

Summary:

This thesis is focused on mapping of contaminants released into the environment probably due to uranium mining. These chemical contaminants are used to reconstruct the sedimentary processes. In the thesis we evaluate geochemical situation in the catchment area in the locality Borecek (part of the municipality Ralsko) using the overbank sediments as sedimentary archives of pollution during the last decades by elements U, Ba, Zn, Ni and ^{226}Ra . A map of aerial survey of gamma activity was used to select the area of interest, for more accurate localisation we used a surface gamma spectrometry. On Borecek we retrieved ten depth profiles of alluvial sediments (up to 230 cm) and one in Mimon, all samples were subjected to X-ray fluorescence spectral analysis (XRF), across the floodplain we performed gamma wire logs. For interpretations of floodplains architecture electrical resistivity tomography (ERT) was used and selected profiles were analysed for the activity of ^{226}Ra and ^{210}Pb . Interrelation of ^{226}Ra and Ba proved that radiobarite is the main source of the gamma activity. $^{210}\text{Pb} / ^{226}\text{Ra}$ ratio was used as sediment age indicator. With enrichment factor (LEF), we performed chemostratigraphic correlation of the sediments, for that the concentration of the target elements is corrected for varying lithology using normalisation. Analyses showed that the deposition of contamination in the floodplain is uneven in depth as well as in the area. Increased contents of the target elements are mainly found in terrain depressions filled with fine overbank sediments. With ERT and digital terrain models (DTM), we interpreted these depression as paleochannels, which are buried due to aggradation. The curves of LEF indicates that origin of majority of the contaminants is most likely joint. Furthermore in the study we discussed the mechanism of secondary pollution. The results of this thesis have become a part of a paper published in a research journal.

Key words: aluvial sediments, heavy metals, uranium, radium, Ploučnice