

THE PERFORMANCE OF A CONSTRUCTED WETLAND WITH MACROPHYTES FOR URBAN WASTEWATER TREATMENT IN A SEMIARID AREA OF SE SPAIN

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Resumen:

This study describes the results obtained in an experimental multi-stage system of created wetlands in Mojacar, in semiarid SE Spain, operating from June to October, 1997. We compare the removal efficiency of four different series of treatments each consisting of three stages, using different flow rates of sewage, flow regimes, types of substrate, macrophytes (*Phragmites australis*; *Typha dominguensis*) and influents. Pretreated water from an anaerobic stabilization pond and treated water from the last pond of a lagoon system were used, the latter to test the system's suitability as a complementary system for removing nitrogen and phosphorus. In spite of the initial high wastewater concentration, the effluent conforms to the strictest European norms (directive 91/271) for primary and secondary retention. A net treatment area of 2.3 m²/PE showed a high performance for SS (90-96%), COD (87%) and BOD₅ removal (90%) during the early stages of operation; however nutrient removal was lower than was expected as compared with other studies. The addition of iron to the substrate improved phosphorus retention significantly (from 55% to 66%). The decrease of the net treatment area to 1.2 m²/PE did not significantly affect the wetland performance with the exception of COD removal (78%). Series fed with treated water from the lagoon system (1.6 m²/PE) noticeably improved the quality of the effluent (average values of 7 mg/l total-N and 3 mg/l total-P).