Leica Geosystems TruStory
Yesterday's Negligence Becomes Today's Problem

While pumping and active charcoal filtering is taking place, the new building is continuously monitored with several inclination Leica Nivel220 sensors.

The level of pollution at the Schnepfenmatt site in Zuchwil makes it one of most contaminated pieces of ground in the Swiss canton of Solothurn. Although the pollution threatens two of Solothurn's public drinking water sources, it has not been possible to successfully remediate the land until now. Emch+Berger is working on the remediation of this contaminated waste site.

Background

In 1998, during the course of a redevelopment project in Zuchwil, it was discovered that there was considerable contamination of the ground (soil, groundwater), on what is now the Schnepfenmatt site, with chlorinated hydrocarbons (CHC). Previous attempts at remediation using conventional methods have not proved successful. Their failure was due to local conditions, the geology and groundwater levels. Remediation works for a new building to the east of the Schnepfenmatt site led to the realisation that the pollution could be treated by extracting water through wellpoints without risk to the sur-rounding buildings.

"Decades of careless handling of environmentally hazardous materials and wastes have left their mark in the soils of Switzerland." Swiss Federal Office for the Environment (BAFU), 2009

Site work

Emch+Berger is responsible for the site work and the evaluation and interpretation of the monitoring data. The CHC-contaminated groundwater is purified by passing it through an active charcoal filter water treatment system. The site manager must ensure that the 92 filter strings installed to extract the

Emch+ Berger

http://vermessung.emchberger.ch/

Objective
Subsidence monitoring of a building

Customer/Institution
Emch+Berger AG Vermessung, Solothurn

Challenge
Real-time subsidence monitoring during remediation
Notification via SMS when any sensor exceeds set limit levels
Pure geotechnical monitoring project

Date
2010 – 2015

Location
Zuchwil/Switzerland

Project Summary

Instruments
- Leica Nivel220
- Groundwater piezometers
- Flow sensors
- Water pressure sensors

Software
- Leica GeoMoS Monitor/Analyzer
- Leica GeoMoS Web

Communication
- ComBox20
- Campbell Scientific datalogger

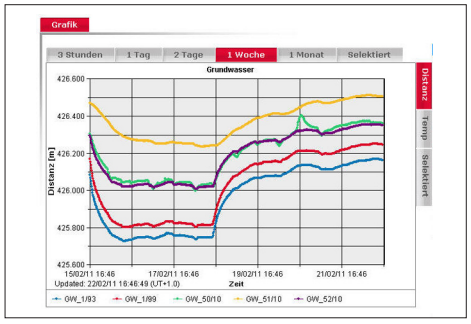
Benefits

Leica sensors and third party sensors combined in a single monitoring system simplifies support and interpretation of the measured data. Two geotechnical sensors systems increase the systems reliability

groundwater do not obstruct or delay progress on the new building to the east. The individual filter strings are connected by several pump lines to the treatment plant. Each filter string must be designed and installed so that it can be individually controlled by a shut-off valve. Remediation is expected to take five years.

Monitoring

While pumping and active charcoal filtering is taking place, the new building is continuously monitored with several inclination Leica Nivel220 sensors. The Leica Nivel220 inclination sensors are directly connected, via two separated RS485 bus systems, to the central communication unit. Every 15 minutes, each sensor registers the longitudinal and transversal inclination of its position. Furthermore, groundwater levels are automatically measured every five minutes by five groundwater piezometer stations spread out over the site. The treatment plant also has two integrated flow sensors and a water pressure sensor. A Leica ComBox20, a central communications unit, controls the groundwater piezometers, the flow and water pressure sensors (using a Campbell Scientific datalogger) and provides them with electrical power. All data is transmitted via a wireless GPRS router in real time to the Leica GeoMoS Monitor software in the Emch+Berger AG Vermessungen office. The Leica GeoMoS monitoring system controls the data acquisition of the Leica Nivel220 inclination sensors and the other sensors, displays the measured data, calculates displacements and checks, in real time, whether the tolerances are exceeded. If the tolerances are exceeded, the system notifies the project partners by SMS. To allow other interested parties (geologist, system maintenance engineer, construction engineer etc.) to see the data, the data viewing application Leica GeoMoS Web is available on the Internet. This allows the data to be analysed from anywhere at any time.



Graph of the groundwater level in Leica GeoMoS Web

Results

The customer receives a truly multi-faceted service including the measuring concept, installation, maintenance of the system and user support in the interpretation of the measured data. The monitoring system includes two independent measuring sensors that increase the reliability when the CHC-contaminated groundwater is purified.

Leica Geosystems AG
Heinrich-Wild-Strasse
CH-9435 Heerbrugg
Switzerland
Phone +41 71 727 31 31

www.leica-geosystems.com

- when it has to be **right**

Leica Geosystems