

# Environmental remediation of uranium mining tailings ponds

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After more than 35 years operation the uranium mining and milling facilities near Pécs city in Hungary were finally shut down in 1997. A complex plan and appropriate strategy have been prepared for restoration tasks. The main principle of the restoration planning is the applying of step by step solutions of each task. Most of the waste rock and heap leaching piles have been already restored or the restoration is in progress now. One of the most important and most complicated tasks is the remediation of tailings ponds because of the complexity of chemical, radiological and geotechnical requirements of the restoration. Material in the tailings ponds contains the residuary isotopes of the uranium decay series after the ore processing, and the ponds are potential sources of radioactive contaminants through both aerial and terrestrial pathways. The potential risk of environmental contamination from the latter route has been substantially decreased by pretreatment of the soil (liming) before construction. The main task of the presented study is development of a covering technology that ensures the radon emanation reduction from the surface of the pond below the established limit. Besides, the cover should solve problems of wind erosion of the ponds, the cover is expected to give an environmental friendly shape to the resulting pile and should prevent soil erosion from the slopes. The presentation gives details on investigation of different covering options of tailings ponds. In the first pilot study concrete rings of 1

m diameter filled with test layers of different materials were used for in situ examination of radon infiltration. In total 11 columns were studied, including the uncovered pond as a reference point. Radon concentrations of the layers were measured by monitors equipped with scintillation soil probe, and in parallel radon flux was measured on the top of each column. On the basis of the evaluation of the results two covering options have been designed for detailed studies on in-field on territories cover about 2000 m<sup>2</sup>. Radon concentration in the layers, radon emanation from the surface of the cover were measured. Results of the described above pilot studies are discussed in the presentation.