

Cark

Infiltration Reduction Plan

Last Updated: September 2026



Executive summary

Cark in Cumbria is currently in the intervention stage (see Figure 1) to address infiltration and reduce spills at the Cark Pumping Station Storm Overflow. An initial desktop assessment concluded that there was a low likelihood of groundwater infiltration in the catchment. CCTV surveys confirmed the presence of infiltration. A first phase of remedials was completed in Summer 2026, and a second phase of remedial works is expected to complete in Autumn 2026.

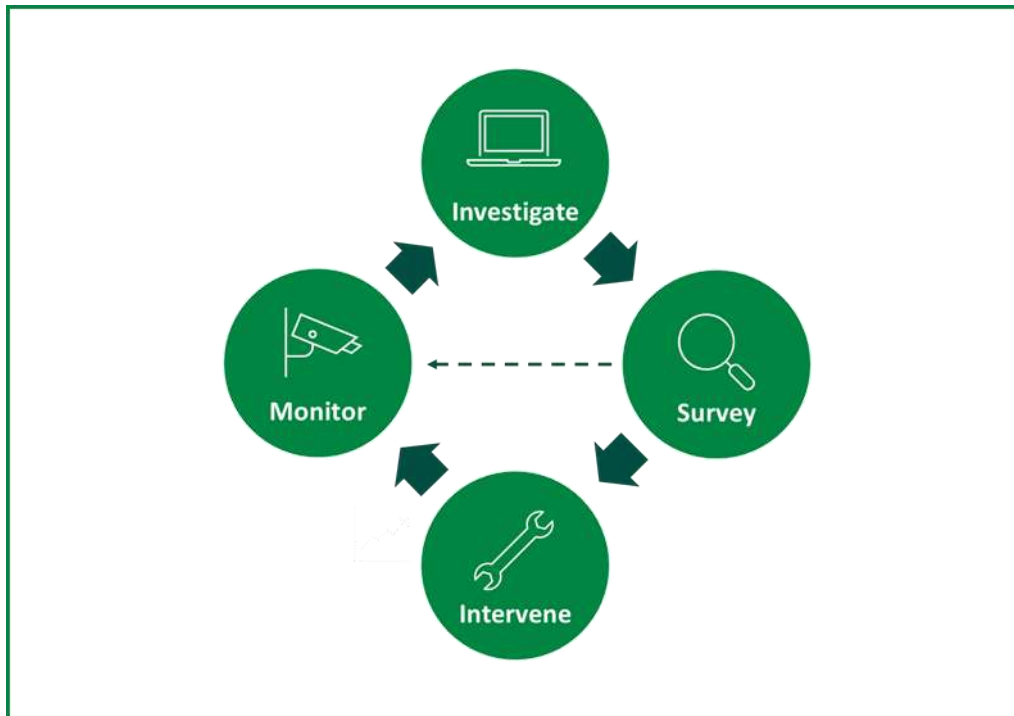


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

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 Cark drainage area and its associated overflow, Cark Pumping Station Storm 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 (September 2024). The green dot marks the Cark Pumping Station Storm Overflow

Cark is a village in Cumbria, north of Flookburgh and south of Cartmel. It lies inland of Morecambe Bay. The River Eea flows through the village towards the bay. It is surrounded by fields falling steeply downhill towards the drainage system.

Investigate

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, there were several indicators that suggested CCTV surveys were needed to clarify whether infiltration was present, including the identification of a sewer crossing a watercourse. There were also indications of slow response runoff.

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

Survey

As recommended, 840m of CCTV surveys were completed in Winter 2024. The surveys were assessed using Artificial Intelligence to rapidly identify and locate points of infiltration. They were then reviewed by an engineer to identify any required remedial works. Infiltration in the sewer network was confirmed, and remedial works were recommended as a result.

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

A second phase of surveys was completed earlier this year and further infiltration was found. As a result, additional remedial works were recommended.

Intervention

A first phase of interventions to address infiltration was completed in Summer 2026, and a second phase of remedial works is expected to complete in Autumn 2026.

Next steps

Cark is currently in the intervention stage of identifying and addressing infiltration. When remedial works have been completed, the site will continue to follow the iterative process displayed in Figure 1 to monitor the efficacy of these works and identify new points of infiltration, should they arise. As more is known on the outcome of the interventions, this Infiltration Reduction Plan will be updated accordingly.