



Potential threat of new public landfill on tap water sources in southwestern Montenegro

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For the purposes of the waste disposal from the territory of the Herceg Novi municipality (Western Montenegro), the landfill "Duboki do" is planned, located on the high karst plateau above the Boka bay. The altitude of the landfill location is about 1050 masl. Since the wider area is characterized by large amounts of rainfall (mean annual precipitation 3000 to 5000 mm) and high permeability of the rocks, the region is very rich in groundwater. The most important groundwater sources are Opačica spring (included in the Herceg Novi water-supply system) and Morinj water-source which represents the potential source for supplying a part of the territory of Kotor municipality, and there are numerous smaller springs water-supplying local settlements. Although the terrain generally is very permeable, the conditions of groundwater flow within a Karst aquifer are very complex. By the application of the conventional hydrologic methods in this terrain, it was not possible to reliably determine the recharge area of the karstic springs to clarify whether a leakage of waste water from the landfill can pollute the nearby springs located near the coast (altitude 5 masl). According to one hypothesis, the recharge area of the Morinj springs is on the Karst plateau with an average altitude of about 1100 masl, covering the wider area of the proposed landfill location. We have monitored the H- and O- stable isotope variations in precipitation from various locations in Montenegro (one year period 2016-2017) and also investigated the water of the springs potentially threatened. The results indicate that the spring water very likely originate from the high karst plateau as its isotope values resemble those of Montenegrin high altitude winter values ($d_{18}O < -9\text{‰}$ $d_2H < -50\text{‰}$), whereas the lower coastal areas have winter values higher than -6‰ for $d_{18}O$ and -30‰ for d_2H .