



Thames Tideway Tunnel Benefits Realisation Report 2025

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1 Abbreviations/Defined Terms

Abbreviation	Description
AQMS	Automated Quality Monitoring Stations
CSO	Combined Sewer Overflow
DO	Dissolved Oxygen
EA	Environment Agency
EDM	Event Duration Monitors
EHRD	Elevated Health Risk Day
LTT	London Tideway Tunnels
MCERT	Environment Agency's Monitoring Certification Scheme
PS	Pumping Station
SDL	Sewage-derived litter
STW	Sewage Treatment Works
TTSS	Thames Tideway Strategic Study
TTT	Thames Tideway Tunnel
TWUL	Thames Water Utilities Limited
UWWTD	Urban Waste Water Treatment Directive
WASC	Water and Sewerage Company

Table 1 – Abbreviations/Defined Terms

2 Background

The Thames Tideway Tunnel (TTT) is a major sewer tunnel designed to intercept storm sewage overflows that would otherwise discharge into the River Thames. Extending 25 kilometres from Acton in West London to Abbey Mills Pumping Station in East London, it connects there with the Lee Tunnel. Together, these tunnels form an integrated system that conveys intercepted storm sewage to the Beckton Sewage Treatment Works (STW) for processing. This combined network is known as the London Tideway Tunnels (LTT).

Spills from Combined Sewer Overflows (CSOs) along the tidal Thames have long posed risks to water quality and the wider river environment. In 1991, the European Union adopted the Urban Waste Water Treatment Directive (UWWTD), aiming to protect the environment from inadequately treated wastewater discharges. Member state compliance was expected for large cities by 2000.

By 2006, however, the European Commission issued a 'reasoned opinion' stating that the UK was failing to meet the Directive's requirements for London. This was followed in 2010 by legal proceedings in the Court of Justice of the European Union, which ruled in 2012 that the UK was in breach due to the volume and frequency of CSO spills into the River Thames. As a result, the UK faced the risk of infringement fines.

Between 2000 and 2005, the Thames Tideway Strategic Study (TTSS) identified a package of measures to achieve compliance with the UWWTD and improve the river environment. These measures included upgrades to sewage treatment works, the construction of the Lee Tunnel, and the development of the Thames Tideway Tunnel - the final component to be delivered.

The TTT was partially brought into operation in April 2024 following completion of its connection to the Lee Tunnel. Activation of the individual interception sites across London took place between August 2024 and February 2025. Since February 2025, the 19 CSOs directly intercepted by the TTT system have been able to capture discharges that would previously have spilled into the River Thames. A further 18 CSOs are indirectly managed by the TTT system and spill less frequently as a result of the wider benefit it provides to the sewer network.

3 Purpose

This report presents the first annual assessment of the benefits delivered by the TTT since it became sufficiently operational for benefit assessment. Following the phased commissioning of the system, 2025 marks the first year in which the tunnel's performance can be measured against its intended environmental objectives. As the tunnel was only partially operational during 2024, it has been deemed that data from this year should not be included in pre-LTT baseline data, nor should it be included to show benefit of the system.

While this report identifies 2025 as the first year in which the benefits of the system are demonstrated, it should be noted that the LTT remained in the commissioning phase throughout this period. As a result, tunnel closure thresholds were, at times, set at lower levels than those expected once commissioning is complete. The results presented, therefore, may under-represent the full environmental benefits expected from the LTT under normal, fully operational conditions.

The purpose of this report is to evaluate the extent to which the TTT has achieved the four core environmental objectives that underpin the project.

- Improve water quality and reduce biochemical oxygen demands in the tidal Thames by significantly reducing CSO discharges into the river.
- Reduce the aesthetic pollution by sewage material / litter and sanitary products.
- Reduce the elevated health risks to river users
- Fully meet the requirements of the Urban Waste Water Treatment Directive (UWWTD) with respect to storm overflows

To do this, the analysis compares monitored data from 2025 against the established pre-tunnel baseline,

providing a clear and evidence-based assessment of the improvements delivered. The findings presented here form the foundation for ongoing annual reviews, supporting continued assurance that the system is delivering the long-term environmental improvements envisaged at the outset of the project.

Thames Water has committed to publishing an annual report on the benefits of the TTT for 10 years.

4 Data Measurement

Each of the environmental objectives have a clear and reliable way of measuring the benefits delivered by the Thames Tideway Tunnel. These objectives were specifically chosen to ensure we can easily tell which improvements come from the TTT itself, as opposed to earlier upgrades such as improvements to the sewage treatment works and the commissioning of the Lee Tunnel.

Data from 2020-2023 will be used as a pre-LTT baseline for trend analysis and comparison with post-LTT data.

Environmental Objective	Measurement	Data Provider	Data Reporting Period
Improve water quality and reduce biochemical oxygen demands in the tidal Thames by significantly reducing CSO discharges into the river.	Measuring Dissolved Oxygen in the River Thames. Measuring the frequency of depletion below 5mg/l. Currently using the EA's Automated Quality Monitoring Stations, this will be taken over by TWUL in due course as all WASCs will be required to monitor upstream and downstream of CSOs.	Environment Agency	2016 - 2035
Reduce the aesthetic pollution by sewage material / litter and sanitary products.	Annual estimate of the tonnes of sewage-derived litter prevented from entering the River Thames. Based on a calculation using the known storm flow pumped from LTT to treatment and the average tonnes of sewage-derived litter screened at Abbey Mills PS.	Thames Water	January 2020 - 2035
Reduce the elevated health risks to river users	Annual elevated health risk days gained through Event Duration Monitors.	Thames Water	April 2020 - 2035
Fully meet the requirements of the Urban Waste Water Treatment Directive (UWWTD) with respect to storm overflows	Annual estimate of volume of CSO discharges. This will be estimated using Event Duration Monitors, derived volume estimates of pumped discharges and models to predict the volume where this cannot be directly measured.	Thames Water	April 2020 - 2035

Table 2 - Data Measurement

5 Weather Summary

As weather conditions have a direct influence on CSO discharges, this report includes rainfall data and an annual narrative to contextualise storm events and provide an overall picture of rainfall patterns across London.

The rainfall data presented below is calculated as a weighted average over the LTT catchment. This means that some areas contribute more to the final rainfall estimate than others, depending on land-use impermeability and how local drainage is connected to the sewer system. Rather than treating all grid areas equally, greater weighting is given to locations that generate more runoff, so the resulting value better reflects where rainfall has the greatest operational impact. The data shown in Table 3 is based on Met Office 1 km × 1 km radar rainfall data.

A pre-tunnel baseline covering the years 2020–2023 is provided to highlight year-on-year variability in rainfall and to support comparison with future performance.

2025 Summary

In 2025, London experienced a generally mild but changeable year of weather. Early in the year there were periods of cold weather, including occasional icy conditions. January was particularly wet, largely due to a succession of smaller rainfall events rather than any major storms.

Following this unsettled start, spring and summer were characterised by predominantly warm and dry conditions. Rainfall during this period was relatively low, with prolonged dry spells and several episodes of elevated temperatures during the summer months.

Later in the year, from September to December, rainfall levels increased somewhat, but there were no major storm events that significantly affected the London catchment during this period.

