

**GROUNDWATER POTENTIAL OF KAJIADO MUNICIPALITY
AND ITS ENVIRONS IN KAJIADO COUNTY, KENYA**

SGL 413 PROJECT IN GEOLOGY

PAUL MURIITHI NJUKI

REG NO: L13/21428/2008

*A dissertation submitted to the department of Geology of the University of Nairobi as
partial fulfillment for the degree of Bachelor of Science in Geology*

June 2012

ABSTRACT

Groundwater exploitation has considerable potential for boosting water supplies. The county's geology and hydrogeology allows for the economic exploitation of the groundwater resources. Kenya consists of three major rock types namely; volcanic, metamorphic basement and intrusive rocks, and the sedimentary rocks. The main groundwater aquifers are closely linked with these three major rock systems. These groundwater resources are spread over five hydro-geological areas: volcanic rocks area in the Rift Valley; volcanic rocks area outside of the Rift Valley; the metamorphic basement rocks area; the eastern quaternary sedimentary rocks area; and the western quaternary sedimentary rocks area.

Kajiado County is characterized by tertiary volcanics and the Precambrian Mozambican belt rocks (basement system). The study analyzed the characteristics of boreholes sunk within Kajiado Municipality and its environs including depth, water struck levels, water resistivity levels, yield per hour and per day; pumping water levels, specific capacities; and transmissivity. The objectives of the study included; establishing groundwater potential by studying the geology of Kajiado Municipality; delineating spatial distribution of groundwater potential by relating this distribution to structures such as deposition basins, fresh basement rocks, faults, joints and fractures; identifying gaps in hydrogeological studies done; and documenting best techniques applicable in the search of groundwater within Kajiado Municipality and its environs.

The study revealed that there were twenty one boreholes within Kajiado Municipality. The study area was also found to be of varied ground water potential namely high, medium and low. Five of the existing boreholes are located in a high potential area while another five on a medium potential area. Seven boreholes were located in a low potential area and the remaining four did not strike any and so were dry. Transmissivity readings were used to determine groundwater potential. The aquifer in the high potential area was struck between 50 and 80m in depth. Further, it was established that depositional aquifers were limited to low grounds near the river channels and characterized by the occurrence of medium ground water potential. High yielding boreholes are located on a fracture

running north south in the project area. The ground water within the area was found to be mineralized but of good quality according to the WHO standards.

The research also established that the most used geophysical method for exploration in the project area is the resistivity method as opposed to the seismic method.

Key words:

Hydrogeological, Infiltration, Joint Percolation, Perched aquifer, Permeability, Pumping test, Recharge, Specific capacity, Static water level, Transmissivity, Unconfined, Yield