

# Turbulent Tube Floc

## Turbulent Tube Floc and Fluidized Bed Flocculator

Though full scale water treatment plants operate with turbulent flocculation, previous flocculation research has been conducted using a laminar flow tube flocculator. Our goal is to design create and test a turbulent tube flocculator for lab scale research to better mimic the processes that occur at full scale plants. With this information, we can hopefully better understand the process of flocculation and make design improvements to improve flocculator performance.

Furthermore, for the Spring 2014 semester, the team aims to evaluate the possibility of using a fluidized bed of sand as a flocculator to accelerate the flocculation process.

## Current Research

The Summer 2013 team developed an optimal design for the flocculator. The basic design is to have a stacked vertical coil of tubes and to use metal bars and PVC to clamp the tubing to create flow expansions which will create turbulence.

Parameter	Value
Energy Dissipation Rate	30 mW/kg
Collision Potential	100 m <sup>2</sup> /3
Reynolds Number	4000
Hydraulic Residence Time	7.5 min
Inner Diameter of Tubing	3.18 cm
Length of Flocculator	56.35 m
Number of Coils	30
Diameter of Coil	0.614 m
Unconstricted Height	1.125 m
Constricted Height	1.464 m

The Fall 2013 team worked on the construction of the flocculator according to the design parameters listed above. The Spring and Fall 2014 teams worked on preparing the apparatus for experimentation by introducing a settled water turbidity unit and updating the process controller method file. The team will perform experiments controlling temperature, pressure, influent turbidity and measure effluent turbidity, floc size distribution and pC\*.

## Members

[Felice Chan](#)

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[Email Team](#)

Documents

	Challenges	Tasks	Symposium	Final Presentation
S p r i n g '15	? Unknown Attachment			
F a l '14	? Unknown Attachment	? Unknown Attachment	? Unknown Attachment	? Unknown At
S u m m e r '14				
S p r i n g '14	? Unknown Attachment	? Unknown Attachment	? Unknown Attachment	? Unknown At

F a l '13	<b>? Unknown Attachment</b>	<b>? Unknown Attachment</b>	<b>? Unknown Attachment</b>	<b>? Unknown At</b>
S u m m e r '13	<b>? Unknown Attachment</b>	<b>? Unknown Attachment</b>	<b>? Unknown Attachment</b>	<b>? Unknown At</b>
	<b>? Unknown Attachment</b>			