

## **ABSTRACT**

The research study was undertaken to determine the suitability of the groundwater in Syokimau area for domestic purposes. The suspicion of groundwater contamination was due to the fact that the area has a poor sewerage system which has been further affected by the construction of the Nairobi Expressway. The presence of many industries in the area was suspected to have an impact on the groundwater quality as industrial effluent that is not properly disposed contaminates groundwater. The study was therefore aimed at conducting chemical and physical analysis of the groundwater and determine the possible pollutants of the groundwater. Groundwater samples were collected from six boreholes in Syokimau. The sample points were chosen based on their proximity to areas with poor sewerage and areas near industries. The samples were collected using acid cleaned high density 1L linear polyethylene sampling bottles and each sample labelled systematically and taken to the Public Health Engineering Laboratory for analysis. Chemical and physical analysis was conducted for each sample in accordance to the Standard Methods for the Examination of Water and Wastewater. Twelve parameters were selected for analysis and compared to both the WHO drinking water standards and Kenyan Standards. The twelve parameters chosen were used in calculation of the water quality index for each sample. All parameters measured were within the required standards except chloride, fluoride and turbidity. Sample S1 had a chloride concentration of 452 mg/l which is far beyond the WHO and KS standards of 250 mg/l. All six samples had a fluoride concentration above the maximum allowable value of 1.5 mg/l. In terms of turbidity, sample S2 had a value of 5.76 NTU which was more than the maximum allowable limit of 5 TCU according to WHO and KS. All samples had very high WQI values. Sample S1 and S2 had values of more than 100 while samples S3 to S6 had values more than 90. The high level of fluoride in the water was the main contributor to the high WQI values. The variations in the chemical levels was due to contamination by the poor sewerage or improperly disposed industrial waste. It was thus recommended that the government should improve the sewerage system in the area while ensuring proper disposal of industrial waste and the Water Resources Authority should conduct regular checks to ensure compliance as per the required regulations.