Caldbeck

Infiltration Reduction Plan

Last Updated: October 2026



United Utilities

Water for the North West

Executive summary

Caldbeck in Cumbria is in the monitoring stage (see Figure 1) to address infiltration and reduce spills at the Caldbeck Wastewater Treatment Works Storm Tank Overflow. An initial desktop assessment concluded that there was a low likelihood of groundwater infiltration contributing to spills. CCTV surveys found evidence of infiltration, and interventions were completed in Autumn 2025.

As groundwater infiltration has been found but is yet to be confirmed as the leading cause of spills to the environment, interventions have been completed to address the localised infiltration identified during surveys. As more is known on the outcome of the interventions, this Infiltration Reduction Plan will be updated accordingly.

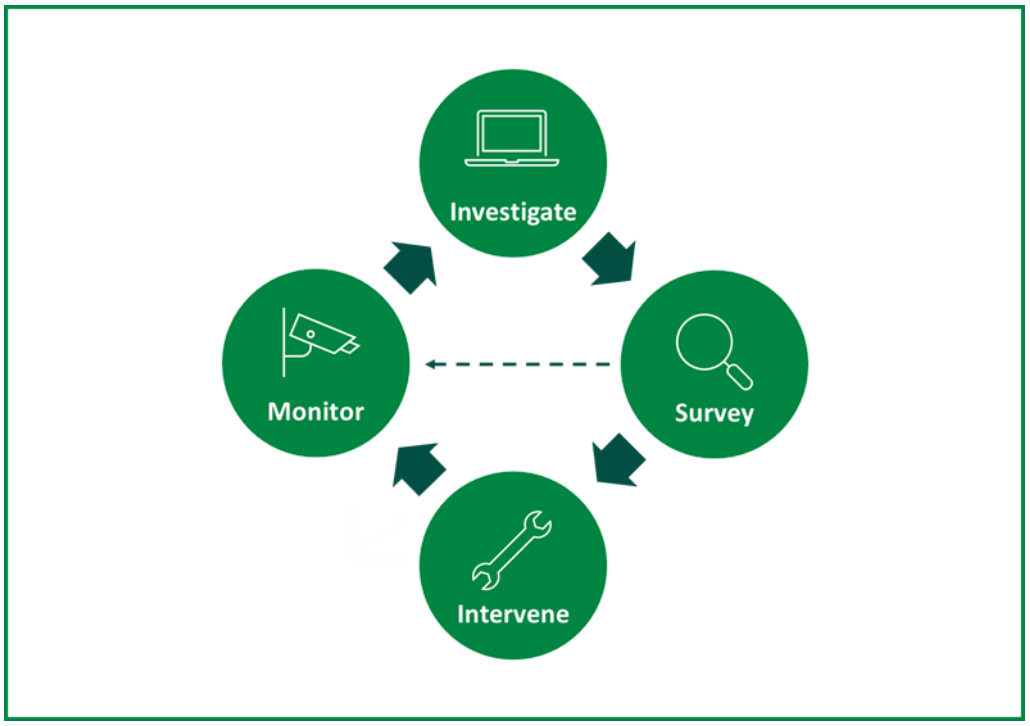


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

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 Caldbeck drainage area and its associated overflow, the Caldbeck Wastewater Treatment Works Storm Tank Overflow. 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.

