

Improving sanitation in the Black Belt of rural Alabama

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TERC
Tiger Engineers for Rural Counties

College/Underserved Community Partnership Program



Background

- History of sharecropping and economic depression
- Poor soil percolation
- Failing infrastructure reinforces slow economic development and medical problems



Current Infrastructure

- Failing septic tanks
- Few wastewater treatment systems
- Unconventional technologies available



Current Regulations





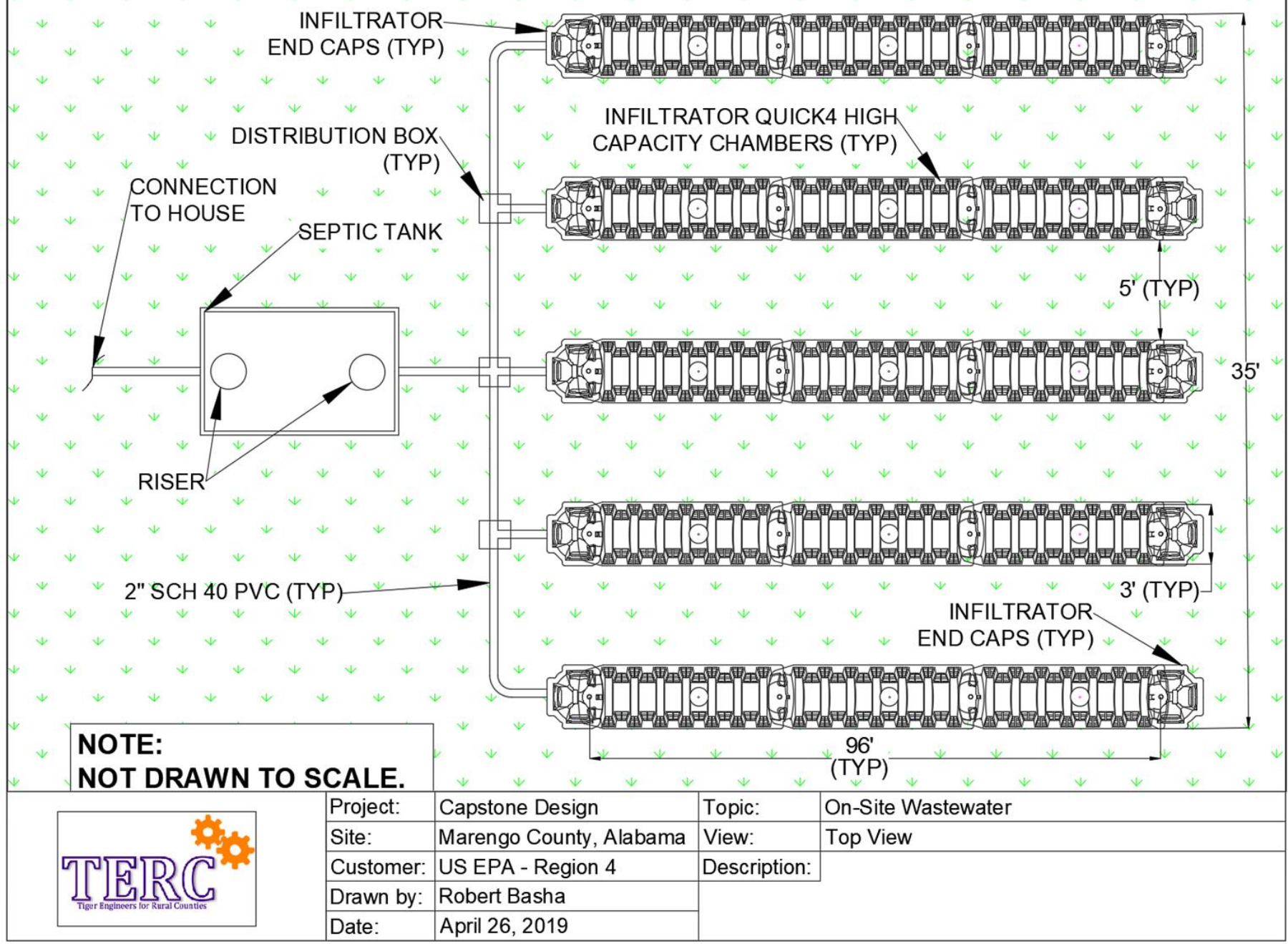
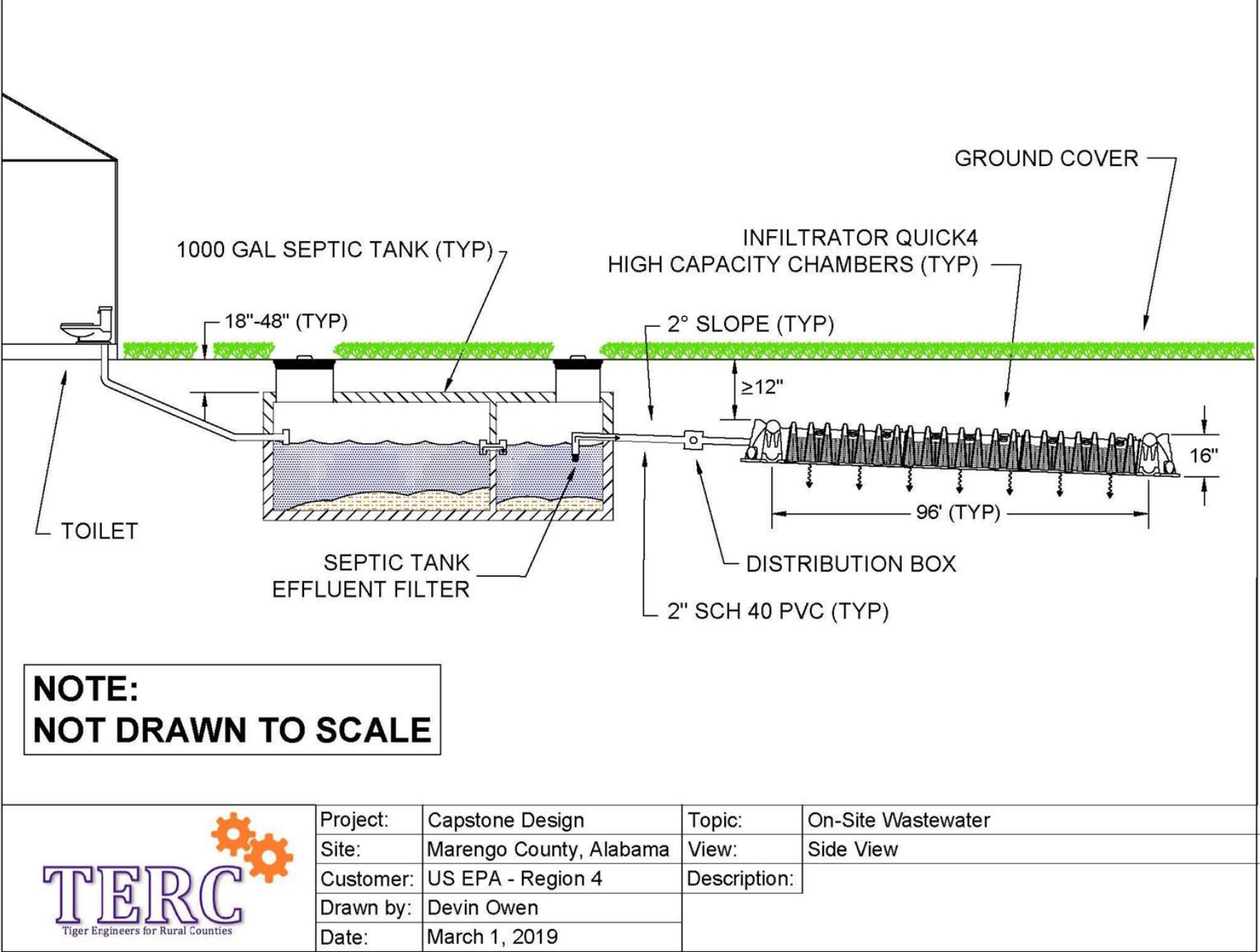




