



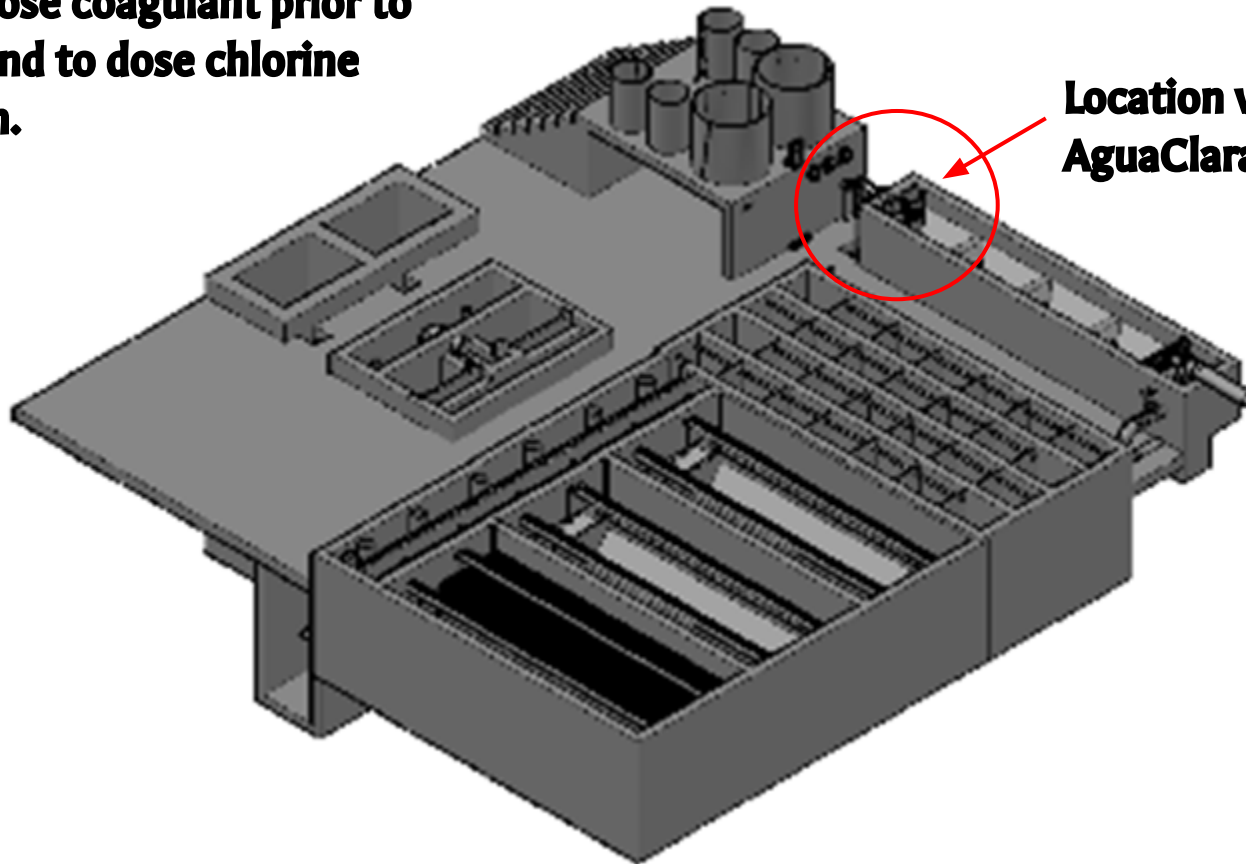
AguaClara

Chemical Dose Controller

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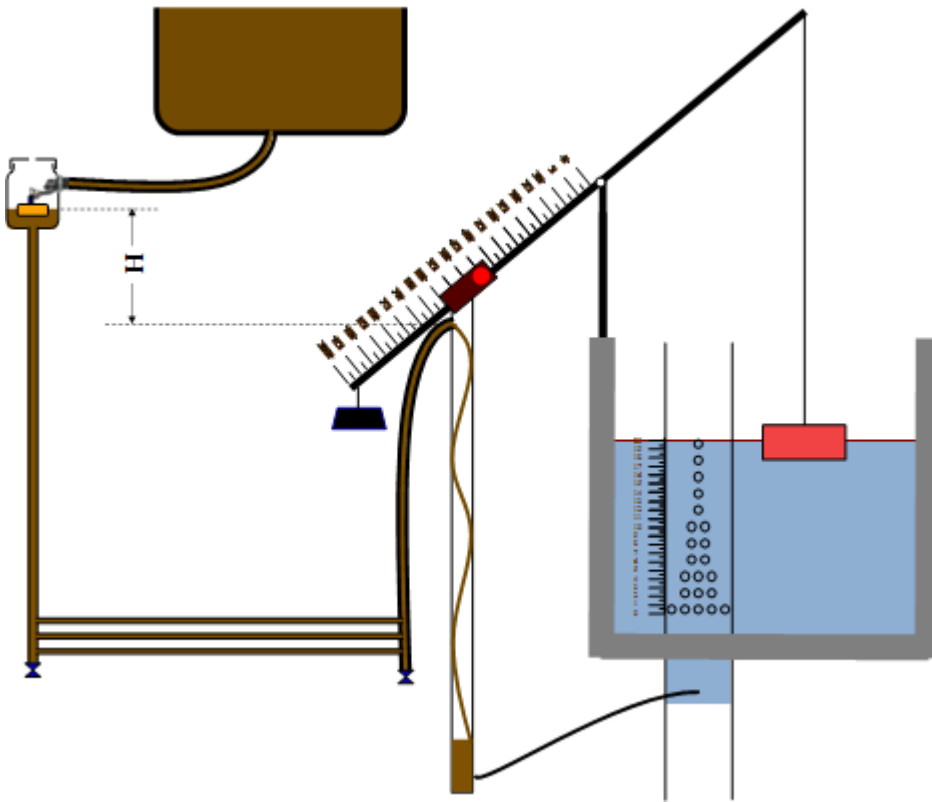
Background

Purpose: To dose coagulant prior to flocculation and to dose chlorine after filtration.



Location within an AguaClara Plant

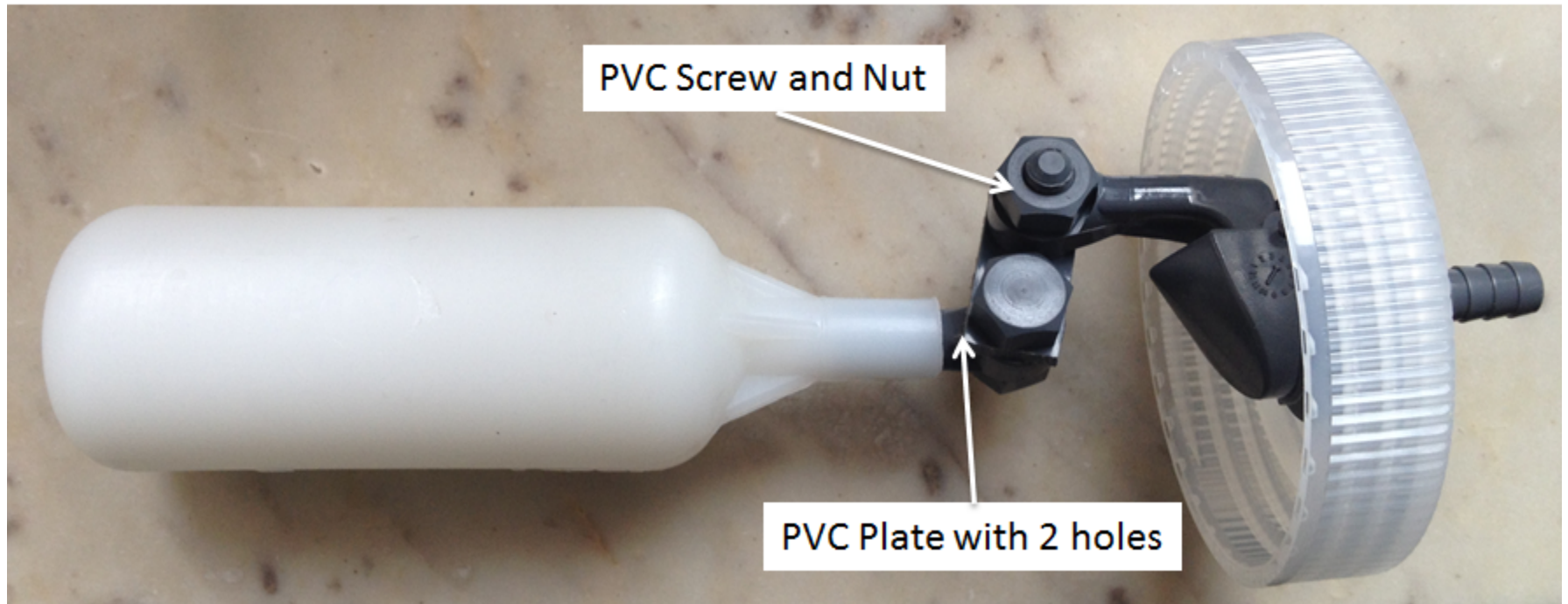
How It Works



- Major losses are important!
- Linear relationship $Q \propto h$

India CDC

MODIFIED CONSTANT HEAD TANK FLOAT VALVE



Images taken by Guneet in India

India CDC

Constant Head Tank/Bottle



**From
Storage
Drums**

To the Manifold

Honduras CDC

Currently in San Nicolás



Honduras CDC

- **Vertical Float**
 - **This design is less sensitive to changes. Requires more pressure to close valve**



