



# Water (Special Measures) Bill

## Factsheet on monitoring discharges from emergency and storm overflows, and wastewater treatment works

### Headlines

- The Bill will ensure all emergency overflows in England and Wales are monitored. Currently only a small proportion of emergency overflows have monitors installed to measure the frequency and duration of sewage discharges.
- This measure closes the current monitoring gap building on the monitoring of 100% of sewage discharges from storm overflows operated by English water companies, which has already been achieved.
- It is separate to the regulation of treated sewage effluent discharges from wastewater treatment works.

### What does the Bill do?

- Clause 3 of the Bill inserts provisions into the Water Industry Act 1991, which will place a statutory duty on water companies to publish near real-time information on the location of relevant sewage discharges and when they began and ended in a clear, accessible format (across England and Wales).
- The information will be publicly available and will significantly boost transparency around the operation of emergency overflows. The introduction of this clause is just one measure that the government will be using to increase our understanding of the scale and impact of sewage entering our waterways.

### FAQs

#### How are treated effluent and untreated sewage discharges monitored and regulated differently?

- **Treated effluent** is discharged from treatment works after the wastewater has undergone treatment. The Environment Agency regulates treatment works by assessing the quality of the treated wastewater they discharge against set compliance limits.
- **Untreated sewage discharges** through storm and emergency overflows are permitted by the Environment Agency. Permit conditions specify the circumstances in which overflows are allowed to operate, such as during heavy rainfall and/or snow melt for storm overflows, or in response to limited emergency events e.g. fire at sewage pumping stations for emergency overflows.
- Event duration monitors to measure the frequency and duration of discharges were installed by water companies at 100% of storm overflows by the end of 2023. Since the start of January this year, water companies have been required to publish storm overflow discharges in near-real time (within an hour) under the Water Industry Act 1991.

### What is the difference between storm overflows and emergency overflows?

- Emergency overflows are regulated separately to storm overflows by the Environment Agency.
- **Storm overflows** are used in combined sewer systems to protect properties from overloaded sewers causing flooding and sewage backing up into streets and homes during heavy storm events (see **Annex A** for a diagram).
- **Emergency overflows** operate at sewage pumping stations, located along the sewage network and at sewage treatment works, as a “last resort” in response to an emergency event, such as a pump mechanical or electrical failure (see **Annex B** for a diagram).

### What are the different types of monitoring that can be used to measure discharges?

- Monitoring the different properties of discharges, such as the duration, the flow, or the quality of the receiving watercourse, can provide insight into the scale and impact of sewage entering our waterways.
- **Event duration monitors** operate inside overflows and measure when they are discharging, and the duration of the discharge. These are already installed at all storm overflows operated by English water companies and the Bill will expand this requirement to emergency overflows.
- **Continuous water quality monitors** operate outside of overflows and measure the impact of discharges on the water quality of the receiving watercourse (see **Annex C** for roll out details). These monitors will be placed upstream and downstream of storm overflows and sewage treatment works to provide information to assess water quality, including levels of dissolved oxygen, temperature and pH values, turbidity, and levels of ammonia.

**Flow monitors** can be used to accurately measure the volume of sewage discharges. The government does not currently have plans to routinely measure volume of sewage discharge from overflows given volume is not a good metric for assessing the impact of a discharge on the watercourse – continuous water quality monitors instead provide more beneficial information on the impact of a discharge on water quality.

### Why is the government not planning to monitor volume from all storm and emergency overflows?

- Information on the volume of discharges does not provide a comprehensive account of the impact of a discharge, particularly as discharges from storm overflows can have a large volume of diluting rainwater. For storm overflows, continuous water quality monitors instead will begin to be installed from April 2025 onwards to measure the impact on water quality from these discharges.

### How is the government planning to roll out monitoring to overflows along the network and discharges from wastewater treatment works?

- The table in **Annex C** summarises the government’s current timelines to rollout monitors to storm overflows, emergency overflows and wastewater treatment works.

