

Earthquakes attributed to geothermal plants near fault zones in the North Upper Rhine Graben

Bernd Schmidt¹

(1) Landesamt für Geologie und Bergbau Rheinland-Pfalz (LGB-RLP), Mainz, Germany

The evolution and geometry of the Tertiary Upper Rhine Graben (URG) were controlled by a continually changing stress field and the reactivation of pre-existing crustal discontinuities. A period of WNW-ESE extension in the late Eocene and Oligocene was followed by lateral translation from the early Miocene onwards. According to its geological settings the URG is an active seismic region with many earthquakes occurred in the past. Since more than one year a geothermal plant extracts heat by drilling deep (3 km) into the crust in existing faults zone in Rhineland-Palatinate in the north segments of the URG. The top of the basement changes about more than 1 km in a small area. Many earthquakes with magnitude of 1.3 to 2.9 were recorded in May, August and September 2009. Most of them were felt clearly in the city of Landau in close neighbourhood of the geothermal plant. More than 200 persons therefore called the the police and the Geological Survey of Rhinland-Palatinate (August 15th and September 14th). A panel of experts was established by the government to prove the reasons of the earthquakes and to explore the processes in the underground.