Tupperware

Residual
Chemicals

What We've Done

Eye-Bolt Experiment

- **Previous eye-bolt rusted.**
- **Purchased new eye-bolt made of type 316 stainless steel for \$1.45.**
- **New eye-bolt showed no sign of rusting or corrosion after tests.**



Constant Head Tank

	Nalgene Bottles	PVC tubing with PVC caps	Trough - Design CHT	Unknown Option 4
Description	Current design. CHT lies on its side with float inside. Chlorine is in contact with all parts.	Replace Nalgene components with all PVC material (caps, tubes).	Have PVC bottle horizontal. Completely seal sides (leak proof). Covered opening is at top of tank.	A currently undiscovered solution that encompasses all of the characteristics of a feasible CHT while being simple and cost-effective.
Pros	<ul style="list-style-type: none"> - Cheap and replaceable. - Easy to take apart. 	<ul style="list-style-type: none"> - Completely chlorine resistant. - Easy to take apart. - Lifespan: ?? 	<ul style="list-style-type: none"> - No leaks because cap is sealed. - Chlorine resistant. - Easy to take apart for cleaning. 	??
Cons	<ul style="list-style-type: none"> - Cap and bottle are not resistant to chlorine. - Leaks from the bottom. - Lifespan: 1-2 years 	<ul style="list-style-type: none"> - Very high cost - Some leaking from threaded cap is possible. 	<ul style="list-style-type: none"> - Manual assembly. - Open to air. 	??
Price per CHT	\$12.25 + \$12.88	\$24.57 + \$12.88	\$7.20 + \$12.88	?? + \$12.88

Shipping CDC To India

Location: Ranchi

- **Problem:**
- **Isolated**
- **Small Village**
- **Closest Major City: Jamshedpur**
 - 125 km away

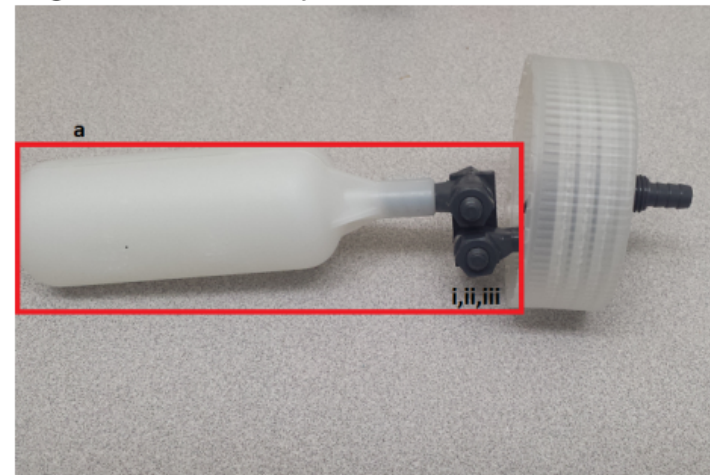


Set-Up Manual

- **Two manuals:**
 - **Manual for future CDC teams.**
 - **Manual for plant operators for set-up**
- **Final manuals are dependent on current research.**

1. Constant Head Tank (send fully assembled)

- a. Mini Float Valve with 1/4" Barbed Fitting (sending fully assembled)
 - i. 2 PVC screws (1/4"-20 x 3/4" Long)
 - ii. 2 PVC nuts (1/4"-20 Hex)
 - iii. PVC plate with 2 1/4" holes drilled 5/8" apart (center-to-center)
- b. Tank AKA Nalgene bottle
 - i. Drill hole through lid and in the bottom
- c. 1/2" Barbed Tube Through Wall Fitting
- d. 1/2" Threaded to 1/2" Barbed PVDF
- e. T-Bracket
- f. 4 Hose Clamps
- g. Stainless Steel Cotter pins



Single Lever Arm

- **Lighter and easier to ship.**
- **Will rotate on a mounted bearing.**
- **Assembles to become double lever arm.**



Future Work

- **Finalize constant head tank design.**
- **Complete set-up manuals.**
- **Shipping coordination with AguaClara LLC.**
- **Design and test air-purge system.**
- **Effectiveness of 16th inch tubing.**
- **LFOM that uses 10 cm of head loss instead of 20 cm.**

Questions?
