



AguaClara

Foam Filter Pore Size



Cornell University

**Lotta Van Leeuwen
Tianchen Yu
Caroline Caglioni**

LARGE SCALE Problems to solve

- Work off challenges from El Carpintero
- Find most efficient stratification of foam



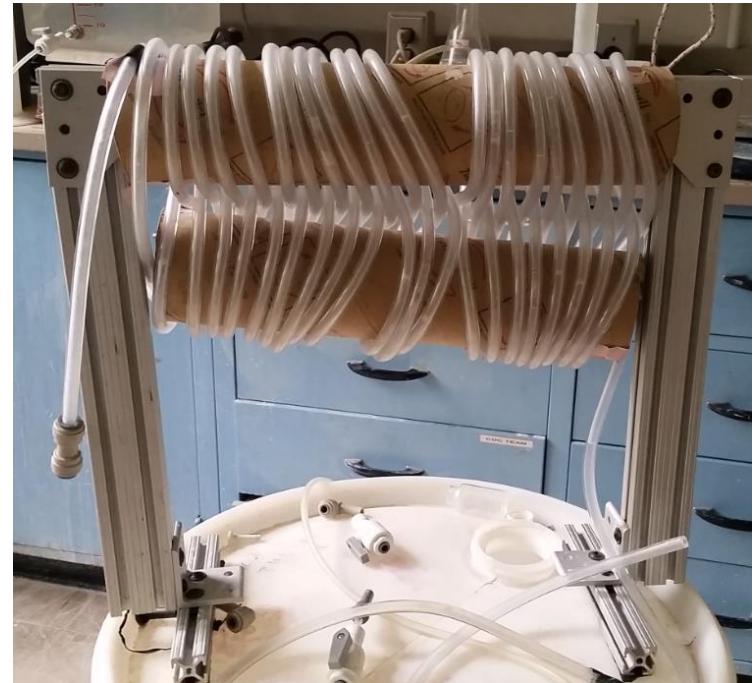
SMALL SCALE Problems to solve

- Build Flocculator
- New 1" Foam Filter set-up
- Replicate El Carpintero Water



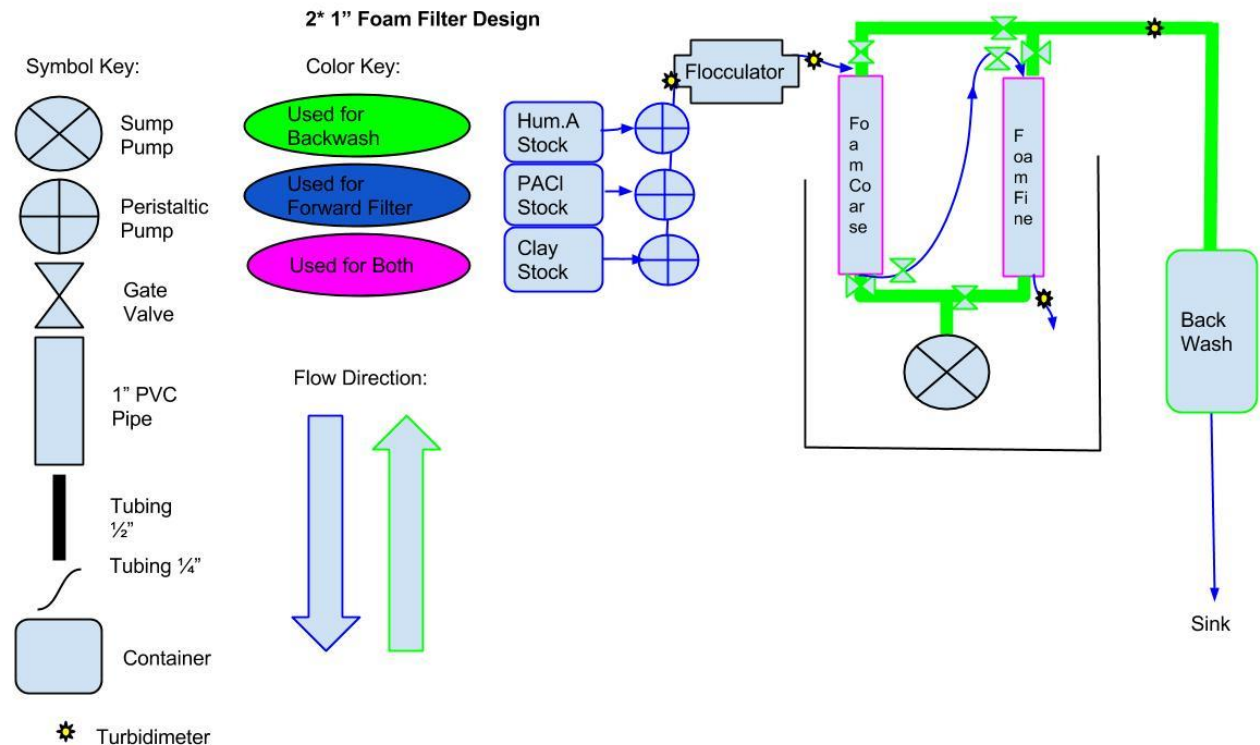
Goal: Determine whether a flocculator increases the filtration efficiency

- Design of new flocculator in MathCad
 - Diameter = $3/16^{\text{th}}$
 - Length = 15.64 m
 - Residence Time = 90 s
- Build new flocculator



