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Case Study

Multilevel Groundwater Sampling for Former Manufacturing Site

Abstract

GEL, working with URS were given the task of developing a cost effective means to isolate and reliably sample groundwater quality and head data from several distinct vertical zones within a complex geological environment.

Equipment Used

The Solinst 7-Channel CMT (Continuous Multichannel Tubing) Multi-level System

Flow - Level - Water Quality
Groundwater - Meteorology - Telemetry

ISO 9001 certified

ISO 14001 certified

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Multilevel Groundwater Sampling for Former Manufacturing Site

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Background

Geotechnical Engineering Ltd (GEL) is an experienced drilling company operating in the United Kingdom. GEL, working with URS were given the task of developing a cost effective means to isolate and reliably sample groundwater quality and head data from several distinct vertical zones within a complex geological environment. The investigation took place at a former manufacturing site in South Wales before it was sold to a new company. The project's scope was largely driven by environmental contamination. Traditional groundwater monitoring approaches were considered. Clustered wells would have proved to be too expensive whilst nested wells would have proven too unreliable.

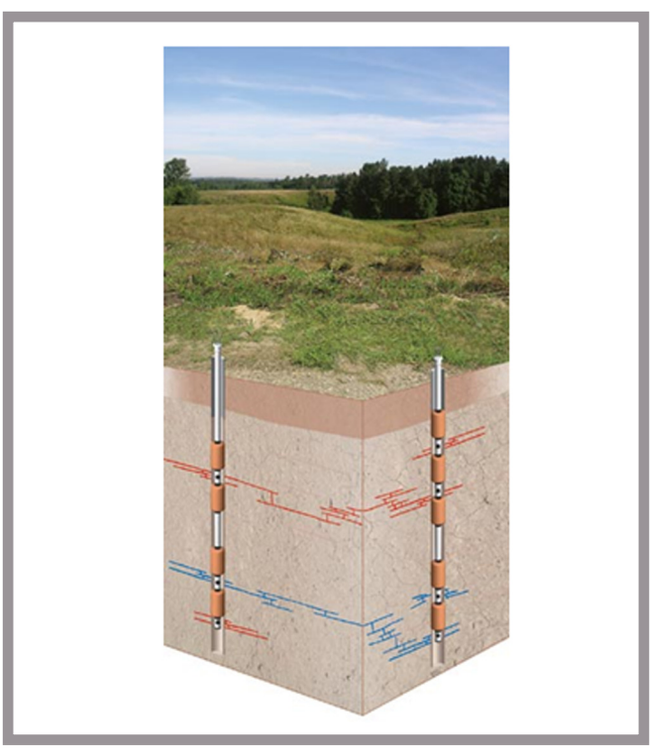

fig1. Installation of CMTs

The Solution

GEL selected the Solinst 7-Channel CMT (Continuous Multichannel Tubing) as the most suitable option, installing a total of 3 Systems to between 6 and 8m below ground level. Five to seven screened zones were monitored in each of the 3 multilevel systems. These screened ports were surrounded by approximately 0.3m of pea gravel with layers of bentonite pellets above and below each port to isolate the sampled zones.

GEL staff were trained by RSH personnel and were then able to construct a seven port CMT system within an hour. It should be stated that nested or clustered wells would have taken 2-4 times longer and therefore the CMT system saved Geotechnical a significant amount of time and money. The total time for drilling and installing each 8m well was less than 90mins but does vary according to geology.

Original site investigations from dedicated monitoring locations suggested possible leakage of hydrocarbons from the waste recycling centre. However, the CMT multilevel systems were installed near the periphery of the site and initial testing has suggested that there is no transgression of hydrocarbons offsite.

CMT multilevel systems do allow for a more detailed characterisation of groundwater dynamics.

Groundwater Sampling Options

Groundwater sample collection using the CMT or Waterloo Multilevel Systems, must be conducted with devices that can extract water or samples from either 1/2"ID (12mm), 3/8"ID (10mm) or 1/4"ID (6mm) depending on the number of zones being monitored. There are a number of options for obtaining groundwater samples from these systems which include:

- Peristaltic Pumps
- Mini Inertial Pumps
- Micro Double Valve Pumps
- Vapour Sampling in the CMT

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