Title: Pipe Condition Assessment

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Affinity Water (AW) is the UK's largest water only supplier. There are 17,112.29 km of pipes in the Affinity's area of supply, providing more than 950 million litres of water each day, serving a population of more than 3.8 million people. Although the current AW burst performance against the target looks promising for Y4, like all water networks, Affinity's infrastructure has some weaknesses and failure is inevitable. To better understand the condition of our underground network and identify the vulnerable assets, the pipe condition assessment is used to provide an insight.

The Asset Condition Lab have been supporting AW since 1992, collecting and analysing data related to the condition of our below ground network and focusing on the metal pipes degradation. Over 30 years of continuous data now has a potential of becoming a leading indicator to enable the business prioritisation of asset renewal, as well as understanding the factors which influence mains' deterioration.

Pipe analysis process starts from the sample being taken after a burst main. During all mains repairs involving cut outs, a pipe sample needs to be taken by the repair gang, appropriately bagged, and delivered to AW workshop. There, the pipe sample is cleaned; initial measurements taken, and pipe undergoes a shotblasting process. The outcome is to provide a basic understanding of the remaining structural integrity of the pipe sample which could be representative of the existing pipeline in the ground.

Data from the pipe analysis process is collected in the internal database, but also made available to the business via GIS and the Qlik Dashboard. To provide a better understanding of the main deterioration, data from the analysis is overlaid with additional datasets like soil aggressivity, soil shrink/swell factor, main material, or main age.

From the condition data we already noticed a clear deterioration trends and identified higher burst rates in certain areas. We can identify an average metal loss of pipes across our network and use it to forecast. We can drill down to identify metal loss in different pipe materials, different soil corrosivity or age of mains.

Insights from the mains condition data allow AW to make decisions related to sustainable management of our pipe network and mains renewal plans, which as a result helps AW focus the investment.