

Monitoring Saltwater Intrusion

Abstract

RS Hydro has recently continued its growth as a unique systems integrator to provide sensors for an accurate and highly reliable saltwater intrusion monitoring project throughout a major aquifer system in South England.

Equipment Used

Aqua Troll 100 conductivity Loggers and PTX1830 vented pressure transducers.

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In-Situ Inc.



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Background

As the south of England becomes progressively more populated demand on the necessary infrastructure become increasingly critical. This is especially true of the water services – in an area with the lowest annual rainfall in the UK and a population of over 16million – over abstraction is an growing worry.

The damage caused by over abstraction is already well documented and with the pressure on service providers escalating the trend is set to continue.

In coastal regions one of the least documented and understood impacts of over abstraction is saltwater ingress. A serious and costly impact as any potable water aquifers affected must undergo expensive desalination processes.



fig1. The monitoring network.

The Project

Sea water ingress can be monitored and tracked by monitoring Electrical Conductivity (EC) to follow possible saltwater plumes through the aquifer system.

Conductivity cells have become one of the most stable water quality parameters available – offering several months between calibration in most applications.

This stability has meant that it becomes increasingly cost effective to monitor conductivity through real time telemetry –which in turn allows a sophisticated alarm system to be implemented.



fig2. The monitoring network.

Due to the aquifers make up and the suspected pathways throughout it was deemed that EC readings should be taken from 2 separate depths along with a single depth measurements – all outputs need to be an analogue 4-20mA.

Our Solution

The Aqua Troll 100 (In-Situ) was the ideal unit for this problem – it's 4 pin EC cell provides unrivalled stability and with a built logger and guaranteed battery life, data loss concerns were eliminated.

The PTX1830 (Druck) as an industry standard was the logical choice for a simple yet accurate level unit.

All of the sensors are constructed from a high grade titanium and Delrin – essential in a potable water monitoring program.

This integrated network was provided through the use of RS Hydro's unique combination of sensors and third party telemetry systems.