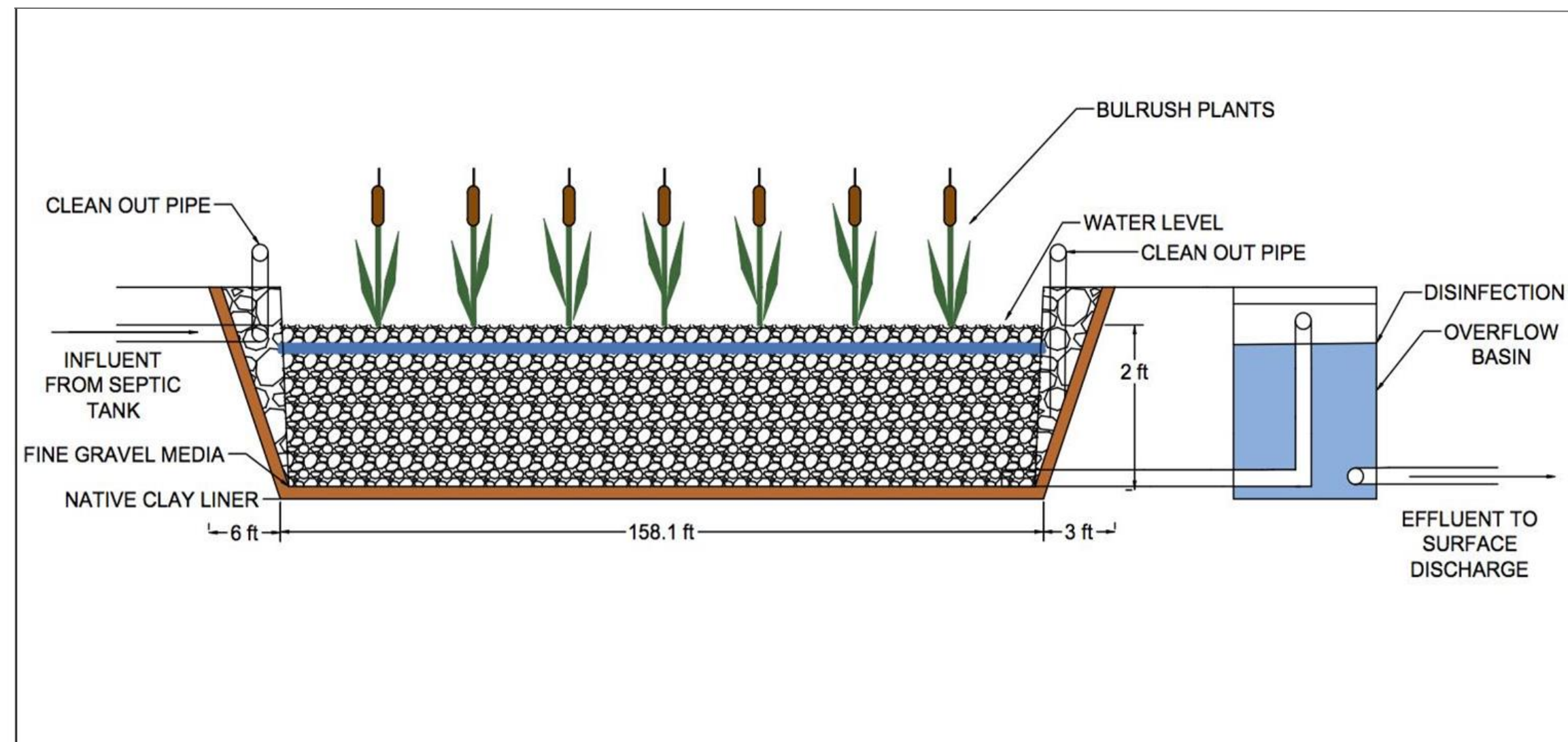
