بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــســـم ﴾

نقسم بالله 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 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

ENVIRONMENTAL STUDY ON QARUN LAKE AS A CLOSED FINAL DISPOSAL BASIN

BY

Samia Mahmoud Sami

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE

In

ENVIRONMENTAL ENGINEERING

Under the Supervision of

Prof. Dr. Ezzat Abdel-Shafi
Professor and Head of
Sanitary & Environmental Engineering Division

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Examining Committee:

Prof. Dr. Ezzat Abdel-Shafi, Thesis Main Advisor

Prof. Dr. Zaher Baher Abd-Alla, Member

Prof. Dr. Mohammed Sadek Al-Adawy, Member

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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ABSTRACT

Lake Qarun can be considered as a natural reservoir in the Fayoum depression. It is the lowest part in the Fayoum depression and its main function is using it as a drainage basin for the Fayoum irrigated area (383,000 feddan). Lake Qarun provides Fayoum's families with 800 ton \ year of fish. Tourism activities can be considered an important income to Fayoum Government. Moreover, because of its international importance as feeding and rest place for migratory birds lake Qarun has been declared a Natural Protectorate in 1989.

Lake Qarun is the only completely closed lake in Egypt. The drainage water enters the lake through two main drains (El-Wadi and El-Batts drains) holding the Fayoum agricultural and domestic pollution. The lake has no outlet and losses water only by evaporation. The lake was historically a fresh water lake. By time its regime was changed to a drainage reservoir and became a salty lake with high salinity of 35,000 p.p.m . Also the salinity of the lake increases 60 times the limits of water characteristics stated in law 48 declared in 1982.

In this thesis, Lake Qarun was considered as a case study. This study compensates the different environmental pollution aspects of the lake. The study involved data collection and analysis of the lake water salinity since 1900 till now (the last century). Also it contains full detailed data collection of salinity, area, volume of the lake and the discharge from the main and minor drains to the lake .From this data, a full analysis of the environmental situation of the lake was presented showing the efforts from the Ministry Water Resources and Irrigation to keep a suitable water level in the lake for achieving an acceptable salt concentration. Moreover, An experimental study was done. Sample were collected from the lake and the two main drains through the seasons of the year. The analysis incorporated 27 set of tests on 20 parameters covering the chemical , biological, and heavy metal analysis.

The main results of this thesis are:

1-In general, there is a serious pollution in the lake. This is related to the accumulation of pollution in the lake which acts as a closed final disposal basin. Now, the lake has a high water salinity of 35,000 p.p.m. In future, it can be reached to 50,000 p.p.m in the next 40 years.

2-There is a seasonal fluctuation in salinity due to the variation in temperature . In summer the T.D.S. increases by 3000 p.p.m.

3-There is a biological pollution in the lake and it affects the fish life and tourism activities.

4-The concentration of the dissolved oxygen is less than the recommended levels for fish life. This is due to organic wastes, biological pollution, and high salinity.

5-There is a marked pollution by heavy metals as copper.

6-The deterioration of the lake began slightly improving through the last three years due to controlling the water levels of the lake by MWRI and extraction of salts by EMISAL.

In addition, more conclusions and useful recommendations for protecting the environment of the lake as a Natural Protectorate is presented in Chapter 7.

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ABBREVIATIONS

BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
EMISAL	Egyptian Company for Salts and Mineral
FWSP	The Fayoum Water and Salt Balance
P.P.M	Part Per Million
S.L	Sea Level
T.D.S	Total Dissolved Solids
M.C.M.	Million Cubic Meter
MWRI	Ministry of Water Resources and Irrigation