

Group C1.04 - Wastewater Management

Jack Butcher, Barrett Guinn, Caden Pugh, Wade Watson



Project Overview

2500 Single family homes being placed at the intersection of HWY 123 and FM 1978.

Task:

Design a way to manage the wastewater produced by this proposed neighborhood.

Background

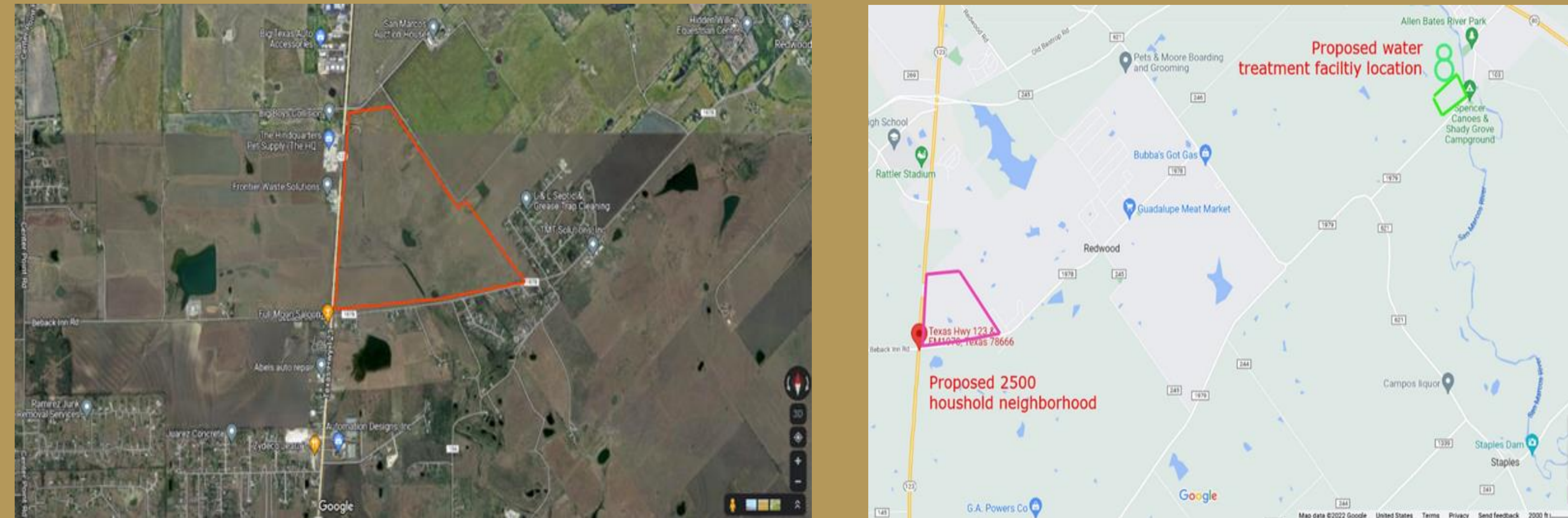
Three Original Alternatives:

- (1) Route wastewater to the existing wastewater treatment plant in San Marcos
- (2) Build a new wastewater treatment plant
- (3) Implement a blackwater/greywater recycling system

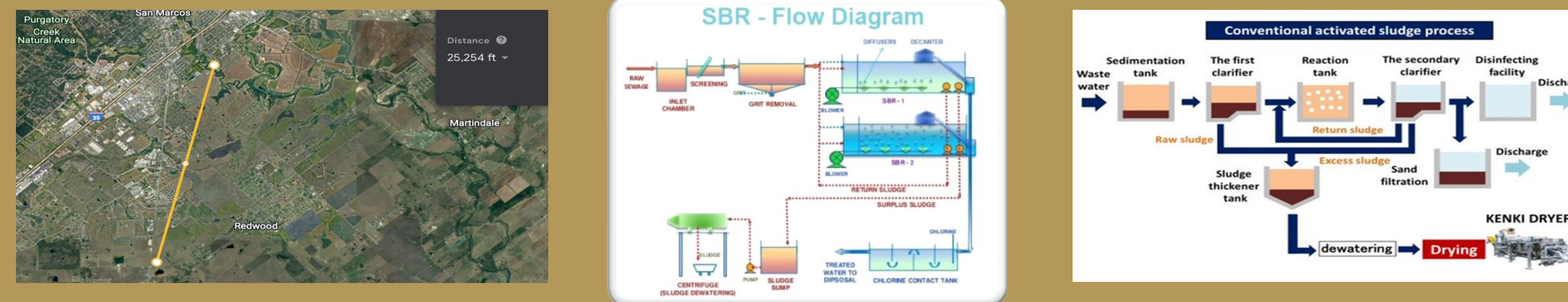
Design Considerations

- Capacity and Effluent Regulations
- Smaller Footprint (Ecologically Friendly)
- Sustainability: Higher Efficiency Leads to Cost Savings over Time

Site Selection



Design Alternatives



Sustainability Evaluation

Based on Envision evaluation, New WWTP will be pursued



Capital and Life Cycle Costs

Factors	Unit Cost	No of Units	Cost
Land	\$3,725/acre	35 acre	\$130,375
SBR Construction	\$5,000,000/MGD	5 MGD	\$25,000,000
Administration/Maintenance Facilities	\$100/sq. ft.	15,000 sq. ft.	\$1,500,000
Roadways	\$900,000/mile	1.5 miles	\$1,350,000
Total			\$27,980,375

Factors	Cost (\$/year)	Total cost over 100-year study period
Operation/Personnel	\$252,000	\$25,200,000
Maintenance	\$71,100	\$7,110,000
Material	\$119,000	\$11,900,000
Chemical	\$24,900	\$2,490,000
Energy	\$115,000	\$11,500,000

Group Pictures



Caden Pugh (left)

Jack Butcher (right)

Wade Watson (left)

Barrett Guinn (right)

Second Semester Plan

CE 4391 will entail the second half of Senior Design, more specifically real design for WW Treatment Facilities

Acknowledgement

Andreana B. Salas

Dr. Felipe Gutierrez

Dr. Feng Hong

SMWWTP