

DWMP 28



Our Drainage and Wastewater Management Plan 2030-2055

Delivering for customers, communities and the environment

Performance Indicator Methodology – Treatment Works Compliance: FFT (Flow to Full Treatment)

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 **Treatment Works Compliance (Flow to Full Treatment) 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 **Treatment Works Compliance (Flow to Full Treatment) 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 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))

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](#)



- **Treatment works compliance (Flow to Full Treatment (FFT))**
- Good Ecological and/or Chemical status: Public sewerage
- 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. **Treatment works compliance (flow to full treatment) Performance Indicator.** The Government DWMP guidelines provide the following definition:

Table 1. Extract from table 2 of the Government DWMP guidelines

Category	Metric	Details
Water environment	Treatment works compliance: flow to full treatment	Annual number of wastewater treatment works predicted to fail to meet discharge permit conditions for annual flow to full treatment

1.8. **Flow to Full Treatment (FFT):** Flow in a sewerage system, and thus the amount of flow a Sewage Treatment Works (STW) treats, can vary substantially over time. On a dry day, flow at a STW typically has two peaks, one in the morning as people get up and use the bathroom, and then again in the evening as people cook and put on their dishwashers, etc. STWs must be able to cope with these peaks, and varying amounts of rainfall, this flow rate is known as ‘flow to full treatment’.

1.9. Permits thus have a condition to ensure that the peak dry weather flow and additional flows from light rainfall are always treated prior to storm discharge. The physical configuration of STWs can differ from site to site. Storm sewage arriving at a STW is typically managed in the two broad configurations set out below:



- 1.9.1. **STW with a Storm Overflow (SO) at the inlet only** – these were historically designed with a FFT set at six times Dry Weather Flow (DWF). The discharged storm sewage has no further treatment, other than screening to remove coarse solids.
- 1.9.2. **STW with a Settled Storm Overflow (SSO) after storm tanks** – the purpose of the storm tanks is to store storm sewage and return it for treatment after the rainfall has subsided. The FFT is set to roughly three times DWF. Flow in excess of this FFT limit, when it is raining, can be diverted to the storm tanks. The diversion of flows can continue until the sewers have drained down to the extent that flows are lower than the FFT level. At this point the storm sewage in the tanks will be transferred back to the works for treatment. If the storm is intense or sustained, generating more sewage than the tanks can cope with, the permit allows the settled and screened sewage to be discharged to the environment.
- 1.10. For STWs with storm tanks, the FFT requirement is typically stated notionally as three times the DWF. The FFT level reflects variations in the flow rate of domestic and industrial wastewater. Infiltration is not expected to show such daily variation and is relatively constant, hence it is not subject to the multiplier. Currently, in most cases FFT is actually around 2.5 to 2.7 times DWF. This will be amended as we implement the requirements of our Storm Overflow Discharge Reduction Plan (SODRP).
- 1.11. For the purpose of monitoring compliance with Environmental Permitting Regulations (EPR), the conditions stipulate that permit compliance can be considered to be achieved when 95% of the individual flow values exceed 92% of the FFT permit when the works is discharging to the storm tanks, or to the environment if there are no storm tanks.
- 1.12. Our methodology for this Performance Indicator will assess compliance with:
1. EPR (Environmental Permitting Regulations) – 95% of flow values exceed 92% of permit.
 2. Urban Wastewater Treatment Regulations (UWWTR) – FFT should be set using the formula below:

STW with a SSO after storm tanks

$$\text{Flow to Full Treatment (litres/sec)} = 3PG + 3E + I_{\max}$$

Where,

P = Population, G = Water consumption per person (l/sec), I_{\max} = Maximum sewer infiltration (l/sec), E = Average industrial effluent (l/sec)

STW with a SO at the inlet only

$$\text{Formula A (litres/day)} = \text{DWF} + 1360P + 2E$$

Where,

DWF = total dry weather flow (l/d) calculated from $PG + I + E$, P = Population, G = Water consumption per person (l/sec), I = infiltration (l/day), E = Average industrial effluent (l/day)



