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Trace elements in groundwater used for water supply in Latvia

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Latvia is rich with groundwater resources of various chemical composition and groundwater is the main drinking source. Groundwater quality can be easily affected by pollution or overexploitation, therefore drinking water quality is an issue of high importance.

Here the first attempt is made to evaluate the vast data base of trace element concentrations in groundwater collected by Latvian Environment, Geology and Meteorology Centre. Data sources here range from National monitoring programs to groundwater resources prospecting and research projects. First available historical records are from early 1960, whose quality is impossible to test.

More recent systematic research has been focused on the agricultural impact on groundwater quality (Levins and Gosk, 2007). This research was mainly limited to Quaternary aquifer. Monitoring of trace elements arsenic, cadmium and lead was included in National groundwater monitoring program of Latvia in 2008 and 2009, but due to lack of funding the monitoring was suspended until 2013. As a result there are no comprehensive baseline studies regarding the trace elements concentration in groundwater.

The aim of this study is to determine natural major and trace element concentration in aquifers mainly used for water supply in Latvia and to compare the results with EU potable water standards. A new overview of artesian groundwater quality will be useful for national and regional planning documents.

Initial few characteristic traits of trace element concentration have been identified. For example, elevated fluorine, strontium and lithium content can be mainly associated with gypsum dissolution, but the highest barium concentrations are found in groundwaters with low sulphate content.

The groundwater composition data including trace element concentrations originating from heterogeneous sources will be processed and analyzed as a part of a newly developed geologic and hydrogeological data management and modeling system with working name “GeoVipum”.

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Reference:

Levins I., Gosk, E. 2007. Trace elements in groundwater as indicators of anthropogenic impact. Environmental Geology, 55, 285–290.