

## Brent Knoll 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 Brent Knoll catchment did not reach critical levels from 2021/22 and the sewerage network was able to cope with increased flow. There were no flooding incidents attributed to Inadequate Hydraulic Capacity (IHC). The improvements in Brent Knoll Catchment have allowed for an increase of flow from upstream Innsbruck SPS in Lympsham to alleviate surcharging in the local network.

### **Action Plan**

#### Annual activity

- Review existing asset and operational data and produce an Infiltration Reduction Report.
- Continued monitoring of telemetry.
- Investigate and review Annual Infiltration Reduction Update.
- Promote a multiple agency approach to managing situations during high groundwater levels.

#### Completed to date

- Put in place a procedure for recording, investigating and resolving incidents.
- Reviewed existing borehole data.
- Pro-active inspection of public sewers. Identify infiltration using CCTV.
- Sewer and manhole sealing of the public system where proven to be cost effective.
- Communication with other authorities during times of elevated groundwater levels.
- Undertake pro-active inspection of public sewers and identify any infiltration using CCTV.
- Review historic telemetry and rainfall records.
- Appraisal of flooding incidents.
- Considered construction of local boreholes and installation of web-based auto logging telemetry to monitor groundwater levels.
- Liaised with the Environment Agency with regarding their groundwater warning modelling and service.

	2015-20	2020-21	2021-22
<b>Length of sewer inspected (m)</b>	3,549	-	-
<b>Length of sewer sealed (m)</b>	38	-	-

#### Short term

- Continued sewer and manhole sealing of the public system where proven to be cost effective.
- Commission pump station surveys and asset update, where necessary.
- Undertake pro-active inspection of sewers.

#### Medium term

- Undertake further infiltration sealing where cost effective, targeting work according to study findings.
- Existing highway outfalls to be inspected and if necessary, cleared of any build-up of silt.
- Where areas of infiltration in private drainage systems are found, pass information on to the Council for further action.
- Review long term options for monitoring and improving data collection for example Event Duration Monitoring.

#### Long term

- Identify road gullies and other impermeable area connected into the foul sewers and remove them where cost effective.
- Liaise with the Environment Agency with regards to their groundwater warning service.
- Routine review of telemetry; compare with borehole data, local watercourse data, rainfall data and customer incidents to assess residual levels of infiltration.
- Review existing boreholes in the area (possibly including data from the Environment Agency).
- Construct observation boreholes and install web-based auto logging telemetry to monitor groundwater levels if deemed cost effective.
- Consider sustainable solutions such as above ground attenuation.
- Monitor and regulate surface water disposal to prevent surface water to foul misconnections.

### Current Performance

This graph compares Inadequate Hydraulic Capacity (IHC) Flooding and Blockage incidents against Iwood River Level and the flow at Forge House SPS. Data from the pumping station is recorded from 24/10/2017 onwards. In 2012, 2014 and 2016 incidents caused by inadequate hydraulic capacity in the sewers are associated with an increase in groundwater level due intense rainfall in the region. There have not been any incidents reported in 2020/21 in the catchment that are attributed to inadequate hydraulic capacity or blockages, despite relatively high rainfall this winter. In 2021/22, there were again no recorded flooding incidents due to IHC. The Iwood river level did not reach high levels as seen in previous years and did not exceed the 0.7m trigger.

