

Cark

Infiltration Reduction Plan

Last Updated: November 2024



Executive summary

Cark in Cumbria is currently in the survey 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. Surveys are underway to clarify this.

If groundwater infiltration is found to be a leading cause of spills, interventions will be assessed and this Infiltration Reduction Plan will be updated accordingly. If not, this plan will end at the investigation stage and next steps will be processed through other relevant workstreams.

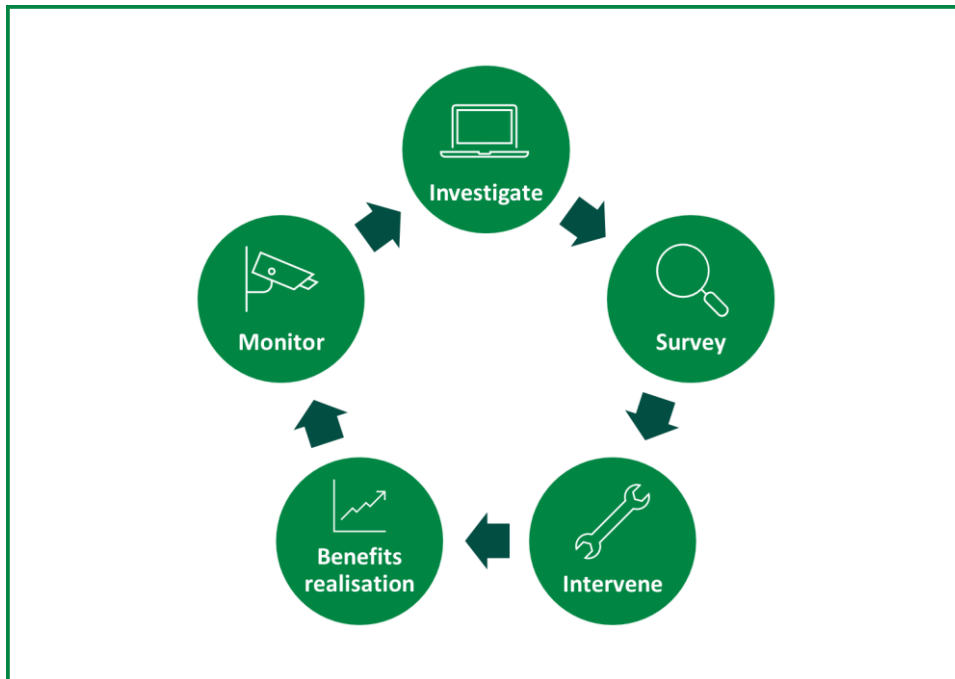


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

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. If groundwater infiltration is found to be a leading cause of spills, an implementation plan will be produced and this Infiltration Reduction Plan will be updated accordingly. If not, then the plan will end at the investigation stage and no further iterations of this plan will be published.

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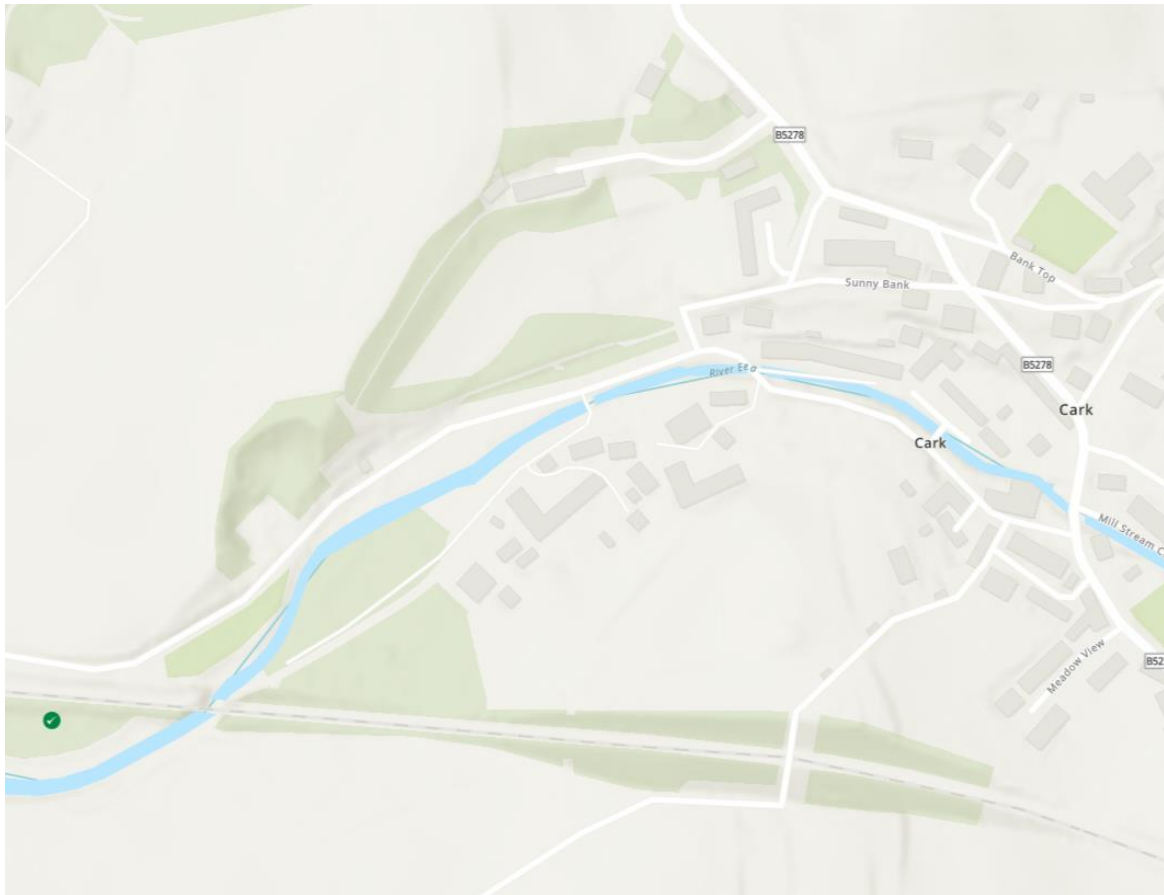


Figure 2: United Utilities – Better Rivers – Storm Overflow Map (September 2024). The green dot marks the Cark Pumping Station Storm Overflow.

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

Comprehensive CCTV surveying of the area is planned for Winter 2024 to identify possible infiltration and inflows to the sewer. This may be extended to Winter 2025 if surveying is not conclusive. The CCTV survey information will then be assessed using Artificial Intelligence to identify outstanding infiltration and inflow issues that need addressing.

Next steps

Cark is currently in the surveying stage of identifying and addressing infiltration (see Figure 1). If the CCTV survey reveals groundwater infiltration, or defects likely to allow infiltration, interventions will be considered, and the site will follow an iterative intervention regime to monitor the efficacy of the solution. Remedial works in Cark could include, but not be limited to, relaying sewers, lining sewer or sealing manholes. This would be expected to be completed in 2025.