Geophysical Research Abstracts
Vol. 14, EGU2012-13455, 2012
EGU General Assembly 2012

Exploration of geothermal energy in the western Pannonian basin

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The Pannonian basin has been a favourable site for hot water utilisation in spas since the medieval ages. Deliberate drilling activity started already more than a century ago and Hungary has become soon a center of balneological teraphy in Central Europe. The increasing interest for wellness resorts and mainly geothermal energy prospects has initiated recently the first systematic survey in the western Pannonian basin. The regional scale of the survey and access to a wealth of drillhole and seismic data led to the elaboration of novel research strategy.

The Pannonian basin formed by rifting, major extension and subsidence of an Alpine orogenic terrain during the Middle Miocene. In the Late Miocene to Pliocene postrift period it was a big lake, which has been filled up by clastic materials transported by big rivers. Four regional aquifers can be defined in the basin from top to bottom:

(1) delta front sand packages and their lateral equivalents (Újfalu Formation),

(2) deep water delta front turbidite and sheet sand packages (Szolnok Formation),

(3) Middle Miocene biogenic limestones and

(4) fractured and karstified Mesozoic carbonates in the basement of Tertiary strata.

In order to fully evaluate the geothermal potential of these aquifers seismic mapping was completed by borehole geology, well logs and flow tests. In addition a large and most complete geothermal data base available for the region has been prepared to facilitate integrated interpretation. A series of maps will be presented to illustrate the main results of the project and deliver the most important message: there are favourable conditions at large areas in the western Pannonian basin for multipurpose utilisation of geothermal energy.