CYPRUS UNIVERSITY OF TECHNOLOGY

FACULTY OF ENGINEERING AND TECHNOLOGY

Master Thesis

WASTEWATER REUSE IN AGRICULTURE

ANTONIS KONSTANTINIDES

Limassol 2013

CYPRUS UNIVERSITY OF TECHNOLOGY

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING AND GEOMATICS

WASTEWATER REUSE IN AGRICULTURE

By

ANTONIS KONSTANTINIDES

Limassol 2013

REQUEST APPROVAL

Master Thesis

Wastewater reuse in agriculture

Presented by

Antonis Konstantinides

Supervisor of the thesis

_____

[Status and name]

Commissioner

_____

[Status and name]

Commissioner

_____

[Status and name]

Cyprus University of Technology

September, 2013

Copyright

The approval of this thesis by the Department of Civil Engineering and Geomatics of Cyprus University of Technology does not necessarily imply acceptance of the views of the author on behalf of the Department.

I would like to express my special thanks to Dr. Nicholas Kathijotes for his excellent cooperation throughout the academic year 2012-2013, and during the preparation of this thesis, the accomplishment of which occurred with his perpetual guidance. Also, a great thanks to the Chairman of the Department of Civil Engineering and Geomatics Dr. Diofantos Hadjimitsis and to Assistant Clerk, Mrs Katerina Kousoulou, who willingly provided assistance in completing this thesis.

ABSTRACT

Wastewater utilization is an upward application universally. At the same time as clean water resources turn out to be inadequate, wastewater reuse has developed into an alternative choice for preserving as well as increasing presented water sources. Wastewater utilization for irrigation in agriculture is undoubtedly the most established appliance from the other wastewater uses, as well as the one with the longest history. Drivers for this appliance development consist of rising urbanisation along with water stress, development of water delivery along with sewerage systems, rising municipal wastewater flows, water scarcity in addition to droughts and climate change. Urban wastewater is created via the daily necessities of people such as defecation, bathroom utilities, food preparation and moreover in public buildings such as hospitals and other public along with private locations. Wastewater qualitative characteristics are separated into physical, chemical and biological characteristics. When treated wastewater is utilized for agriculture irrigation, it encloses considerable threats to human health as a result of numerous associated diseases which can be propagated via wastewater utilization to those people working in fields, and additionally to the nearby areas as well as to crop consumers. Criteria have been established in order to examine water quality as well as determining the appropriateness of water delivery for irrigation utilization. Guidelines can act as protecting measures to cultivators health as well as to public health but in addition to soil and plant growth, as problems such as salinity, soil permeability, toxicity and other can develop serious soil and crop production troubles. Urban wastewater previous to irrigation have to go through treatment procedures in order to meet the eligibility criteria for irrigation water and avoid possible risks to environment as well as human health. Wastewater treatment procedures are separating unsafe material from the effluent water with the aim of lessening the organic load of suspended solids, pathogens and chemical constituents and subsequently wastewater to be able to be used without any risks to the environment.