

## Sonic-Pro S3 Ultrasonic Flowmeter solves build-up challenge

### Application

In a groundwater remediation process at a large oil company located in southern California, the ground water is contaminated by some unknown bacterial/chemical agent. During the remediation process, the water is pumped through PVC and HDPE pipes, through a series of filters and into a processing chamber where enzymes are injected before being returned to the ground. To be effective, the enzymes must be accurately injected into the water at a rate which is proportional to the water flow rate.

### Problem

Accurate measurements of the water flow rate and total flow is critical to the application. Initially, paddlewheel type flowmeters were installed but a black deposit built up on the paddles, which required cleaning every 2-3 days. The paddle wheel meters were replaced with insertion mag meters which failed after one day, as the coating proved to be non-conductive. A turbine meter was tried and failed after only a few hours of operation. A Doppler type ultrasonic meter was tested next but it failed to give any measurement at all.

A sample of the water was sent to Blue-White's test lab for analysis. The analysis indicated that there were no particles present that could reflect the sound waves making Doppler measurements impossible. However, Transit-Time test

measurements were successful using the Sonic-Pro hybrid ultrasonic meter which can function using either the Doppler or Transit Time measurement methods. The Sonic-Pro was also able to measure and display the sound speed of the fluid which, due to the contaminants, was significantly different from plain water. Knowledge of the actual fluid sound speed is necessary to properly install and calibrate the meter.

Besides its tendency to coat the inside wall of the pipe, which over time could possibly block the sound waves, the contaminants also caused a marked reduction of the sound wave intensity in the groundwater, when compared with clean water. However, the Sonic-Pro's automatic gain function enabled the meter to function properly over time by increasing and decreasing the sound wave intensity as needed.

### Solution

Clamp-on Sonic-Pro meters were successfully installed at the site on 2" diameter PVC and 4" diameter HDPE pipes at multiple measurement points.

