Improvement of Hydrogeophysical Methods to Detect Special Subsurface Contaminants

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Chlorinated organic compounds and hydrocarbons are among the most serious soil and groundwater contaminants because of their mobility and persistence in the subsurface, their widespread use, and their health effects. Developing and applying reliable and accurate geophysical methods and transport models is greatly needed to assess the risk posed by the plumes of these compounds to the subsurface.

A consortium with the presenting three partners was formed for a three-year-long project to improve hydrogeophysical methods in order to detect and characterize special subsurface contaminants. Four different contaminated sites were chosen in Hungary as study-areas to improve and calibrate special geophysical methods to provide remediation experts and hydrogeologists with necessary information for reliable transport modeling. A strong collaboration between the geophysicists and hydrogeologists evolved protocols and techniques to carry out successful site assessment and remediation schemes of contaminated lands. The applied geophysical techniques are non-invasive and cost-effective. On the other hand they can be performed with high spatial sampling characteristics. The obtained pieces of information provided by the geophysical methods were included into the transport models to predict the behavior and future movement of the investigated plumes. The advantages and applicability of this new approach are well illustrated by means of theoretical investigations and geophysical and hydrogeological case studies.