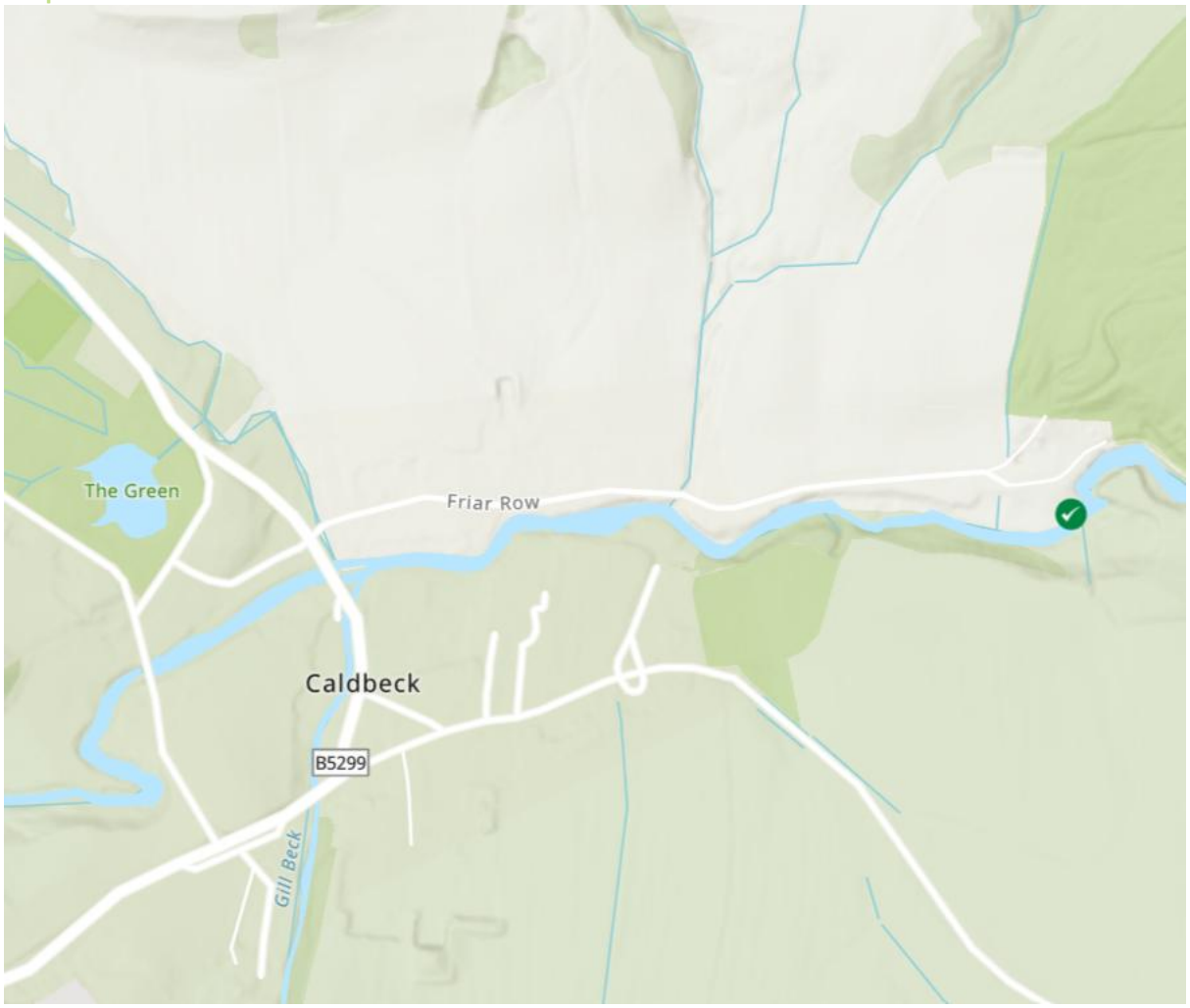


Figure 2: United Utilities – Better Rivers – Storm Overflow Map (April 2026). The green dot marks the Caldbeck Wastewater Treatment Works Storm Tank Overflow

Caldbeck is situated at the northern border of the Lake District National Park in the Northern Fells. It sits on Cald Beck, with Gill Beck also flowing through the village.

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 unlikely in the catchment. However, it was found that there were areas in the catchment where sewers crossed a river or ran adjacent to a local pond.

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

Survey

As recommended, 752m of the sewer network was surveyed in Autumn 2024. The surveys were assessed using Artificial Intelligence to rapidly identify and locate points of infiltration. They were then reviewed by an engineer to assess for any required remedial works. Some minor infiltration was identified, and interventions were recommended to resolve this.

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

Interventions

Remedial works were completed in Autumn/Winter 2025. This included lining 74m of the sewer network in order to prevent infiltration.

Next Steps

Caldbeck is currently in the monitoring stage of addressing infiltration. The site will continue to follow the iterative process displayed in Figure 1 to monitor the efficacy of these interventions and identify new points of infiltration, should they arise.