"Hydrogeophysical-Hydrogeological Study For The Nile Valley Tract Streched Between Beni-Suef and El-Saff, Egypt"

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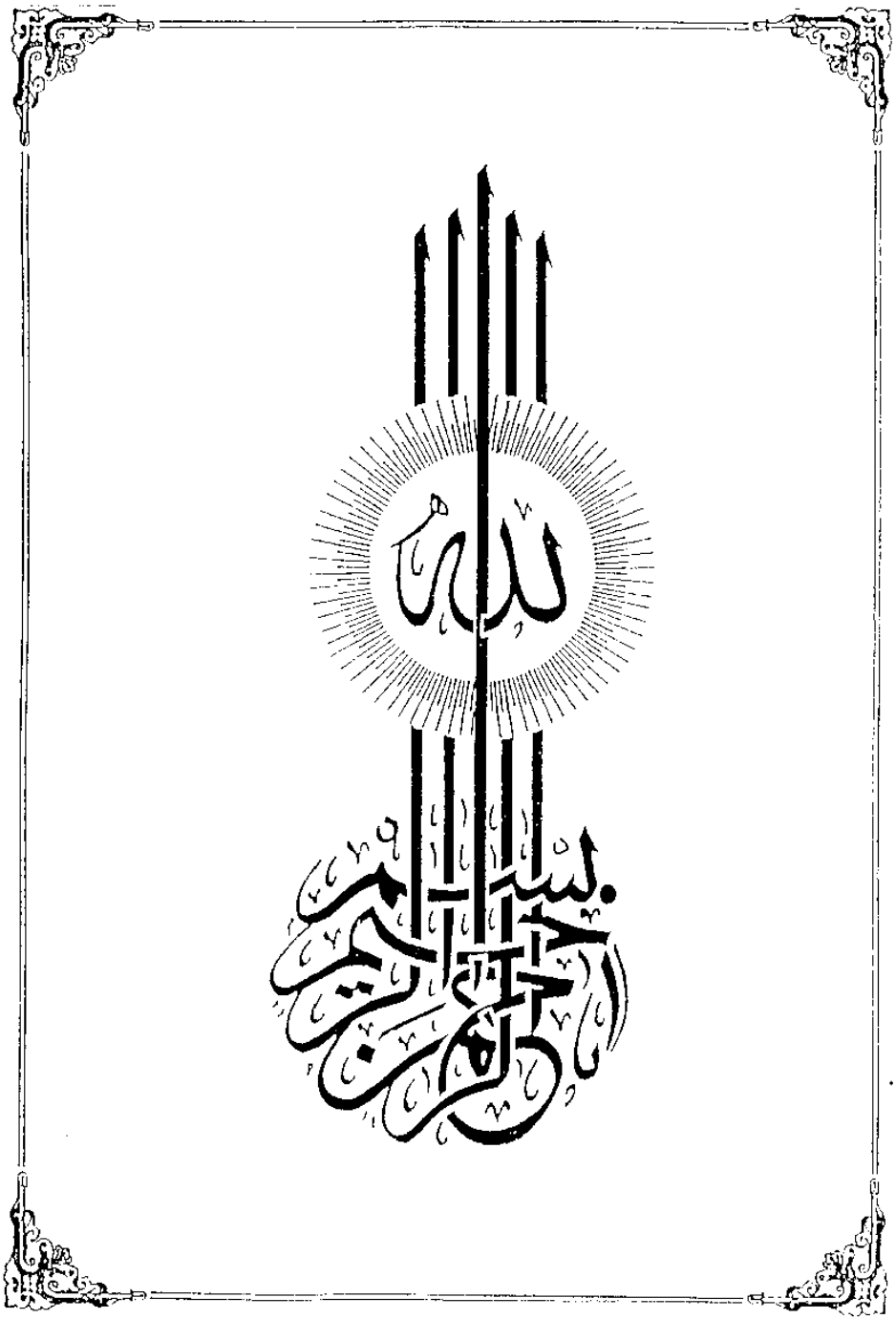