	Monthly Rainfall Data - Weighted Average (mm)													Annual Rainfall (mm)
	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Pre-LTT	2020	60	135	46	50	6	69	45	78	34	204	57	142	928
	2021	134	61	39	12	102	88	142	83	58	148	9	83	958
	2022	21	77	49	26	58	31	7	57	66	82	156	73	702
	2023	94	7	130	83	47	32	88	66	70	125	118	117	976
	2025	96	60	12	37	40	37	71	36	65	91	83	82	709

Table 3 - Rainfall Data – Weighted Average

6 Improve Water Quality and reduce biochemical oxygen demand

6.1 Background

Dissolved oxygen (DO) concentration is recognised as the principal indicator of water quality in the tidal Thames. To support ecological protection, the Thames Tideway Strategic Study (TTSS) developed an ecological objective based on DO concentrations, defining the levels required to sustain a healthy and resilient ecological community.

DO levels in the tidal Thames fluctuate naturally due to factors such as temperature and salinity, with typical background concentrations ranging from 6 to 14 mg/L. During summer, elevated temperatures and algal activity can further increase this variability. Discharges containing biochemical oxygen demand, such as treated effluent or storm sewage from CSOs, reduce DO as organic material is broken down. When DO falls below 4 mg/L, aquatic organisms experience stress, particularly if low levels persist, and more severe

depletion can result in mortality. Although ammonium is not used as a reporting metric, elevated concentrations are a useful indicator of sewage discharges and can provide supporting evidence when investigating the causes of DO depletion events.

A threshold of 5 mg/L has been set for reporting purposes in this assessment. DO readings above this threshold may reflect natural variability, whereas values below 5 mg/L are more likely to be associated with CSO discharges. Under normal conditions, with no storm sewage discharges and STWs operating within their permits, DO concentrations would not typically drop below this threshold.

DO data for this assessment will be obtained from Automated Quality Monitoring Stations (AQMS) operated by the Environment Agency. Five AQMS are located within the tidal-influenced reaches of the river, but to minimise interference from Mogden and Beckton STW discharges, this report uses data from the Cadogan Pier and Barrier Gardens stations (refer to Figure 1). While these instruments are not MCERTS-certified and are serviced and calibrated on a best-efforts basis, they provide valuable insight into long-term water quality trends in the tidal Thames.

To ensure robust and reliable reporting, a 'DO depletion day' is defined as any day on which 5 consecutive DO measurements fall below 5 mg/L. Because AQMS units record DO every 15 minutes, this requirement equates to DO remaining continuously below 5 mg/L for at least 1 hour. Applying this threshold reduces the influence of anomalous or short-lived fluctuations and helps ensure that recorded DO depletion days more accurately reflect storm-related impacts rather than natural variability.

During the baseline period, DO measurements may have been affected by active mitigation measures deployed in the river, including hydrogen peroxide dosing and the use of oxygenation vessels to reoxygenate the water following stormwater discharges. As the LTT reduces the frequency and volume of CSO discharges, these mitigation measures are no longer required. Consequently, comparisons between baseline and post-tunnel periods may not fully reflect the true ecological benefit delivered by the operational tunnel.

