

عنوان مقاله:

Using CFD method to optimum the hydraulic design of WSPs and increasing the operational efficiency

محل انتشار:

کنفرانس و نمایشگاه مهندسی آب (سال: 1394)

تعداد صفحات اصل مقاله: 10

نویسندگان:

B Hozzar - *PhD student of mathematics, Region five Water & Wastewater Company*

S Mohammadi - *PhD student of mathematics, Bestsun Group*

B Pirouz - *M.Sc. Civil-Water Engineering, ADP Company*

H Javadinejad - *M.Sc. Environmental Engineering, Bestsun Group*

خلاصه مقاله:

In many countries especially in developing countries, the natural ways for wastewater treatment like wastewater stabilization ponds (WSPs) are so popular because good efficiency and noneeds to high technology. Furthermore the WSPs are suitable for wastewater treatment in small societies and some special industries namely slaughterhouse, dairy products, meat products and etc. The advantages of this method are high efficiency in treatment of pathogens, toxic and organic materials. But there are some problems and issues in using them. Inappropriate design can lead to dead space and short-circuiting and Etc in the ponds and will reduce the efficiency. In this regard, in this paper the hydraulic design of WSPs have been considered and the CFD method used for modeling. Therefore a WSP pond modeled with Fluent software and some parameters like different inlets and outlets length and situation and also different numbers of inlet structures modeled and analyzed to optimum the efficiency. The model is calibrated with field data of previous Tehran WSP. The results of CFD modeling show the numbers of inlet and outlet structures change the spatial distribution of the velocity and with increasing the number of structures, more uniform flow and cross sectional velocity profile occurs. With increasing in the length of the inlet structures the dead space increase and therefore the retention time decrease so the efficiency of the WSP operation reduce. The models within the structure in the bed also have more uniform flow profile in comparison with inlet structure in the wall. For other parameters and conditions the papers, manuals and documents about the WSPs checked and analyzed and at the end some methods and tips presented to improve the efficiency of WSP ponds. In conclusion, it can be seen that the CFD models are needful to optimum the efficiency of WSP ponds.

کلمات کلیدی:

WSPs, CFD modeling, waste water treatment, Hydraulic design

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/407733>



