BUSITEMA UNIVERSITY
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF MINING AND WATER RESOURCES ENGINEERING

FINAL YEAR PROJECT REPORT

DESIGN OF A SLUDGE MANAGEMENT SYSTEM FOR BUGOLOBI SEWAGE TREATMENT PLANT.

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BU/UG/2011/202

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MAY, 2015

DECLARATION

I hereby declare that all information and illustrations that have been put down are a reflection of my efforts placed in the project according to the best of my study, training and research and not from any external transfer, copy or illegal methods.

Name: **Mukasa Stanley Wilson**
Sign_____ 5/06/2015

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APPROVAL.

This report has been submitted for examination after approval by my keen supervision as having the needful content as regards the project title in question.

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DEDICATION

I dedicate this report to my siblings; **Allan Kizza, Catherine Nakamya Ssebuwufu, Brian kityo, Grace Kyaterekera, Moses Ssozi Hussein and Maria Zahiya**. I love you from the bottom of my heart.

ACKNOWLEDGMENTS.

I thank the Almighty God for blessing me with life, health and the opportunity to study. I also wish to extend my sincere thanks to my family and Pr. Andrew Wesonga for mentoring me during this educational journey.

National Water and Sewerage Corporation, quality control department for allowing me to use their facilities for analyzing my sludge samples.

Last but not least I wish to extend my gratitude to the staff and members of Busitema University faculty of Engineering especially the Department of MEB and WAR for nurturing me to this level of education, it was not easy but it was worth it. I am forever indebted to you.

May the Almighty God bless the works of your hands.

LIST OF ABBREVIATIONS

BSTW – Bugolobi Sewerage Treatment Works
STW – Sewage Treatment Works
DWF – Dry Weather Flow.
BOD – Biological Oxygen Demand
TSS – Total Suspended Solids
DS – Dry Solids
VS – Volatile Solids
VOC – Volatile Organic Compounds
COD – Chemical Oxygen Demand
pH - Potential Hydrogen ions
i.e- that's to say
HRT – Hydraulic Retention Time

SRT – Solids Retention Time

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ABSTRACT

Sludge is water that contains suspended solids from the source water and the reaction products of chemicals added in the treatment process. The treatment and disposal of sewage sludge is an expensive and environmentally sensitive problem. It is also a growing problem world-wide since sludge production will continue to increase as new sewage treatment works are built and environmental quality standards become more stringent. With some traditional disposal routes coming under pressure, and others such as sea disposal having been phased out, the challenge facing sludge managers is to find cost-effective and innovative solutions whilst responding to environmental, regulatory and public pressures. Recycling and use of wastes are the preferred options for sustainable development, rather than incineration or landfilling, but with sewage sludge this is not straight forward because of perceptions over contaminants, pathogens and its feacal origin, particularly by the food retailers. If future quality standards for sludge and the receiving environment are made too stringent, the agricultural outlet may become untenable for the water utilities resulting in sludge being disposed of by other means that offer the utilities greater operational and financial security, but which may be less acceptable in the long-term

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CHAPTER ONE

1.0 Background

Bugolobi Sewerage Treatment Works (BSTW) was constructed prior to 1940 and subsequently extended during the periods of 1956/1958 and 1968/1978. It is located on plot10/13 spring road/old port-bell road. It covers an area of approximately 27 hectares. Domestic sewage is predominantly treated using a conventional system designed to handle a hydraulic flow capacity of 33,000 m^3/day with a dry weather flow (DWF) of 16,000 m^3/ day. However on average, the STW receives 15,000 m^3/day of very strong raw sewage with BOD range of 230 – 550 mg/l and TSS of 200 – 800 mg/l.

1.1 Statement of the problem

In Kampala, due to a problem of rapid population growth associated with urbanization and industrialization. Sewage treatment plants are faced with the problem of receiving very strong raw sewage which has to be treated to meet acceptable effluent standards. This produces vast amounts of sludge which poses a very strong public health hazard to the community around if not treated to acceptable standards. All the while sludge disposal options are continually being dwarfed by the increasingly stringent environmental regulations leading to acute shortages of disposal options for sewage treatment plants case in point Bugolobi sewage treatment plant. Thus the need for an appropriate management system to address the growing concerns.

1.2 Justification

Sludge management is an important part of any municipal waste water treatment plant because it finds means of reducing the likely hazards of sludge if not treated properly prior to discharge to the environment. The purpose of this research is to design appropriate systems that will be able to handle increasing amounts of sludge handled at Bugolobi STP while disposing it of in ways that conserve the environment and do not threaten human health especially to downstream users

1.3 Scope

References

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