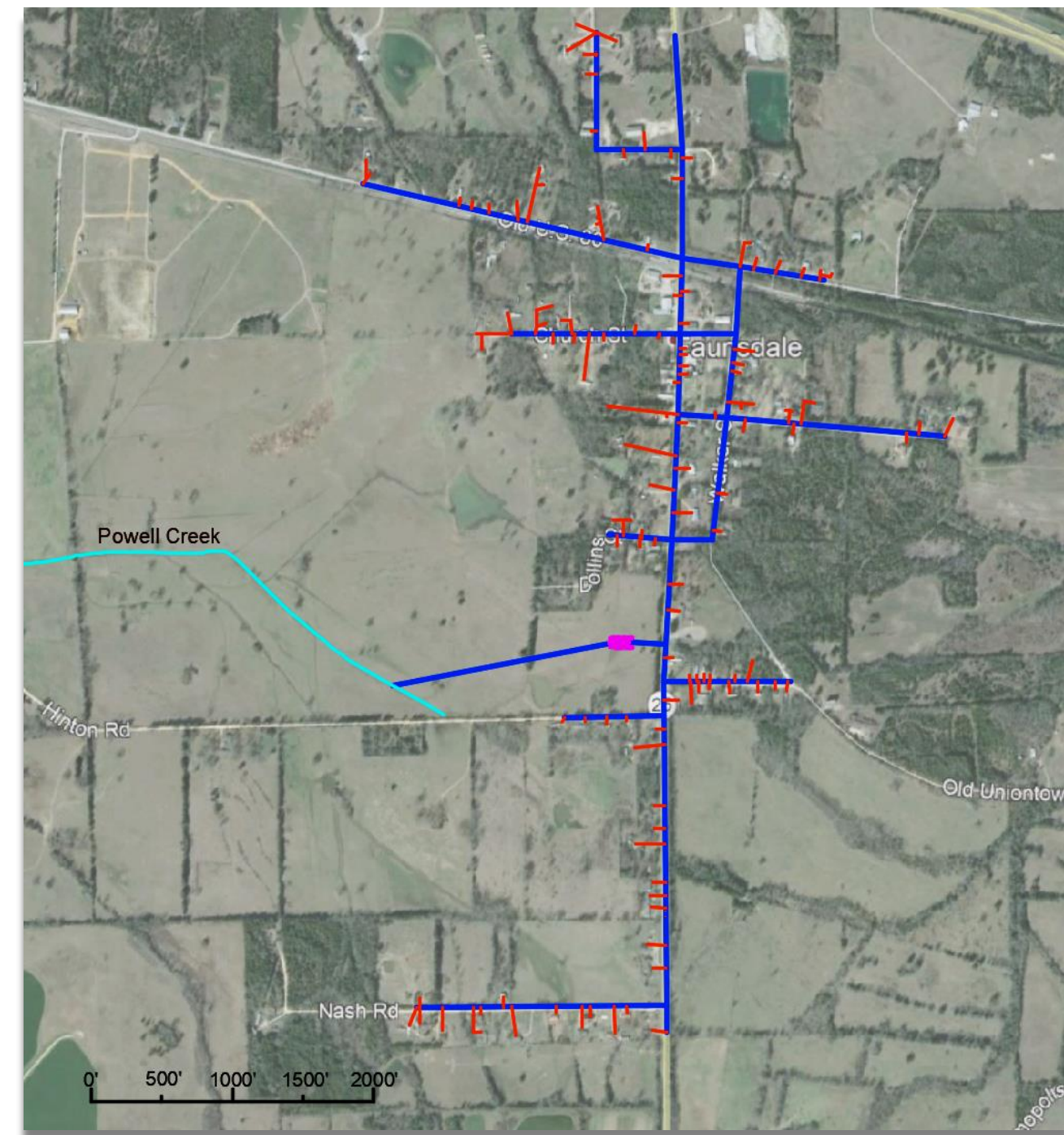
Decision Matrix

