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Wastewater characteristics and pre-treatment efficiency in small localities in north-west Spain

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ABSTRACT

Wastewater from small localities (<2.000 inhabitants) in Leon Province (north-west of Spain) and the quality of their sewers and wastewater treatment plants were surveyed and characterized during spring and summer. A total of 821 localities were visited and wastewater was characterized in 76 of them. Two different regions below (plain region) or above (mountain region) 1.000 m.a.s.l were considered, having mountain regions lower mean winter population (76 inhabitants) and higher ratio winter/summer population (3 times) than plain regions (191 inhabitants and 2 times, respectively). Mean flow per person was 705 l/p.e./d, being higher in the mountain (946 l/p.e./d) than in the plain region (521 l/p.e./d). Infiltration was responsible for these high flows and their correspondent low organic concentrations (mean values of 16 g BOD5/p.e./d and 12 g TSS/p.e./d). Wastewater treatment systems were mainly septic tanks (47% of localities) and Imhoff-type tanks (38%). Most of systems (83.4%) had no any maintenance or was very deficient. Septic tanks were higher efficient than Imhoff tanks in BOD5 removal (33% and 15% for septic and Imhoff tanks, respectively). Reduction of infiltrations and wastewater characterization is essential for the design of wastewater treatment systems in rural areas of northern Spain.

Keywords: Small localities; Wastewater characteristics; Pre-treatment; Septic tanks; Efficiency; Rural areas

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