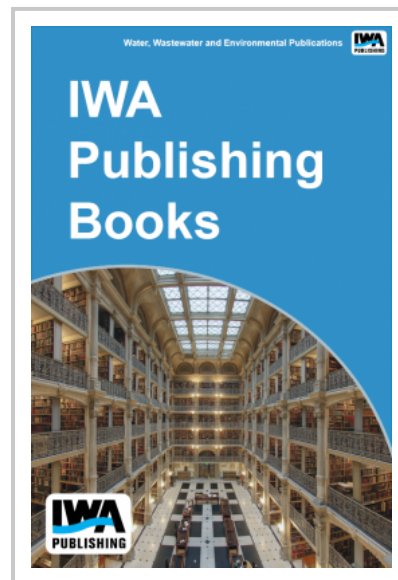


# Sustainable Technology for Achieving Very Low Nitrogen and Phosphorus Effluent Levels

This project addresses the successful nitrogen and phosphorus removal technologies being implemented at existing wastewater treatment plants (WWTPs), some key challenges and knowledge gaps in implementing technologies, research needs to improve the existing methods and technologies to achieve low total nitrogen (TN) and total phosphorus (TP) effluents (TN <5 mg/L and TP < 0.5 mg/L). Technology and cost assessment of successful technologies for TN and TP removal on a sustainable basis was accomplished by using a “threshold limit” approach to categorize technologies for different effluent TN and TP limits based on desired criteria.

Membrane-based process applications were selected among advanced treatment processes for N and P removal from wastewater at pilot and lab scale technology demonstration studies. The investigations included membrane bioreactor application for N and P removal from wastewater, centrate treatment, and to achieve simultaneous nitrification and denitrification. The results indicated membrane based applications are attractive methods for achieving low TN and TP effluents, but supplementary chemical addition is needed depending on the wastewater characteristics. Full scale implementation of step feed BNR with chemical P removal was demonstrated as a successful technology transfer application at John Egan Wastewater Reclamation Plant of Metropolitan Water Reclamation District of Greater Chicago (MWRDGC).



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