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Hydrogeological interpretation of natural radionuclide contents in Austrian groundwaters

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The Austrian Agency for Health and Food Safety (AGES) stores comprehensive data sets of radionuclide contents in Austrian groundwater. There are several analyses concerning Rn-222, Ra-226, gross alpha and gross beta as well as selected analyses of Ra-228, Pb-210, Po-210, Uranium and U-234/U-238. In a current project financed by the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management, AGES and the Geological Survey of Austria (GBA) are evaluating these data sets with regard to the geological backgrounds. Several similar studies based on groundwater monitoring have been made in the USA (for instance by Focazio, M.J., Szabo, Z., Kraemer, T.F., Mullin, A.H., Barringer, T.H., De Paul, V.T. (2001): Occurrence of selected radionuclides in groundwater used for drinking water in the United States: a reconnaissance survey, 1998. U.S. Geological Survey Water-Resources Investigations Report 00-4273).

The geological background for the radionuclide contents of groundwater will be derived from geological maps in combination with existing Thorium and Uranium analyses of the country rocks and stream-sediments and from airborne radiometric maps. Airborne radiometric data could contribute to identify potential radionuclide hot spot areas as only airborne radiometric mapping could provide countrywide Thorium and Uranium data coverage in high resolution.

The project will also focus on the habit of the sampled wells and springs and the hydrological situation during the sampling as these factors can have an important influence on the Radon content of the sampled groundwater (Schubert, G., Alletsgruber, I., Finger, F., Gasser, V., Hobiger, G. and Lettner, H. (2010): Radon im Grundwasser des Mühlviertels (Oberösterreich) Grundwasser. – Springer (in print).

Based on the project results an overview map (1:500,000) concerning the radionuclide potential should be produced. The first version should be available in February 2011.