

Long Sutton 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.

The telemetry at Knole Sewage Pumping Station (SPS) and Bennetts Orchard SPS show that both sites react to rainfall and suffer from infiltration as the pump activity increases when the groundwater begins to rise.

Action Plan

Annual activity

- Review asset and operational data and update annual reports.
- Continue 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.
- Appraised incidents of sewer and surface water flooding.
- Review of historic telemetry and rainfall records.
- Undertook significant infiltration sealing of sewers 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.
- Routinely reviewed telemetry and compared it with borehole, watercourse, rainfall data and customer incidents to assess infiltration levels.

	2015-20	2020-21	2021-22
Length of sewer inspected (m)	10,973	-	213
Length of sewer sealed (m)	558	-	-

Short term

- Undertake rehabilitation work based on the survey findings where cost beneficial.
- CCTV and targeted infiltration studies according to analysis from previous surveys and telemetry data.
- Analyse flows in the sewers using flow surveys and modelling where appropriate.
- Use of machine learning and rainfall forecasting to predict flows in sewers. Stormharvester programme to be extended to the entire region.

Medium term

- Identify road gullies and other impermeable areas connected into the foul sewers and remove them where cost effective.
- Further infiltration sealing according to study findings.
- Investigate the use of Artificial Intelligence to code CCTV footage, increase survey efficiency and help identify defects and hotspots.

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.
- Commission pump station surveys where necessary.

Current Performance

This graph shows incidents against Somerton River level and Bennetts Orchard Sewage Pumping Station (SPS) telemetry. Prior to the sewer sealing, to prevent infiltration, there was a strong correlation between groundwater level and Bennetts Orchard SPS pump run times and sump level. Post sealing the correlation between sump level and the rise in groundwater levels is still evident suggesting residual infiltration remains in the catchment. However, there has been a significant reduction in the number of incidents attributed to inadequate hydraulic capacity (IHC) suggest sealing has worked. One incident was reported in 2021/22 due to IHC, during a month with significant rainfall.

