

An integrated approach to the design and operation of low capacity sewage treatment works

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ABSTRACT

Low capacity sewage treatment works (STWs) serving small-scale urban areas make up approximately 80% of the total number of water works in Europe. There are many limitations to the attention and economic resources that management offices can allocate to these treatment facilities generally serving a population equivalent of less than 5,000. The adequate coordination and management of these works is often compromised due to the large quantity of plants and their distances from the head office. Consumers currently pay an average of €0.4/m³ according to what is measured in their water meter, which is bigger than the amount of waste water drained. This amount has to cover the cost of power, maintenance and operations, as well as other expenses for conservation and upgrading. In addition, STWs give rise to sludge that must be disposed of in compliance with a very specific legislation. Spreading sludge around the fields adjacent to the STWs has become a thing of the past; the general public no longer tolerates the use of sludge as a fertilizer due to the strong odour that is produced. Furthermore, there is an increasing concern about potential contamination from pathogens in the sludge. From a technical point of view, small STWs should involve an individual design approach based on a specific catchment assessment and its response to storm events. Due to the major differences between peak and low flow rates, there is a high risk of untreated effluent reaching public watercourses. This risk is greater during rainy seasons, even though, theoretically, these networks are independent. The aim of this article is to provide an integrated overview as a guide in the design of small STWs. The information and findings (both operational and economic) have been compiled from existing treatment works in the Spanish region of Navarra.

Keywords: Trickling filters; MBBR; IFAS; Sand filters; ATAD; SUDS; CSOs
