River pollution in London: causes and solutions

London Mayor Sadiq Khan made an election promise in 2024 – to clean up London's Rivers. **What will it take?**

Introduction and purpose

CPRE London leads the More Natural Capital Coalition and is part of the Rivers in London Partnership, a group of experts who care about rivers. We work with both and in 2025 will be working with RiPL to make recommendations to the GLA on how to clean up London's rivers. This paper will be fed into that process.

The extent of river pollution in London

London's rivers are polluted with sewage and other foul water from houses and businesses, and micro plastics and other substances from roads. The River Thames and its tributaries are all polluted. Of London's 41 rivers, two are classified by the Environment Agency as 'Bad', three 'Poor' and 36 'Moderate'. None are classified as Good.[1]

Pollution enters the rivers in the following ways:

Via the 'foul' network:

- The foul sewers are designed to take 'foul water' from toilets, bathrooms and kitchens, etc., from households to sewage treatment plants. However, in roughly one third of London, rainwater from rooves and roads is routed into foul sewers. Heavy rain overwhelms the network, overflowing into rivers via 'Combined Sewer Overflows' or CSOs – a legalised system which exists to stop sewage backing up into properties.
- Where new housing is built without adequate new sewer capacity, this can lead to increased numbers of overflow incidents i.e. where sewers overflow into rivers because the sewers are overwhelmed. This can also happen as a result of poor maintenance by water companies, i.e. blockages are not cleared and so the sewer capacity becomes constrained. This is also a result of 'sewer abuse' i.e. flushing of wet wipes, fat, etc into the sewers.

Via the surface (rainwater) network:

- Misconnections: foul waste is incorrectly plumbed into surface (rainwater) drains. Since rainwater drains go straight into rivers (unlike sewage pipes which go to water treatment works), misconnections mean sewage goes straight into rivers.
- Road run-off i.e. rainwater falling on road and hard surfaces, carries pollutants from vehicles into rivers when it rains, via road drains, which are part of the surface (rainwater) network.
- Businesses and members of the public illegally dispose of pollutants into surface water drains.

[1] Environment Agency, Additional Correspondence London Area Director, 20 October 2023

This table aims to summarise the causes and solutions needed, reflecting key issues in four areas – infrastructure, enforcement, monitoring and awareness / understanding.

	PROBLEM	WHAT'S NEEDED
Infrastructure		
1	**Too much paved / built surface, causing too much rainwater to enter constrained sewers and treatment works, leading to sewage overflows into rivers** When overwhelmed by rainfall, sewers overflow directly into rivers via 'Combined Sewer Overflows' (CSO) taking sewage with them. This happens where rainwater goes into the same combined sewers as foul waste (this applies to roughly one third of London). There is currently no requirement for property owners to manage rainfall within the boundaries of their property, even though the cost of managing run-off falls on other bill payers (including e.g. long-term maintenance costs of SUDS, which would not apply if managed within a property).	Rainwater should be captured before it enters the sewers or rivers/waterways: 1. Urgent and widescale installation of Sustainable Urban Drainage Systems (SuDS) – i.e. largescale wetlands in green spaces; on-street rain gardens (not on main roads); and within gardens etc. The delivery mechanism for this, the London Surface Water Strategy Group, needs to ensure this happens and work to establish necessary funding. 2. Government should incentivise or require rainfall to be managed within a property (via de-paving of front and back gardens so they are genuinely permeable; capture of rainwater from roofs via rain gardens/ rain planters/smart water butts; and installing green / blue roofs, and rainwater recycling e.g. for cisterns). Additionally, mapping of locations for SUDS needs to reflect pollution management as well as flood management (SUDS needs mapping currently focuses on flood risk).
2	**Unmapped sewer and road drain network** 30% to 40% of London's sewage system is unmapped, including as yet unidentified CSOs and other outfalls (where water pours into rivers), for example surface water drains discharging water into rivers. This makes it hard to identify what action is needed and where. Road drains also need to be mapped.	Thames Water should set a target for mapping for each catchment as well as publish a clear plan / target for the mapping exercise by June 2025 and should aim to complete mapping by the end of 2030 latest with interim targets for each year. This task can be supported by a volunteer effort where appropriate e.g. via outfall safaris.
3	**Unlicensed Combined Sewer Overflows** Not all CSOs are licensed which means they are not monitored, their impact is unknown and they are illegal (discharges of pollution need to have a permit or they are breaking the Environmental Permitting Regulations 2016). Also, there are likely to be more (unidentified) CSOs which need mapping and licensing (see 2 above).	Thames Water to submit all 118 unlicensed overflows for permits by 2027. Environment Agency to issue strong permits for the 118 unlicensed/illegal overflows.