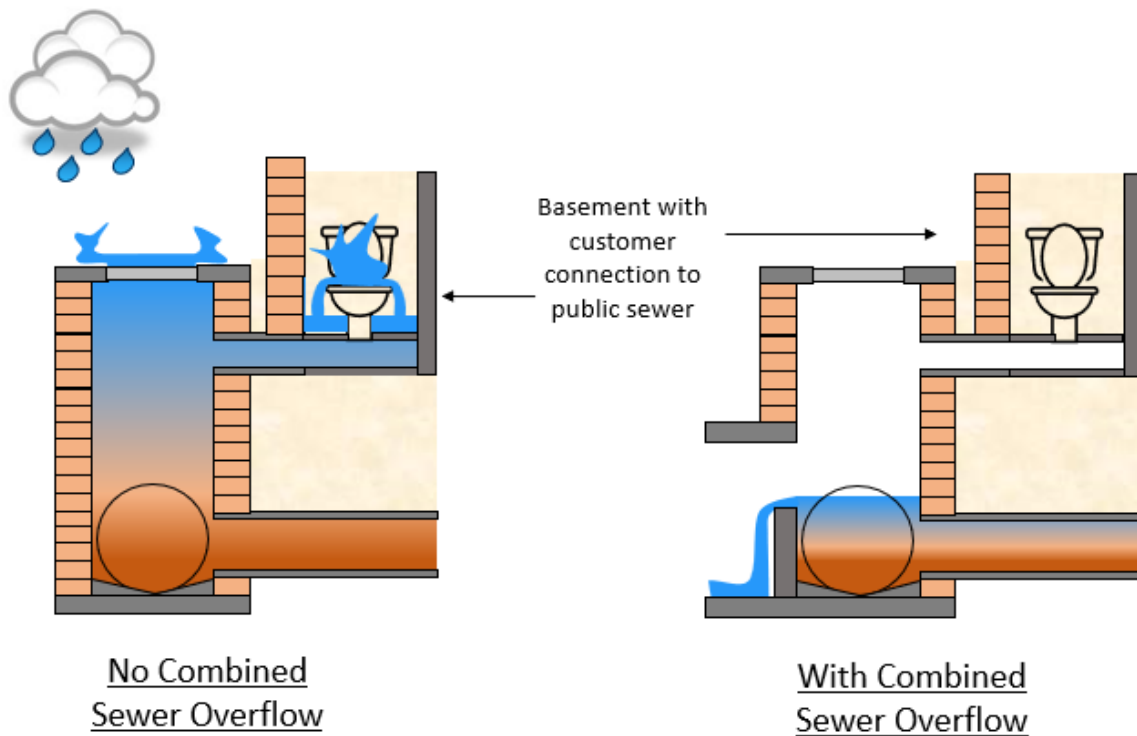
### What are the expected costs of rolling out monitors to emergency overflows?

- As set out in the Impact Assessment for the Bill, we expect the roll-out of monitors at emergency overflows to cost £533 million over a 10-year period. We believe this pace of rollout strikes the right balance of, recognising the urgency, whilst ensuring companies have capacity to progress other improvements. Where companies can move further and faster to achieve roll-out of monitors at emergency overflows, they will be encouraged to do so.

### How much would it cost to rollout flow monitoring to every overflow site in England and how did you calculate this figure?

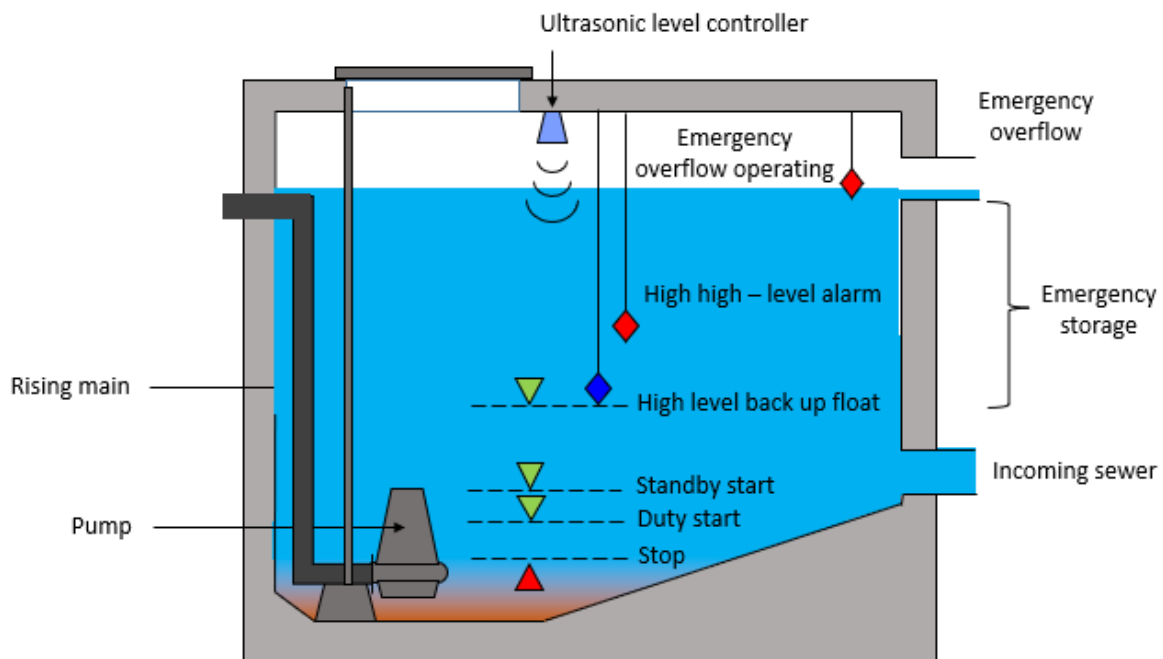
- By comparing with the cost of installing flow monitors at wastewater treatment works, we estimate that the cost of installing a flow monitor at all storm and emergency overflow sites in England would be **up to £6 billion**.
- We estimate that there are ~18,000 overflow sites (comprising ~14,500 storm overflow sites and ~3,500 emergency overflow sites that don't also have a permit for a storm overflow at the same site).
- To support the rollout of flow monitors at wastewater treatment works during PR24, Ofwat modelled two average unit costs for installing flow monitors:
  - Unit cost of complex civil installation scheme: £311,000.
  - Unit cost of simple monitor installation: £74,800
- Network overflows are not set up for flow monitors to be installed. This means that the vast majority of overflows would require complex works – such as pipework modifications – in order for monitors to be able to record accurate measurements of volume. More complex installation will mean higher costs and longer construction times. As such this estimate is uncertain and could be significantly higher, the cost of installation in the future may also increase due to inflation.
- This figure has been derived as an initial estimate. It does not take into account the efficiencies that may be gained from large-scale rollout.

