

Monitoring the remediation of salt water intrusion

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ABSTRACT

At a food processing factory, the delivered vegetables in pickles are rinsed out before they are processed for consumption. Formerly, the rinsing activities took place in the open field. So the water loaded with salt infiltrated in the soil, have been polluting the groundwater reservoir. The rinsing activities in the open field have been stopped, but the groundwater reservoir is still polluted. Considering the structure of the groundwater reservoir (two aquifers separated by one aquitard), the pollution is mainly situated in the upper part. Only at the center of the pollution plume, there are indications that pollution has migrated through the intercalated aquitard and polluted also the upper part of the bottom aquifer. Nowhere the pollution has reached the base of the groundwater reservoir, which is bounded at a depth of ca. 18 m by a thick aquitard.

The horizontal and vertical extent of the pollution have been determined by means of the electromagnetic induction method: electromagnetic profiling with the EM34-3 instrument and EM induction well logging.

During the summer of 2009, the remediation has started. A scattered network of pumping wells have been installed in the upper part of the reservoir. From that moment on, the apparent ground conductivity has been monitored regularly along the same profiles and in the same boreholes. These results are used to evaluate the progress of the remediation and the vertical and horizontal extent of the pollution which are compared with the findings before the remediation. Even if the remediation has only started shortly, a decrease in ground conductivity can be seen in the borehole loggings. Also the results of the electromagnetic profiling show an decrease in apparent ground conductivity in the vicinity of the pumping wells. With these results, it is shown that the electromagnetic induction method is a useful tool for monitoring of remediation, which can be considered as an innovative approach.