MONITORING OF GROUNDWATER BODY IN DRINI I BARDHË RIVER BASIN IN KOSOVO

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Monitoring, Kosovo, groundwater, surface water, risk, agglomeration influences

INTRODUCTION

The article focuses on methodology and results of groundwater and surface water monitoring in western part of Kosovo, including geophysical survey in Drini I Bardhë River Basin in Kosovo. Main activity of the monitoring was to obtain real hydrogeological data from pre-defined areas in Drini I Bardhë River Basin with special focus on agglomeration influences (waste water, agriculture etc.).

METHODOLOGY

GEOtest, a.s. was commissioned by the Ministry of the Environment and Spatial Planning of the Republic of Kosovo (the Employer) to perform Geophysical Investigation of Groundwater Resources in Drini I Bardhë River Basin in Kosovo, where:
• Part A is focused on Geophysical Investigation in the true sense,
• Part B is focused on Groundwater Body Characterization,
• Part C is focused on Delineation of Agglomerations in the Drini I Bardhë River Basin.

Groundwater body characterization comprises technical condition inventory, sampling and analytical works. Groundwater abstractions were carried out on objects lying nearby proposed geophysical measurement. Taken samples mostly represent shallow quarter groundwater structures. One sample was taken from Drini river representing surface water. Nearby the selected sites measured by using geophysical methods (LOT A) were not existing any boreholes.

Fieldwork was carried out in August 2017, 29 sampling points were inventoried and used for the collection of parameters such as location, owner, material, covering, type of use, geometry of sampling points (diameter, measuring site above level, depth), groundwater level, thickness of groundwater body, measuring of coordinates.

Fig. 1 Groundwater bodies in Kosovo with sampled points

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by GPS, on site measuring of parameters – temperature, pH, electrical conductivity (EC), incl. color, odor, contamination.

CONCLUSION AND RECOMMENDATION
29 samples of groundwater from shallow aquifer and surface water was taken at selected places across all the river basin of Drini I Bardhë. Thickness of aquifers in Drini I Bardhë river basin is, based on geophysical investigation, approximately 23 meters depth (6 – 40 meters). Thickness of an each aquifer depends on geological (proluvial cones, cretaceous flysch, fluvial gravels, neogene sandy sediments overlain by fluvial sediments and valley sediments) and hydrogeological (karst, porous, fissured) conditions. Based on field survey and on finding the current state of affairs we recommend followings:

- Completing and harmonization of legislation with the EU acquis as it is mentioned in chapter 2.1. EU Legislation and its Transposition
- Prepare administration of the strategies and plans for the river basins on state level:
  - Establish the river basin authorities
  - Prepare the river basin management plans
  - Do a management plan for the protection and regulation of river beds
  - Establish a protected areas and protection zones
- Prepare wastewater treatment strategy plan, build WWTPs
  - Compile cadaster data on water polluters
  - Construction of wastewater treatment plants (WWTPs) and canalization system
- Based on EU Directive 2000/60/EC do a regularly quality and quantity monitoring of surface water and groundwater:
  - Upgrading surface water monitoring networks, add more stations
  - Creating a groundwater-monitoring network
    - Drill new monitoring boreholes
    - Refine the results of geophysical investigations based on new information from new boreholes (geological description, water level, thickness of aquifer(s))
  - Interpreting and present data on quality and quantity based on Directives regulations
- Protect the surface water. Be focused on main pollution sources and consider measures against:
  - Urban wastewater discharges
  - Direct industrial discharges from large industrial installations
  - Agriculture activities (surface runoff, soil erosion, artificial drainage flow, leaching of fertilizers)
  - Waste management (landfills, dumps, storages – chemical fluxes in leachate)
  - Contaminated sites (brownfields, industrial zones, military activities, fuel storage, freight railway stations, i.e.)
  - Impacts of mining (mine waste water, quarries, deposits, heaps)
  - Other negative influences on water pollution (e.g. dredging of river sediments, fish farming)
- Protect the groundwater, the main objectives are essentially:
  - Estimation and identification of significant water abstraction for urban, industrial, agricultural and other uses, including seasonal variations and total annual demand, and of loss of water in distribution systems.
  - Implement the measures to prevent or limit the input of pollutants into groundwater and to prevent the deterioration of the status of the groundwater body (quantitative and also qualitative status)
  - Protect, enhance and restore all bodies of groundwater, and ensure a balance between abstraction and recharge of groundwater, with the aim of achieving good groundwater status
  - Reverse any significant and sustained upward trends in the concentration of any pollutant resulting from the impact of human activity in order to progressively reduce pollution of groundwater

LITERATURE
Bartoň, J., Duras, R., Oprchal, J., 2017: Kosovo Environmental Programme, Geophysical Investigation of Groundwater Resources in Drini I Bardhë River Basin, GEOTest, a.s., Brno

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