Removal efficiencies of indicator micro-organisms in the Al-Khobar wastewater treatment plant

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Environmental Engineering Science 17 (4), pp. 227-232, 2000

Abstract: Increasing population and developmental needs of Saudi Arabia underline the need for an increase in the reuse of treated wastewater. However, treated wastewater contains a large number of pathogens that requires proper treatment before reuse. Little information is available on the treatment efficiency of waste-water treatment plants operating in this region. A 1-year study was conducted at the Al-Khobar waste-water treatment plant to investigate the removal efficiency of five indicator micro-organisms, namely, Standard Plate Count, total coliform, fecal coliform, coliphage, and Clostridium perfringens. The raw sewage, secondary effluent, and chlorinated effluent were analyzed weekly for the detection and enumeration of these indicator micro-organisms. High-percent removal of Standard Plate Count, total coliform, and fecal coliform (98 to 99%) was observed after secondary treatment compared to coliphage removal of 83.6% and Clostridium perfringens removal of 55.5%, whereas, after chlorination, standard Plate Count, total coliform, and fecal coliform were removed up to 99.7% compared to coliphage reduction of 52% and Clostridium perfringens removal of only 42%, Showing a high resistance against chlorination. The insight gained from this study may be applied to other similar treatment plants.