

Abstract

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Modeling of Gravity Thickeners Using Different Primary and Secondary Sludge Mixing Ratios

An investigation was carried out to evaluate the effect of using different mixing ratios from primary and secondary sludge at El Gabal El Asfar Wastewater Treatment Plant to highlight the performance of the thickening process in gravity thickeners to improve the quality of the thickened sludge and the supernatant. Sludge was mixed in a cylindrical thickener pilot plant tubes made of transparent plastic reinforced with aluminum bar with five dragging ports for sampling. Sludge was mixed with different ratios starting 10% primary sludge to 90% secondary sludge, ending with 90% primary sludge to 10% secondary sludge to determine the optimum mixing ratio that will give the maximum total solids removal and the optimum sludge thickening ratio. At the end of the experiment, a supernatant sample was taken to determine the solids removal ratio. The experiment results indicate that the optimum mixing ratio is 30% primary sludge to 70% secondary sludge. The same mixing ratios done for the sludge taken from Gabal EL Asfar WWTP have been implemented to El Berka WWTP with a capacity of 600,000 m³/d using computer modeling (GPS_X) to validate the experimental results.