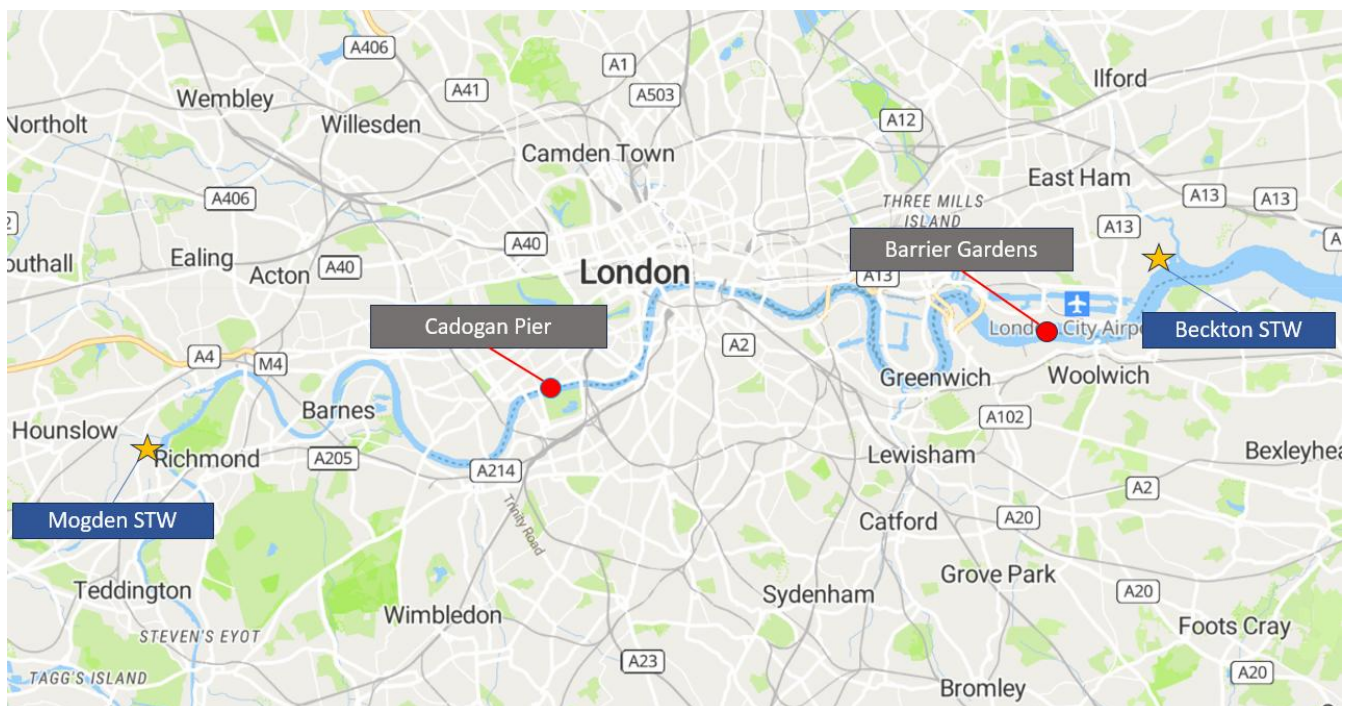


Figure 1 - AQMS locations

6.2 Reporting

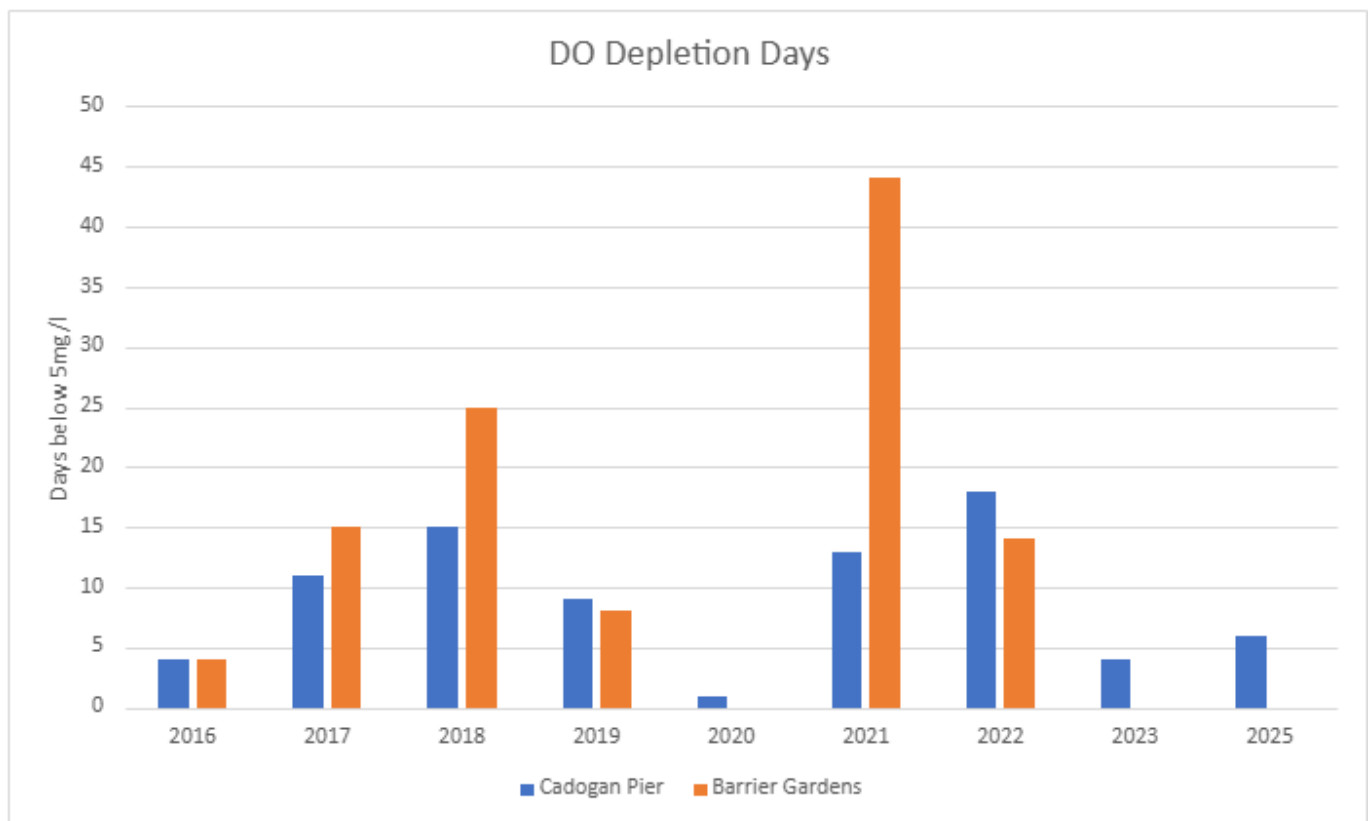


Figure 2 - Dissolved Oxygen Depletion Days

DO Depletion Narrative 2025			
DO Depletion date	AQMS Station	CSO discharges from tidal Thames CSOs	Narrative
2/7/2025	Cadogan	No	Dissolved oxygen levels in the river are likely to have been influenced by a combination of prolonged dry weather, elevated temperatures, and natural seasonal variation. Rainfall in the month preceding the DO depletion was extremely low, with the last significant rainfall event occurring on 7th June. There were no CSO discharges from tidal Thames CSOs from 7th June through to the 6th July. This lack of freshwater input, combined with the possibility of Mogden STW final effluent influence during low-flow conditions, would have reduced overall river dilution and mixing. At the same time, DO levels naturally fall in summer, and this period coincided with a significant heatwave from 23rd June to 2nd July, with temperatures reaching 28–32°C in the four days prior to this DO depletion event. There is a direct inverse relationship between water temperature and dissolved oxygen solubility. As such, these sustained high temperatures would have further reduced DO concentrations, making temperature-driven depletion a key factor in the observed conditions. Furthermore, no corresponding increase in ammonium concentrations was observed during this period, providing additional evidence that

			storm sewage discharges were not a contributing factor to the DO depletion event.
20/7/2025 - 24/7/25	Cadogan	Yes	Five days of DO depletion were recorded during this period, which coincided with a significant rainfall event on 19 th July and multiple CSO discharges across the tidal Thames. Discharges occurred from 33 tidal Thames CSOs, including storm discharges from Beckton, Mogden and Crossness STWs, which were unable to treat all incoming flows. Mogden STW alone discharged approximately 210,000m ³ of stormwater, introducing additional ammonium to the river. As ammonium is oxidised by naturally occurring bacteria, dissolved oxygen is consumed, potentially contributing to the observed DO depletion. Despite operating with lower thresholds for tunnel closure due to commissioning, the LTT intercepted 1,183,709m ³ of storm sewage during this event. Prior to this, warm summer water temperatures meant the river's natural DO concentration was already low, at around 5.5 mg/L. Once the spills occurred, this low baseline significantly amplified the extent of DO depletion observed in the river and increased the recovery period required.

Table 4 - DO depletion narrative 2025

6.3 Summary

Even with the LTT in operation, some dissolved oxygen depletion events will continue to occur within the River Thames. Although the LTT is designed to capture the majority of storm sewage discharge within the tidal Thames, exceptionally large or prolonged rainfall events can exceed its storage capacity. When the tunnel fills and subsequently shuts the penstocks that allow flow to be intercepted, any additional storm sewage results in residual discharges to the receiving watercourse. Within this context and compared to pre-LTT data, it is encouraging that in 2025 only a single DO depletion event (albeit accounting for 5 depletion days) was attributable to CSO activity. This indicates that the LTT is reducing the frequency and magnitude of wastewater-driven impacts on water quality without the aid of hydrogen peroxide dosing or oxygenation vessels that were previously used to mitigate CSO impacts.

As the 19th July storm occurred while the tunnel was operating with lower settings for tunnel closure, it is anticipated that a comparable event under fully commissioned conditions would result in greater storm sewage interception with potentially reduced impact to the River Thames.

The dataset also provides valuable insight into the natural variability of DO in the River Thames. Notably, the heatwave during June and July demonstrates that even with the absence of CSO discharges, DO can fall to levels capable of stressing aquatic organisms. Elevated temperatures reduce oxygen solubility and can increase biological oxygen demand, both of which contribute to naturally driven DO depletion. These observations highlight that while infrastructure improvements such as the LTT significantly mitigate pollution-related risks, environmental conditions - particularly extreme weather and low freshwater fluvial movement from upstream - remain an important driver of water quality variability.

Together, these findings reinforce the need for continued monitoring and nuanced interpretation of DO data. The presence of both human-caused and natural influences means that distinguishing the underlying cause of each depletion event is essential for accurate reporting and effective management of the River Thames' health.

7 Reduce the aesthetic pollution by sewage-derived litter

7.1 Background

Aesthetic pollution is best illustrated by the two photographs below. The photograph on the left shows sewage-derived litter (SDL) collecting on the foreshore after a CSO discharge and the photograph on the right shows litter removed from the sewage by screens at a sewage pumping station (PS). Once sewage litter has been collected by a screen it is then termed screenings. It is removed, washed, compacted and put into skips ready for disposal.



Figure 3 – Sewage-derived litter



Measuring the quantity of sewage-derived litter prevented from reaching the river is an objective measure that indicates the environmental benefit of the TTT on the river.

The simplest way to measure the reduction in sewage-derived litter discharged to the River Thames would be if the LTT had a separate screening and weighing facility available at Beckton STW, however the system is not configured to assess benefits of individual aspects and has been designed as an integrated system. Therefore, Thames Water shall use the best data available to estimate the reduction in sewage-derived litter due to the benefit of the tunnel.

As Abbey Mills Pumping Station is the only CSO that screens sewage-derived litter, screening tonnages at this PS will provide an indication of the sewage-derived litter prevented from entering the River Thames via the TTT. The screenings at Abbey Mills PS are to be used as a proxy for the litter from all the other CSOs which the tunnel captures but are not screened. This approach assumes that the sewage-derived litter content of flows intercepted elsewhere in the Tideway catchment is broadly comparable to that measured at Abbey Mills Pumping Station. While some variation between catchments is likely, Abbey Mills PS provides the best available dataset from which to estimate the overall reduction in sewage-derived litter entering the River Thames. As a direct measurement cannot be made, the below calculation will be used to extrapolate the total amount of litter prevented from entering the river.

