



INTEGRATED GEOPHYSICAL INTERPRETATION FOR GROUNDWATER POTENTIALITY AT WADI GHUBBA, CENTRAL SINAI, EGYPT

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ABSTRACT

Groundwater in Sinai is the main source for different developing programs. This can be done by exploring new aquifers contain water of appreciable amounts and good qualities. To outline the expected aquifers different geophysical tools were used in the study area. These geophysical tools are geoelectric, magnetic and gravity methods. Fifteen deep vertical electrical soundings have been measured with current electrode spacing ranges between AB=10 m and AB= 6000 m to define the main aquifers in the studied area.

All vertical electrical sounding measurements (VES) were re-interpreted by using IPI-1D program. The actual thicknesses and resistivities were used to construct geoelectrical cross-section to define subsurface stratigraphic units and water bearing aquifer. The geoelectrical cross-section shows that, the subsurface section consists of five geoelectric units. The first unit is limestone overlying clay unit. The third unit is limestone, while the fourth unit is clayey limestone. The last unit is Nubian sandstone of Lower Cretaceous deposits which considered the main aquifer. The depth of upper surface of the Nubian sandstone (aquifer) ranges between 334 to 980 m. One hundred fifty land magnetic stations were measured to cover the studied area. The interpretation of the magnetic data started with reduction to the magnetic pole, then depth to the upper sur-

face of the basement has been determined applying Euler deconvolution technique. The results of magnetic interpretation show that, the depth of the basement surface ranges between 1270 m at the northwestern corner and 2720 m at the southern part of the study area. Gravity measurements have been taken using Autograv gravimeter of sensitivity 0.01 mGal at the same stations of magnetic measurements. Regional-residual separation carried out using high and low pass filter technique. The residual gravity anomaly map has been used to detect the structural elements. There are normal faults whose directions are: NW-SE, N-S and NE-SW.

Keywords: VES, Gravity, Magnetic, Groundwater, Sinai, Egypt.