	Treatment System	Capital Cost	O&M Cost	Social Acceptance	Effluent Quality	Life-span	Operation Expertise	Sum
Decentralized	Aerobic	2	2	5	5	2	3	21
	Septic to Lagoon to Drain Field	2	3	3	5	5	5	25
	Biodigesters	4	3	4	5	1	1	22
	Recirculating sand filter	4	2	2	5	3	2	22
	Septic to Constructed Wetlands to Surface Discharge	5	5	4	5	3	5	32
On-Site	Septic System with Improved Drain Field	2	5	5	3	3	5	25
	Outhouse	4	5	1	3	5	2	24
	Compost Toilet System	3	5	2	3	5	3	24

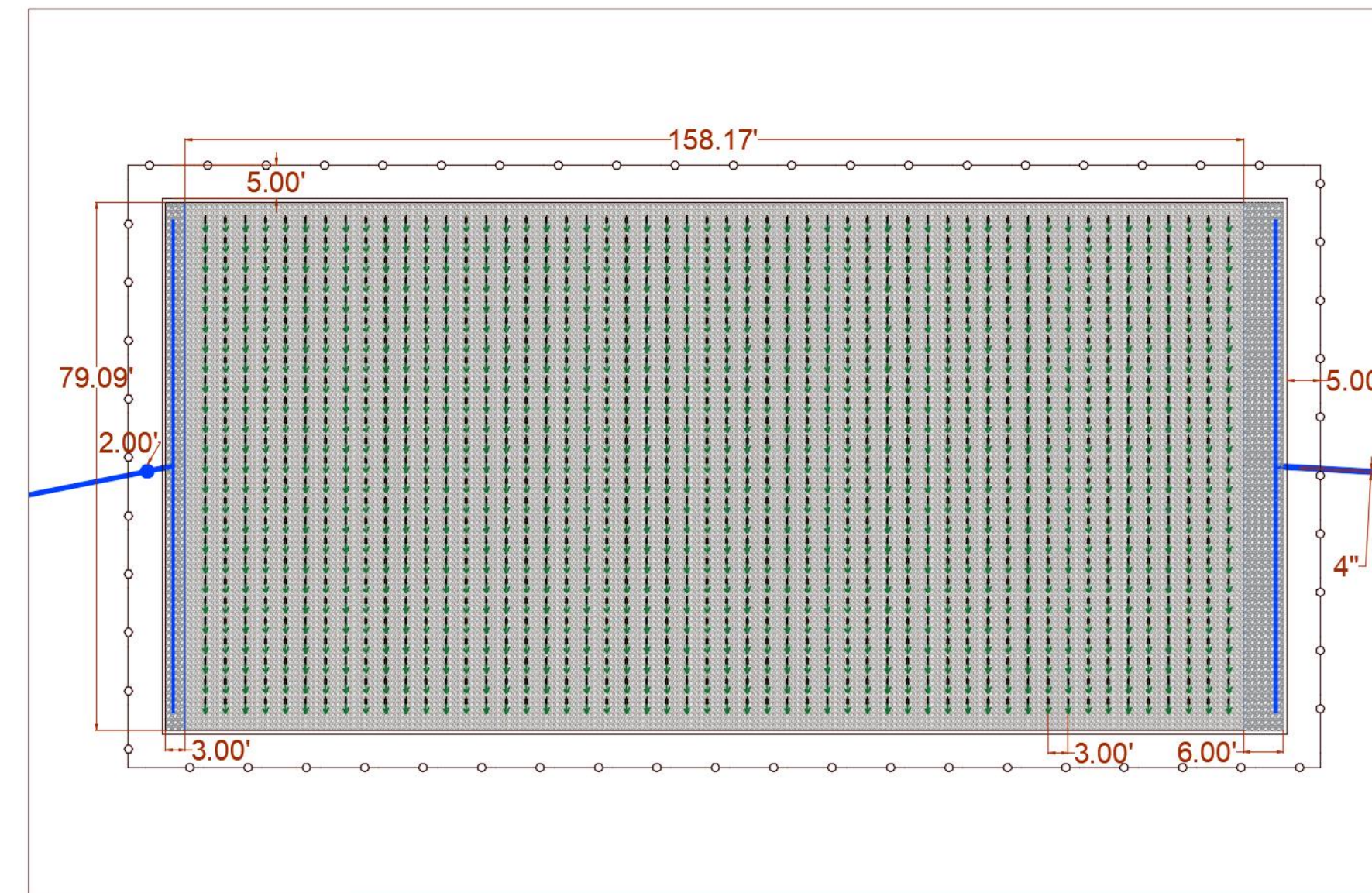
On-site Design Solution



Decentralized Design Solution



	Project:	Capstone Design	Topic:	Decentralized Wastewater
	Site:	Marengo County, Alabama	View:	Section View
	Customer:	US EPA - Region 4	Description:	
	Drawn by:	Claire Townsend		
	Date:	March 1, 2019		