TTT Tonnes of Sewage Derived Litter = ((Storm Flow from LTT Pumped to Treatment / 1000) x Abbey Mills PS Average kg/1000m³ of litter) – Annual Kilograms of sewage derived litter from Abbey Mills PS

While the method above estimates the annual volume of sewage-derived litter intercepted by the TTT, it can also be used to determine the total volume intercepted across the entire London Tideway Tunnels system, which includes screenings intercepted from storm sewage at Abbey Mills PS.

The quantity of sewage-derived litter prevented from entering the river due to the TTT will be estimated using the calculated screenings rate from Abbey Mills Pumping Station during the pre-LTT baseline period. Based on this assessment, an average of **14.63 kg of sewage-derived litter per 1,000 m³ of storm sewage** will be applied as the representative figure for the amount of litter the TTT is expected to intercept. This value therefore serves as the basis for estimating how much sewage-derived litter will be captured by the TTT and consequently prevented from entering the river.

Year	Rag screened (kg)	Flow to Lee Tunnel m ³	kg / 1000m ³
2020	105,340	7,357,590	14.32
2021	86,340	8,056,268	10.72
2022	50,560	3,868,244	13.07
2023	131,680	6,272,346	20.99
Total	373,920	25,554,448	14.63

Table 5 - Sewage-derived litter baseline calculation

In addition to calculating the reduction in sewage-derived litter from entering the tidal Thames, Thames Water are working closely with environmental charity Thames21 to obtain data regarding the amount of sewage-derived litter washing up on the tidal Thames' foreshores and riverbanks. Thames River Watch, run by Thames21, regularly conduct river cleanup projects and their observations will show any changes to sewage-derived litter accumulation since the TTT became operational.

Thames21 undertakes systematic surveys of litter pollution across eight monitoring sites, as shown in Figure 4. At each site, the quantity of sewage-derived litter - alongside other litter categories - is recorded on the foreshore. Of the 8 sites, four sites are designated as sinking hotspots, where high-density plastic litter has a propensity to sink and accumulate. At these locations, they conduct bulk surveys. The remaining four sites are recognized as floating litter hotspots, where floating litter accumulates on the foreshore at high tide. For these locations, they carry out quadrat surveys.

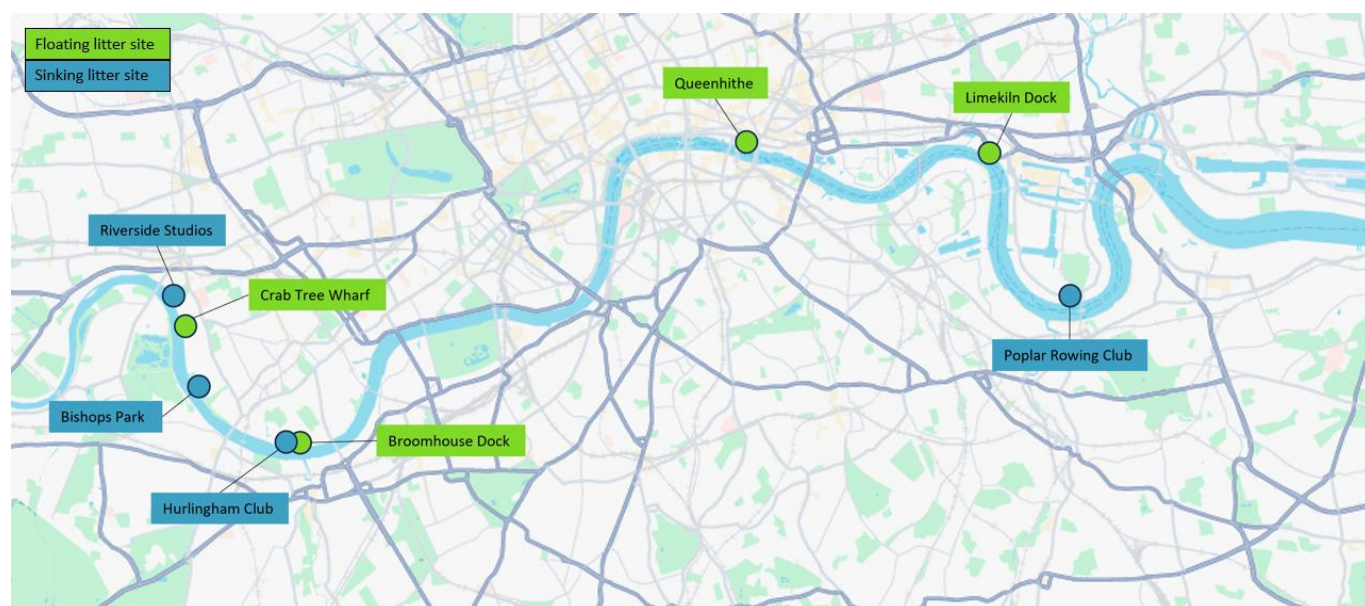


Figure 4 - Thames21 Survey Map

Seasonal surveys are systematically conducted at all sites during the following survey periods: Spring (May/June), Summer (August/September), Autumn (November/December), and Winter (February/March).

Data collected prior to the commissioning of the TTT provides us with a baseline that can be compared against over the coming years.

In addition to these 8 survey sites, Thames21 carries out a '**Big Wet Wipe Count**' every six months on the Hammersmith foreshore in collaboration with the Port of London Authority. This location is a well-known hotspot where large quantities of sewage-derived wet wipes accumulate. During each survey, the distribution of wet wipes across defined sections of the foreshore is mapped, providing a detailed spatial record of accumulation patterns.

In August 2025, remediation work was undertaken to remove the so-called *wet wipe island*, significantly reducing the volume of accumulated material on Hammersmith foreshore. Ongoing surveys will continue at this location to monitor the rate of re-accumulation. Over time, these repeat assessments are expected to demonstrate the beneficial influence of the LTT in reducing the input of sewage-derived litter to the foreshore.

7.2 Reporting

Reduction in Sewage-derived Litter Calculation

Storm flow from LTT pumped to treatment (m3)	9,012,624
/ 1000	9,012.62
X Abbey Mills PS Average (kg/1000m3)	14.63
Total SDL captured for LTT (kg)	131,854.69
Total SDL captured by LTT (Tonnes)	131.85
- Annual SDL from Abbey Mills (Tonnes)	47.50
Total SDL captured by TTT (Tonnes)	84.35

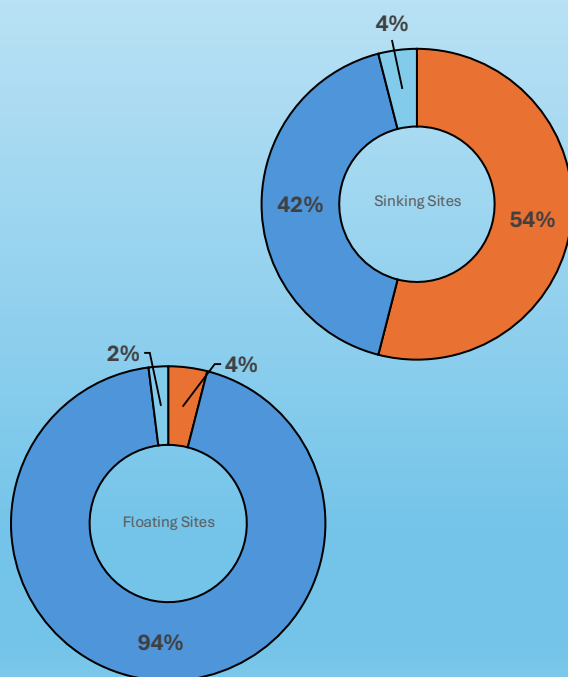
Table 6 - Reduction in Sewage-derived litter

