

Grange

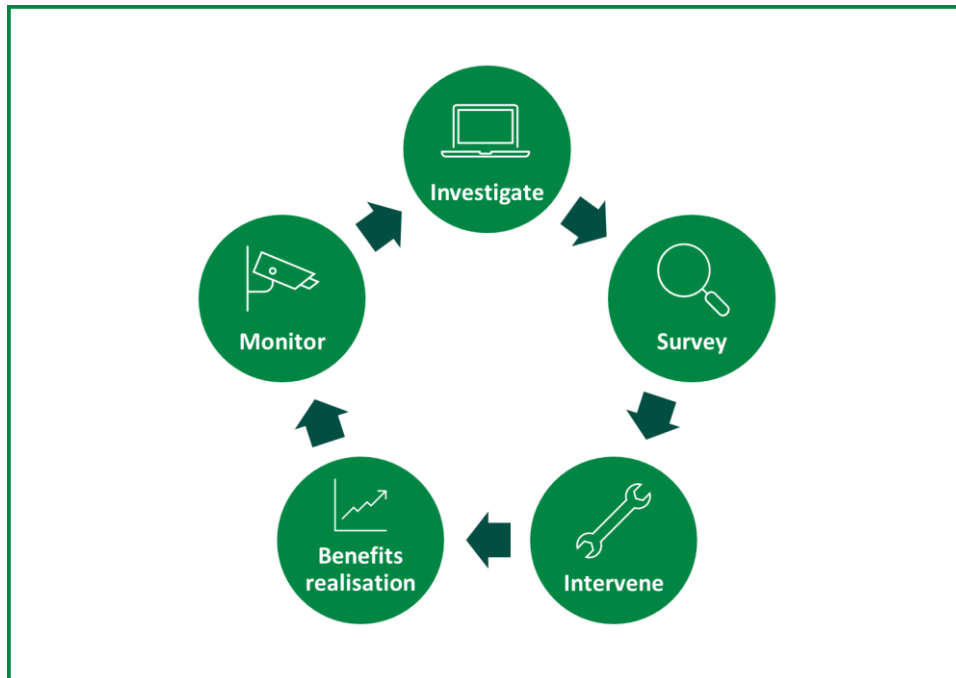
# Infiltration Reduction Plan

Last Updated: March 2025



## Executive summary

Grange in Cumbria is currently in the intervention stage (see Figure 1) to address infiltration and reduce spills at the Grange Pumping Station Storm Overflow (LAK0074SO). A desktop assessment concluded that there is the possibility of groundwater infiltration but not likely a significant amount that would reduce spill count if addressed. CCTV surveys confirmed the presence of infiltration and interventions to address this are underway, due to be completed in Spring / Summer 2025.

