



Quality assessment and hydrogeochemical status of potable water resources in a suburban area of northern Greece (Thermi Municipality, central Macedonia)

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ABSTRACT

Twenty-seven (27) tap water samples were collected during October 2012 from the supply network of Thermi Municipality (central Macedonia, northern Greece) in order to assess their hydrogeochemical signatures and the overall quality status according to the European legislation and international standards. Samples were analysed for a total of 25 environmentally significant parameters including physicochemical properties (pH, EC, colour, turbidity and hardness), major and minor ions (Ca^{2+} , Mg^{2+} , NO_3^- , NO_2^- , NH_4^+ , Cl^- , SO_4^{2-} , F^- , and CN^-) and trace elements (B, Sb, As, Cd, Cr, Cu, Pb, Hg, Ni, Se, and Mn). The vast majority of the parameters appeared in values below the maximum admissible concentration for potable waters. Individual elevated concentrations of B and NH_4^+ may be attributed to natural (geogenic) factors related with local lithology and anthropogenic influences possibly deriving from agricultural practices (excessive use of N-fertilizers). The assessments of the analytical results were validated with the use of PoS index, which classified nearly all samples of low to medium quality degradation and outlined the dominant triggering parameters affecting the hydrogeochemical status. These parameters included, apart from ammonium and boron, chromium, fluoride and nitrates. PoS index proved to be a versatile tool to communicate environmental information of groundwater quality characteristics, especially in environmental monitoring projects, since it abets to understand the overall evaluation of water quality. In addition, PoS application offers a valuable alternative for

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on-the-spot comprehensive and comparative analysis of all available water quality data, and may be used as a screening tool for environmental assessment applications.

Keywords: Groundwater quality; Hydrogeochemistry; Drinking water quality; Environmental monitoring; Thermi Municipality; PoS index