Thames21 Survey Data

Sewage-derived Litter Survey Data

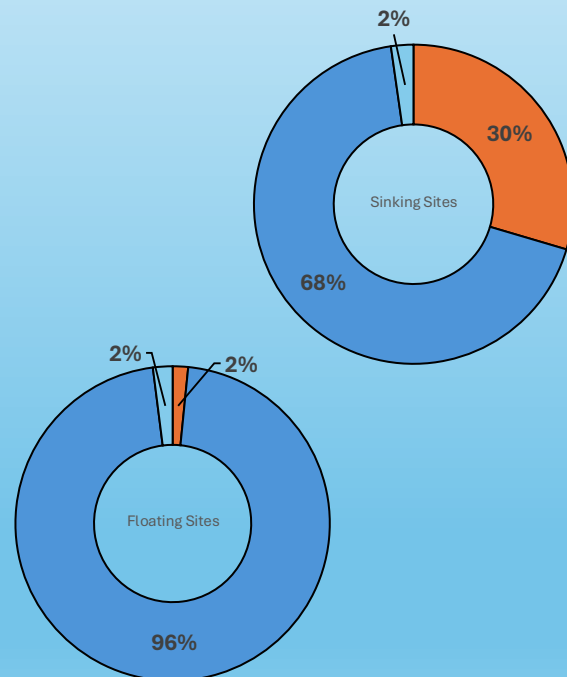
Pre - London Tideway Tunnels

30% of all litter collected from the tidal Thames foreshore was sewage-derived



2025

18% of all litter collected from the tidal Thames foreshore was sewage-derived



■ Sewage-derived plastic
 ■ Non sewage-derived plastic
 ■ Non plastic litter

Figure 5 - Thames21 Survey Data

7.3 Summary

As per the data in Table 6, it is calculated that the TTT prevented over 80 tonnes of sewage-derived litter from entering the river during 2025, representing a substantial environmental benefit to the River Thames. When the Abbey Mills PS interception is considered alongside the TTT, the LTT system as a whole intercepted approximately 130 tonnes of sewage-derived litter during 2025, clearly illustrating the significant contribution made by the Abbey Mills PS interception to overall system performance.

While sewage-derived litter does not directly impact water quality, it is highly emotive for river users and the wider public. Visible items such as wet wipes, sanitary products and plastics undermine perceptions of the River Thames, reinforcing the notion that the river is 'dirty'. Reducing the volume of sewage-derived litter accumulating on foreshores is therefore a significant and valuable outcome, improving both the aesthetic quality of the river and the experience of those who use and enjoy its banks.

Data collected by Thames21 (Figure 5) shows a clear reduction in sewage-derived litter between the

pre-LTT baseline and 2025, with the proportion of sewage-related items found on foreshores decreasing from 30% to 18%. Although it's anticipated that a considerable quantity of wet wipes already within the river system will continue to wash up on foreshores for some time, the ongoing interception of sewage-derived litter by the TTT is expected to drive continued improvements in future survey results. Nonetheless, given the persistence and slow redistribution of legacy litter within the tidal system, it may take several years for the full long-term benefits of the TTT to be conclusively demonstrated.

8 Reduce the elevated health risks to river users

8.1 Background

The River Thames is not a designated bathing water and, as such, there is no routine programme of bacteriological or pathogen monitoring from which a long-term baseline can be established. Consequently, this report does not provide guidance on the suitability of the river for recreational use. Instead, it assesses the reduction in potential health risk associated with storm sewage discharges and the benefits delivered by the Thames Tideway Tunnel. The metric presented should therefore be regarded as an indicator of health risk arising from CSO activity, rather than a direct measure of water quality within the river.

The means to achieve this benefit is to reduce the volume and frequency of CSO discharge events to the river.

By using EDM data across each of the 21 CSOs (Figure 6) that have been identified as having a significant contribution to elevated health risk, we are able to calculate the number of elevated health risk days (EHRD) due to storm sewage discharges. Validated EDM discharge data from each CSO has been used to provide spill days for this calculation (Table 8).

Evidence from a 2007 river users study undertaken in support of the Thames Tideway Strategic Study demonstrated that bacteriological water quality deteriorates following rainfall and associated CSO discharges, with elevated risk potentially persisting for between 2 and 4 days after a discharge event. For reporting purposes, a precautionary 4-day duration has therefore been applied to each discharge event to represent the upper end of the observed risk period.

Should a second discharge occur within these 4 elevated health risk days following the initial event, the number of health risk days will be calculated as the days between incidents plus 4 days, to account for the impact of the second discharge.

As data monitoring started at the beginning of April 2020, the data reported for 2020 represents 9 months only.

