

Case Study

Misconnections – Birmingham UK

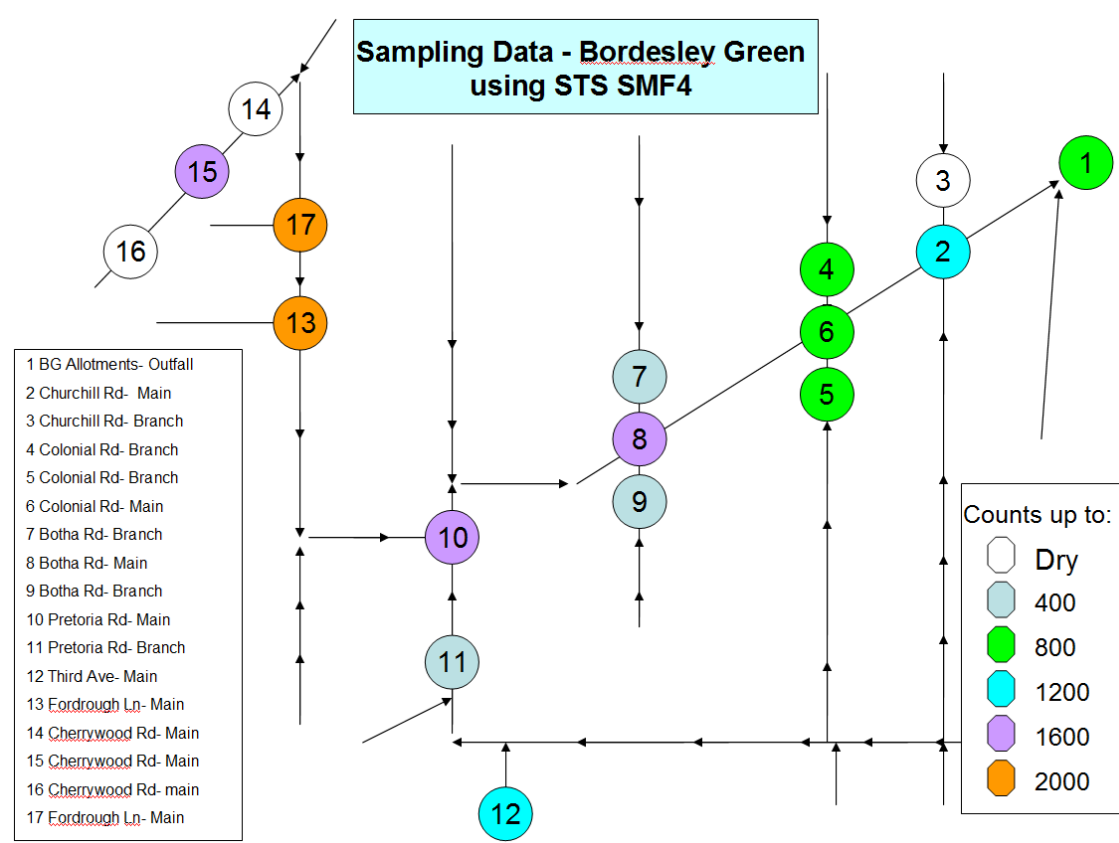
Background

- STS was invited independently by the Environment Agency and Severn Trent water to carry out a series of monitoring operations in an area which had a history of issues arising from the misconnection of waste water into a “clean” surface water sewer system.
- Traditionally surveys of this type are carried out using contractors who are tasked to lift manhole covers along a predetermined route and obtain samples for 5 day BOD analysis.
- Obtaining samples for laboratory analysis is both time consuming and costly and take approx 7 days for results.
- A snapshot of the condition of the sewers load is achieved but returning to the same sewer and re-sampling may return completely different results with still no indication of the source.
- Using the SMF4 would enable tracing of the pollutant source upstream to a particular junction serving only a single or perhaps a small number of properties.