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. Compliance with the EPR (95% of the individual flow values exceed 92% of the FFT permit when the works is discharging to the storm tanks, or to the environment if there are no storm tanks) will be assessed using MON3 (Overflow operation) and MON4 (FFT) monitors. The installation of these monitors started in AMP7 (2020-2025) and will continue throughout AMP8 (2025-2030). We will assume that these monitors are installed on time.
- 2.3. When assessing whether FFT permit limits are sufficient for UWWTR, we will note the current FFT permit limit but also calculate and test against a theoretical FFT based on increased future DWF due to growth. This tests whether the wet weather treatment capacity of the STW is maintained. The new FFT is defined by a formula that is set out as the correct FFT setting in the Urban Wastewater Treatment Regulations and also in Environment Agency instructions⁴ for permitting FFT at STW. Our SODRP may increase FFT further to meet new Environment Act targets. Where these are known, they will be incorporated in our assessment. For example, our DWMP will not include investment for increasing FFT if a SODRP scheme is already planned to increase FFT to the same or a higher value.
- 2.4. Population (P) is taken from forecasts supplied by specialists Edge Analytics for the likely population in each wastewater treatment catchment. Water consumption (G) is assumed to change, in line with the projections made in Water Resource Management Plans⁵ (WRMP) for the water supply zone covering each wastewater catchment. Not all water supply zones in the Thames Water area providing wastewater services are operated by Thames Water. All water companies have obligations to reduce water consumption significantly (from around 150 litres/head/day to around 110 litres/head/day) over the next 25 years. Thames Waters customers' average water consumption is forecast in its WRMP to decline from 133 litres/head/day in 2030 to 126 in 2035, 110 in 2045 and 103 in 2055.
- 2.5. Maximum infiltration (I_{max}) is calculated using observed flow data measured at the STW inlet or outlet, as available. I_{max} is calculated by first computing the infiltration on every dry ($\leq 0.25\text{mm}$) day (I_{dryday}) of a period of at least one year. I_{max} is the 98th percentile of these values.
- 2.6. Infiltration calculated for the base year is assumed to increase 0.5% per year due to the deterioration of sewer asset health and/or urban creep. This is a standard planning assumption inferred from observed data over multiple years and is part of our design

⁴ [Water companies: environmental permits for storm overflows and emergency overflows - GOV.UK](#)

⁵ <https://www.gov.uk/government/publications/water-resources-planning-guideline>



standards. This method is supported by the Environment Agency. Over 25 years infiltration is hence assumed to increase by a total of 12.5%. Where network interventions are currently (in the period 2025 to 2030) planned which may reduce infiltration we will monitor performance to assess whether the rate of infiltration should be reduced for these catchments.

- 2.7. Trade effluent flows (E) are any liquid waste that is discharged into our sewers from a business, industrial or trade process, excluding domestic sewage and surface water. Annual trade effluent flow for a particular STW catchment is based on the last three years of trade effluent billing records. This is adjusted if we are aware of planned changes to trade effluent flow. Daily trade effluent flow (E) is calculated as annual trade effluent flow divided by 303 working days.
- 2.8. For forecasting FFT compliance with EPR we will assume that investment schemes planned in our current planning period (2025 to 2030) and outlined in our Delivery Plan will be completed.
- 2.9. All 'day to day' investment related to this Performance Indicator e.g. Opex, maintenance and reactive spend on existing assets will be defined by separately and included in the DWMP data tables under the following: Base (Asset Health / Capital Maintenance) and Base (Reactive / Opex).
- 2.10. We operate a total of 352 wastewater treatment works. 197⁶ have a FFT permit limit and there are a further five sites where the permitted FFT is controlled by an upstream pumping station or network storm overflow with a pass forward flow setting. This Performance Indicator will therefore be applied at these 202 STWs plus any additional sites (for the 2030 base year planning horizon) where new permits will come into force over the current planning period (2025-2030).
- 2.11. We have 34 wastewater treatment works where the FFT permit limit has yet to be formally agreed with the Environment Agency, these are known as Temporary Deemed Consents (TDC). We will include these sites in our assessment using the proposed FFT permit limited until such time as they are formally agreed.

Alignment with Government DWMP guidelines

- 2.12. Our assessment methods, risk thresholds and our approach to reporting performance aligns with Government DWMP guidance and is consistent with the recently published revision to the Environment Agency's Environmental Performance Assessment (EPA) guidelines⁷ and subsequent correspondence.