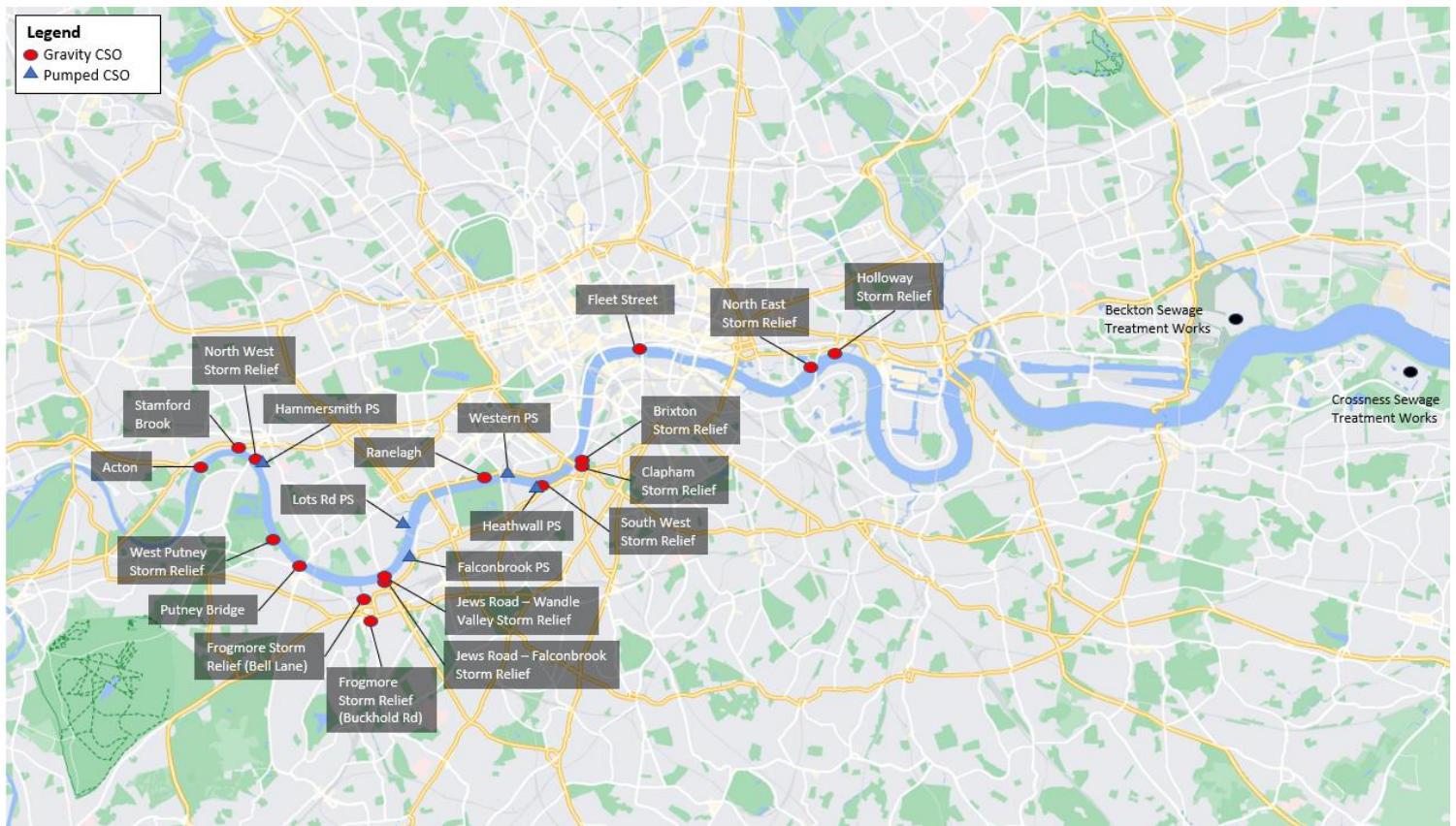


Figure 6 - Elevated Health Risk CSOs

8.2 Reporting

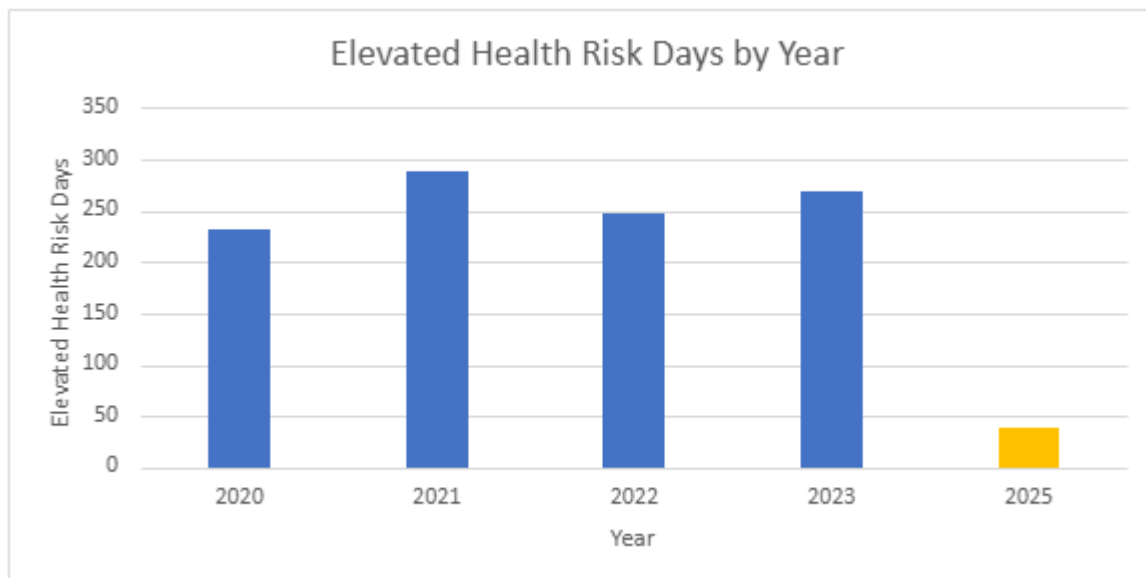


Figure 7 - Elevated Health Risk Days by Year

Elevated Health Risk Days			
Year	EHRD	Total Days	Percentage of EHRD
2020	232	275*	84.4%
2021	288	365	78.9%
2022	248	365	67.9%
2023	269	365	73.7%
Pre-LTT Total	1037	1370	75.7%
2025	38	365	10.4%

Table 7 - Elevated Health Risk Day Percentage

* Only 9 months of data as Event Duration Monitoring started in April 2020.

Significant Health Risk CSOs – CSO Discharges					
CSO (directly intercepted by LTT in bold)	2020	2021	2022	2023	2025
Acton	13	25	18	20	1
Stamford Brook	2	16	11	5	1
North West Storm Relief	2	17	11	2	1
Hammersmith Pumping Station	9	35	15	29	2
West Putney Storm Relief	9	17	0	0	3
Putney Bridge	44	35	85	11	2
Frogmore Storm Relief (Bell Lane)	16	25	21	41	2
Frogmore Storm Relief (Buckhold Rd)	58	71	31	61	1
Jews Rd - Wandle Valley	2	20	0	1	0
Jews Rd - Falconbrook Storm Relief	0	3	2	16	4
Falconbrook Pumping Station	18	25	27	34	3
Lots Rd Pumping Station	12	27	15	21	1
Ranelagh	33	54	41	83	1
Western Pumping Station	16	28	12	22	5
Heathwall Pumping Station	31	45	21	43	4
South West Storm Relief	106	33	27	32	0
Brixton Storm Relief	103	25	68	130	2*
Clapham Storm Relief	3	25	13	22	
Fleet Street	12	39	14	71	2
North East Storm Relief	15	31	13	25	2
Holloway Storm Relief	6	7	0	2	0

Table 8 - Significant Health Risk CSOs - Annual CSO Discharges

* Brixton and Clapham Storm Reliefs CSOs are now combined at the Tideway interception site at Albert Embankment Foreshore.

8.3 Summary

Due to the LTT intercepting flows that would previously have discharged into the river from several key CSOs, the number of elevated health risk days reduced from a pre-LTT average of 75.7% of days during the baseline to 10.4% in 2025. This has been driven by a significant reduction in CSO spills across the tidal Thames as a result of tunnel operation.

While a substantial decrease in discharges from CSOs that the LTT directly intercepts was expected, a notable finding is that spills have also reduced at CSOs not directly connected to the tunnel, such as North West Storm Relief and Stamford Brook. These locations are considered Indirectly Actively Managed, meaning they experience operational improvements as a secondary effect of the LTT intercepting flows elsewhere in the network. Essentially, by removing storm volumes elsewhere in the system, the tunnel reduces hydraulic loading across wider catchment areas, preventing spill conditions from developing at these non-intercepted CSOs.

Western Pumping Station recorded 5 CSO discharges in 2025 that contributed significantly towards the total number of elevated health risk days. It should be noted, however, that all of these spills were impacted by tunnel commissioning, with the site pumping to river earlier than would be expected under normal operating conditions. It's likely that most of these discharges would have been prevented under fully commissioned operation.

Overall, the collective reduction in CSO discharges across the tidal Thames has resulted in a substantial decline in the number of days associated with elevated health risks for river users.

9 Comply with the requirements of the Urban Waste Water Treatment Directive

9.1 Background

In 1991, the European Union introduced the Urban Waste Water Treatment Directive (UWWTD) to protect the environment from the adverse effects of wastewater discharges. In 2006, the European Commission determined that the UK was not meeting the Directive's requirements for London.

In response, the UK Government granted approval in 2007 for the TTT, designed to capture the majority of combined sewer overflow discharges to the River Thames and thereby mitigate the environmental impact of storm events.

Compliance with the UWWTD is assessed using the annual estimated volume of CSO discharges from the 55 CSOs on the tidal Thames that are either actively managed by the TTT or indirectly influenced by it. Spill events are recorded by EDMs and are subsequently validated. Discharge volumes are determined by combining calculated pumped discharges and modelled estimates for gravity CSOs. Together, these form the reported **Annual Discharge Volume**.

Pumped discharge volumes are calculated by multiplying pump run times by individual pump flow capacities. As pumps may operate outside of storm conditions (for example during maintenance or testing) volumes are cross-checked against EDM data for validation. At some locations, operational teams calculate and log pumped discharge volumes on a daily basis.

For the purposes of this report, calculated volumes are used for pumping stations rather than modelled estimates. This is due to the high number of operational variables, including real-time human decision-making, which can create discrepancies between actual performance and model predictions. As a result, modelled values are not considered sufficiently reliable for pumping station discharge volumes.