Testing Regime

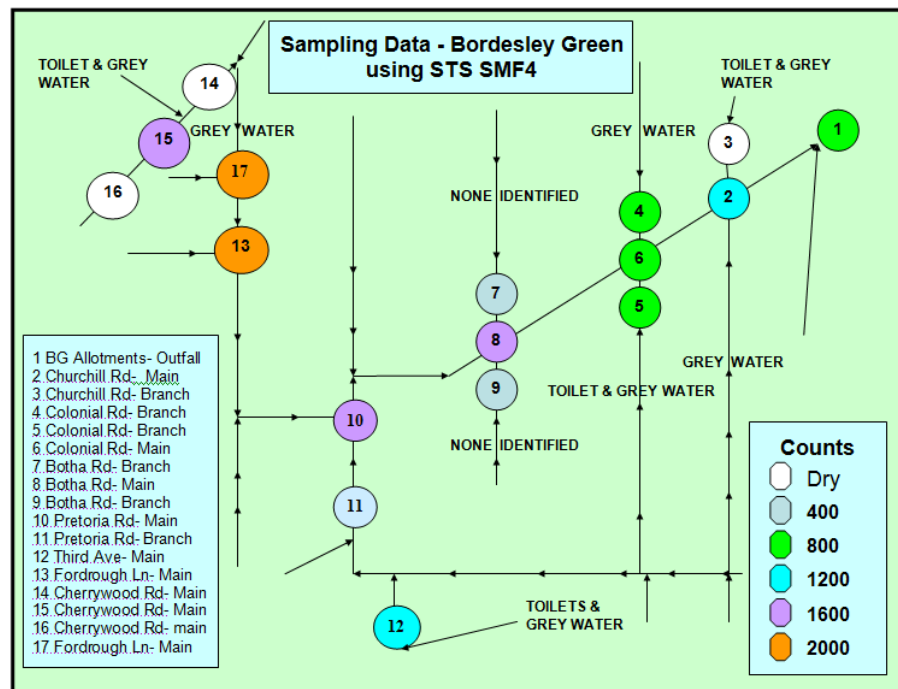
A typical main surface water sewer running through a mostly residential area and discharging into a stream in an urban green area was chosen. The main sewer had a number of connecting surface water sewers feeding it with connections made directly into these from properties.

The map below shows the area surveyed:



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- Water samples were placed into a UV Quartz cell, 5 consecutive readings were taken of each sample and the results averaged.
- This procedure was repeated at each sampling point and the results were then provided to Severn Trent by STS for their comment. A topographical map was produced showing the sewers direction of flow and branches joining the main sewer with the sample reading at each location.
- Severn Trent had however previous knowledge of the area and had carried out extensive sampling and dye tracing to establish the sources of grey water pollution into the rain water sewer system. Severn Trent was therefore able to annotate the Map of readings taken with known sources of pollution.



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- As can be seen the areas where high readings were taken corresponded with known upstream sources of pollution. Similarly areas where there was no known source of pollution were found to have very low readings.
- The survey also shows clearly the affect of dilution that clean water joining the system has in lowering the readings further downstream. The final outfall monitored (sampling point 1) also shows the affect of a 2nd rain water sewer which joins it just before discharge causing a dilution of the pollution seen at sample point 2.
- Sample points 17 & 13 although not identified on this map as having any direct misconnections were later found to have had domestic services coupled up to the rain water sewer after the Severn Trent survey had been completed.

Conclusion

- The SMF4 provided a rapid and reliable method of determining the presence of organic pollution in the form of grey water and faecal contamination in the rain water sewer.
- The instrument was able to differentiate between variable pollutant loads and was able to trace the source of the pollution back to the branch.
- Most importantly the operators could have traced the pollution directly back to a particular connection, taken a sample for BOD testing or Bacti counts and to provide admissible evidence- and directly approached the homeowner to resolve the issue.
- Savings in time and cost of secondary visits, extensive dye testing and paperwork!

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