# Angola Wastewater Treatment Plant Expansion

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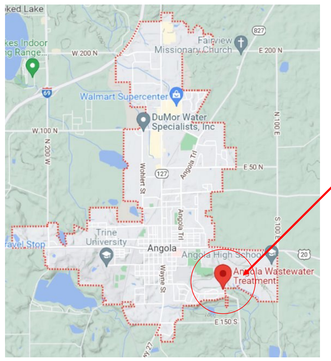
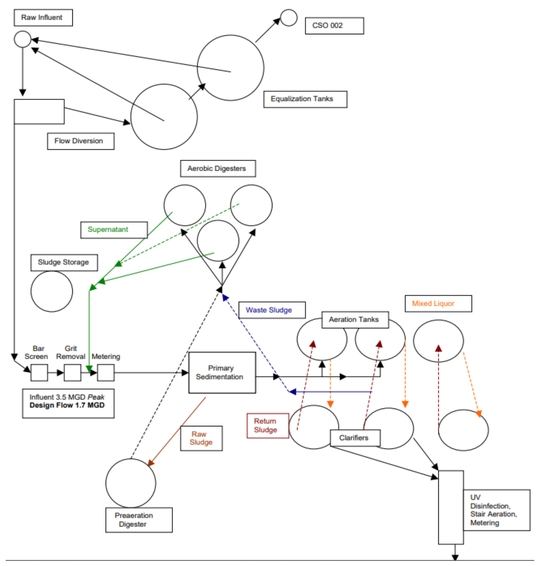
## INTRODUCTION

The Angola Wastewater Treatment Plant (WWTP) treats our wastewater to protect the environment and reduce risks of diseases. With a growing population in Angola, increased enrollment at Trine, and new IDEM standards, the Angola WWTP needs an update to meet increased demand and improve efficiency.



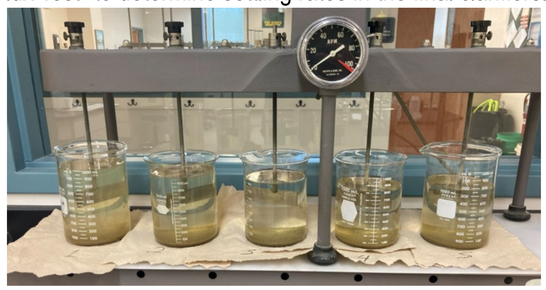

## PROJECT GOALS

Our goal was increasing the WWTP's capacity to treat higher influent flowrates while also improving removal efficiency of Carbonaceous Biological Oxygen Demand (CBOD), Total Suspended Solids (TSS), Phosphorus, and Ammonia. We adding additional Primary, Aeration, and Clarifier tank to achieve this goal.



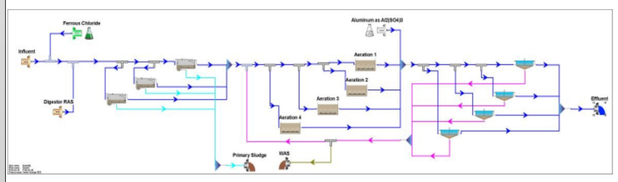

## DATA COLLECTION

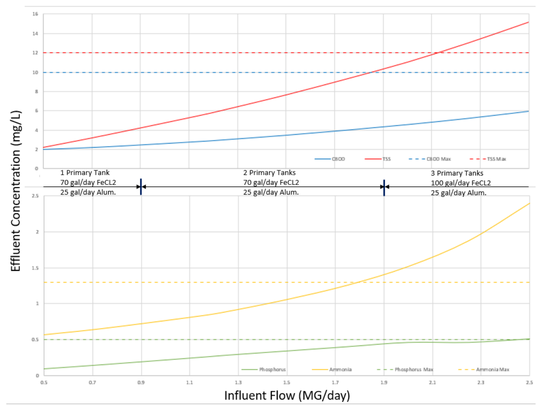
We collected and performed experiments on raw samples from the Angola WWTP for further analysis. We utilized a "Jar Test" to determine optimal Ferrous Chloride dosing rates to target Total Suspended Solids (TSS) and Phosphorus. We performed a "Gravity Flux Test" to determine settling rates in the final clarifiers.



