Geophysical Research Abstracts, Vol. 9, 00191, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-00191

An improved means of groundwater exploration using a combination of geophysical methods and groundwater modelling

J. Bening , J. Bayor
American Geophysical Union, USA

A Geophysical survey for water site selection has been carried out in the Lower Voltaian Sedimentary Basin of the Northern Region of Ghana. This has been necessitated because of mixed groundwater fortunes of the region. Previous groundwater campaigns in the region using other techniques have resulted in poor drilling water yields. Albeit, selection for well drilling is as sensitive as it could be, and hitherto ordinary terrain evaluation methods were relied upon in a geologically difficult terrain of the Basin. This method was used for the first and second phases of Ghana Rural Water Project (GRWP) operations. The drilling operations yielded an average of 55% success.

An initiative was undertaken to improve upon the rate of well drilling success in the Basin. With the area being basically underlain by voltaian rocks, this more necessitated the introduction of area photo interpretation together with geophysical methods and this provided a marked improvement.

The electromagnetic (EM) 34-3 Ground Conductivity equipment from GEONICS Ltd was used for ground profiling, while the SAS ABEM Terameter was used for the Vertical Electrical Sounding. Results for the conductivity meter greatly showed contact zones. These were then selected for further probing by the dipole-dipole configuration method. A simple computer software was developed to enhance interpretation of the data obtained. Due recognition was given to all unique field conditions and local perturbations, and the software was run for various model parameters.

After a year, backing this technique with a sound hydrogeological terrain experience ,a 25% increase in yearly success was realized.