Higher Technical Institute
CIVIL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

DESIGN OF A WATER TREATMENT PLANT

BY
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CIVIL ENGINEERING COURSE

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SUMMARY

The Water Development Department is committed to continuously improving standards in terms of both the quality and reliability of our water supply, while providing protection to the environment.

It is with this objective that existing Water Treatment Plants need to be refurbished and upgraded to further improve compliance with the EC Drinking Water Directive and the level of service.

The Limassol Water Treatment Plant project is one of three water treatment works that is commissioned in the present program within Southern Division illustrating the extent of the Water Development Department investment.

The following report has been prepared to define design suggestions for

(i) upgrading existing Limassol treatment Works to ensure a better drinking water quality;

(ii) increasing safety.

The introduction of an ozonation stage will satisfy (i) above. An on-site electrolytic chlorination (O.S.E.C.) plant will satisfy (ii) above.

The report as well as making design suggestions for the improvement of a specific Water Treatment Plant, outlines the design considerations objectives and criteria that need to be taken into account for a proper Water Treatment Plant design.

INTRODUCTION

1.1. WATER QUALITY STANDARDS

When considering any series of treatment processes it is often convenient to define the desired quality of the end product and to decide how much has to be done to the raw water in order to achieve the necessary step-by-step degree of purification.

The ultimate Objectives, Aims and Standards of Service must be set out having in mind the requirement that: 'Distribution system samples are to comply with the chemical and physical requirements of the WHO [1] standards and the EC Drinking Water Directive. The water supplied should not give rise to complaints of color, suspended matter, taste, smell or the presence of visible aquatic animals'.

To ensure that this level of service is achieved the design performance parameters of any new treatment plant should be set to allow for deterioration of quality within the distribution system.

The performance standards to be achieved, on a percentage compliance basis, for those parameters affected by treatment are recommended therefore as indicated on the Table1. It may be helpful to specify additionally for each of the parameters affected by treatment, a target mean value which should not be exceeded. Suggested levels for use in association with the design performance standards are also given. For comparison purposes the Table also sets out the corresponding EC Directive – Minimum Admissible Concentration (MAC) values relating to the quality of the water for human consumption, as monitored at the point where it is made available to the user. [2]

Compliance with the design performance standards should be assessed over a 12 month period, for key parameters on at least 250 discrete samples taken on an approximately daily basis, at various times of the day, and for non key parameters, on at least 10 samples at a rate of one per month. (Key parameters being those which the treatment process is designed to affect; non key parameters being all other water quality