Task List Fall 2011-Completed

1. Determine which setup is optimal for minor k-value.

   (a) If it is using the straight tube, continue to testing to confirm the k-values from before. Continue experiments to complete k-values for specific lengths with the other setups (1.32m, 1.42m, 1.54m, 1.64m, 1.75m, 1.85m)

   (b) Possibly continue to use split tube setup and single tube to 1/2 in setup, both using the weight. An increase in weight size could be used for the split tube to see if it can straighten the tube sections even more.

      i. Create a different tube length setup, possibly for a longer length (max 1.85m) if the rig can be raised to a high enough level.

      ii. Create a Mathcad file that will help determine the lengths of two tubes to be used if the split apparatus is worthwhile. (Might not be necessary?)

   (c) 1/4 in ID with weight, with and without the double ended barbed fitting

   (d) The k-value should not change with the different viscosity, thus water testing can still be used and converted using the viscosity/density array from Matt's previous work. Perform experiments to see, with high kinematic stock concentrations (PACl>>200 mg/L), if we can maintain <10% maximum percent error with shorter tube lengths.

      i. Make a graph/table showing these values with the calculated k-values.

   (e) Instead of push-to-connect from base of CHT, change to barbed fitting

2. Write article for submission to Journal of Environmental Engineering that details the LCDC design, theoretical/testing and practical designs in use. The only paper that has been published was one created by Monroe Weber-Shirk, detailing the theoretical idea of the LCDC. The project is now more developed theoretically and experimentally, and it should be documented.

   (a) This should expand on Monroe's paper, and continue into the new apparatus that is being used in Honduras plants. Should use references and open source data from the AguaClara website, but not go over max of 10,000 words.

   (b) A rough draft should be finished before Thanksgiving, with final editing happening before finals week.

3. The LCDC design has increasingly added more stress to the lever arm by the addition of a heavier drop tube and the float attachment. A counterweight will also be added to the design and connected directly to the lever arm. Look into the development of a thicker lever arm and thicker sliders to be tested to see when then currently-used components might be replaced.

(a) This is also required due to the larger tube being attached to the larger barbed fitting. Both of which are causing the lever to tilt slightly when not in use.

i. Thicker lever bar = More fittings = More dosing tubes = Higher flow

(b) Will the addition of a small fitting/tube on the head loss pin stabilize the lever enough? (has worked in experiments to a fairly decent effect)

4. Create an up-to-date list of all components currently being used. Include price, unit number and McMaster Carr ID#. This will be necessary to practice how part ordering would be done in an AguaClara plant in Honduras.

(a) This should be done after experimentation/new lever manufacture.

(b) Include new parts that were purchased for the 1/4 in ID testing.

(c) 1/2 in barbed fitting used for drop tube is incorrect/serial # has changed since ordering. Find and fix this discrepancy.