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Implementation of the EU-Waterframe Directive-Hydrochemistry in the Marchfeld Region

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According to the European Water frame Directive it is a requirement that surface- and groundwater in the EU should be brought to a good condition by 2015. For the implementation of this goal it is necessary that any measures to improve groundwater quality show an impact within the upcoming 10 years. A prerequisite for any change of groundwater chemistry within this time frame is that the mean residence times of the groundwater body is shorter than 10 years.

The area of investigation is located in Austria. The Marchfeld is a 1000 square kilometre large which is intensively used agricultural area hence it is a highly sensitive system. This region exhibits one of the largest pore groundwater body in Austria. Since the area is distinctively agricultural used fertiliser lead to high concentrations of nitrate in the aquifer which results in problems of hydrogeochemical parameters. Since 1992 the Austrian Umweltbundesamt (UBA) accomplish a hydrochemical groundwater monitoring in the Marchfeld.

The aim of this project is to investigate whether it is possible to improve the groundwater conditions in the Marchfeld region accordingly to the European Water Directive until 2015.

Since 2005 hydrochemical monitoring in this region is supported. The program is using isotope hydrological methods for groundwater dating with CFC and 3H/3He. The aim of this project is to interpret the spatial and temporal variability of hydrochemical parameters. This is tested by applying multivariate geostatistic, cluster analysis and time series analysis and correlation of these results with isotope hydrological age information. The isotope hydrological investigations will be carried out in cooperation

with the International Atomic Energy Agency (IAEA).