

7. Intelligent control of wastewater flow



Situation

Wastewater capacity issues within sewer networks are affecting development. The challenge is to optimise the operation of a complex network of pumping stations to improve the situation by flow management. The North Coast system is being used as a pilot.

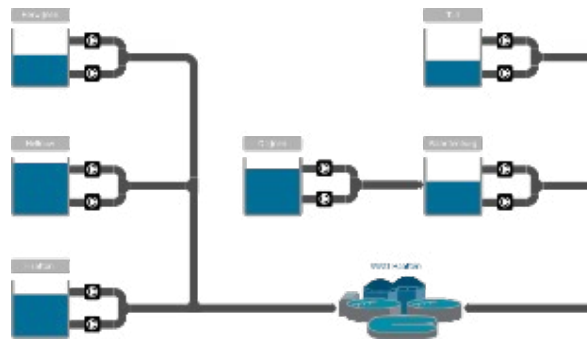
Action

We have carried out studies in five areas (North Coast, Larne, Dungannon, Culmore and Belfast) to determine to potential to hold wastewater and run our pumps in the system in such a manner that it arrives at a works at a more steady rate.

In conjunction with Royal Haskonings, we are piloting a scheme to regulate the flow to the North Coast treatment works. The works is feed from five external sites, Blackrock Portstewart, Dhu Varren, Causeway street, Ballycairn and Riversdale.

We have installed an artificial intelligence system called Aquasuite (flow), as with any artificial intelligence the system has the capacity to learn. Original information and historical data have been feed into the system, enabling it to learn about operational flow from the five sites and create an operational baseline. Weather data has been provided as rain patterns are also essential so the system can predict when and where to switch pumps to eliminate possible spills.

Aquasuite will now control all the feed from each individual site to ensure the flow to the treatment works is at a constant rate, so eliminating large variation in flow. It controls all five sites at once and will decide which site is given priority based on how much storage capacity is available to regulate the flow to the North Coast treatment works.



Results

The system has been installed and test runs carried out over subsequent months. Having successfully achieved completed the tests, the system has (as of start of October 21) been switched on for operational optimisation. During this phase, the system will continually interrogate data updating every 15 minutes to ensure that the system is balancing the flow to the works.

This solution will create more headroom at works which means capital investment for upgrading can be deferred or avoided. We are anticipating that improved treatment efficiency and better compliance at the works. We also expect that the system will also improve our carbon footprint as we will now be running more energy efficiently by managing pumping regimes.

Once the system has proven its ability to regulate flow, it will be handed over to operations.

We await the results with interest.