

## Frances Ciolino's Individual Contribution Page

### Fall 2012 Contributions

This semester I worked on the Sedimentation Tank Hydraulics team. The main goal of this semesters work is to optimize the floc hopper. In addition to our research we also wrote a blog article for the public relations team to help with our outreach. One of the ideas we are working on is continuous wasting of the flocs. The idea behind this is to allow for constant removal of flocs instead of collecting the flocs and then having to manually open a valve to let them leave the tank. When the wasting rate is optimal, the flocs will be allowed to compact a little before they are removed so that the least amount of water is removed in the process. During our research we managed to concentrate our flocs so much that we hit the maximum on the turbidimeter. Our main experiment is testing floc hopper sizes to see what percentage of the total area is most efficient. We are looking for a size and rate that keeps the plant running efficiently, meaning the least amount of water wasted while keeping the water leaving the plant clean. We are hoping that once we find the best relationship between floc hopper size and wasting rate, we will be able to use this technology in future AguaClara plants.

### Spring 2013 Contributions

After visiting Honduras on the January trip and seeing the current plants, I decided to work on the sedimentation tank again since there is still a lot to learn about it. One of our main aspects of the semester was switching to PACl instead of alum. The PACl seemed to be much stickier than alum and we had problems with it sticking to the glass and insides of the flocculator. We also did some experiments switching energy dissipation rates in the jet reverser. We were expecting to find a point where the energy dissipation rate is too high and performance decreased. We didn't find a point where the floc breakup caused a decrease in performance. During these tests we actually found that momentum can play a large role in floc blanket failure because if the momentum of the floc sliding down the incline gets too large it can overpower the jet reverser and cause it to fill up. We also looked at sludge consolidation depending on the depth of the floc hopper. We found that the depth can make a large difference in consolidation.