Project 4: Aqua Aerobic Cloth Filters

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Background

- Primary Filtration – Main Objectives
  - Higher removal of organic load (BOD)
  - Reduction in primary treatment area
  - Higher removal of volatile suspended solids (VSS)
  - Reduction in foot print
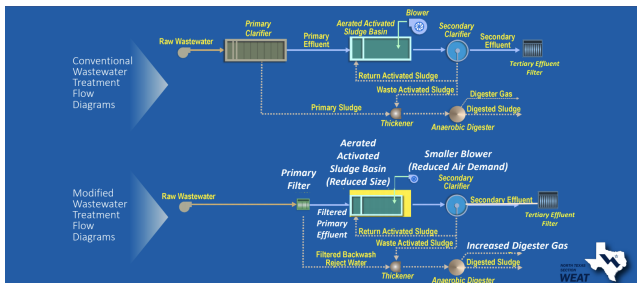- Cloth filters replace primary clarifiers

Figure: Flow Diagram of Conventional and Modified Treatment

Aqua Aerobic

- Manufacturing firm that has designed novel treatment technologies
- Designed a primary filter – cloth filters reject in the micro-meter range
- Pilot, demonstration, and **full-scale project**

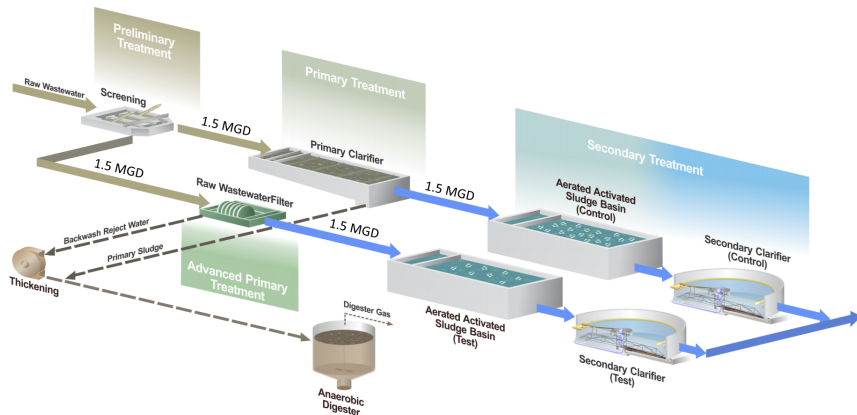- Cloth filter unit implemented in 2017

Figure: Flow Diagram of Linda County Water District WWTP

The Question

- Compare the removal of water quality variables from the clarifier and the filter using the lab data. Are the differences significant?
- Are there correlations between the filter's online process data and the filter's offline laboratory results?

Figure: Site view of LCWD WWTP

The Data
Lab Data

- Intermittent daily laboratory data from April 2017 – October 2019 ⇒ **Start here!**
  - Samples include grab, 1-hr composite, 2-hour composite, 12-hr composites, and 24-h composites of the filter influent and effluent and clarifier influent and effluent.

Category	Variable
Water Quality	TSS
	Alkalinity
	Ammonia
	BOD
	COD
	ortho-Phosphate
	Phosphorous
	TKN
	VSS

The Data
Online Data

- Online data at the 5-second interval for 2019
- Each day has 17,181 observations and 25 variables (all together 6,271,000 observations across 2019)
- Variables included
  - Water quality: basin pH, waste TSS, effluent and influent TSS and many more
  - Process: influent and effluent flow, basin level, and more

Figure: LCWD site view

The Data
EDA

Check out an EDA