Executive Summary

A Guide For The Design Of Chloramine Disinfection Facilities For Purified Sewage Effluent

The aims of the project were as follows:

- To assess the current disinfection practices followed at South African sewage treatment facilities
- To conduct a review of the relevant literature
- To evaluate the performance of chloramine as an alternative to chlorine as a disinfectant under conditions typical of South African sewage treatment facilities
- To evaluate the accuracy of kinetic disinfection models found in the literature by doing batch and continuous flow inactivation studies in the laboratory.
- To prepare a practical guide for the design of disinfection facilities for purified sewage effluent.

The project documentation is contained in three parts:

The first part consists of the guide aimed at the design engineer of a sewage treatment facility. The guide contains an overview of the relevant literature and covering the basic chemical and biological aspects of disinfection. A section on the kinetics of the inactivation of microorganisms gives an overview of the development of mathematical models of disinfection. The disinfectant contact chamber and the factors affecting the process is discussed followed by step-by-step design example.

The second part reports the findings of a national survey conducted in 1996/1997 to which 175 sewage treatment plants responded. The survey showed that only a third of the total effluent flow complied to accepted bacteriological standards and that 67% of the total flow surveyed was discharged to public streams. These facts indicate the need for better design and operation of disinfection at sewage treatment plants in South Africa. This information is presented in Appendix A.

Part three is presented in Pretorius & Pretorius, (1999) and reports the results of research conducted at the University of Pretoria. The aim of the research was to evaluate the efficiency of monochloramine as a disinfectant for purified sewage effluent under South African conditions. The research also identified the most suitable mathematical model for predicting the behavior of continuous flow disinfection using monochloramine. The use of tracer studies to predict the efficiency of a contact chamber is shown.

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