Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

"Gheorghe Asachi" Technical University of Iasi, Romania

EVALUATION OF PATHOGEN CONTROL PROCESSES/METHODS FOR WASTEWATER EFFLUENTS DISCHARGED INTO THE ENVIRONMENT

Abdul Samad Ganiyu[1], Adil Ashraf[2]*, Racchana Ramamurthy[2]

[1]School of Civil Engineering, University of Leeds, LS2 9JT Leeds, United Kingdom
[2]Department of Environmental Engineering and Water Technology, IHE Delft Institute for Water Education, PO Box 3015, 2601 DA Delft, The Netherlands

Abstract

Surface water protection and sustainability is a vital move to enhance public health and ensure food and water security. Pathogen containing wastewater when discharged into water bodies, affects the water quality and poses health risks to the intended users. Even though various disinfection methods of domestic wastewater exist for pathogen control, much work has not been done to compare and ascertain the most effective method(s). A systematic literature review has therefore been conducted on the various available disinfection methods that have been evaluated in laboratory or on pilot scales or employed in full-scale wastewater treatment plants. Approximately 21% of the disinfection studies were conducted at full-scale. The technologies identified included advanced oxidation, microwave-induced electrodeless UV irradiation, ozonation and filtration, tin oxide anode, UV irradiation and peracetic acid. Generally, the combined technologies proved to be more effective than when used on their own. UV irradiation processes or their combination was the most frequently applied wastewater disinfectant method. Many of the disinfection processes proved effective in inactivating some of the pathogens and indicator organisms such as *E. coli*, total coliforms, *C. perfringens*, *Enterococci* and enteric viruses. Nearly all the disinfection methods were able to reduce *E. coli* and total coliforms.

Keywords: disinfection, inactivation, pathogen, reduction, sewage, wastewater

Received: June, 2020; Revised final: July, 2020; Accepted: October, 2020

* Authors to whom all correspondence should be addressed: e-mail: ashraf_adil@outlook.com; Phone: +447741919998