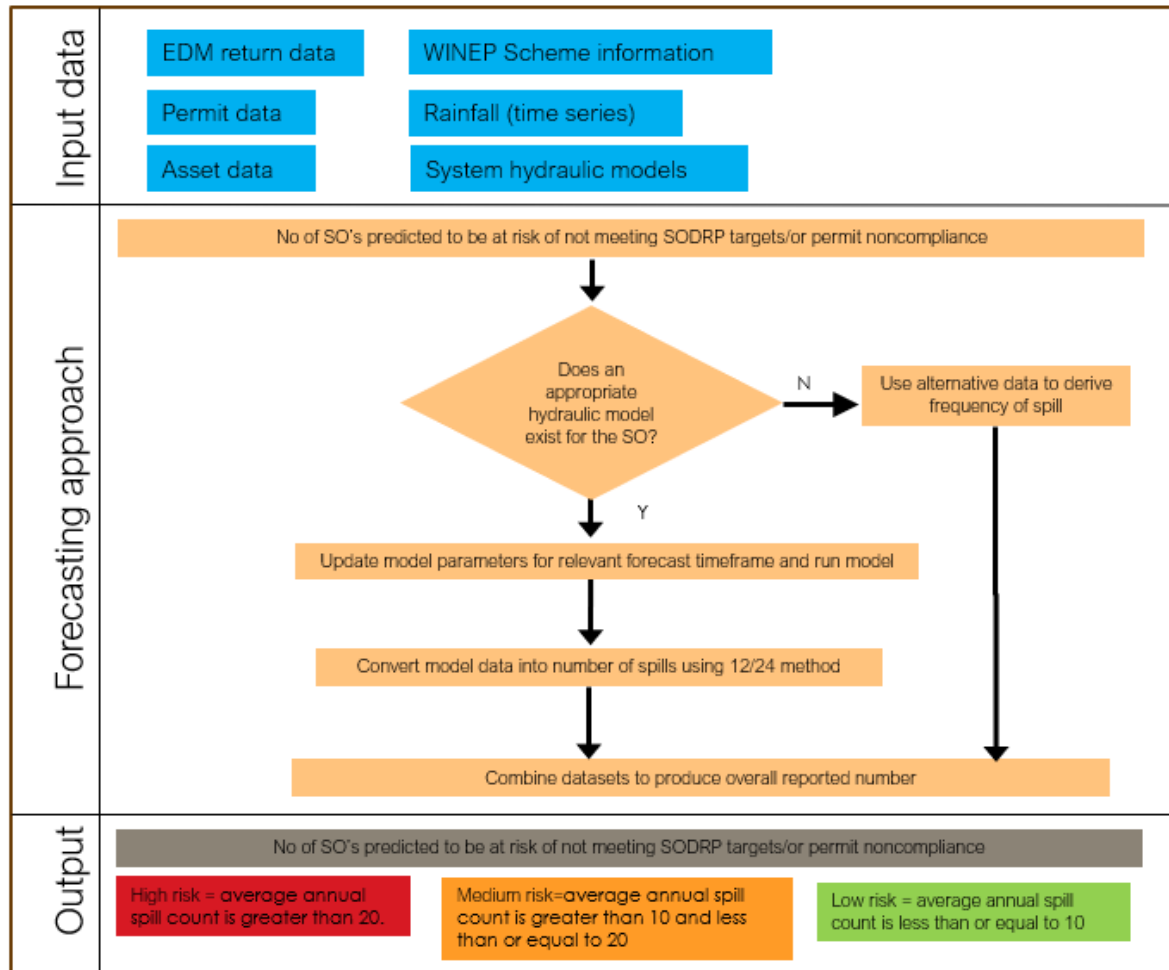
- 4.1. The main reporting outputs for this Performance Indicator will be the number of annual average expected spills at each overflow, for the base year, short, medium and long term planning horizon.
- 4.2. Each overflow will be banded as follows:
- Risk band 0 (green) – where the average annual spill count is less than or equal to 10
 - Risk band 1 (amber) – where that average annual spill count is greater than 10 and less than or equal to 20
 - Risk band 3 (red) – where the average annual spill count is greater than 20
- 4.3. **Spatial scales** - The average number of Storm Overflow spills will be reported at the following spatial scales:
- Level 1 (L1) Company level
 - Level 2 (L2) River catchment or Local authority level
 - Level 3 (L3) Sewerage catchment(s) level
 - Level 4 local level (London catchments only)
- 4.4. The average number of spills for each geography will be reported by adding the total number of spills and dividing it by the total number of overflows. This will allow clear comparison between regions/sub regions as well as between water companies.



5. Performance Indicator methodology

5.1. The following methodology will be applied to forecast base year and future baseline Storm Overflow performance. The approach is illustrated in Figure 1.

Figure 1. Performance Indicator methodology



Baseline & projected performance

5.2. Hydraulic Network models (where available) and Event Duration Monitoring data (where models do not exist¹⁰), will be simulated using time series rainfall to generate the performance of Storm Overflows for the following scenarios in Table 3.

¹⁰ Network models for small systems such as those serving populations of <1,000 population, where the flow monitoring of sewer system may not be possible due to flow measurement constraints meaning the creation of appropriate models is not possible. In these instances, recourse to Event Duration Monitoring may be utilised.



