

Flow Monitoring Case Study

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Project Location

A remote farm at Helton between Penrith and Ullswater in the Lake District.



Key Issues

The presence of asbestos pipe made cutting a hole, shortening or replacing the old pipe impossible.



The Solution

Intelligent use of existing equipment delivered an innovative, effective solution to low flow monitoring.

Helton Reed Bed Outflow Monitoring

OnSite's flow monitoring team recently developed an innovative low-tech, but highly successful solution to monitoring low volume flows in pipes, despite being hampered by the presence of old asbestos pipe that could not be cut due to its hazardous nature.

The Project

United Utilities identified a remote farm in Cumbria which was discharging effluent into a collection tank for primary treatment to remove large solids, grease and oils.

The partially clarified water from this collection tank then passes through an effluent filter to remove any large solids that remain, before it drains into the reed bed filter.

Once inside the reed bed, the wastewater undergoes a complex series of natural treatment processes as it moves laterally through the root zone from one end of the bed to the other.

The Environment Agency had tasked United Utilities to understand flow volumes into the receiving water course from the reed bed.

The Problem

At this stage United Utilities brought OnSite into the project.

The 100mm pipe that discharges from the reed bed into the water course had insufficient flow rate for conventional flow measurement due to the low volume of the water within it.

After careful consideration OnSite enquired whether ultrasonic and radar measurement could be utilised. This required an open section of pipe to provide access prior to discharge into the water course. United Utilities confirmed that the end of discharge pipe was above ground, enabling a section to be cut out.

Asbestos Pipe

However, close inspection of the photo supplied by United Utilities identified that the existing pipe material was cementitious asbestos, meaning OnSite would not be able to cut or break into the pipe without complex and extremely costly remediation measures.

...So we were back to square one in terms of the measuring equipment that could be utilised.

The Simple Solution

OnSite's Flow Service Delivery team collaborated with the Worcester Workshop team to develop a fresh solution that would involve extending the asbestos pipework using modern safe PVC pipe. The flow was channelled through the new section which featured a calibrated V-notch weir, enabling use of a downward-looking ultrasonic monitor to be placed directly over the extended open channel pipework.

The next obstacle was working out how the modified pipework could be secured to the old discharge pipe approximately 1.4m above the river bed. Our simple, but effective solution was to utilise the L-shaped stainless steel bars normally used for securing ultrasonic sensors into sewers. These feature adjustable hinges which allowed the pipe to be positioned at the desired gradient.

OnSite installed and commissioned the new low-tech, but extremely effective 'Flow Rig' on 27 August 2020 with data being transferred via a telemetry link directly into the new OnSite Live data portal.

Thanks from United Utilities

United Utilities thanked OnSite for their innovative thinking and ingenuity in resolving the long-standing problem of low flow rate capture in small diameter pipework.

