AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
IRRIGATION AND HYDRAULICS DEPARTMENT

POLLUTION IN GROUNDWATER

By
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B.Sc. CIVIL ENGINEERING,
AIN SHAMS UNIVERSITY, 1991.

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A THESIS

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بسم الله الرحمن الرحيم

بسم الله الرحمن الرحيم

" سبحانك لا علم لنا الا ما علمتنا انك انت العليم الحكيم "

صدق الله العظيم

سورة البقرة آية ٣٢

AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
IRRIGATION AND HYDRAULICS DEPARTMENT

APPROVAL SHEET

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STATEMENT

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

The work included in this thesis was carried out by the author in the department of Irrigation and Hydraulics, Ain Shams University, From November 1992 to June 1994.

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

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CIVIL ENGINEERING
IRRIGATION AND HYDRAULICS

SUMMARY OF THESIS SUBMITTED BY ENG: EHAB MOSTAFA FATOUH

FOR MASTERS DEGREE IN CIVIL ENGINEERING

POLLUTION IN GROUNDWATER

UNDER SUPERVISION OF

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Groundwater constitutes an important component of many water resources; supplying for domestic use, industry, and agriculture, etc. So, we have to protect it from the pollution which has many sources.

In addition to the velocity of groundwater, the dispersion coefficient is the responsible factor that affects the spread of a pollutant in an aquifer. So, the aim of this research is to measure the dispersion coefficient experimentally and compare its value analytically and numerically.

A horizontal viscous flow model "Hele-Shaw" was designed and utilized successfully to carry out many experiments, and

the experimental results were compared with the analytical and numerical solutions.

It was concluded that the horizontal "Hele-Shaw" model is capable to simulate successfully the groundwater pollution problems. The comparisons showed that the analytical value of the dispersivity is 30% higher than the experimental value, whereas the numerical one is hundred times as much as that obtained experimentally.

Furthermore, the effect of the ratio between the longitudinal dispersivity and the transversal dispersivity on the contaminant spreading was investigated.

It was recommended to use another technique for measuring the concentration in the laboratory, and to improve the used "Hele-Shaw" model in order to simulate more different groundwater flow and pollution problems.

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