

Quality of Groundwater at Kaakkaithivu Landfill Site

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The groundwater is the major source of potable water and its quality is affected by the waste disposal sites. The disposal of solid waste into the landfills can be predictable as the major source for groundwater contamination. The aim of the study was to assess the water quality of selected well waters near the Kaakkaithivu landfill site in Jaffna. The groundwater samples were collected into clean plastic bottles of 500 ml capacity from 60 dug wells. Water quality parameters such as pH, Temperature, Electrical Conductivity (EC) were measured insitu and other parameters such as Total Dissolved Solids (TDS), nitrate, phosphate, heavy metals (Cr, Cd and Cu) and bacteriological contamination were analyzed in the laboratory and compared with the SLS standard 614:2013. Based on the results, their spatial distribution patterns were designed using ArcGIS software 9.0 - 9.1. The results showed that out of tested water samples, 96 %, 95 %, 25 % and 100 % of samples were exceeded the maximum permissible level of EC, TDS, Nitrate and Cadmium, respectively. Phosphate, Cu and Cr ions were less than the maximum permissible level of the SLS standard 614:2013. The pH value of water samples were within the range of 6.96 to 7.59 indicating a slight alkalinity. The EC of the well water were ranged from 3.82 to 61.5 mS/cm. Concentration of Nitrate was ranged from 0.00 mg/l to 188.54 mg/l and the Phosphate was ranged from 0.13 to 1.34 mg/l. The Cr, Cu and Cd concentrations of water samples were ranged from 0.002 to 0.163, 0.001 to 0.111 and 0.016 to 0.132 mg/l, respectively. The groundwater of the study area was found to be heavily polluted with Cd. bacteriological parameters in groundwater were found high near dumping site which deteriorates its quality for drinking and other domestic purposes. Based on the results of water quality parameters, it can be concluded that groundwater of the study area is mostly unsuitable for human consumption. Effective monitoring of groundwater quality is frequently suggested to safe guard the health of the public residing in the surroundings of the dump site.

Key words: Dumping site, Groundwater, Contamination, Heavy metals, Solid waste