

# AE progress report 11-2-07

Honduras Interns Progress Report

Date: 11/2/07

Location: Ojojona

## Work Completed This Week

### ¿ Improvements to Plant

o Ran an underground ½" PVC tube from the chemical stock barrel drains to the entrance chamber overflow pipe. Antonio will bring an abressadera to connect the ½" pipe to the 3" drain pipe so that it gets sent to the same drain.

### ¿ Progress in Problem Solving

#### o Sed Tank Cleaning

¿ Thursday, Oct 1, the sed tanks hadn't been cleaned for 9 days. We haven't had high entrance turbidity since then, (mainly around 10 NTU), but there were flocs rising up in two tanks.

¿ We tried slowly purging (rate of about 4 gal/min) all three sed tanks, one at a time, for at least an hour each one. Although we are sure there was mud in the bottom of all of them, a significant amount of sludge only came out of tank #3 when we purged them. Mainly clear water came out of tanks #1 and #2. After, we emptied all three tanks to clean them, and there was a considerable amount of sludge in all of them. Our conclusion is that a manifold is necessary to effectively collect sludge from the bottom of the tanks. We were able to slowly drain the tanks with the 3" valve causing a disturbance on the top of the tank or causing a spike in turbidity. Even draining at a rate of 30 gal/min (slightly greater than the per/tank flowrate), we didn't notice much disturbance up top.

¿ After several days, a decent amount of sludge forms on the sed tank laminas and effluent launderers. After 9 days of relatively low turbidity, the effluent launderers had between ¼" and ¾" of sludge sitting on top of them. Some of this sludge falls off and goes through the effluent orifices. We're not sure how much of a problem this sludge on top causes, but even with a sludge removal system, it will probably be necessary to empty the tanks periodically to remove it.

¿ We haven't had hardly any foam/sludge developing on the surface of the sed tanks, even though we still aren't pre-chlorinating. The foam was probably only during high turbidity.

#### o Sed tank critical velocity

¿ Friday, Nov 2 we tried running the plant only sed tank #1 (the one with three 6 inch influent tubes). The plant flowrate was about 230 L/min and the incoming turbidity was about 9 NTU. The plant had been working fine with 2 tanks. When we switched to one, the effluent turbidity did not go up significantly (stayed below 3 NTU), but rising flocs were visible in the sed tank. We're not sure why the effluent turbidity did not rise more, but think the rising flocs are evidence that the sed tanks do not function well at that flowrate. 230 L/min through one tank corresponds to a critical velocity of about 18 m/day. If we design the next plant for a critical velocity of 10 m/day and run it on 2 out of 3 tanks, we will be using a critical velocity of 15 m/day, pretty close to 18. Would it be worth designing for a slightly lower critical velocity?

#### o Sulfate problem

¿ We are down to about 150 kg of sulfate and Antonio started looking into buying more. He says their supplier only has 50 kg sacks of the same sulfate granules that we are currently using available. They come from San Pedro Sula, so getting a sample will not be easy. We are concerned that this sulfate may have the same problems as the type we have. Monday we will look into whether there are other suppliers or whether we can get a sample.

### ¿ Capacitation of plant operators, Sustainability in Ojojona

o Alexis is in charge of the plant this week and has been doing a good job keeping records and checking the water quality in 3 houses every day.

However, he still is probably only putting in 5-6 hours a day.

o Were supposed to meet with the Alcalde others from the municipality Thurs, Nov 1, but the Alcalde couldn't make it and the Junta didn't want to meet if he wasn't going to be there. Martin is going to try to get an appointment with the Alcalde next week. This process is getting drug out more than we'd like.

### ¿ Manual

o We started working on a manual for the Ojojona plant. We'll likely have an English rough draft done next week. We'll send it to Cornell for revision when we have a draft. Our plan is to first make a somewhat-polished English version and then translate it to Spanish.

### ¿ The Next Plant

o Visited Tamara Tuesday, Oct 30. Visited all of their water sources and talked with Danny from the Junta to get population and financial information. We sent a report to Monroe on what we found.

o The Tamara Junta may come this Sunday for a tour of the Ojojona plant.

### ¿ Plans for the Future

o We still need to develop a method to sample flocs at different stages of the flocculator. We are going to try finding a syringe to extract samples from different levels of a jar after the flocs settle.

o Install a sludge removal manifold in Ojojona once it is designed by the design team.

### ¿ Question for Cornell

#### o Sludge Removal / Sed tank cleaning

¿ Could we incorporate the sludge removal manifold into the table?

¿ Are we still considering an un-level floor in the sed tanks to aid in cleaning?

¿ Would it be possible to cast horizontal drain tubes with lots of orifices directly into the sed and floc tank floors so that the drain holes are flush with the floor level?