⁶ 34 of which currently are TDC (Temporary Deemed Consent)

⁷ [Water and sewerage companies: EPA methodology for 2026 to 2030 - GOV.UK](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/674211/water-and-sewerage-companies-eпа-methodology-for-2026-to-2030.pdf)



3. Data sources

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

Table 2. Data sources and assurance

Dataset	Source	Assurance
Current FFT permits	Thames Water Permit Database. The permit level is described for each STW.	Subject to second line assurance within Thames Water
Population served by our wastewater treatment works	<p>The current and forecast future population equivalent is described for each STW and input to our SOLAR (Strategic Overview of Long-term Assets and Resources) system.</p> <p>SOLAR includes the following sources of population / PE data:</p> <ul style="list-style-type: none"> •Existing residential population – Ordnance Survey address points multiplied the average household size as reported in the 2021 census. •Future housing development – provided by Edge Analytics •Hidden and transient population e.g. short-term residents, irregular migrants – provided by Edge Analytics •Cess PE – taken from annual return •Trade effluent PE – taken from annual return 	Subject to second line assurance within Thames Water
Calculated current and forecast future flows arriving at our wastewater treatment works	Thames SOLAR (Strategic Overview of Long-term Assets and Resources). The current and forecast future DWF is described for each STW, drawing on current and forecast levels of water consumption, infiltration and trade flow.	Subject to second line assurance within Thames Water
Per Capita Consumption (PCC)	PCC forecast scenarios taken from WRMP24 published data tables for all water companies within the Thames Water wastewater area.	Full WRMP assurance process
Current FFT compliance assessment	Taken from data returns produced for the Environment Agency on an annual basis.	Subject to second line assurance within Thames Water



4. Reporting thresholds and outputs

4.1. This section includes a detailed description of:

- The reporting thresholds used to categorise the base and year baseline performance risk across our short, medium and long-term time planning horizons, and
- The outputs that will be reported.

Reporting thresholds and planning horizons

4.2. There are no reporting thresholds within the EPA guidance as this is currently a shadow metric. The thresholds used in the DWMP will mirror those used for the Treatment works compliance (numeric) Performance Indicator.

4.3. The thresholds are used to summarise the forecast compliance with FFT permits across the whole of Thames Water. These thresholds are:

- Where fewer than 98% of STW meet this permit condition the overall situation is described as high risk.
- Where between 98 and 99% of STW meet this permit condition the overall situation is described as medium risk.
- Where greater than 99% of STW meet this permit condition the overall situation is described as low risk.

Reporting outputs

4.4. The main reporting outputs for this Performance Indicator will be GIS layers for the Thames Water DWMP portal showing the forecast treatment works compliance (flow to full treatment) risk level (high, medium, low) for the base year (2030) and the future baseline points (the planning horizon 2035, 2045 and 2055).

4.5. In addition, data tables will be produced that summarise performance for each STW in 2030, 2035, 2045 and 2055.

Assessing the value of performance

4.6. 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.



