A 2.1 km deep hole was drilled near Litomerice, Czech Republic, to improve the knowledge on geothermal conditions below the site considered for a geothermal power plant. Thermal conductivity and diffusivity were determined on several metres long drill-core samples taken only at 855, 955 and 1000 m depth. Heat production was measured in a broader interval 850–1170 m on the drill-cores and also on rock chips produced by rotary drilling. Due to technical problems temperature logging was performed to depth of 1.8 km only and extrapolated linearly to 69 °C at 2.3 km, where geophysical prospection indicated an upper boundary of a different geological body reaching down to the target depth of 5 km. The temperature–depth profile yielded heat flow 70 mW/m² at the depth of 1 km. Considering 5–10 mW/m² increase of heat flow due to post-glacial warming and 3–4 mW/m² heat flow decrease due to observed heat production, heat flow of 75±5 mW/m² was proposed for 2.3 km depth. Two alternative models: (i) gabbro type alkaline rock and/or (ii) granite body were proposed as stationary geothermal model below 2.3 km. Following values were used: thermal conductivity and heat production (2.6 ± 0.2 W/(m.K))/(1 + 0.0001* T °C), 1 or 2 µW/m³ and (3±0.3 W/(m.K))/(1+0.0012* T °C), (4±2 µW/m³) * exp[– (depth(m) - 2300(m))/9700(m)], respectively. Estimated temperature at 5 km is 146±7 °C (min.135 °C, max.159 °C) for the alkaline rock model and 140±8 °C (min.126 °C, max.157 °C) for the granite model.