Assessment of quality of water resources around Khalkhal municipal waste landfill in Khalkhal at 2019-2020

Introduction: Transmission of leachate from municipal solid waste landfills will potentially threaten ecosystems and human societies, where the landfill has no system for collecting and treating leachate. Leachate produced from landfills finds its way through the soil to groundwater and surrounding surface waters, leading to pollution of water resources. This study aimed to investigate the effects of leachate from Khalkhal landfill (a city in Ardabil province; northwestern Iran) on the quality of groundwater and surrounding surface water.

Materials & Methods: During 2019-2020, 4 wells (one control well upstream and three wells downstream of the landfill) and two stations on the surface water resource of Herochai River were spots for sampling. First, we did Sampling during high and low rainfall seasons in keeping with the standards. Second, we analyzed the values of some physical, chemical, and biological quality parameters according to standard methods. We conducted the sampling of the soil texture following 422 ASTMD standards. Then, the soil was analyzed at the site of the Reference Laboratory of Water, Soil, and Plant in Ardabil Province.

Findings: The value of most parameters measured in the water of downstream wells is a smaller amount than the limit recommended by the Iranian standard and World Health Organization and also has no limitation for drinking and agricultural uses. The quality of Herochai River water was also relatively undesired in terms of turbidity, total coliform, and only in some samples. Also, consistent with the study results, no difference was between high and low rainfall seasons.

Conclusion: According to the results obtained from different parameters, Schuler and Wilcox diagrams, and Landfill Water Pollution Index, the quality of upstream and downstream water resources of Khalkhal municipal solid waste landfill was not much different. In other words, the landfill did not affect water.

Keywords: Water Resources, Landfill, Water Pollution Index, Iran, Khalkhal

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1. M.Sc. Student of Environmental Health Engineering, School of Health, Ardabil University of Medical Sciences, Ardabil, Iran

2. Department of Environmental Health Engineering, School of Health, Ardabil University of Medical Sciences, Ardabil, Iran

3. Department of Environmental Health Engineering, Khalkhal University of Medical Sciences, Khalkhal, Iran

* Corresponding Author: E-mail: u.industry96@gmail.com