As reporting commenced in April 2020, the figures for 2020 represent a nine-month period rather than a full calendar year.

9.2 Reporting

Annual Discharge Volume (m3)					
Year	2020	2021	2022	2023	2025
Total	18,826,544	32,682,720	16,003,355	17,310,962	2,987,880

Table 9 – Annual Discharge Volume

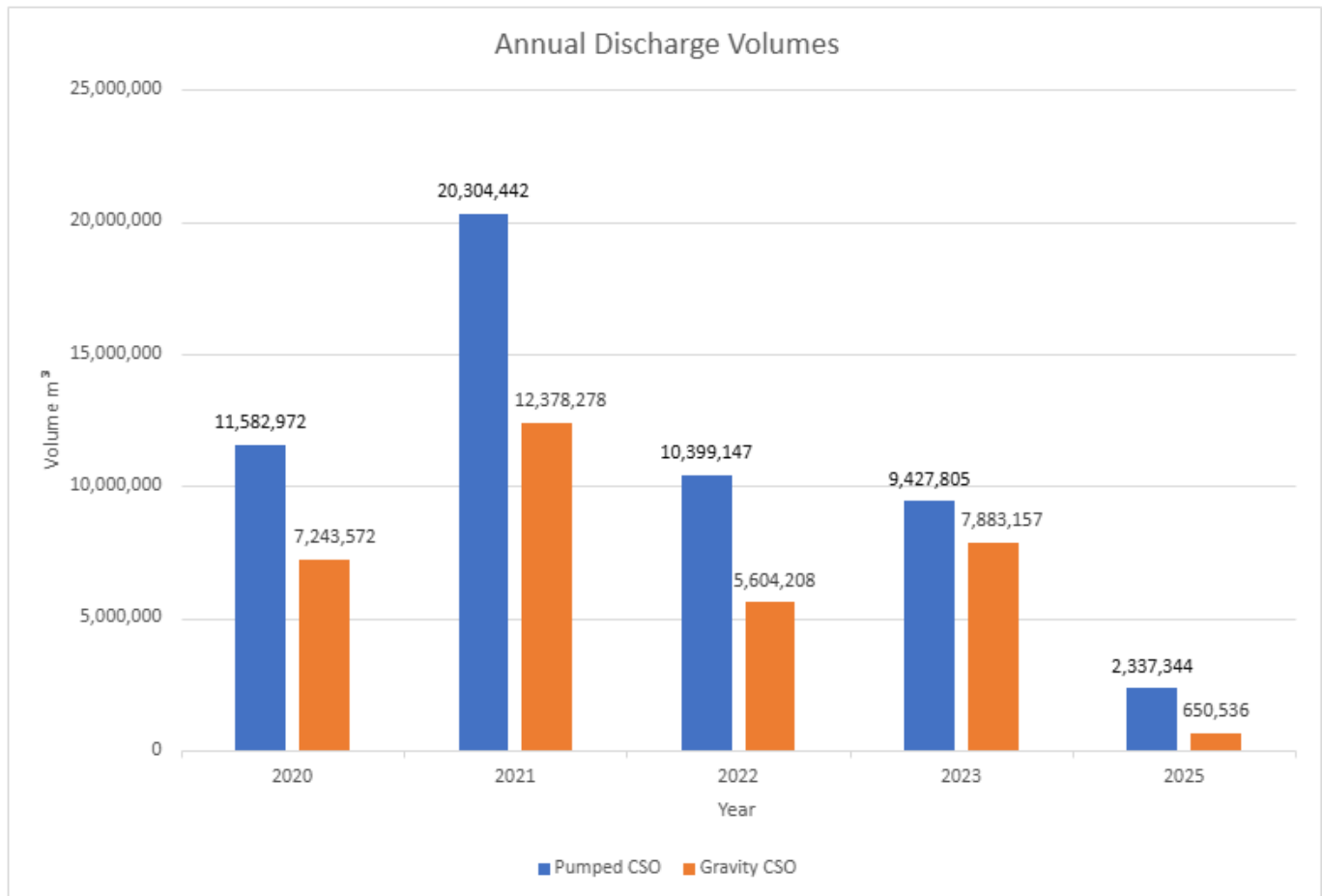


Figure 8 - Annual Discharge Volumes – Calculated Pumped & Modelled Gravity CSO Volumes

9.3 Summary

The 2025 results show a substantial reduction in CSO discharge volumes when compared with the 2020–2023 baseline period. As per Figure 8, both pumped and gravity CSOs exhibit clear decreases, reflecting the operational impact of the TTT. While 2025 was drier than several baseline years (Table 3), the reduction observed substantially exceeds what would be expected from rainfall variability alone, indicating that tunnel operation is the primary driver of the improvement.

For gravity CSOs, most sites (particularly those directly intercepted by the TTT – see Appendix 1) show significant reduction in CSO discharge volumes. Modelled outputs demonstrate the tunnel’s ability to capture storm sewage that would have previously discharged to the tidal River Thames. While the model does not capture the operational testing carried out in 2025 (during which tunnel control was modified and resulted in early CSO discharges), it provides a strong indication of the long-term reduction expected once the tunnel operates without intervention. In several cases, the model suggests lower spill frequencies than those

recorded by EDMs; Thames Water is currently investigating the reasons for these variances.

Essex Street CSO was modelled to discharge a very small volume (5 m³) in 2025 despite a pre-LTT average of zero. This reflects improvements in the hydraulic model and a better understanding of the sewer network since the baseline was established, rather than an adverse impact of the Thames Tideway Tunnel. The baseline represented the best available prediction at the time, but subsequent model refinements suggest that small historical discharges may not have been captured. The volume involved is negligible and does not materially affect the overall assessment of tunnel benefits. With the exception of Essex Street, all comparable gravity CSOs showed reductions relative to the pre-LTT baseline. Victoria CSO is excluded from baseline comparisons as it was commissioned after the baseline period.

CSOs not directly intercepted by the TTT (Appendix 1) also show meaningful reductions in discharge volumes during 2025. This shows that the TTT reduces overall stress on the wider catchment, thereby lowering the likelihood of spills at non-intercepted sites.

For pumped CSOs, 2025 data shows significant reductions across nearly all pumping stations. With most of these stations now connected to the tunnel, pumping to the river only occurs when the system reaches predefined operational thresholds. As a result, 2025 pumped volumes are markedly lower than the pre-LTT average shown in Appendix 2.

Taken together, the 2025 results indicate that the TTT is effectively achieving the UWWTD objective of substantially reducing the frequency and volume of CSO discharges to the tidal Thames, both at directly intercepted CSOs and across the wider sewer network.

It is important to recognise that these reductions are strongly influenced by weather conditions; in years with few significant storm events, CSO discharge volumes would be expected to be lower even in the absence of the TTT. While several pre-LTT years recorded higher annual rainfall than 2025 (Table 3), 2022 presents a broadly comparable rainfall profile and nonetheless shows a notably higher annual discharge volume. This comparison provides additional confidence that the reductions observed in 2025 cannot be explained by weather conditions alone and are consistent with the expected performance benefits of the TTT. A more comprehensive understanding of the long-term benefits delivered by the TTT will develop as further operational data is collected across a wider range of rainfall scenarios in future years.

10 Report Summary

The 2025 results provide the first annual assessment of the environmental benefits delivered by the Thames Tideway Tunnel following commissioning. Across all four environmental objectives, performance in 2025 demonstrates clear improvements when compared to the 2020–2023 pre-LTT baseline, despite a number of CSO discharges associated with tunnel commissioning that would not be expected under normal operational conditions.

