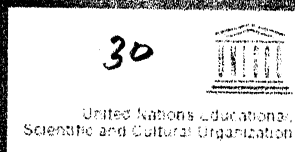


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**ANTHROPOGENIC EFFECTS ON THE
HUMAN ENVIRONMENT IN THE TERTIARY
BASINS IN THE MEDITERRANEAN
PROCEEDINGS**

**Edited by:
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**THE RISK OF SURFACE CONTAMINATION OF GROUND WATER
RESOURCES OF THE RIVER BREGALNICA USED FOR
THE WATER SUPPLY OF THE TOWN OF STIP**

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Abstract

The water supply system of the town of Stip uses the ground waters from aquifers of intergranular porosity formed in alluvial sediments of the River Bregalnica. The aquifers are close to the town with high risk of contamination as the area is urban with the presence of anthropogenic contaminants.

The wider area is built up of Mesozoic granites and Tertiary and Quaternary sediments. The water-bearing alluvial sediments are of Quaternary age being the first river terraces of the Bregalnica. They are made up of gravel and sands. They are from 10 to 11 meters thick overlying impermeable Eocene marls. The water-bearing layer is 6 - 7 meters thick and the water level is 2 - 5 meters under the surface depending on the relief.

Filtration coefficient according to granulometric analyses carried out ranges from 0.099 to 0.55 cm/s. According to testing carried out on wells it ranges from 0.229 to 0.885 cm/s.

Water is pumped by a series of wells located near the river their density being from 50 to 100. The good filtration coefficient and the good hydraulic connection of the river and the wells imply that the water quality in the wells depends entirely on the water quality of the River Bregalnica.

There are a number of active and potential contaminants in the vicinity of the town above the zone used for pumping water. The discharge of materials from the Brilliant Oil Company, the pig farms, the cultivated fields where pesticides and fertilisers are used, petroleum and its derivative stores, the possible catastrophes along the Stip - Kocani road and that from Stip to Mt. Plackovica used for the transport of various materials and washing of waste materials from the roads and their discharge into the river are an enormous threat to the water in the river.

In addition, there are a number of smaller contaminants such as small and open rubbish dumps, unhygienic settlements with no sanitation and sewer network that dispose of organic matter wastes that penetrate the aquifer.

The protection of ground waters calls for the construction of sanitary protection zones around the wells that supply waters for the water supply system. It is of note that measures should also be taken in order to protect the waters before it is late.

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