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A web-based analysis tool for wastewater treatment equalization volume

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The wastewater equalization process is always essential and necessary in the wastewater treatment system. This process is purposed to stabilize the influent flow characteristics to improve the overall performance of wastewater treatment plants. An equalization tank (usually a complete mix reactor) is employed to dampen the variation of the influent flow characteristics such as the concentration of the wastewater contaminants and its flowrate. On the current applications, portions of the treatment plants require a steady flow, while the other plants either require a relatively small variation on the concentration or both. Due to the existing different designs on the treatment plants, the purpose of the equalization tank varies which makes the calculation of the volume of the equalization tank difficult. A web-based Simulation and Optimization Techniques has been developed as an easier and quicker way for the wastewater treatment factory. The website calculates the most economical volume of the equalization tank which is the smallest volume while meeting the demands of the downstream plant. The algorithm behind the scene uses a numerical solution with central difference to ensure the result is accurately and precisely approximated. Depends on the needs, users can choose from one of the following three scenarios: equalize the flowrate only, equalize the concentration only, and equalize both flowrate and concentration. After data has been entered and submitted by the user, the minimum volume of the required equalization tank will be shown on the website, and graphs regarding the performance will be plotted and provided. The web-based application with the numerical technics provides the convenience, easy access service to the industries around the world.

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