

# Floc Probe

Skills: fabrication of detectors. electronics, programming

There are two goals for this team. One goal is to develop an easy method for operators to monitor the floc blanket depth and the depth of sludge in the floc hopper. Currently the operators in Atima, Honduras use an LED flashlight that they shine down between the plate settlers. They are able to see the floc blanket if it is up to the level of the floc hopper weir. They probably can't see the floc blanket if it is still growing.

The second goal is to learn what is happening inside our sedimentation tanks. We need to understand what is happening inside the floc blanket and also in the floc hopper. The plants that have floc blankets continue to note a deterioration in plant performance that they can remedy by cleaning the sedimentation tank. This suggests that sludge is accumulating somewhere in the sedimentation tank. The sludge may be interfering with the action of the jets that are designed to resuspend settled flocs. It is possible that the jets don't have enough momentum to resuspend the dense floc blankets. Perhaps the problem is that the sedimentation tanks are operating at less than the design flow.

The potential technologies range from simple to complex and include:

- eye as detector
  - sludge judge (a transparent tube with a valve at the bottom that can be used to grab a column of water from the sedimentation tank)
  - submersible LED light (see prior AguaClara research on low cost turbidimeter)
    - viewed from above and the point of extinction is used to measure the height of the flocs
    - Viewed through a tube filled with air that has a glass bottom and an LED light separated a short distance below the glass bottom. The gap between the LED light and the glass viewing port can be varied depending on the turbidity of the floc blanket that will be viewed. The previous AguaClara research on the relationship between turbidity and optical extinction will be useful in setting the appropriate gap
- sensors
  - submersible camera with strong LED light source
  - It may be possible to use an LED light source with a photodetector mounted next to the LED light to measure backscattered light. The backscattered light should increase in intensity as the floc blanket concentration increases.

The best option for assessing the behavior of the current sedimentation tanks will likely be to devise a method to move a submersible webcam or [submersible camera](#) and light source. It would be great if the submersible webcam could be monitored by computer so the camera could be somehow steered to exam locations of interest.

The submersible camera will require a method to guide the camera under the plate settlers and all the way down to the jet reverser in the bottom of the sed tank.