Ingleton

Infiltration Reduction Plan

Last Updated: October 2026



United Utilities

Water for the North West

Executive Summary

Ingleton is currently in the intervention stage to address infiltration and reduce spills at the Ingleton Wastewater Treatment Works Storm Tank Overflow. An initial desktop assessment concluded that groundwater infiltration was likely. However, the first phase of CCTV surveys found no indication of active infiltration. A second phase of surveys, undertaken between autumn/winter 2025 and spring/summer 2026, subsequently confirmed that infiltration is present within the network. The findings will inform the next stage of the plan, with remedial interventions planned for completion in 2027, to help reduce infiltration and minimise spills from the site.

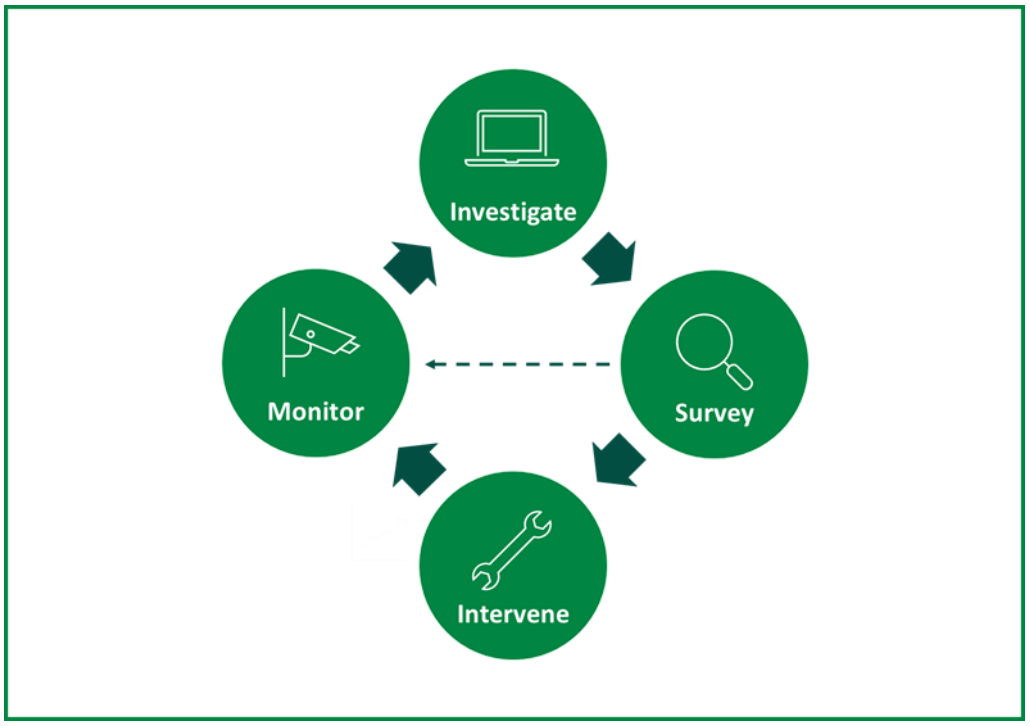


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

Context

Sometimes, water can enter our wastewater pipes for which they were not designed to receive. One source of these additional flows can be groundwater infiltration which can occur through pipe defects, leaky joints, or issues with manholes. Extra water in the network can cause the sewer capacity to be exceeded, leading to sewer flooding or contributing to storm overflow activations.

As part of our ongoing work to maintain an effective network and achieve Better Rivers for the North West, our Infiltration Reduction Plans demonstrate our efforts to date and next steps to address infiltration and inflows in the catchment. This plan covers the Ingleton drainage area and its associated overflow, Ingleton Wastewater Treatment Works Storm Tank Overflow. In 2023, infiltration was identified as a potential leading cause of the storm overflow discharging. The purpose of this plan is to capture the process to investigate, identify and address significant groundwater infiltration.

If groundwater infiltration is found to be a leading cause of spills, interventions will be undertaken, and this Infiltration Reduction Plan will be updated accordingly. If not, we will continue to monitor the network to identify any new points of infiltration, should they arise.

