

**OPTIMUM ENVIRONMENTAL SOLUTION FOR
INDUSTRIAL WASTEWATER MANAGEMENT
IN EGYPTIAN INDUSTRIAL ZONES**

Submitted By

Maysara Fouad Abd-Allah Ahmed

B.Sc. of Chemical Engineering, Higher Technological Institute,
10th of Ramadan City, 2004

A Thesis Submitted in Partial Fulfillment

of

The Requirement for the Master Degree

in

Environmental Sciences

Department of Environmental Engineering Sciences

Institute of Environmental Studies and Research

Ain Shams University

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2019

APPROVAL SHEET
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Department of Environmental Engineering Sciences
This Thesis Towards a Master Degree in Environmental
Sciences

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2019

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَعَلَّمَ آدَمَ الْأَسْمَاءَ كُلَّهَا ثُمَّ عَرَضَهُمْ عَلَى الْمَلَائِكَةِ فَقَالَ
أَنْبِئُونِي بِأَسْمَاءِ هَؤُلَاءِ إِنْ كُنْتُمْ صَادِقِينَ (٣١)

سورة البقرة

وَجَعَلْنَا مِنَ الْمَاءِ كُلَّ شَيْءٍ حَيٍّ (٣٠)

سورة الأنبياء

صدق الله العظيم

DEDICATION

*This thesis work is dedicated to my
beloved big family,
who have been a source of support and
encouragement during the challenges of
graduate school and life. I am truly thankful
for having them in my life.*

*This work is special dedicated to
my Mother, my Father,
my Sister,
my Wife &
my Son ADAM (My Sweet Heart)
who have always loved me.*

*Finally, this piece of work is dedicated to the
spirit of
Grandmother (Mama Hafsa),
who never stopped sharing her wisdom,
tutelage, support and encouragement to me.*

Mayasara Fouad Abd ALLA Ahmed

ACKNOWLEDGEMENTS

I express my sincere appreciation to those who have contributed to this thesis and supported me in one way or the other during 6 years for without any of them, this research work would not have been possible.

*First and foremost, I wish to place on records my heartfelt and sincere thanks to my supervisor **Prof. Dr. Mohamed El-Hosseiny El-Nadi**, Prof. of Sanitary & Environmental Engineering, Faculty of Engineering, Ain Shams University, for providing me an opportunity to complete my Master thesis. I appreciate his contributions of time and ideas to make my work productive and stimulating. His valuable suggestions, comments and guidance encourage me to learn more day by day. His deep insights helped me at various stages of my research. I am also indebted towards him for his generosity, selfless support and especially for the excellent example and patience that he has provided to me. Big thanks once again go to him for without him this work would have never seen the light as it is today.*

*I am extremely grateful to my joint supervisor, **Dr. Nahla Mohamed Badawy**, Assistant Prof. of Chemistry, Faculty of Engineering, Ain Shams University, for her comments and guidance.*

*I am also indebted to my colleague **Eng. Nagwa Monsef**, not only for all her help and useful suggestions but also for being there to listen when I needed an ear. I owe her a big thanks.*

Mayasara Fouad Abd ALLA Ahmed

ABSTRACT

The industrial wastewater management in Egypt is one of the main goals for sustainable development. The water crisis in Egypt has led the industrial sector to search for resource efficiency and cleaner production technologies through a proper management of water, energy, and raw materials. As a result, the aim of this study is to choose the optimum environmental solution for industrial wastewater management in Egyptian industrial zones. Quesna industrial zone in Monofeya governorate was chosen as a case study where different scenarios for industrial wastewater management are proposed in this study to choose the optimum environmental solution. Industrial wastewater samples were taken from ten factories representing the ten main industrial sectors in the study area and sixteen parameters were measured in each sample. Results achieved from different applied scenarios showed variation in flow rates, industrial wastewater loads, treatment methods, removal efficiencies, capital and operation costs of the applied scenarios. Finally, these scenarios were compared technically and financially to determine the optimum environmental solution for industrial wastewater management. This study could be applied for all industrial zones using the same methodologies as a first one to discuss the industrial wastewater management in Egypt.

Key words:

Industrial Wastewater Management, Quesna Industrial Zone, Industrial Sectors in Egypt, Industrial Wastewater Treatment, Optimum Environmental Solution, Removal Efficiency, Industrial Wastewater Load.

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