

High G Flocculation

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Introduction

The High G Flocculation team this semester designed an experimental set-up to test the effects of velocity gradient (G) in a flocculator and to determine the optimal G value based on flocculator performance in terms of effluent turbidity. The G value was varied in different trials by varying flocculator flow rate while controlling for coagulant dosage, influent turbidity, flocculation tube length, and upflow velocity through the sedimentation tank. The product of G and residence time was kept constant at around 20000. The constant sedimentation tank upflow velocity was achieved using a waste stream between the flocculator outlet and sedimentation tank. It was found that for a standard coagulant dose, lower G values were associated with lower effluent turbidity, with 100 Hz being the lowest value tested. The same general relationship was observed for a higher coagulant dose, except that the lowest G value resulted in higher effluent turbidity due to floc blanket collapse. Data from this study will be used in the future to inform the geometry of the flocculator, i.e. the optimal distances between baffles, in a full-scale water treatment plant.

Goals

The team goal this semester was to design and a setup to test the relationship between G value and turbidity. The tests conducted were used to inform the current understanding of the optimal G value for drinking water treatment. This information will ultimately be used to determine the geometry of full-scale water treatment plants. We also hope to test for optimal coagulant dosage.

More Information

Current & Future Research

Summary and links to relevant resources.





Team Members

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Team Documents

	Challenges	Tasks	Teach-In	Presentation	Final Report
Fall '17					

Past Research

None.