5. Performance Indicator methodology

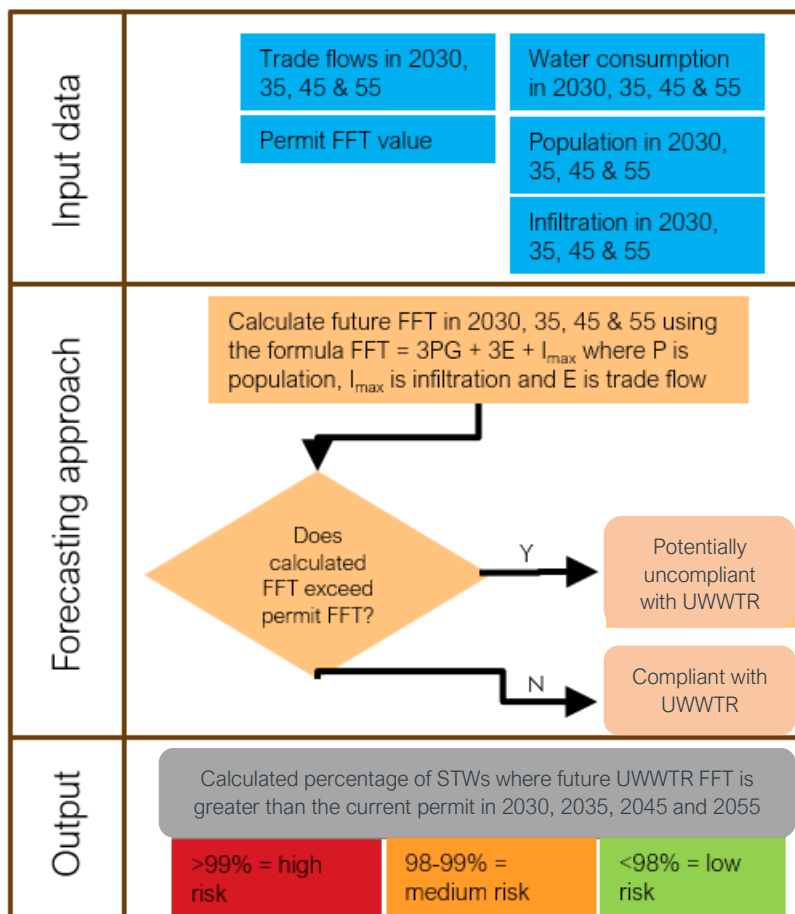
EPR Compliance

- 5.1. Data from MON3 and MON4 monitors will be used to calculate compliance with the permit condition that states that 95% of flow values during storm overflow operation should be greater than 92% of the permit value.
- 5.2. Thames Water have a large compliance investment programme which stated in AMP7 (2020-2025) and will continue into AMP9 (2030-2035). We will assume schemes within this programme are delivered in line with our AMP8 delivery plan and will therefore be compliant in the 2030 base year.

UWWTR

- 5.3. The following methodology will be applied to forecast base year and future baseline UWWTR FFT compliance risk. The approach is illustrated in Figure 1.

Figure 1. Performance Indicator methodology





Base year performance – 2030

- 5.4. We calculate the idealised FFT permit limit using the formula $3PG + 3E + I_{MAX}$ for 2030 using forecasts for P, G and E consistent with those applied for the DWF compliance Performance Indicator, as indicated in Table 3. This is then compared with the existing FFT permit value.

Table 3. Forecasting key Performance Indicator parameters

Parameter	Forecasting method
Population (P)	We apply a future population forecast for the STW catchment area using demographic data supplied by specialist Edge Analytics that are embedded within Thames Water’s SOLAR system.
Water consumption (G)	We apply a water consumption unique for the relevant water supply zone and consistent with forecasts in the relevant company WRMP.
Maximum infiltration (I_{max})	I_{max} is held constant from observations unless improvements (relining, sealing, separation) are due for completion by 2030 in which case I_{max} will be reduced on advice from the design teams implementing scheme(s).
Trade flows (E)	We apply historical average flow rates unless there is information from businesses about planned substantial increases or reductions. The average historic flow rate is applied as a constant future forecast by default.

Future baseline performance – 2035-2055

- 5.5. Future baseline FFT limits for each planning horizon will be evaluated as described for the base year (2030). Data will be revised, where applicable, to account for future forecasts as indicated in Table 4.
- 5.6. Where there is a range due to uncertainty in the forecastable future input data for the Performance Indicator, then a scenario planning approach will be adopted here 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.
- 5.7. 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 Table 4). For 2055 a more conservative estimate is made (scenario C) so that the ‘worse 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

- 5.8. Calculated future FFT limits for 2030, 2035, 2045 and 2055 are then compared to the current FFT permit at each STW. If the forecast future FFT limit is greater than the current FFT permit, the STW is considered to be not compliant with UWWTR for the purposes of this evaluation.
- 5.9. Current performance (for 2025) will also be reported, showing where there are investments underway to correct any non-compliance for 2030.
- 5.10. The percentage of all STWs passing/failing the UWWTR requirements at each planning period is then evaluated and reported.

Base and Asset Health

- 5.11. We will also consider the risk of poor and deteriorating asset health affecting FFT permit compliance. Thames Water is evaluating the asset health of all STW by calculating the annual likelihood of failure of key equipment types at STWs and using the change in this and the equipment / site criticality, to elicit a risk of non-compliance with permits at individual STWs. This will be reported at all three DWMP spatial scales (L3, L2 and L1).

6. Next steps

- 6.1. We will develop and refine our asset health index and forecasting assessment for STWs.



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.

