

## Abstract

The Riverbank Filtration (RBF) water supply system Karany has been affected by increasing  $\text{NO}_3^-$  concentrations during recent decades. This thesis deals with flow and chemical composition of groundwater in Skorkov and Sojovice RBF systems, which are the most problematic ones according to their quality in long term. Twelve new groundwater wells (V1- V12) were drilled in study area in 2013. Data derived from the wells were used to improve the conceptual hydrogeological model of the area and I tried to specify information about the origin of nitrate pollution. The Groundwater level logging showed hydraulic connection between the river and the wells situated up to 130 m faraway from the river (V1, V2 and V10), which were also demonstrated by the short-term temperature fluctuations caused by fast penetration of surface water from The Jizera River during higher flow rate to wells. I compiled geological sections which show the geometry of The Quaternary fluvial deposits and groundwater level. The chemical analysis of groundwater showed that it is not possible to differentiate groundwater from the shallow part of The Cretaceous aquifer from the aquifer of fluvial deposits by major chemical components. The result of infiltration experiments showed higher permeability in the environment with grass cover ( $k_v = 8,6 \cdot 10^{-5} \text{ m/s}$ ) where the grass roots disrupt the surface of soil than in the field plots environment which is predominantly bare soil or in the compacted path ( $k_v = 2,6 \cdot 10^{-5} \text{ m/s}$ ) where the infiltration is slow. The average values of vertical hydraulic conductivity of infiltration experiments ( $k_v = 2 \cdot 10^{-3} \text{ m/s}$ ) in the Jizera River bed are relatively high and show that river bottom is probably not sealed by fines particles. The batch tests were performed to confirm assumption about possible denitrification in The Upper Cretaceous sediments. During the batch tests anoxic conditions were probably disrupted in incubation and results did not confirm denitrification.