

**Skelton**

# **Infiltration Reduction Plan**

**Last Updated:** November 2024



## Executive summary

Skelton in Cumbria is currently in the intervention stage (see Figure 1) to address infiltration and reduce spills at the Skelton Wastewater Treatment Works Storm Overflow (017670116SO). 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.

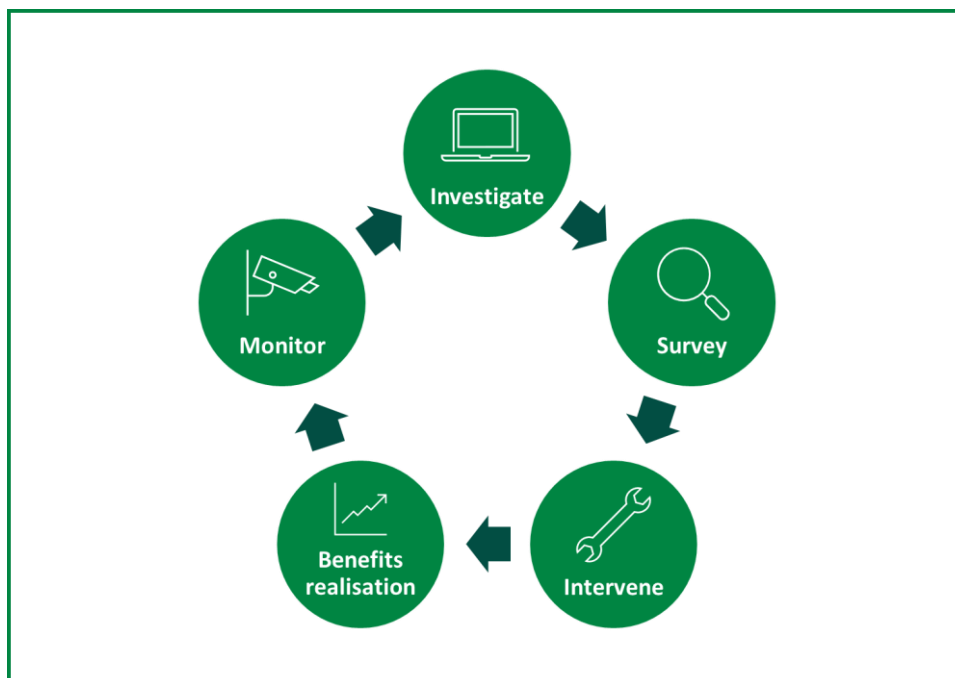


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

## 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 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 Skelton drainage area and the associated overflow Skelton Wastewater Treatment Works Storm Overflow (017670116SO). In 2022, infiltration was identified as a potential leading cause of the storm overflow discharging. The purpose of this plan is to further investigate and address this.



**Figure 2:** United Utilities – Better Rivers – Storm Overflow Map (October 2024). The green, most northerly dot, marks the Skelton WwTW Storm Overflow.

Skelton, North East Cumbria, is a small village and civil parish that lies around 6km outside the Lake District National Park Boundary, northwest of Penrith near Grise Beck.

## 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 infiltration was unlikely in the catchment. However, further observations identified an area of catchment where a rural stream runs adjacent to public sewers. It may be that flow from this stream can enter the sewer system through pipe defects, leaky joints or issues with manholes.

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

It is expected that if groundwater infiltration is found, it will not significantly reduce spill count at Skelton Wastewater Treatment Works Storm Overflow.

## Survey

As well as the recommended lengths to survey, additional lengths were surveyed to take in the lengths running through the village and through the school, totalling 514m of CCTV surveys completed in Winter 2024. The CCTV surveys were reviewed by an engineer and assessed using Artificial Intelligence to rapidly identify and locate points of infiltration requiring remedial works. Infiltration was confirmed to be entering the sewer network throughout the areas surveyed.

Checks were also carried out on all lateral connections, and none 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 of over 100m of the sewer network.

## Next steps

Skelton 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 monitor the efficacy of the remedial works and identify new points of infiltration, should they arise.