

Cark

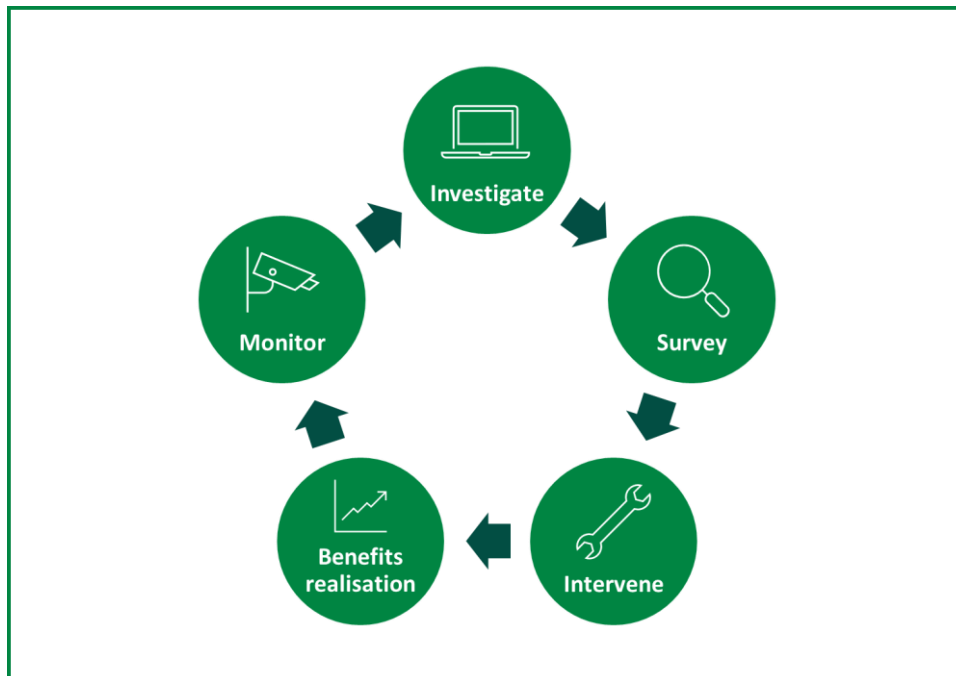
# Infiltration Reduction Plan

Last Updated: March 2025



## 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 (LAK0076SO). A desktop assessment concluded that there is a low likelihood of groundwater infiltration in the catchment however, CCTV surveys have confirmed infiltration and remedial works are due to be completed in Spring / Summer 2025.

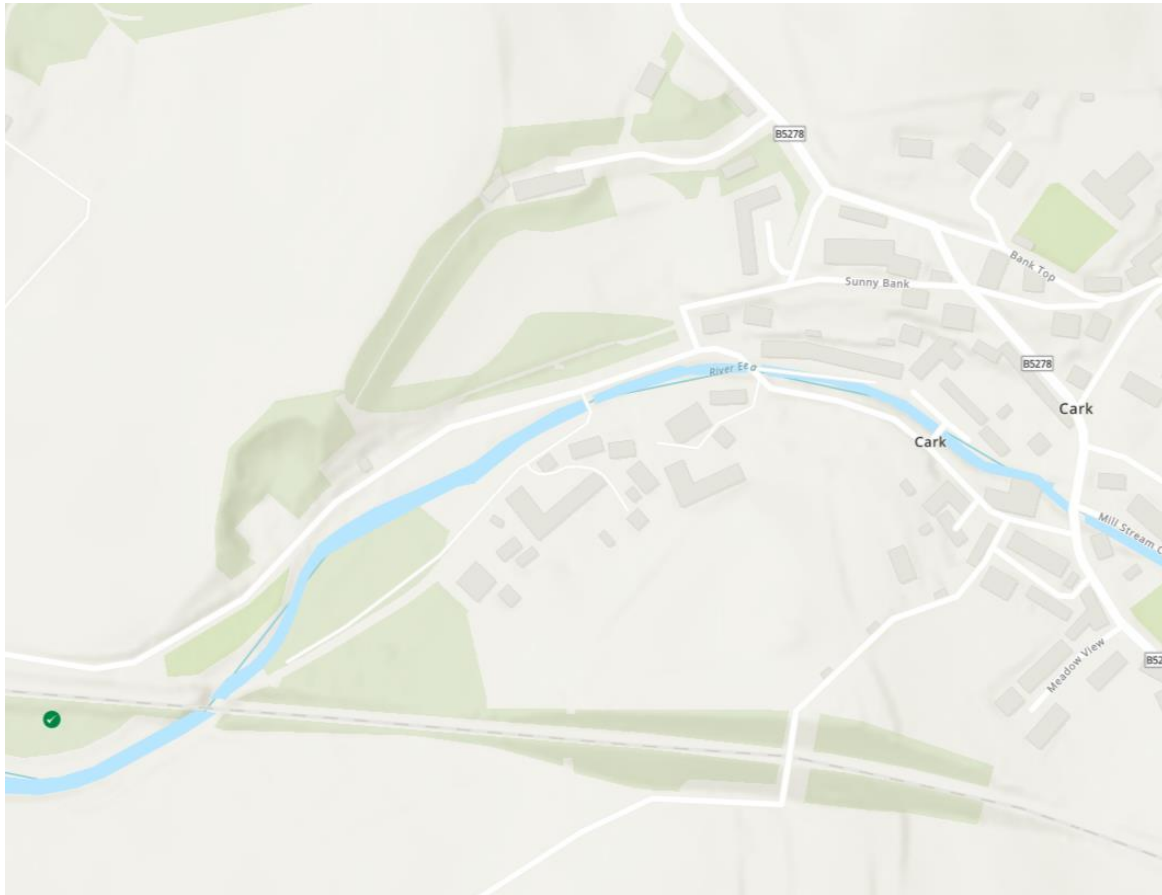


**Figure 1:** Iterative process to investigate, identify and address groundwater infiltration

## 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 Cark drainage area and the associated overflow, Cark Pumping Station Storm Overflow (LAK0076SO). 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. 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, inland of Morcombe Bay. The River Eea flows through the village towards the bay. It is surrounded by field areas falling steeply downhill towards the drainage system.

## 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. However, there were several indicators that suggest that surveys are required to clarify whether infiltration is present, including the identification of a sewer crossing a river. There were also indicators of slow response run off.

From these findings, it was recommended that CCTV surveys are completed to identify any 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, we completed 840m of CCTV surveys in Winter 2024 and identified areas of infiltration within the catchment. 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 in the sewer network was confirmed.

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 expected to be completed in Spring / Summer 2025. Remedial works at Cark could include, but not be limited to, relaying sewers, lining sewers, sealing manholes or disconnecting inflows the best methods for the specific points of infiltration are currently being assessed.

## Next steps

Cark is currently in the intervention stage of identifying and addressing infiltration. 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.