



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



شبكة المعلومات الجامعية
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شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكرو فيلم

قسم

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



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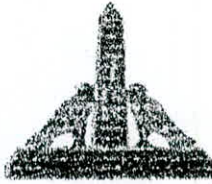
تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of
15-25- c and relative humidity 20-40%

بعض الوثائق الأصلية تالفة

بالرسالة صفحات لم ترد بالاصل



**AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
IRRIGATION AND HYDRAULICS DEPARTMENT**

**OPTIMAL MANAGAEMENT OF
UNDERGROUND WATER IN WEST DELTA
ZONE**

THESIS

Submitted For Partial Fulfillment of
Ph.D. Degree in Civil Engineering

By

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Appendix A

STATEMENT

This dissertation is submitted to Ain Shams University for the degree of Doctor of Philosophy in Civil Engineering.

The work included in this thesis was carried out by the author, at Ain Shams University, Faculty of Engineering, Irrigation and Hydraulics Department from May 1997 to November 2000.

No part of this thesis has been submitted for a degree or a qualification at any other university or institution.

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ABSTRACT

Waseem Mostafa Kaml Darweesh, Optimal Management of Underground Water in Western Delta, Doctor of Philosophy dissertation, Ain Shams University.

This work focuses on developing a uni-modal multi-objective groundwater management model. The utilized approach is combining optimization-simulation models. The chosen simulation model is MOC32big, which is a two-dimensional finite-difference solute transport model and the optimization model is GENOCOP III, which is a floating-point genetic algorithm model. In addition, the multi-criterion decision making is used for determining the major hydrogeochemical, mechanical and economical parameters. The developed management model helps the decision-makers to optimally operate and design a regional groundwater field. It can be run on a personal computer in a reasonable execution time, despite of the large number of variables involved. In addition it solves accurately nonlinear objective functions and nonlinear constraints, and overcomes the contradiction of the objectives that may be faced for exploiting the groundwater aquifer safely and economically.

Key Words: groundwater management model, genetic algorithm, multi-criterion decision making, well field design.