	Project:	Capstone Design	Topic:	Decentralized Wastewater
	Site:	Marengo County, Alabama	View:	Overhead View
	Customer:	US EPA - Region 4	Description:	
	Drawn by:	Christina Phillips		
	Date:	April 9, 2019		

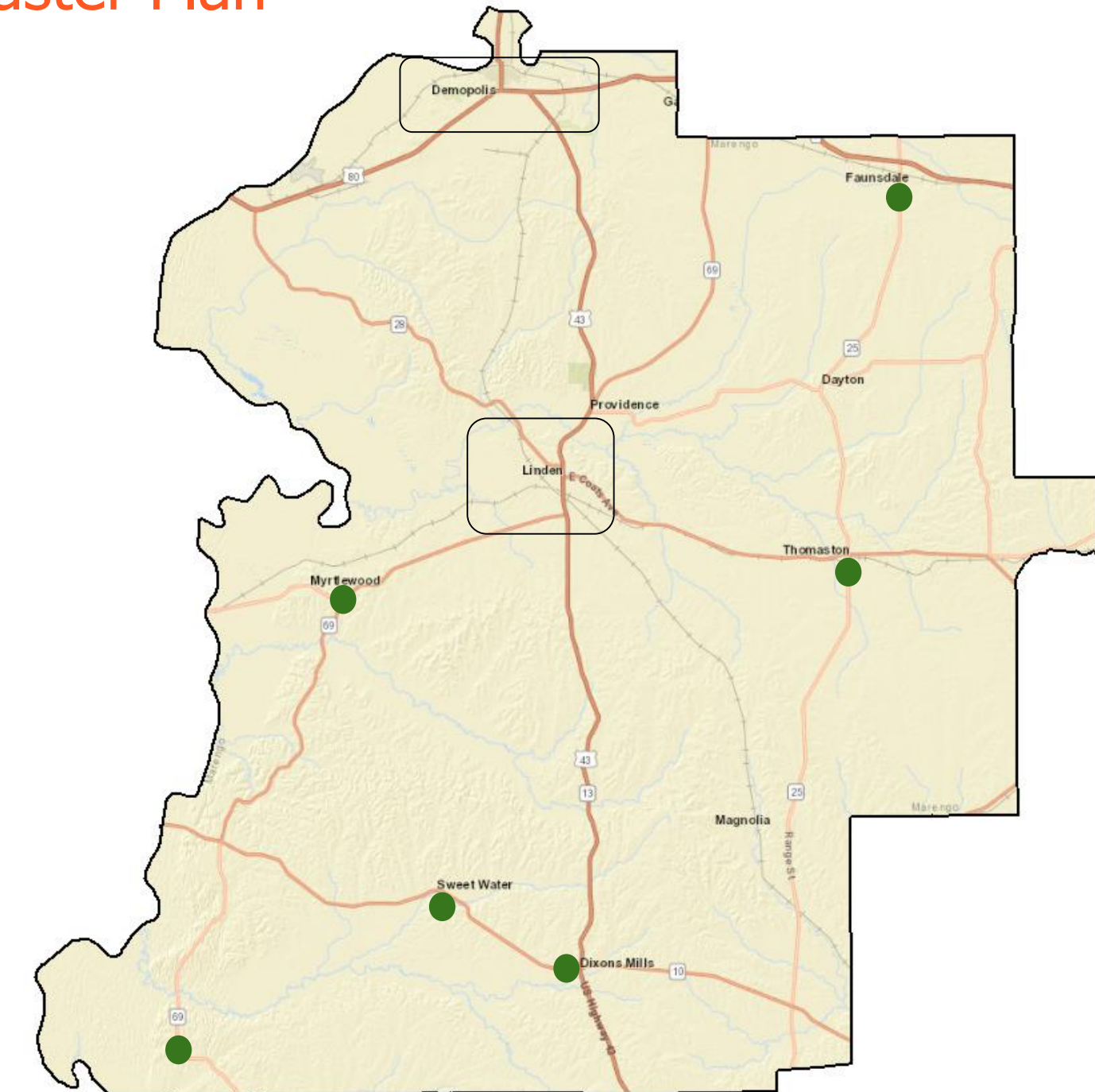
Regulatory Suggestions

1. Separation of blackwater and greywater
 - Surface discharge for homes that are remote and have poor soil
2. Surface discharge for systems between 4,500 gpd and 15,000 gpd