**Annex A. A diagram of a storm overflow discharge during a rainfall event**



- During heavy rainfall, combined sewer overflows (also known as storm overflows) discharge excess storm water into watercourses to prevent sewage from backing up through pipes into streets and homes.
- The diagram above shows a heavy rainfall event with street and basement flooding in the scenario without a storm overflow (left), and the scenario of a storm overflow discharge (right) which protects the property.

## Annex B. A diagram of an emergency overflow at a pumping station



- Emergency overflows are built at pumping stations along the sewage network and at sewage treatment plants.
- The diagram above shows the typical set up of a “wet well” (a chamber where the sewage is pumped) within a pumping station, with an emergency overflow outlet.
- The pump transfers the sewage along the network. If the pump breaks down or becomes blocked in an emergency, the sewage level in the wet well will rise.
- The ‘ultrasonic level controller’ detects the level of sewage within the wet well using a sensor.
- The operator is notified if the sewage rises to certain levels, so that they can take action to mitigate a discharge if possible. Stand-by pumping systems may be turned on to keep transferring the sewage along the network and prevent levels rising further in the wet well.
- If the sewage level continues to rise then the emergency storage space in the wet well will be used. Eventually the emergency overflow will need to be operated if the sewage rises above the emergency storage capacity.
- Monitors installed at the emergency overflow will be able to transmit information on the timing and duration of the discharge. Clause 3 of the Bill will require this information to be published within an hour of the discharge occurring. This will allow regulators to investigate the cause and impact of the discharge quicker and take enforcement action if required.

**Annex C. Summary of Government’s current roll-out plans for sewage discharge monitoring in England.**

Site	Description of monitoring required	Timeline
Storm overflows	Event duration monitoring	All storm overflows are monitored, and data is being published in near real-time. This was achieved by the end of 2023 after water companies were directed to increase storm overflow monitoring in 2013.
	Continuous water quality monitoring	<p>Monitors will be installed at 25% of assets in scope for the continuous water quality monitoring program in the next Price Review period (PR24), which runs from 2025-2030. The 25% will be based on Defra’s priority areas, such as those that impact designated bathing and shellfish waters.</p> <p>Installing monitors at 25% of sites leaves sufficient scope for innovation in future price review cycles of the programme, as technology around water quality monitoring is developing quickly and new monitoring methods are being trialled.</p> <p>Requiring sewerage undertakers to install more than 25% of sites in this initial rollout would risk the program being overtaken by developing technology, which could make the program more expensive than necessary due to outdated equipment, causing unnecessary cost to sewerage undertakers and subsequently billpayers.</p> <p>We will review the progress of the continuous water quality monitor rollout before deciding on the pace of installation for the next Price Review.</p>
Emergency overflows	<p>Event duration monitoring</p> <p>Pass forward flow monitoring to sites that also operate as storm overflows</p>	<p>Water companies have been directed to install monitors to at least 50% of sites by the end of PR24 (2030), and 100% by the end of PR29 (2035).</p> <p>This means that the emergency overflow monitoring roll-out programme will take a similar length of time as the storm overflow monitoring roll-out programme. While there are fewer emergency overflows than storm overflows in England, the roll-out of monitoring is more complex, given the need for pass forward flow monitoring at</p>

		those sites that also operate as storm overflows.
Wastewater treatment works	Continuous water quality monitoring	Included in the program set out above of 25% of assets in scope for the continuous water quality monitoring program by the end of PR24 (2030).  As noted above, we will review the progress of the continuous water quality monitor rollout before deciding on the pace of installation for the next Price Review.
	Pass forward flow monitoring	This program to roll out pass forward flow monitoring in wastewater treatment works builds on existing work for flow monitoring at sites and is expected to be completed by end of 2026.
	Monitoring of quality of effluent after final treatment	This type of monitoring is already established through environmental permits.