



Experimental study on mixing efficiency in water supply rectangular tanks

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Phenomenon of mixing in drinking water storage tanks and reservoirs has a direct effect on the quality of water. Creation of poor mixing zones and volume stratification can have negative effects in public health. The design of a storage tank must consider the conditions of the inlet and outlets, and also their orientation (vertical or horizontal) to prevent the formation of these zones. Experiments done in a reduced scaled-model with a rectangular base and three different inlets (two waterfalls and a pipe inlet) had the objective to decide which of these inlets achieved the best mixing efficiency. Four situations were considered while three entrances, two unsteady: filling and drawing, and two steady with different outlets. Moreover the effects of columns that support the roof of the tank were studied by running the three entrances with and without columns in the four situations. Neglecting the viscous scale effects, the time taken to mix the volume stored depends on the distance between the inlet and the opposite wall as though as its orientation. Taking into account the whole tank columns have a negative effect on mixing efficiency although they divide the flux and create local zones of turbulence around them, increasing local mixing. Using a digital treating image technique the results are found in a quantitative way.