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PRELIMINARY DATA ON THE IMPACT OF WASTE DISPOSAL SITES ON THE QUALITY OF SURFACE AND GROUNDWATERS

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Abstract

Contamination of surface and ground water occurs when urban waste materials, such as domestic garbage, are disposed without any pre-treatment, causing deterioration of the water quality. Groundwater pollution happens mostly due to percolation of pluvial water and the infiltration of contaminants through the soil while surface water pollution happens due to untreated leachate discharge. The purpose of this preliminary investigation was the evaluation of water quality due to the impact of two existing dumpsites, located in Vlora city and Orikumi city in Albania.

Samples of surface water, groundwater and leachate were collected during December, 2021, after a period of heavy rains. The assessment of water quality was based on the analysis of the main water quality indicators such as: pH, DO, Conductivity, COD, BOD5 N-NH^{4+}, N-NO^{3-}, PO_4^{3-}, total N, total P as well as major components including Ca^{2+}, Mg^{2+}, Cl^-, SO_4^2. Only standard methods of analysis were used for the determination of each parameter, including UV-VIS spectrophotometry and titrimetry. Physico-chemical parameters such as pH and conductivity were measured in situ by potentiometry using glass electrode and platinum electrode, respectively. Water quality was evaluated by comparing obtained data with current Albanian National Regulations as well as the EU Directives for surface and groundwater quality, respectively Surface water regulations from 1989, and Directive 2006/118/EC of the European Parliament and of the Council of from 2006.

Obtained results showed that among the analyzed samples, concentration of water quality indicators such as ammonia (N-NH^{4+}), nitrates (N-NO^{3-}) and phosphates (P-PO_4^{3-}), total N and P as well as COD and BOD5 have resulted to be higher in the leachate sample, collected at the base of the dumpsite in Vlora city. Pollution from the site has also effected the quality of surface water, which can be confirmed by the increase in concentration of pollutants in the main drainage channel that passes in the vicinity of the area. The quality of groundwater collected in Vlora city showed poor quality compared to the quality of groundwater in Orikumi city.

Analysis of water bodies in the areas of existing dumpsites are important tools aiming to evaluate the environmental and health hazards due to untreated disposed wastes. Preventive management is recommended for water safety and new landfill construction methods should be designed to prevent pollution of water bodies.

***Key words**: Water quality, Dumpsite, Leachate, Pollution index.*