

Great Orton

# Infiltration Reduction Plan

Last Updated: November 2024



## Executive summary

Great Orton in Cumbria is currently in the survey stage (see Figure 1) to address infiltration and reduce spills at the Great Orton Waste Water Treatment Works Storm Tank Overflow (017670128ST). A desktop assessment concluded that there is the possibility of groundwater infiltration. Surveys are underway to clarify this as well as the exploration of Natural Flood Management to manage rural run off if this is found to be a significant contributing factor in spill numbers.

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 survey stage and next steps will be processed through other relevant workstreams.

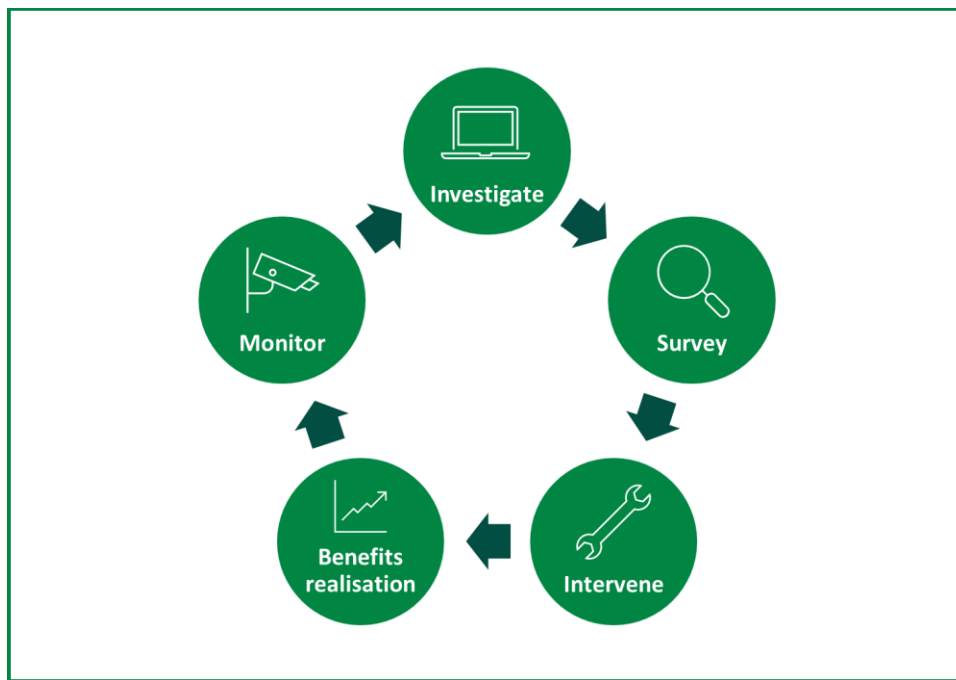
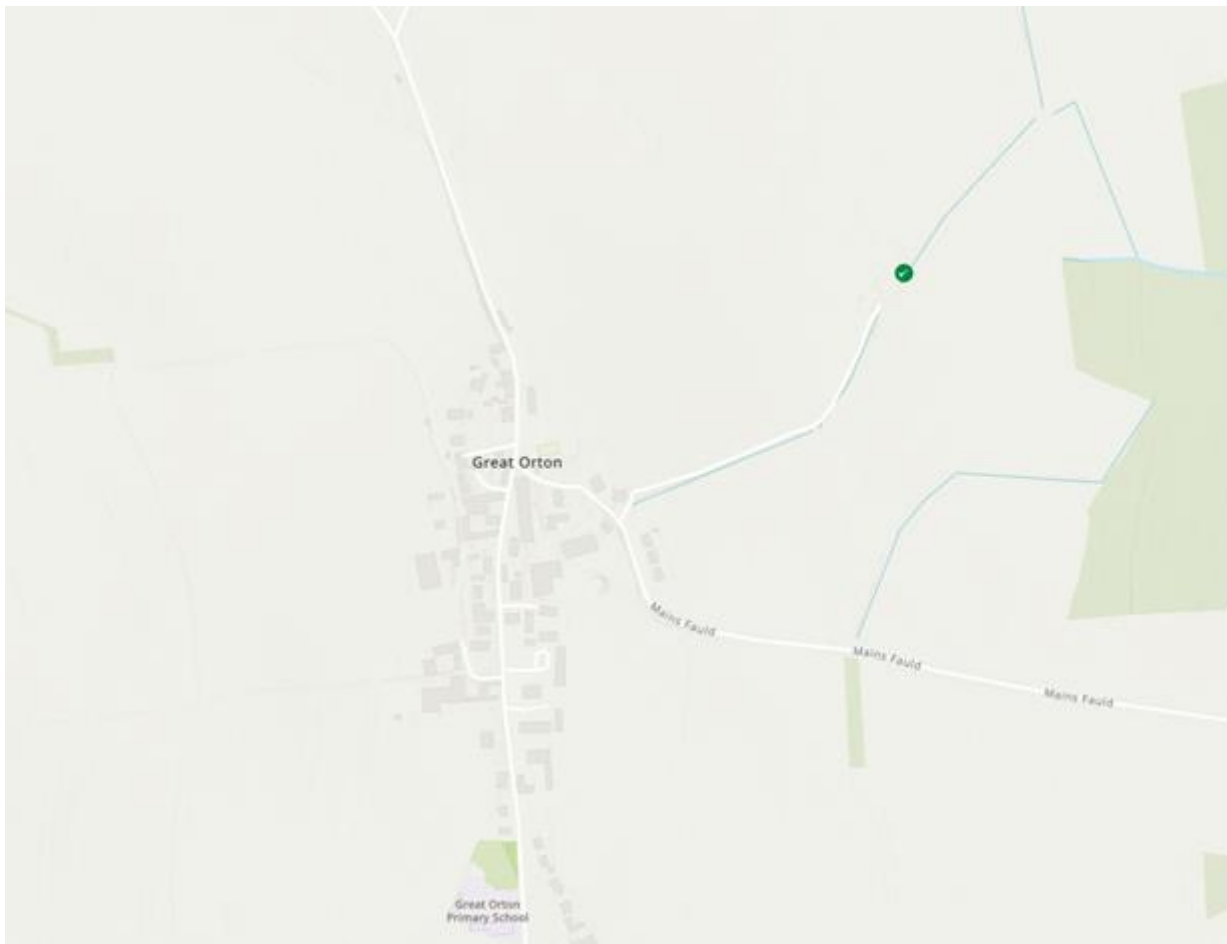


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

## 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 show our efforts to date and next steps to address infiltration and inflows in the catchment. This plan covers the Great Orton drainage area and the associated overflow Great Orton Waste Water Treatment Works Storm Tank Overflow (017670128ST). 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, interventions will be assessed and this Infiltration Reduction Plan will be updated accordingly. If not, this plan will end at the survey stage and next steps will be processed through other relevant workstreams.



**Figure 2:** [United Utilities – Better Rivers – Storm Overflow Map](#) (September 2024). The green dot marks the Great Orton Waste Water Treatment Works Storm Tank Overflow.

Great Orton is a small village in Cumbria, South of Wigton. It is surrounded by rural land and discharges to Roughton Beck.

## 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 there is some evidence of seasonal infiltration due to groundwater ingress and that, based on an analysis of the baseflow, reducing infiltration in this area could be significant enough to reduce spill frequency at Great Orton WwTW.

However, further observations identified rural streams/ditches running adjacent to public sewers that might enter the sewer system via highway drainage systems or defects in the pipe fabric. There is also the possibility of very slow rural run off contributing to spills.

From these findings, it was recommended that CCTV surveys are completed to see if there is 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

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