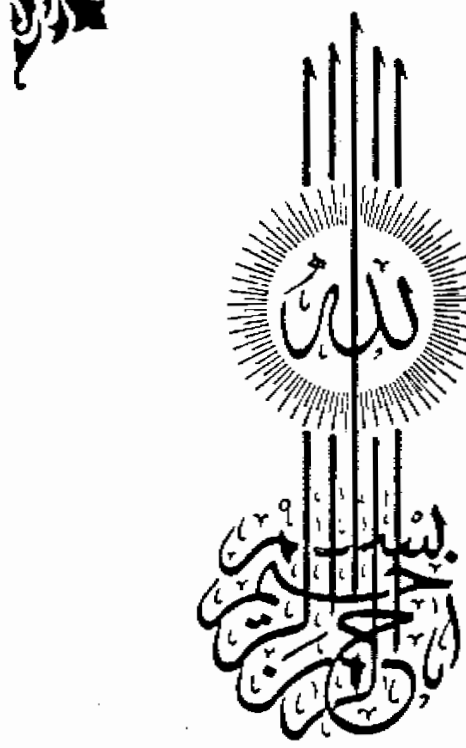

قالوا سبحانك لا علم لنا إلا ما
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صدق الله العظيم
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ABSTRACT

On "Hydrogeophysical-Hydrogeological Study For the Nile Valley Tract Stretched Between Beni-Suef And El-Saff, Egypt"

The purpose of this work is to analyze, critically, the shallow section of the study area, that bounded by latitudes 29° 00` & 29° 40` N and longitudes 30° 50` & 31° 25` E, through integrated shallow geophysical and geological system.

This involves, an overview for the geomorphological and geological background of the investigated area. Accordingly, three main geomorphologic units are outlined, beside the drainage and surface hydrological system of such an area. Also, the geological units cropped out on the surface range from Middle Eocene to Quaternary. Moreover, the subsurface stratigraphy has been dealt with, starting from the deep Pre-Cambrian rocks up to the most recent Quaternary deposits, in addition to the dominant structural elements of the study area.

Then after, interpretations for the available geophysical data, that represented by the gravitational and geoelectrical data were done for determining the main shallow subsurface geological conditions controlling the groundwater occurrences. By this way, the gravity analysis is mainly devoted to decipher the upper section of the study area, that embraces the shallow (Quaternary) aquifer, through separating the residual gravity anomalies from the regional ones. These residual gravity anomalies have been subjected to a number of analyses, mainly to determine the extension of the water-bearing main aquiferous unit in terms of width, length and thickness. From these, the probable paleocourse of the Nile River has been aligned.

The geoelectrical analysis is essentially oriented for determining the geometry of the water-bearing formation and deducing the probable distribution of the expected groundwater salinity. This has been accomplished through the interpretation of the available resistivity data through the manual interpretation which had been further ascertained

through the analytical automatic interpretation using two computer programs of ***Hemker (1987)*** and ***Zohdy (1989),***accompanied by utilizing the transverse resistance of the Dar Zarrouk parameters. From these, it can be deduced that, the shallow subsurface section could be generally differentiated into three main layers of varying and distinguishable electrical resistivity ranges. Then, the expected distribution of the water salinity could be delineated using the determined resistivity values and the available salinity information from some given wells. Also, checking the alignment of the paleocourse of the Nile River.

The hydrogeological investigations involved an overview about the irrigation system used in the old cultivated lands and the newly reclaimed lands. The general hydrogeological setup of the considered area is discriminated into five hydrogeological units ranged from the highly productive to the non-productive. Then, the aquifers are differentiated age-wise into three major aquifers; the Pleistocene, the Plio-Pleistocene and the Middle Eocene Carbonate. This is further followed by discussing the water, logging problems originated in the study area due to the effect of irrigation losses. Finally, the area has been classified into four main units of varying water potentiality; from high to medium to low to none potential units.

The hydrogeochemical analysis involved the study of the hydrogeochemical assumptions of the groundwater contained in the different water-bearing units. The hydrochemical studies have been conducted on the surface water, Pleistocene aquifer's water, Plio-Pleistocene aquifer's water and the Middle Eocene aquifer's water using the pH, TDS, E.C., ion dominance, water type, total hardness and the hydraulic parameteres. Accordingly, it is concluded that, generally the water salinity decreases towards the Nile River and increases towards the desert areas. Then, the probable groundwater genesis has been concluded using the classifications of ***Sulin (1946), Durov (1948)*** and ***Ovitchinkov (1963).*** From such a study, it is deduced that, the Plio-Pleistocene water is ranging in origin between meteoric and marine and the Eocene water is entirely of marine origin. This is followed finally by evaluating the available groundwater of such aquifers for drinking & domestic, poultry and irrigation purposes.

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