Ireby

Infiltration Reduction Plan

Last Updated: March 2025

United Utilities

Water for the North West

Executive summary

Ireby in Cumbria is currently in the intervention stage (see Figure 1) to address infiltration and reduce spills at the Ireby Wastewater Treatment Works Storm Overflow (017570071SO). A desktop assessment concluded that there is a low likelihood of groundwater infiltration however surveys confirmed points of infiltration and remedial works are planned for Spring / Summer 2025.

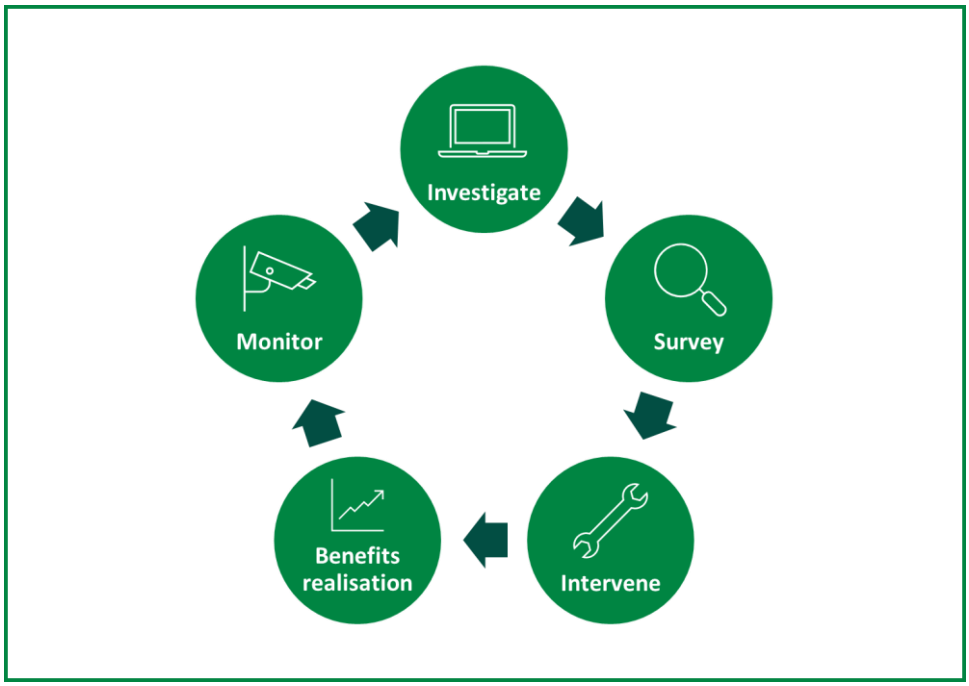

Figure 1: Iterative process to investigate, identify and address groundwater infiltration

Context

Sometimes, water can enter our wastewater pipes that 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 Northwest, our Infiltration Reduction Plans demonstrate our efforts to date and next steps to address infiltration and inflows in the catchment. This plan covers the Ireby drainage area and the associated overflow, Ireby Wastewater Treatment Works Storm Overflow (017570071SO). In 2022, 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.

