



The Influence of Urban Drainage on Groundwater Quality and Quantity

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For the central position in the country and the geographical position of the area the gravel plain of Ljubljana Field is where the interests of urbanisation, industry, agriculture and public drinking water supply intersect. Ljubljana had been developed in the last hundred years from a town of twenty thousand inhabitants to a city of almost three hundred thousand inhabitants. The small town situated at the foothill of the Castle hill has been expanded over the great part of the Ljubljana Field and joined with the villages in the vicinity.

The aquifer of Ljubljana Field is drinking water sources for the city. Today the drinking water supply has been distributed from five water fields, four of them are situated on the Ljubljana Field and one on Ljubljana Marshland. The water fields were in the past situated far away from the city. Today they are surrounded with intensive urban areas and industrial zones.

The progress of pipeline and sewage system network has followed the city expansion. But in some parts of the city, especially on the borders, are still buildings and houses not connected to public sewage system. The drained area is 6576 ha, and the length of sewage system is 1039 km. The sewage system is predominantly combined (approximately 80 per cent) in average 30-40 years old, but several channels and main collectors are older than 50 years. In the areas on the margin of the city the sewage is built in separated systems, where the waste water has to be pumped in the main collectors and the precipitation water goes to the nearest recipient.

Local the influence of the untied and damaged sewage system is detected in the groundwater quality. The presence of nitrate, chlorine, VOC, P, B, E. coli and some others pollutants show the influence of urbanisation on groundwater quality.

The length of water supply pipeline is 1114 km. The groundwater abstraction was 37,9 mio m³ in 2003 and the 23 mio m³ of water was sold. About 30% of abstraction are losses in water supply system and present the urban drainage to groundwater.

Anthropogenic activities modify the entire aquifer area, impact the hydrological balance, reduce aquifer recharge, influence groundwater flow characteristics and change the water source availability and restoration.

In the paper the observed influence and relations between sewage and water supply pipeline on groundwater quality and quantity will be describe.