4	**Road run-off pollution goes straight into rivers** Rainwater in much of London runs into a surface water drainage system which empty directly into rivers (i.e. does not combine with sewage, and so does not go to a treatment plant). These carry road run-off pollutants straight into the river. These are unregulated currently. Very few, if any, have a permit. There is an MoU between the EA and National Highways that allows some road drains (on motorways mainly) to be fitted with SUDS or separator. Thames Water is not responsible for most road drains. There may be some owned by Thames Water, but they are not held responsible for the runoff.	Specially engineered solutions such as settling tanks, filters, and wetland SUDS in parks and green spaces, and also on-street SUDS (rain gardens), are needed to filter rainwater from road drains, before the water enters a river. Responsibility for eliminating road run-off pollution needs clarifying. A system of regulation should be established in law to manage and eliminate the high levels of pollutants entering watercourses via roads.
5	**Sewage pipes are (mis)connected so they run straight into rivers** There are many misconnected or cross-connected sewage pipes i.e. sewage / foul water is mis-plumbed, so it goes directly into rivers. The systems to deal with misconnections are not always effective.	"Outfall safaris" by volunteers have been effective at identifying polluting outfalls and should continue and be funded. But not all pollution and not all outfalls are visible. Thames Water needs to increase its investigations into pollution sources, and to set binding targets to eliminate all misconnections. Boroughs have a duty to enforce the rectification of misconnections and must take action in all cases. [See also 9 below]
6	**The system to prevent new/future misconnections is not always effective.**	A report is needed on how to prevent new / future misconnections and recommendations need to be actioned urgently to halt a rising tide of new misconnections. [See also 9 below]
7	**New Housing Developments can be built without funding for extra sewerage capacity.** This leads towards further CSO discharges as water companies 'sweat their assets'.	New development should minimise pressure on the sewage network by reusing rainwater and minimising water use and incorporate SUDS to reduce run-off in the neighbourhood.
Enforcement issues		
8	**Environment Agency lacks capacity** The Environment Agency has a duty to licence outfalls, monitor levels of river pollution and enforce infringements by companies causing pollution spills. It does not have enough resources to do this, e.g. there is one person to	Environment Agency needs to increase capacity for this location in particular and London generally. It should publish its plan to increase capacity with detail.

	monitor the whole of North & NW London.	
9	**Local authority powers not used effectively** Local authorities are responsible for issuing certificates for new developments but frequently do not identify misconnections. They also have a duty under 1984 Building Act to require householders to resolve misconnections. However not all boroughs do this.	Government should enable stronger sanctions against builders installing inappropriate connections. Building Control inspections need clarifying and tightening to prevent new misconnections. London boroughs have a duty to require rectification of misconnections and should seek a 100% rectification rate for misconnections they are informed about. The GLA should support boroughs to discharge this duty efficiently by establishing a central team which boroughs can contract to discharge this duty.
Monitoring		
10	**Combined Sewer Overflows not all monitored** Not all CSOs are monitored or even known about (see 2 and 3 above).	As above (see unlicensed / unmapped CSOs), all 128 unlicensed overflows, and any hitherto unmapped CSOs, must have strong permits and monitors, to enable proper monitoring and to plan solutions.
11	**Missing info from CSO monitors** CSO 'Event Duration Monitors' (EDMs) do not measure quantity or quality of water pollution, merely duration. This hampers analysis needed to identify and implement the necessary infrastructure to halt overflows.	Thames Water should produce quarterly summaries of estimated volume (based on evidence) and number of 'events' from all EDMs to better inform prevention. Up and down stream water quality monitoring should be implemented urgently. Thames Water is required to do this by July 2025: they should publish progress.
Awareness and understanding		
12	**There is poor public understanding of the issues and what individuals can and should / should not be doing.** A wide range or behaviours are currently normalised despite being extremely damaging, at best, and often illegal.	Much more publicity is required about 1.Foul sewer abuse (wet wipes, fat, etc, being put down toilets and drains) 2.Surface water abuse i.e. sewers being connected to rainwater drains (which discharge into rivers); and substances other than rainwater being put down road drains 3. Problems with excessive paving, and the need for permeable paving and SUDS[2] etc.

[2] *SUDS = rain gardens or rain planters which householders can put in their gardens; on-street SUDS which are installed by local authorities to capture and filter rainwater from road run-off; and wetland SUDS which are largescale water-capture and filtering systems usually in green spaces, taking larger quantities of water e.g. from road drains.