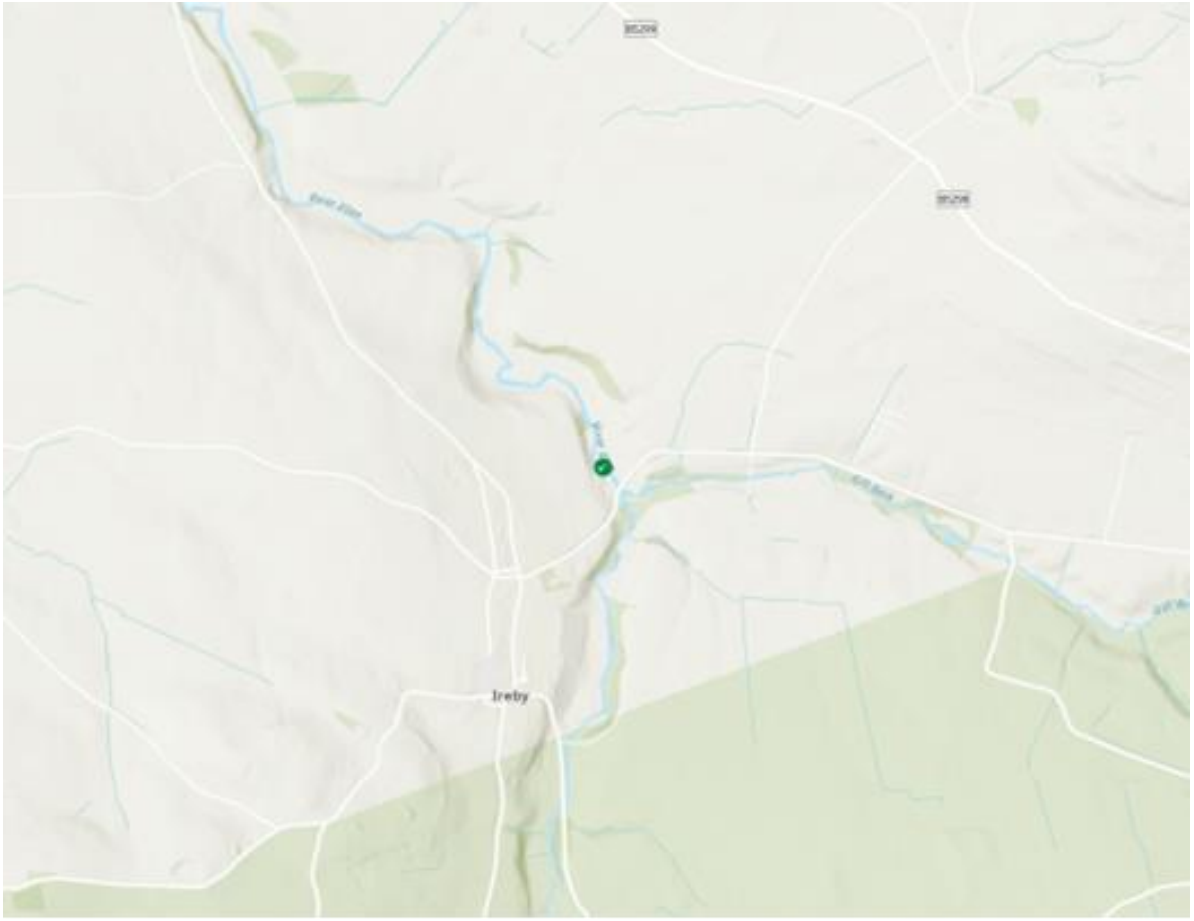

Figure 2: United Utilities – Better Rivers – Storm Overflow Map (October 2024). The green dot marks the Ireby WwTW Storm Overflow.

Ireby is a village just outside the Lake District National Park northern border in the Cumberland district. The village sits higher than The River Ellen, which borders Ireby to the East.

Investigate

A 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 unlikely in the catchment and modelled spill counts do not appear to be related to infiltration. However, further observations included sewers upstream of the WwTW that cross open fields that may be vulnerable to infiltration.

From these findings, it was recommended that CCTV is completed to see if there is infiltration of the water course into the sewer. The CCTV survey should also identify if there is land drainage connected into the sewer, which would be assessed for removal.

Survey

As recommended by the desktop investigations, over 277m of CCTV surveys were completed in Winter 2024. These surveys identified various points of infiltration into the sewer network. The CCTV surveys were reviewed by an engineer and assessed using Artificial Intelligence to rapidly identify and locate points of infiltration requiring remedial works.

The network was also checked for inflows and no lateral connections are suspected of receiving flows not bound to receive.

Intervention

Remedial works to address infiltration are due to be completed in Spring / Summer 2025. Plans include relining around 80m of the sewer network where infiltration was found.

Next steps

Ireby is currently in the intervention stage of identifying and addressing infiltration (see Figure 1). The site will follow the iterative process displayed in Figure 1 to complete remedial works and monitor the area for their efficacy and identify any more significant areas of infiltration, should they arise.