Base year performance – 2030

- 5.3. Hydraulic models of each wastewater catchment will be used in most circumstances. Where no system model exists, or where the model inadequately represents system performance, the number of spills expected in future years can be derived from recent observations (historical EDM data); projected forward using statistical trends identified in similar catchments with hydraulic models.
- 5.4. The hydraulic models will be updated to reflect the anticipated population and associated flows for the planning period (2030). Any recent or planned system changes designed to reduce overflow spills will be accounted for. Increases in populations i.e. growth and assumptions about water consumption, infiltration and trade flows will be generated consistently with related Performance Indicators (e.g. Dry Weather Flow (DWF) permitting and Internal or External flooding).
- 5.5. No Climate Change (CC) adjustment will be made to time series rainfall input data for the 2030 baseline. An appropriate time series rainfall data set will be applied from a collection of 30 spatial data sets, covering the whole Thames Water region. For future forecasts beyond 2030, CC is accounted for.
- 5.6. Hydraulic models will be simulated for a 10-year time series period, and the spills from each overflow counted using the 12/24 method¹¹.
- 5.7. To support assessments, a current system simulation will also be undertaken, allowing comparisons between model outputs and recent EDM measurements to be made. However, it is widely accepted that actual performance and model predictions will often not align, an industry investigation by UKWIR¹² was undertaken into this challenge.

Future baseline performance – 2035-2055

- 5.8. A similar approach will be taken for making future baseline assessment, but with the addition of allowances for changes in population, water consumption and climate change perturbations appropriate for each planning period as indicated in Table 3.

¹¹ [Storm overflow assessment framework 2025 - GOV.UK](#) – see Appendix A for methodology

¹² [Quantifying, managing and communicating the differences in storm overflow spill data between EDM outputs and hydraulic model predictions](#)



Table 3. System model simulation scenarios

Scenario	Rainfall series	Rainfall perturbation for climate change	Modelled changes
Current system	2015 to 2024	None	
Base Year (2030)	2015 to 2024	Yes – 2040	AMP8 and ongoing operational enhancements. New population and DWF
Short term (5 years)	2015 to 2024	Yes – 2040	New population and DWF
Medium term (15 years)	2015 to 2024	Yes – 2050	New population and DWF
Long term (25 years)	2015 to 2024	Yes – 2060	New population and DWF

5.9. Where there is a range of data, due to uncertainty in the forecastable future input data for the Performance Indicator. Then a scenario planning approach will be adopted in this Performance Indicator and throughout the DWMP. This is to inform our understanding of the sensitivity of our forecasts to uncertainty in input parameters and ultimately support the development of an adaptive pathway to dealing with the risk.

5.10. For 2030, 2035 and 2045 a central estimate for our input parameters is adopted as being the most likely future condition (scenarios A and B in **Error! Reference source not found.**). For 2055 a more conservative estimate is made (scenario C) so that the ‘worst case’ outcome can be forecast.

Table 4. Scenario planning approach

Scenario	Description	Likely occurrence within	Low estimate	Central estimate (most plausible)	High estimate (conservative)
A	5-year medium – most plausible for short-term planning	Approximately 5 years (2030 Planning Year)	Not Applicable	✓	Not Applicable
B	Core scenario – high likelihood for long-term planning.	10 to 20 years (2035, 2045 Planning Year)	Not Applicable	✓	Not Applicable
C	25-year high – conservative for long-term planning	Greater than 25 years (2055 Planning Year)	Not Applicable	Not Applicable	✓



Assessment

- 5.11. Modelling results will be processed to compute the ten-year annual average spill count at each Storm Overflow, and this will be compared to the standard 10 spills, or any relevant alternative standard. The number of overflows where the annual average spill count is predicted to not meet SODRP targets and/or permit non-compliance for the relevant planning horizon will be reported in the DWMP data tables. Each overflow will be attributed to a risk band (low, medium, high) in accordance with thresholds for each planning period.
- 5.12. In parallel, for scenario planning purposes, the average number of spills per overflow for each catchment, sub-regional and the whole of Thames Water will be computed, tabulated and mapped for each planning period (i.e. normalised by the total number of overflows at the relevant spatial level).
- 5.13. It is important to note that, at optioneering stage, this measure will explain when sites become compliant with the Environment Act 2021¹³ and meet SODRP requirements, in line with our agreed delivery plan.

Assessing the value of performance

- 5.14. Alongside publication of this Performance Indicator methodology, there is a requirement to value performance outcomes using our Value Framework. This step will be completed during the Options Development and Appraisal (ODA) stage, once the framework has been fully defined and agreed following consultation with stakeholders.

6. Next Steps

Receipt and adoption of any changes/adjustments as dictated by Ofwat/DEFRA.

- 6.1. Data will be collected generated in support of this Performance Indicator.
- 6.2. Elements of this document may be subject to change based on feedback received from the regulator or the government.

¹³ [Environment Act 2021](#)



We welcome your views on this technical methodology. Please share them with us by emailing DWMP@thameswater.co.uk.



Our Drainage and Wastewater Management Plan 2030–2055 will include a number of technical methodologies, like this one. They will all provide detailed information on specific topics featured in our draft Plan such as climate change and sustainable approaches to drainage. You will be able to access all of the technical methodologies on our DWMP webpage.



For more DWMP28 information please visit our DWMP webpage and portals on our website.

