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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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بعض الوثائق الأصلية تالفة

GEOELECTRICAL STUDY TO DELINEATE THE EFFECT OF GROUNDWATER INCREMENT IN ABU-SIR ARCHAEOLOGICAL AREA, GIZA, EGYPT.

A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUREMENTS FOR THE MASTER DEGREE OF SCIENCE

(GEOPHYSICS)

By

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in Geophysics

TO

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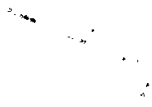
2000



NOTE

Beside the research work presented in this thesis, the candidate attended 10 courses over one year period in the following topics.

(1) Geophysical field measurements,

(2) Numerical analysis and computer programming,

(3) Potential theory,

(4) Electric methods,

(5) Magnetic method,

(6) Gravity method,

(7) Shape of the earth,

(8) Plate tectonics,

(9) Electromagnetic and telluric current method,

(10) Radiometric method.

He successfully passed the final examination of these courses in 1997. In addition, the student has successfully passed the English language examination.

Approved

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ABSTRACT

Mamdouh, Mohamed Mohamed Soliman. Geoelectrical study to delineate the effect of groundwater increment in Abu-Sir archaeological area, Giza, Egypt. M. Sc. Degree, Ain Shams University, Faculty of Science, Geophysics Department, 2000.

Abu-Sir area lies between Latitudes 29° 50` and 29° 55` N and Longitudes 31° 10` and 31° 15` E. This area has a great archaeological importance whereas, it includes the Sun Temple, three famous archaeological pyramids, and many other tombs.

The present study is concerned with mapping the groundwater aquifers, delineating the litho-facies distribution and the structural controls, and for studying the characteristics of the groundwater in Abu-Sir archaeological area. Moreover, archaeological prospecting using the newly developed Resistance Scanning technique has been applied at three archaeological sites south Abu-Sir Pyramids to delineate any resistivity contrasts showing any hidden archaeological bodies.

In the geoelectric resistivity work, 45 VESes using schlumberger configuration were carried out. In a primary step to interpret the present data qualitatively, the apparent resistivity data are used to construct iso-apparent resistivity maps and sections. From the qualitative interpretation, it is concluded that, the resistivity values increase with increasing AB/2 reflecting the presence of two bearing water zones (shallow and deep aquifers). The thicknesses of these aquifers increase to the east of the area under investigation and decrease gradually to the west of the area.

The apparent resistivity data is processed and interpreted quantitatively using Zohdy (1989) and Resist (Velpen, 1988) programs. The interpreted resistivity data are used in constructing twelve geoelectrical cross-sections, two iso-pach maps for the two upper layers (zone A and B) and water level map for the deep aquifer surface (zone C). According to these cross-sections and maps, the area under investigation is divided into four geoelectrical zones. The upper zone has a thickness varying from 4 to 19m and consists mainly of sandy gravel, while the second zone varies in thickness from 15 to 40m and varies in lithology from clay to sandy clay, and is underlain by a sandy zone intercalated with clay lenses having a thickness of about 50m. The fourth zone is a very high resistive zone, which is referred to limestone and marly limestone equiclude.

It is also appeared from the groundwater map constructed based on the resistivity data and in the light of the previous hydrographs for the groundwater wells in and near the area under study that, there is slightly decrease in the groundwater level after the construction of the High Dam.

In the resistance scanning work, three archaeological sites south Abu-Sir Pyramids in the studied area were surveyed using the Geoscan RM15 resistance meter applying the twin electrode configuration. Each site is divided into a certain number of grids, each grid is 20x20m. The obtained data from the three sites are processed and interpreted using geoplot program. The processed data are represented in the form of images and maps. The inspection of these maps shows circular high resistance anomalies, which likely seem to be mud brick tombs.

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