

Cost of operating a borehole abstraction system reduced by 47%

Our Process Energy approach allowed us to achieve savings far and above what would be possible from improving individual pump performance in isolation.

The Challenge

A water treatment site relied on two remote boreholes to achieve an acceptable water quality blend. Run hours of the submersible borehole pumps were high and so we conducted a site survey to measure pump efficiency and performance.

Our Approach

Pumping efficiency could be improved at one borehole by replacing the pump. However crane access was restrictive and additional unexpected costs were likely should this be attempted.

Groundwater levels were shallow when the pump was stopped but increased rapidly when the pump was operating due to poor borehole performance.

The second borehole had high pumping efficiency but the pump was found to be oversized and heavily throttled to maintain the abstraction licence. Pumped water levels were generally shallow but were very sensitive to local rainfall patterns.

Immediate savings were realised by installing a variable speed drive (VSD) operating on a flow control loop. This allowed the throttle to be removed by reducing the speed of the pump to maintain a constant flowrate irrespective of water levels.

This borehole was far cheaper to operate due to increased pumping efficiency but more importantly because of shallower pumped water levels.

The two boreholes shared a combined abstraction licence and so we installed a VSD at the expensive borehole and offset 40% of the total flowrate from the expensive borehole to the cheaper borehole. This was beneficial for two reasons: significantly more volume could be pumped at lower cost and a reduction to flowrate from the expensive borehole reduced its pumped water level, making it a cheaper source.



Borehole headplate

Result

The project resulted in a staggering 47% reduction in the cost to operate the boreholes and achieved payback in only 8 months. Water quality was not affected and the flow control loop ensured the combined abstraction licence could not be breached.

Benefits

- ▶ Net annual savings of **£28,000**
- ▶ Carbon dioxide savings of **147 tonnes** per annum
- ▶ **Short payback time** under 1 year



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