

## CDC Challenges for Spring 2012

Although the research efforts and experiments for the Fall 2011 team were positive, there is still a lot of work that can be completed for the LCDC design. The longer term goal is to minimize all minor losses, so they are equal to zero and major losses are the only loss present in the system. Since most experiment done in the lab are completed with water instead of coagulant concentrations, the goal of next semester (Spring 2012) is to improve to design further if possible and to perform tests with coagulants!

1. Continue to use experiments that diminish the amount of horizontal distance needed created by Fall 2011 team. Replace the push-to-connect at the base of the constant head tank (CHT) with a tested 3/16" barbed fitting (McMaster part# 5116K82).

2. A weight is required because it creates the largest sections of straight tubing in the experiments, and stabilizes tube that might swing. In the lab-setting, this weight is a random piece that was found which had a hole and could be threaded over a tube. A more easily obtained/uniform weight should be found. It should be a weight <100gm in weight that can either be snapped onto tube(s) or slipped over while the tubes are in use.

3. Coagulant testing was not completed during the Fall semester due to the need to create an experimental design that both lowers the k-value and horizontal distance for ease of use. It is possible that the coagulant data created by the Summer 2011 team, and used to convert water flow values into concentration specific coagulant flows, is incorrect. If possible, test at various coagulant flows to see if they are in agreement with the Summer coagulant data.

4. Deposit buildup is a big problem in the float valve orifice, due to it being in contact with the atmosphere causing carbonate buildup on the small orifice opening. This could possibly be controlled by flipping the float valve 180-degrees, so it is upside down. This fully submerges the entire float valve and should, theoretically, stop buildup and it has been fixed in this manner in some plants. It has not been determined if this changes the flow rate, so this should be tested in the lab.

5. All experiments have been completed using only one tube from the base of the CHT and the k-value has been consistent over multiple different lengths. It should be determined if multiple tubes from the base, such as three or four, have similar k-values or if this increase in tubes creates higher minor losses.