شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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يجب أن

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HANAA ALY

A STUDY ON THE EARLY SEASONAL CLOGGING OF WATER FILTERS AT EL-FOSTAT WATER PURIFICATION PLANT

Submitted By

Bardes Samir Muhammed Salem

B.Sc. of Science (Geology), Faculty of Science, Helwan University, 2002

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Master Degree
In
Environmental Sciences

Department of Environmental Basic Sciences
Institute of Environmental Studies and Research
Ain Shams University

2021

APPROVAL SHEET

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Abstract

The present study was carried out at EL-Fostat water plant at Dar El-Salaam in Cairo Governorate, where these was an early seasonal clogging of the filters especially during autumn. Water samples were collected seasonally, during 2017 - 2018 from seven stages. Seasonal variations of the physico-chemical parameters (Temp, pH, EC, DO, TDS, total alkalinity, nutrients [NO_2, NH_3 and PO_4], Ntu, SiO_2, chloride and F). Biological parameters and sand analysis were done for these water samples.

The results showed correlation between some physico-chemical parameters and phytoplankton standing crop during the different seasons. The phytoplankton community was represented by 44 species belonging to 26 genera and 3 algal groups: Chlorophyceae (25 species) Cyanophyceae (11 species) and Bacillariophyceae (8 species) arranged according to their number of species. But the Bacillariophyceae was a dominant group according to its quantity.

The results of the sand analysis showed an effective size of 0.916 mm, 0.983 mm and 0.95 mm. In order to solve the problem of the early clogging, two filters (activated carbon and sterilized rice straw) were used beside the ordinary sand filters. The results showed also the greatest effect of these two filters in solving this problem.

These filters helped in the extension of the of filtration period from 8 hours to 24 hours, which reduce the washing time of the sand filter once, instead of washing three times, leading to the provision of large quantities of water and reduce the doses of the used chemicals at El- Fostat water plant .

Keywords:, Activated carbon, Clarifier**,** Filters**,** In take, Back washing, Sterilized rice straw**.**

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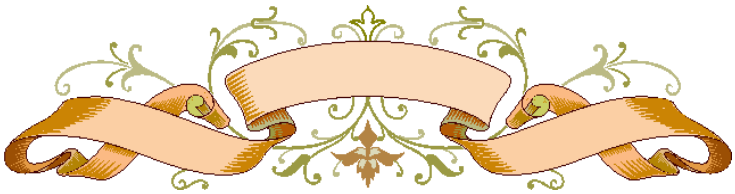
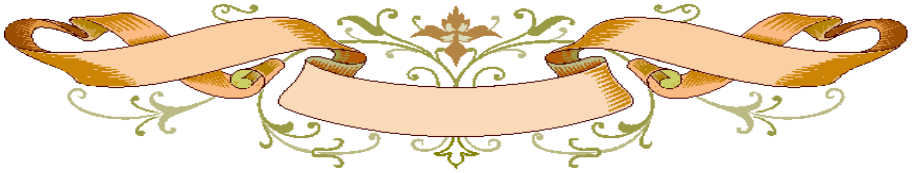


INTRODUCTION



1. Introduction

Study area

This study was carried out in the EL-Fostat water purification plant, an area of approximately 66 acres and has been run for the first time in 1988. The total actual production was 1000000 m^3 / day before the expansion, after the last expansion it is 1200000 m^3 / day. El-Fostat water plant provides drinking water, which serves several parts in Cairo Governorate (Figure 1).

Description of El-Fostat water plant Site

El-Fostat water plant consist of 7 stages, the first stage is the intake (raw water) where the water samples were collected (before the treatment) and it is located at Corniche El-Nile Road of Maadi (Figure 3). Second stage is the disinfection of the raw water by chlorine which disinfects micro-organisms and oxidization of water entry (pre chlorination Figure 4). Third stage is coagulation in which aluminum sulphate was added to coagulate the flocs inside clarifiers (Figure 5). Fourth stage is the filtration which goes through 3 stages (stages 4, 5and 6) which is essential to filtrate the flocs escaped from clarifiers (Figure 6). Then finally stage is reservoir.