





ثبكة المعلومات الجامعية





جامعة عين شمس

التوثيق الالكتروني والميكروفيلم



نقسم بللله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأفلام قد اعدت دون آية تغيرات



يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15-20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of 15-25c and relative humidity 20-40 %



ثبكة المعلومات الجامعية







HYDROGEOLOGICAL AND ISOTOPE ASSESSMENT OF GROUNDWATER IN WADI EL-NATRUN AND SADAT CITY, EGYPT

A THESIS

Submitted In Partial Fulfillment For The Requirements Of The Degree Of Master Of Science In **GEOLOGY** "HYDROGEOLOGY"

By SALAH ABDEL WAHAB EL-SAYED AHMED

(B.Sc., in Geology, 1983, Ain Shams University)

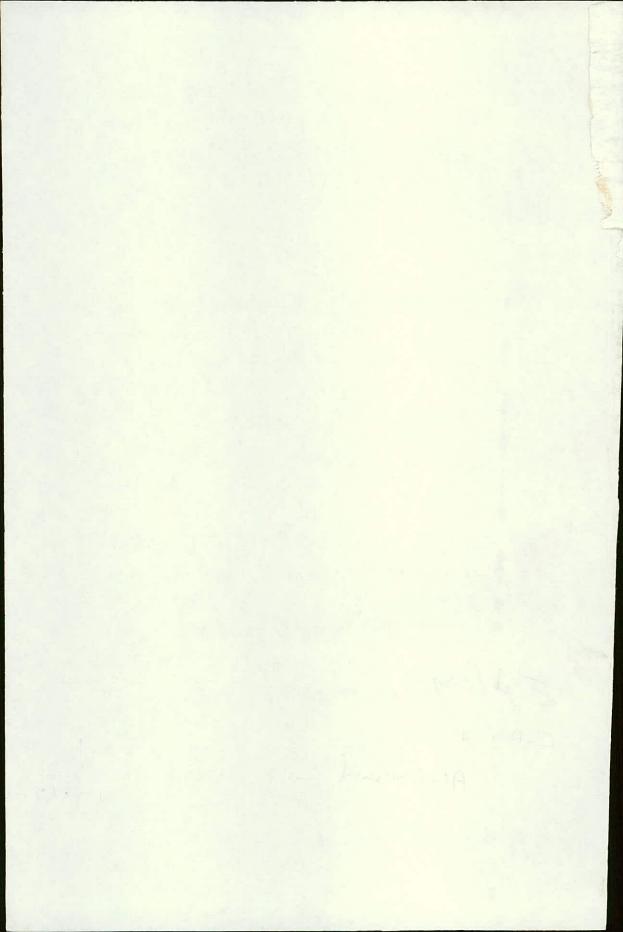
To

The Department of Geology
Faculty of Science
Ain Shams University

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1999

1999





Ain Shams University Faculty Of Science

Approval Sheet

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TITLE: HYDROGEOLOGICAL AND ISOTOPE

ASSESSMENT OF GROUNDWATER IN WADI

EL-NATRUN AND SADAT CITY, EGYPT

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Supervised By:

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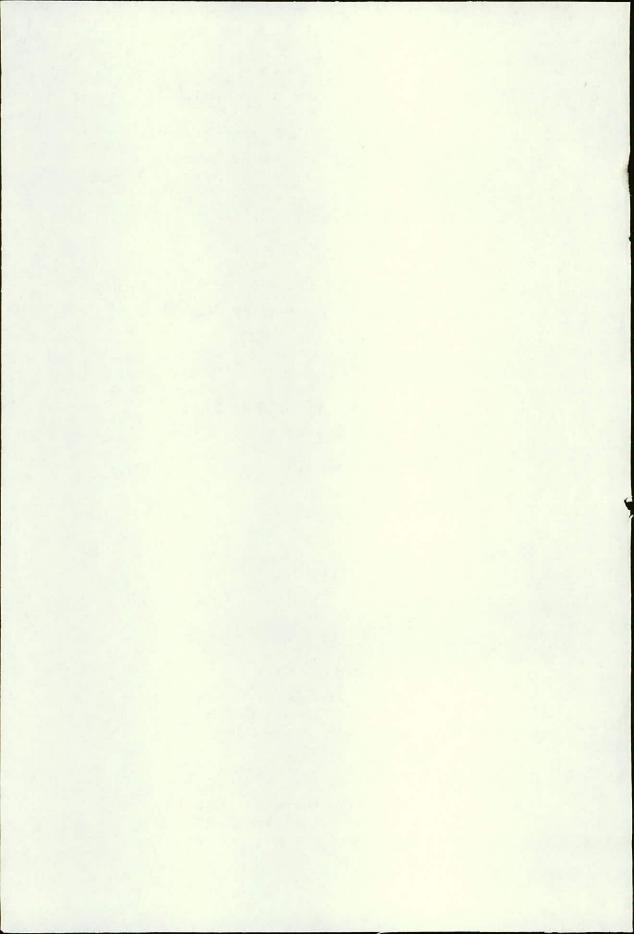
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Note

The present thesis is submitted to the Faculty of Science, Ain Shams University in partial fulfillment for the requirements of the degree of Master of Sciences in Geology (Hydrogeology).

Beside the research work materialized in this thesis, the candidate Salah Abdel Wahab El-Sayed Ahmed has attended ten post-graduate courses for one year in the following topics:-

- 1] Field Geology and Statistical Geology.
- 2] Physical properties of rocks and Formation evaluation.
- 3] Hydrogeology and Hydrodynamics.
- 4] Sedimentary Petrology and Sedimentation.
- 5] Lithostratigraphy and Structural Geology.

He has successfully passed the final exam in the above mentioned courses, besides an English language courses.

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ABSTRACT

HYDROGEOLOGICAL AND ISOTOPE ASSESSMENT OF GROUNDWATER IN WADI EL-NATRUN AND SADAT CITY, EGYPT

By Salah Abdel Wahab El- Sayed Ahmed

The present study aims to assess the groundwater resources on isotopic and chemical grounds in Wadi El-Natrun and Sadat City areas. The area of study is located in the northern corner of Western Desert between longitudes $30\,^{\circ}00'$ and $30\,^{\circ}35'$ E and latitudes $30\,^{\circ}15'$ and $30\,^{\circ}30'$ N. Three geomophologic units are distinguished in the studied area; old alluviall plain, Wadi El-Natrun structural depression and El-Hadid tableland.

Attentions are paid to the Pleistocene and the Pliocene aquifers where the majority of productive wells are tapping the two aquifers. The Pleistocene water- bearing formation is mainly formed of sand and gravel intercalated with clay lenses (deltaic deposits), while the Pliocene water-bearing formations are formed of alternating sand and clay layers with common occurrences of gypsum and limestone (brackish water and marine facies). The groundwater in the two aquifers is found under different hydrogeologic conditions; water table condition (the Pleistocene aquifer) and confined to semiconfined conditions (the Pliocene

aquifer). It is found that piezometric surface of the Pliocene aguifer is much lower than that of the Pleistocene one. The major component of flow in both aquifers was found from east to west direction. The structural framework has greatly affected the groundwater regime in the studied area and is reflected on the mixing of water of different origin. Mixing of water of different origin was confirmed using hydraulic, chemical and isotopic criteria. The groundwater quality of the investigated aquifers are found to suite most of the and irrigation purposes with some required domestic constrains. Calcite, dolomite, gypsum and halite are the main sources of mineralization in the groundwater of Wadi El-Natrun and Sadat City. Modeling of mean residence time and mixing ratio were achieved through applying the computer code of MULTIS and using the environmental isotope data.