شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

Ain Shams University
Faculty of Engineering
Irrigation and Hydraulics Department

ASSESSMENT OF THE CURRENT DRAINAGE WATER QUALITY MONITORING NETWORK IN HADUS DRAIN (EASTERN DELTA)

By

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A Thesis Submitted for the Fulfillment of the Requirements for The Degree of Master of Science in Civil Engineering

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2001

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STATEMENT

This thesis is submitted to Ain Shams University, Faculty of Engineering 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, Faculty of Engineering, Ain Shams University from 1998 to 2001.

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

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ACKNOWLEDGMENTS

I would like to express my sincere gratitude and appreciation to my supervisor Prof. Dr. Abdel El-Mohsen El-Mongy, Professor of Costal Engineering, Irrigation & Hydraulic Department, Faculty of Engineering, Ain Shams University, for his continuous encouragement, support, advice and skillful guidance to make the completion of this study possible.

Grateful thanks and appreciation are due to my supervisor Dr. Mohamed Abu El-Einin El-Sammoudy, Dr. of Irrigation and Hydraulics Engineering, Irrigation & Hydraulic Department, Faculty of Engineering, Ain Shams University, for his continuous assistance, comments and valuable guidance throughout the work of this study.

Particular mention must be made to Dr. Ashraf El-Sayed Ismail, Head of the Open Drainage Department, Drainage Research Institute, National Water Research Center, And Ministry of Water Resources and Irrigation, Whose sincere efforts extended more than supervising this study, his endless support and encouragement have continued since the author started his professional career.

I would like to express my gratitude to Prof. Dr. Shaden Tawfik Abdel Gawad Director of Drainage Research Institute, National Water Research Center, Ministry of Water Resources and Irrigation, for her endless assistance and motivation.

Also, I would like to extend my appreciation to the staff of the Drainage Research Institute for their encouragement and support.

ABSTRACT

Title: ASSESSMENT OF THE CURRENT DRAINAGE WATER QUALITY MONITORING NETWORK IN HADUS DRAIN (EASTERN DELTA)

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In view of the scarcity of water resources limited to a portion amounting to 55.5-milliard m^3 annually from Nile water, the ministry of Water Resources and Irrigation in Egypt prepared a strategy for re-use of agricultural drained water, which is spilled in the sea, about 7.5 milliard m^3 annually. The ministry started important steps to implement this strategy, by expanding in new agricultural lands, using Nile water mixed with drained agricultural water. El-Salam canal project comes beforehand of projects relying on this strategy, by using around 2.3-milliard m^3 annually from agricultural drained water. The total area planned for irrigation on El-Salam canal is around 620 thousand feddans. To benefit from the re-use of some water from Lower Serw drain, Farsqur drain and Bahr Hadus drain, by mean of mixing it with fresh water from the Nile (Damietta Branch) with variable mixing proportion through the year, up to 1:1. It is important to monitor the quality of water at regular basis along the years of cultivation and modify the mixing proportion according to the variation in properties of water and soil. In 1995, the Drainage Research Institute (DRI) implemented drainage water-quality monitoring network. The primary goal of the network is to provide relevant and consistent drainage water-quality information to assist policy makers who must address water-resource management issues at the national, and local levels. The network plans to assess the drainage water quality in Nile Delta and Fayoum regions. The overall objective of this research is to assess and redesign the water quality-monitoring network for Bahr Hadus drain in Eastern Delta as one of the main feeders of El-Salam Canal. This is to provide reliable drainage water quantity and quality information about the drainage water which could be reused for El-Salam Canal Project. It is concluded that The locations of some existing sampling sites do not correspond to the proposed sites, primarily because the former have been established as project-oriented observation sites, therefore they do not present an overall picture of the water quality conditions in the Bahr Hadus basin. Also, it was clear that the network covers most of the important water quality parameters. Sampling frequencies were also calculated for some of the water quality parameters monitored in the network. It was clear that the water quality parameters in Hadus drainage system should be monitored with different frequencies according to the data variability for each parameter.

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