Goal: Build quickly new filter allowing specific pore size experiments

- 1" Diameter
- Coarse and fine foam
- Backwash capability



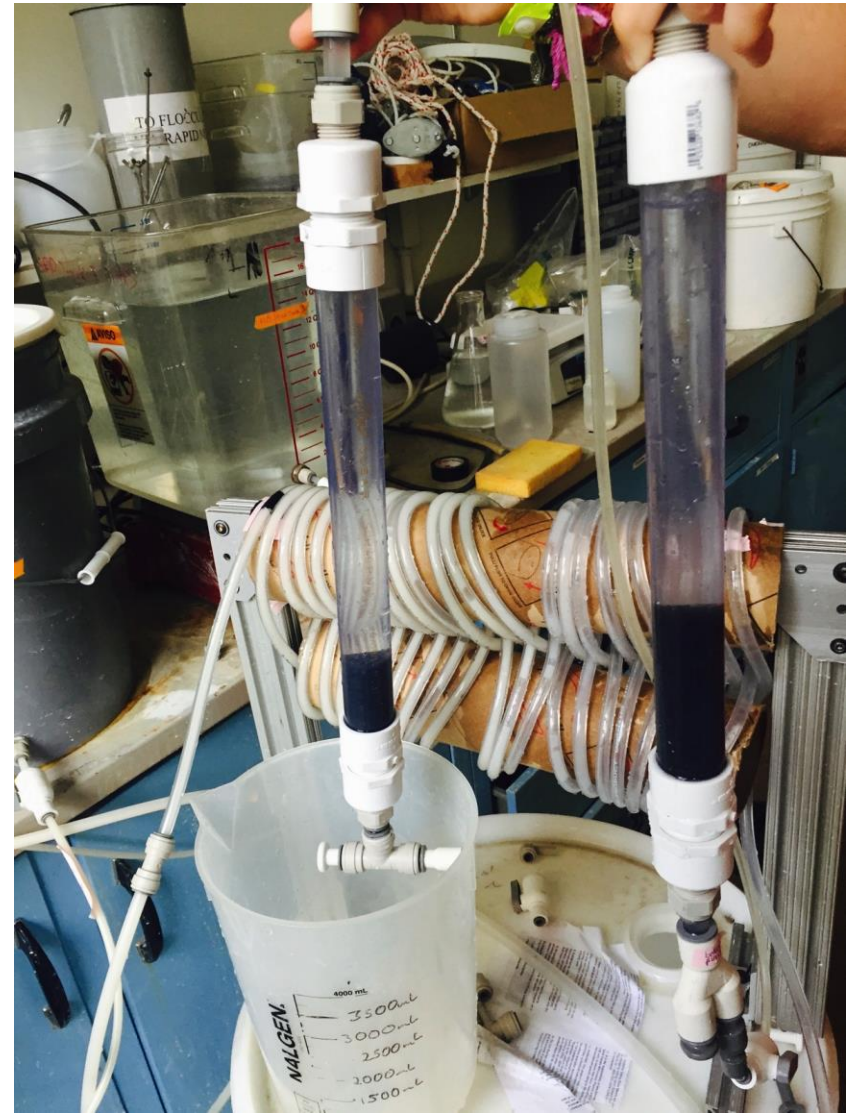
Goal: Create a more representative influent

- Include humic acid → organic matter alternative
- Collect data from Walker
- Run through 1" design



Case	Influent (NTU)	Effluent (NTU)	PACl (mg/L)
1	17	2-4	20-25
2	30	2-5	30

- Build New 1" Filter
- Build New Flocculator
- Run test through the new apparatus



New Flocculator



... and then we ran water through it!

Trial	PACl dose (mg/L)	Influent Clay Turbidity (NTU)*	Influent Clay dosage (RPM)	Effluent notes: settling, etc.
1	80	A	85	After 5:30 minutes, the supernatant and precipitate have equal height
2	70	A	100	After 5:20 minutes, the supernatant and precipitate reach same height
3	80	A	80	After settling for more than 10 minutes the effluent didn't change much couldn't see clear layer inside
4	80	A	70	The effluent was quickly settled, after 1:30 minutes, the supernatant and precipitate reach same height



AguaClara **Connect Flocculator with Filter**



New Foam Filter



Item	Picture	Key words	What does it connect to? Function?	Comments
Male Adapter, Socket Female x NPT Male		Female Unthreaded Socket End; Male NPT Threaded End; available for various pipe sizes	Glued on pipe, threaded to cap to cap	
Cap, Female NPT		Standard-Wall White PVC Pipe Fittings; available for various pipe sizes	End of pipe. A threaded hole in this allows the screwing of a straight adapter tube (push to connect) to male threaded	
Swivel Wye x 1/4 Male Pipe		Tube-to-Male Threaded Pipe;		This piece was never actually used, ordered by mistake
Straight adapter, Stem to tube		Adapter Stem-to-tube	Big push to connect to smaller hard tubing	
Tube-to-tube connector/adaptor		Adapter Tube-to-tube	Big hard tube to smaller hard tube	



AguaClara

Future Expectation

Expectations

Fix the Foam in the Foam Filter

Run more quantitative experiment with the new set up

Keep looking for the most optimum strategy





Thank you
Muchas Gracias

谢谢

Merci

Dankjewel

Grazie

תודה



Cornell University