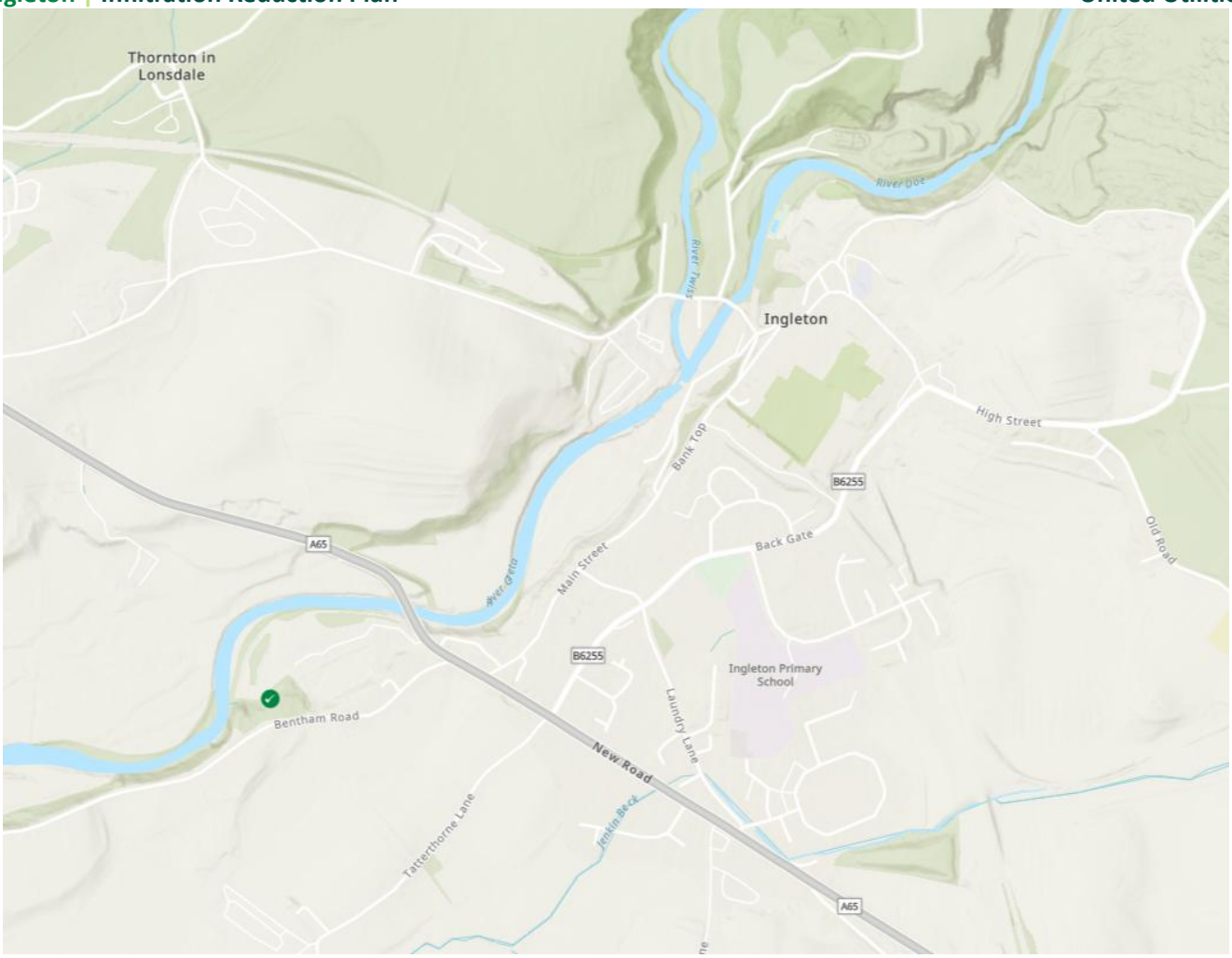


Figure 2: United Utilities – Better Rivers – Storm Overflow Map (November 2024). The green dot marks the Ingleton Wastewater Treatment Works Storm Overflow

Ingleton is situated 17 miles from Kendal and Lancaster. It sits at the foot of Ingleborough and is surrounded by limestone countryside. Ingleton lies along the meeting point of where the River Doe and the River Twiss join to form the River Greta.

Investigation

An initial desktop study was undertaken using available data to understand the extent of infiltration in the sewer network of the drainage catchment. The following data (where available) was analysed to determine the scale and location of potential infiltration:

- Relevant flow and depth data
- Operational information
- MCERTS data
- Hydraulic models of the catchment
- River levels
- Groundwater (borehole) data
- Spill analysis
- Topographical and sewer maps

The assessment concluded that significant groundwater infiltration was likely. However, there was also indication of a very slow response runoff. Monitoring at the storm tank indicated ingress from high

groundwater levels in the catchment; a level of base infiltration in the system that remains high in the winter could be due to rural runoff or groundwater infiltration due to soil saturation.

The assessment highlighted areas in the catchment where sewers crossed the river or ran close to bodies of water. It can be that flow from these watercourses can enter the sewer system through structural defects. The assessment also found that there were fields that fell towards the catchment, notably towards the combined sewer. There could be rural runoff from these fields that drains to the combined sewer.

From these findings, it was recommended that CCTV surveys be completed to see if there was infiltration from the watercourse into the sewer. The CCTV surveys could also identify if there was land drainage connected into the sewer, which would be assessed for removal.

Survey

As recommended, 545 metres of CCTV surveys were completed in November 2024. The surveys found evidence of historic infiltration but no presence of active infiltration. Consequently, no remedial interventions were recommended following the initial surveys.

All lateral connections were also inspected, with no evidence that they were receiving flows they were not designed to accept.

A second phase of CCTV surveys, comprising 8,393 metres of survey work, was undertaken between autumn/winter 2025 and spring/summer 2026. These surveys confirmed the presence of infiltration within the network. The findings will inform the next stage of the plan, with remedial interventions to address infiltration planned for completion in 2027.

Next Steps

Ingleton is progressing towards the intervention stage of addressing infiltration (see Figure 1), with remedial interventions planned for completion in 2027. Following the interventions, the site will then follow the iterative process displayed in Figure 1 to monitor the efficacy of these interventions and identify new points of infiltration, should they arise.