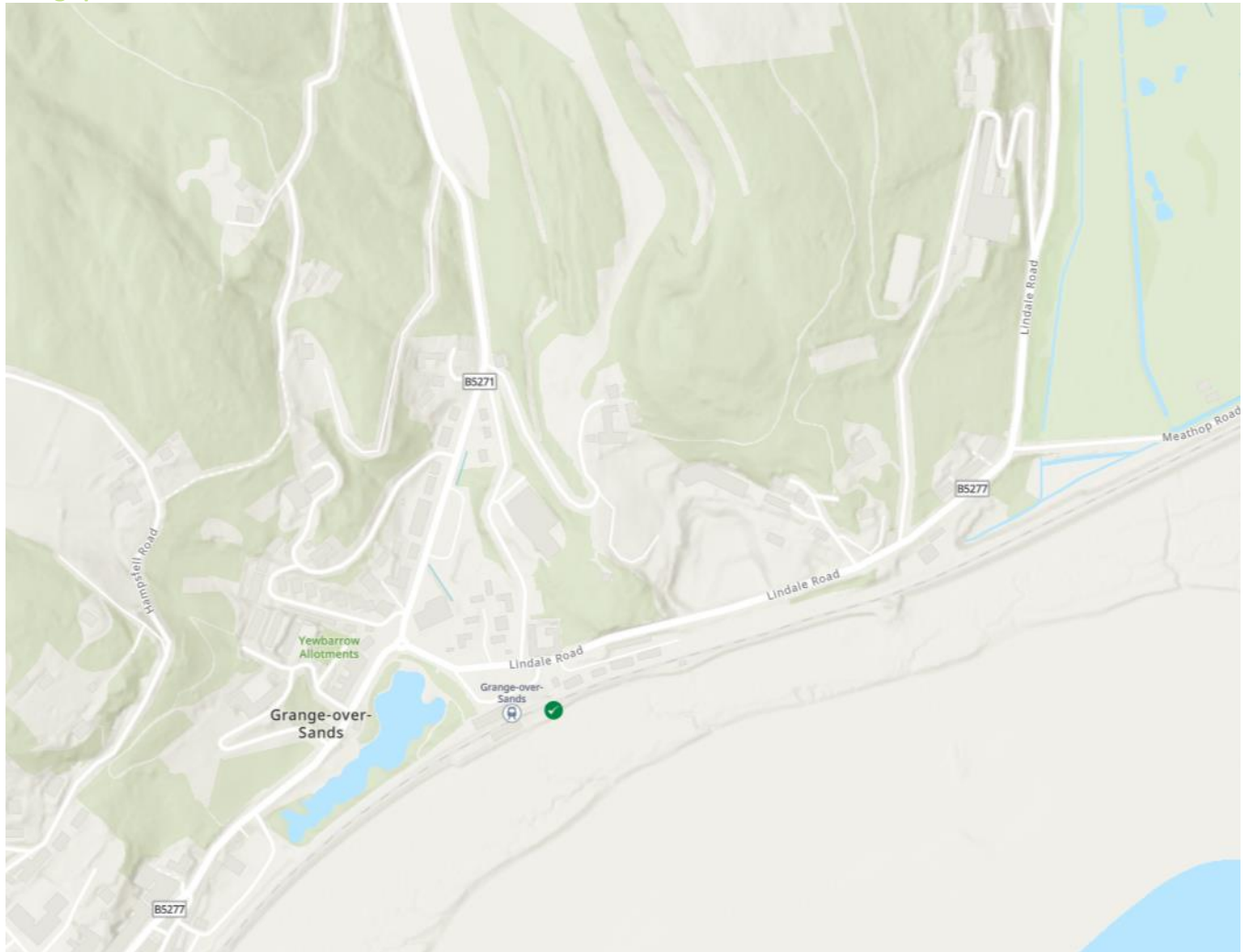


**Figure 1:** Iterative process to investigate, identify and address groundwater infiltration

## 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 Grange PS drainage area and the associated overflow, Grange Pumping Station Storm Overflow (LAK0074SO). 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 (November 2024). The green dot marks the Grange Pumping Station Storm Overflow

Grange-over-sands lies on the northern stretch of Morecambe Bay in Cumbria. It is surrounded by coastal and upland area and lies just outside of the Southern Lake District National Park border. The mixture of woodland, farmland, hills, urban areas and the estuary creates a unique catchment landscape.

## 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. Some evidence of base infiltration in the system was identified, as well as rainfall driven run off and areas of the catchment where water bodies run next to sewers and highways where public sewers are located. It's possible for flow to enter the system through highway gullies and therefore, further investigation was recommended.

From these findings, it was recommended that CCTV surveys are completed to see if there is infiltration 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, 580m of CCTV surveys were 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. Multiple points of linear infiltration were identified. This confirmed the need for an intervention to seal the network.

Checks were also carried out on all lateral connections, none are suspected of receiving flows not bound to receive.

## Intervention

Remedial works to address infiltration are underway and due to be completed in Spring / Summer 2025. Plans include:

- Lining of over 80m of the sewer network to seal it against infiltration.
- Installation of 3 top hats - A top hat is a specialist type of liner to seal a junction or connection where there may be wear and tear or defects allowing infiltration.

## Next steps

Grange 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.