

Microbiological and physico-chemical quality of surface and groundwater sources and its socio-economic impact in the Mpheni-Elim Village, Limpopo Province, South Africa

by

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ABSTRACT

Water is a precious natural resource, vital for life, development and the environment. In many rural communities the majority of people have to use groundwater sources as an only source of water supply. The main problem is the contamination of aquifers due to inadequate sanitation and improper waste disposal in these rural areas. In addition the borehole water supplies are also closely associated with surface water flow patterns. This study concentrated on the microbiological and physico-chemical quality of surface and groundwater sources and its socio-economic impact in the Elim-Mpheni Villages, Limpopo Province of South Africa. Bacterial indicator microorganisms were used to assess the microbiological quality of both the surface and groundwater sources in the communities and included total coliform bacteria, faecal coliform bacteria, faecal enterococci bacteria, heterotrophic plate count bacteria and *Clostridium perfringens* (vegetative cells and spores). Physico-chemical assessment of the surface and groundwater sources included pH, turbidity, electrical conductivity, nitrates, nitrites, phosphates and fluorides. All results were analyzed using the South African water quality standards as a guideline.

The results of this study indicated a microbiological and physico-chemical difference between the two types of water sources. In addition the microbiological and physico-chemical data indicated less potential health risk to consumers using the water from these sources. In addition, a questionnaire survey identified several factors which impacted on the household sanitation and hygiene environment. The recommendation of this study was to increase the education of rural communities depending on borehole water sources on proper care and treatment of their water sources.