## COMPUTER MODELING

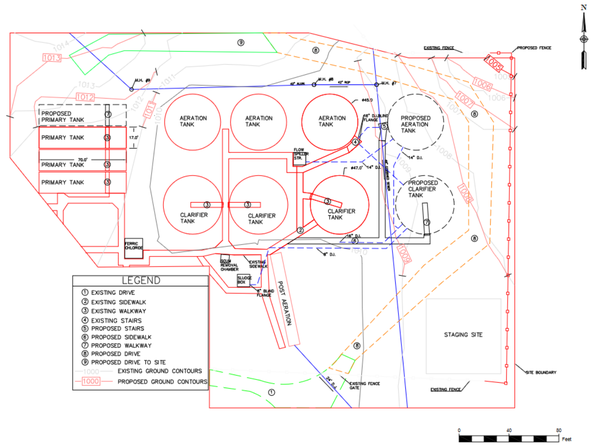
We utilized a WWTP modeling software called BioWin to determine the plant's removal efficiency after the new proposed tank additions



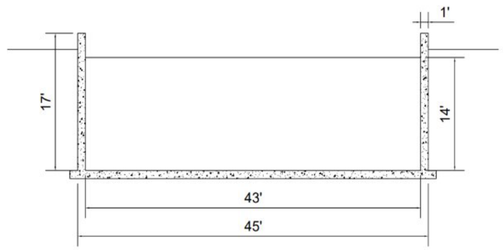



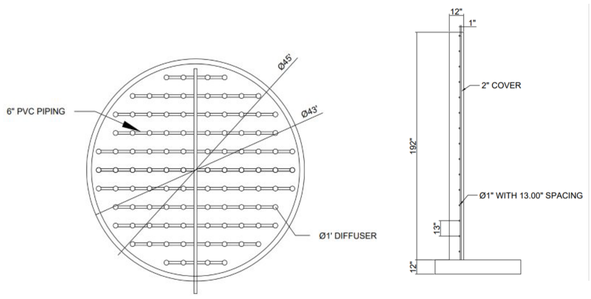

## SITE LAYOUT

We surveyed the plant and created a topographic map and layout for the proposed Aeration, Clarifier, and Primary tanks. The base map was used to create a grading plan and demolition plan to perform earthwork calculations.

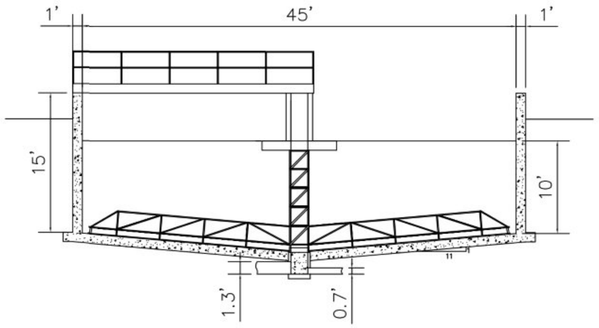


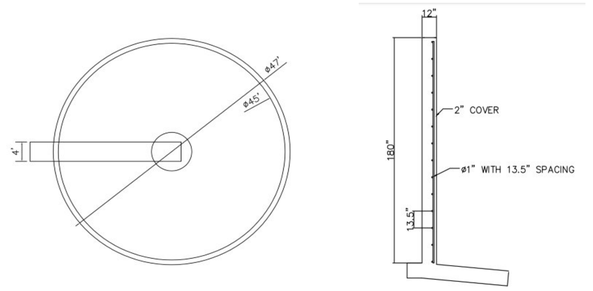

## AERATION DESIGN




## CLARIFIER DESIGN




## FINAL COST ESTIMATE

| | |
|---|---|
| Sidewalk | $ 20,108 |
| Erosion and Siltation | $ 4187 |
| Soil Movement | $ 111,604 |
| Demolition | $ 5,753 |
| Tanks | $ 145,974 |
| Miscellaneous | $ 393,724 |

| Final Cost | |
|---|---|
| Total | $ 681,349.79 |
| 10% | $ 749,484.77 |
| Contingency (4%) | $ 779,464.16 |
| City Indices (.882) | $ 687,487.39 |

**$687,500**