The 2025 results indicate that the TTT has substantially reduced the frequency and volume of CSO discharges to the tidal Thames. Total annual discharge volumes fell to 2.99 million m³, an 86% reduction from the pre-LTT average, with both pumped and gravity CSOs showing substantial decreases. Many gravity CSOs, particularly those directly intercepted by the tunnel, recorded substantially lower modelled discharge volumes when operated in full tunnel operation mode. Pumped CSOs also recorded significant reductions as the tunnel's availability limits the circumstances in which pumping to the river is required.

This reduction in spills has delivered measurable benefits to water quality, aesthetic conditions and potential public health impact. Dissolved oxygen depletion events attributable to CSO activity were limited to a single storm period, and an estimated 84 tonnes of sewage-derived litter were prevented from entering the river. Elevated health risk days also decreased significantly to 10% during 2025 as a result of fewer spill events across the network.

Given that CSO discharges closely track weather patterns, the limited number of significant storms and higher number of dry days in 2025 contribute to the low spill volumes reported. Only through monitoring performance across wetter and more variable future years will the full, long-term impact of the tunnel be

understood.

Overall, the 2025 results indicate that the TTT is delivering the environmental benefits anticipated at the design stage, contributing to substantial reductions in CSO discharges and supporting long-term improvements in the health, appearance and resilience of the tidal Thames.

11 Appendix

Appendix 1 – Gravity CSO Modelled Discharge Volumes

Annual Modelled Discharge Volume (m ³) – Gravity CSOs							
CSO Name (directly intercepted by LTT in bold)	2020	2021	2022	2023	Pre-LTT Average	2025	Difference
Acton	214,612	545,083	302,467	426,645	372,202	0	-372,202
Stamford Brook	1,535	44,140	4,316	7,532	14,381	2,460	-11,921
North West Storm Relief	9,594	168,039	7,520	23,711	52,216	0	-52,216
West Putney Storm Relief	18,664	31,998	9,925	25,276	21,466	120	-21,346
Putney Bridge	91,245	143,087	64,706	123,450	105,622	0	-105,622
Frogmore Storm Relief (Bell Lane)	23,177	37,914	12,322	26,359	24,943	483	-24,460
Frogmore Storm Relief (Buckhold Road)	156,403	1,552,012	862,932	1,352,856	981,051	4,150	-976,901
Jews Road – Wandle Valley Storm Relief	0	2,591	0	0	648	0	-648
Jews Road – Falconbrook Storm Relief	17,302	77,308	5,211	6,292	26,528	5,154	-21,374
Church Street	0	1,416	0	0	354	0	-354
Queen Street	2,809	1,215	47	13	1,021	182	-839
Smith Street Main Line	4,524	7,174	851	1,193	3,436	906	-2,530
Smith Street Storm Relief	27,688	85,062	3,604	794	29,287	0	-29,287
Ranelagh	426,127	771,093	372,348	444,205	503,443	11,723	-491,720
South West Storm Relief	875,170	606,080	280,209	441,850	550,827	1,212	-549,615
Kings Scholar Pond	2,193	102,233	10,766	19,141	33,583	23,348	-10,235
Brixton Storm Relief *	343,340	525,326	225,158	374,218	367,011	8,281	-372,033
Clapham Storm Relief *	6,723	38,126	328	8,036	13,303		
Grosvenor Ditch	68,426	112,680	66,326	94,004	85,359	31,196	-54,163
Regent Street	219,518	272,611	93,704	123,933	177,442	0	-177,442
Victoria **	N/A	N/A	N/A	N/A	N/A	14,112	N/A

Northumberland Street	255,173	332,775	113,870	149,000	212,705	2,954	-209,751
Savoy Street	7,909	15,817	8,486	5,726	9,485	6,185	-3300
Norfolk Street	0	0	0	0	0	0	0
Essex Street	0	0	0	0	0	5	+5
Fleet Street	954,488	1,754,665	819,771	969,912	1,124,709	209,866	-914,843
North East Storm Relief	1,267,771	2,142,680	1,188,970	1,283,489	1,470,727	49,780	-1,420,947
Holloway Storm Relief	696	46,717	3,644	1,909	13,242	8,935	-4,307
Deptford Storm Relief	2,083,260	1,950,673	1,023,411	1,747,531	1,701,219	152,886	-1,548,333
Deptford Creek	41,955	39,536	10,763	0	23,064	0	-23,064
Charlton Storm Relief	20,411	540,907	18,527	65,833	161,420	39,553	-121,867
Low Level 1 – Brook Green	113	7,017	423	807	2,090	139	-1,951
Horseferry	16,944	55,837	15,194	20,396	27,093	1,195	-25,898
Wood Street	32,210	69,278	31,978	45,249	44,679	4,865	-39,814
Goswell Street	169	12,905	1,074	315	3,616	379	-3,237
Pauls Pier	2,481	17,709	3,482	2,801	6,618	1,285	-5,333
Beer Lane	3,448	22,376	1,016	2,512	7,338	3,255	-4,083
Iron Gate	12,873	50,932	6,468	16,227	21,625	12,903	-8,722
Nightingale Lane	11,172	39,075	3,671	10,343	16,065	7,495	-8,570
Wapping Dock	0	0	0	2,210	553	0	-553
Bell Wharf	5,628	30,730	9,078	20,292	16,432	12,953	-3,479
Ratcliffe	533	18,383	1	0	4,729	1,343	-3,386
Henley Rd	0	44	0	0	11	0	-11
London Bridge	17,288	105,033	21,640	39,097	45,765	31,233	-14,532
TOTAL m³	7,243,572	12,378,278	5,604,208	7,883,157	8,277,308	650,536	-7,640,884

* Brixton and Clapham Storm Reliefs CSOs are now combined at the Tideway interception site at Albert Embankment Foreshore.

** Victoria CSO was commissioned after the baseline period and therefore has no comparable pre-LTT dataset.

The total difference is calculated as the sum of comparable site-level differences. As Victoria CSO has no pre-LTT baseline, its 2025 discharge volume is included within the total 2025 volume but excluded from the difference calculation.

Appendix 2 – Pumped CSO Calculated Discharge Volumes

Annual Calculated Discharge Volume (m ³) - Pumped CSOs							
CSO Name (directly intercepted by LTT in bold)	2020	2021	2022	2023	Pre-LTT Average	2025	Difference
Hammersmith PS	456,200	4,002,400	2,034,400	2,229,200	2,180,550	207,000	-1,973,550
Falconbrook PS	631,392	2,025,408	492,576	701,309	962,671	98,051	-864,620
Lots Rd PS	622,238	2,342,540	1,226,070	1,228,220	1,354,767	95,400	-1,259,367
Western PS	1,333,350	3,160,875	1,438,800	1,743,080	1,919,026	306,850	-1,612,176
Heathwall PS	2,368,878	2,565,906	995,096	1,404,004	1,833,471	86,796	-1,746,675
Shad Thames PS	218,145	151,569	74,630	169,722	153,517	28,400	-125,117
Earl PS	400,179	845,850	407,922	717,021	592,743	33,647	-559,097
Greenwich PS	3,159,770	2,589,070	2,177,236	775,646	2,175,431	742,933	-1,432,498
Abbey Mills PS	0	0	0	0	0	0	0
Isle of Dogs PS	35,340	57,000	2603	1,453	24,099	0	-24,099
Tideway CSO	2,357,480	2,563,824	1,549,814	458,150	1,732,317	738,268	-994,049
TOTAL m³	11,582,972	20,304,442	10,399,147	9,427,805	12,928,592	2,337,344	-10,591,247

