

Downton Infiltration Reduction Plan Summary

This provides an update on the last year's groundwater situation, what mitigation actions, if any, were taken and a summary of our action plan to prevent flooding due to groundwater infiltration of our sewer network.

April 2021 – March 2022

Winter groundwater levels across the region were relatively low, with peak levels comparable to the winters of 2014/15 and 2016/17. Following high groundwater levels during the preceding winter, groundwater levels rose again in May 2021 with a monthly rainfall 66% above the long-term average (LTA) (fourth highest UK May rainfall on record). This particularly affected areas in the north of the region. During the autumn, heavy rainfall in October (33% above the LTA) caused groundwater levels to rise. However, below-average rainfall between November 2021 and March 2022 meant that most catchments were not severely affected by infiltration. No incidents attributed to inadequate hydraulic capacity (IHC) were reported in the catchment during this period, and the network was not severely affected.

Action Plan

Annual activity

- Review asset and operational data and update annual reports.
- Monitoring system performance using telemetry, rainfall records and local groundwater levels.
- Communicate with other authorities during times of elevated groundwater levels and promote a multiple agency approach.
- Pro-active maintenance of vulnerable sewers including routine jetting.

Completed to date

- Proactive inspection using CCTV of vulnerable public sewers.
- Analysis of inspection data to identify infiltration.
- Analysed flows in sewers using flow survey and modelling.
- Commissioned pump station survey and asset update.
- Appraisal of sewer and surface water flooding incidents.
- Reviewed telemetry and compared it with data collected from the area to assess residual levels of infiltration.
- Wessex Water infiltration [video](#) added to website.
- Considered the construction of local boreholes to monitor groundwater levels.
- Carried out significant infiltration sealing of sewer and manholes, where deemed cost-effective, targeting work according to study findings.
- Raised awareness about mechanisms of sewer overloading and need for risk-based approach for improvements.
- Liaised with the Environment Agency about their groundwater warning service.
- Monitored local watercourse data and groundwater levels during periods of inundation to inform Operational Mitigation Action Plans.

	2011-20	2020-21	2021-22
Length of sewer inspected (m)	9,025	-	-
Length of sewer sealed (m)	659	22	-

Short term

- CCTV and targeted infiltration studies according to analysis from previous surveys and telemetry data.
- Investigate the use of Artificial Intelligence to code CCTV footage, increase survey efficiency and help identify defects and hotspots.
- Use of machine learning and rainfall forecasting to predict flows in sewers.

Medium term

- Identify road gullies and other impermeable areas connected into the foul sewers and remove them where cost effective.
- Undertake rehabilitation work based on the survey findings where cost beneficial.
- Further infiltration sealing according to study findings.
- Commission pump station surveys where necessary.

Long term

- Inspection of private gullies, drains, and manholes.
- Remedial works of private assets.
- Monitor and regulate surface water deposal to prevent foul sewer infiltration.
- Consider sustainable solutions.

Current Performance

The graph below compares operational incidents with telemetry at Downton South Lane Sewage Pumping Station (SPS) and groundwater at Homington borehole.

Incidents attributed to inadequate hydraulic capacity (IHC) have occurred only when groundwater levels are exceptionally high, showing that groundwater inundation is the main cause of flooding within the catchment. Properties upstream of South Lane SPS have been most severely affected, particularly during the winters of 2012/13, 2013/14 and 2019/20 when the SPS was surcharged for multiple weeks.

However, following extensive sewer lining, manhole sealing and pump station improvements, the number of incidents attributed to IHC have dramatically reduced. This is despite groundwater level during the winter of 2019/20 being comparable to 2012/13.

