

## **ABSTRACT**

Underground water is one of the major sources of water for domestic use in many parts of the world. Since this water is used for domestic purposes, its quality is of great importance to the consumers. The main source of water for domestic use in Ngatataek Town and its environs is underground water from wells. The main objective of this project was thus to assess the quality of groundwater and thereafter offer appropriate solutions based on the findings.

I collected samples from four different boreholes namely: Silale Farm, Kwa Gatimu, Kwa Tinga, and Ngatataek Community Water Project. I decided to test whether the following parameters meet WHO Guidelines for water quality: Total Hardness, pH, Turbidity, Iron, Total Suspended Solids, Fluorides, Chlorides, Total Dissolved Solids and Total Coliforms. For both turbidity and total dissolved solids the samples passed the World Health Organisation guidelines. The samples contained negligible amounts of total suspended solids. Water from Kwa Tinga Borehole contained the highest amounts of Total Dissolved Solids ( $1030 \pm 20$  mg/l). The hydrogen ion concentration in all the samples tested were within the recommended range as set by the World Health Organisation (6.5 - 8.5). All the samples collected exceeded the limit set by the World Health Organisation of 180 mg  $\text{CaCO}_3$ /l of hardness and are therefore classified as very hard. All samples collected had amounts of iron slightly above that required by the World Health Organisation at 0.3 mg/l. Silale Farm Borehole exhibited the highest levels of chloride concentration ( $339 \pm 5$  mg/l) as compared to the rest of the samples. Water from this borehole exceeds the recommended threshold set by the World Health Organization (250 mg/l). The rest of the samples collected had lower than recommended chloride concentrations. The water from Silale Farm Borehole had less fluoride concentration ( $1.26 \pm 0.1$  mg/l) than the amount set as a standard by the WHO (1.5 mg/l) and as such is suitable for use. The rest of the samples tested yielded higher concentrations of fluoride than the guidelines set. E Coli tests turned out negative for most samples confirming absence of fecal contamination in water from Silale Farm. For water from the rest of the boreholes tested, fecal contamination was confirmed.