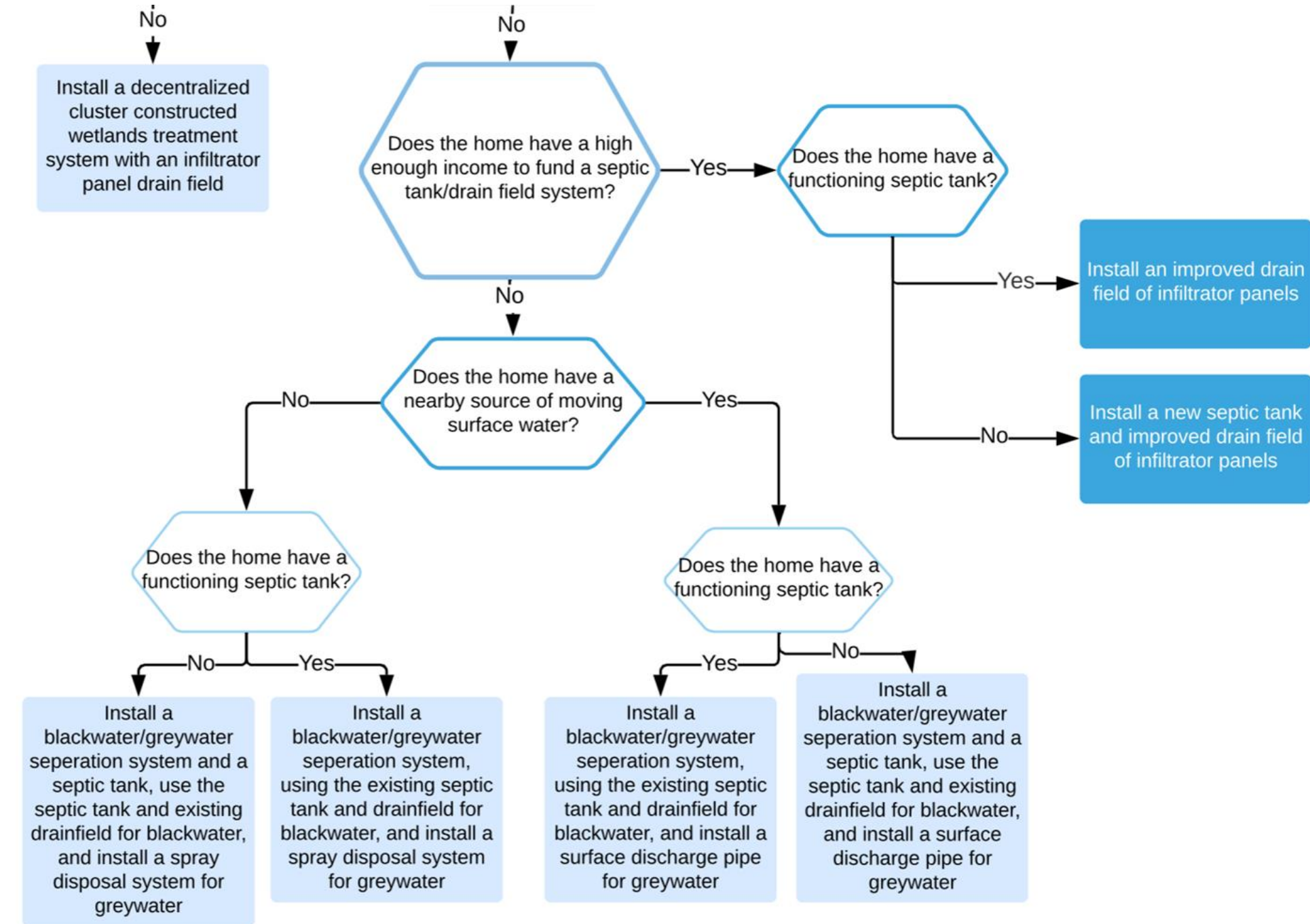
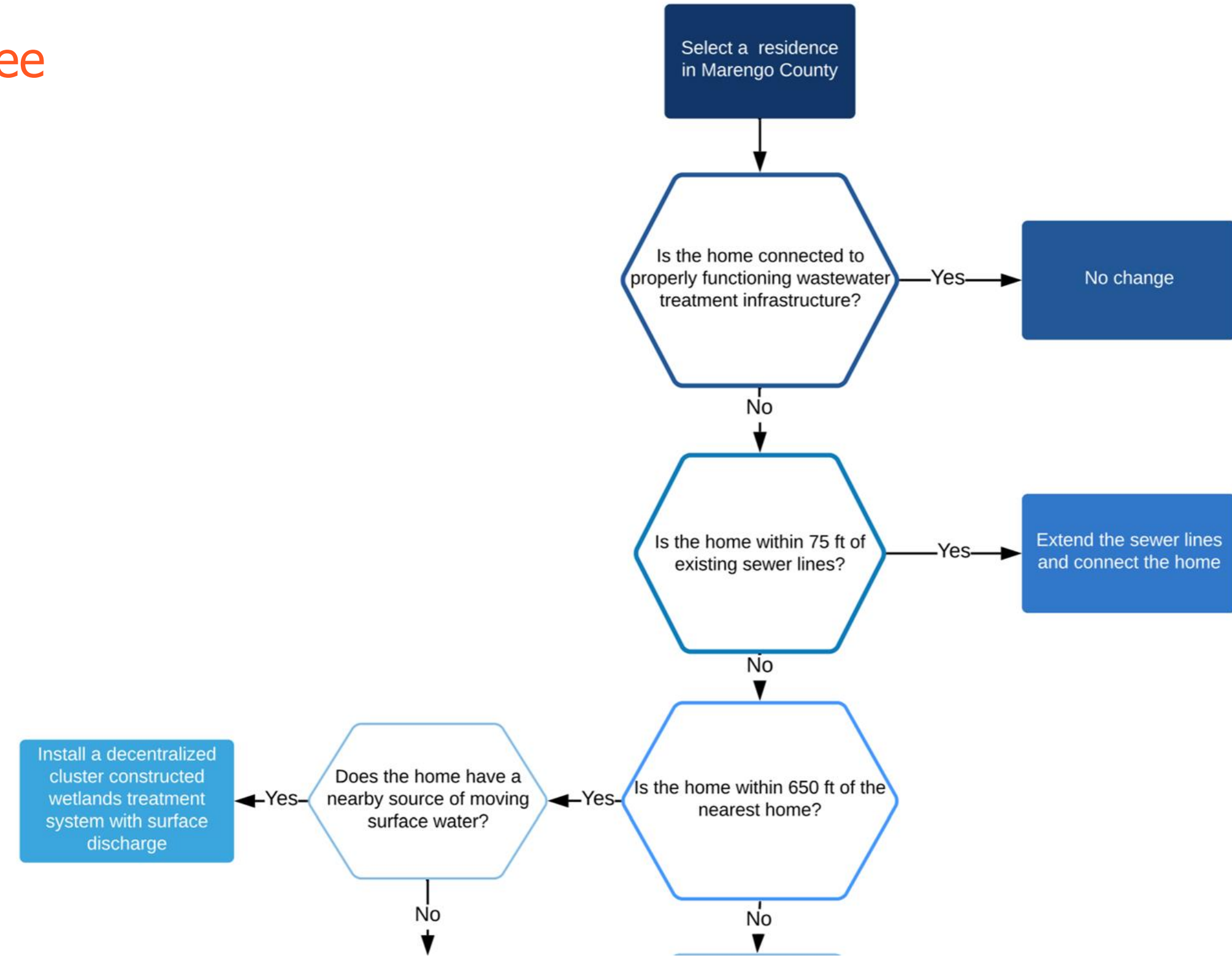
Cost Estimate

Wetlands Overview				
Description	Qty	Unit	Unit Cost	Extension
1. Mobilization	1	LS	\$31,750.00	\$ 31,750.00
2. 4" Class 200 PVC Force Main	55,000	LF	\$7.50	\$ 412,500.00
3. 2" Class 200 PVC Force Main	27,500	LF	\$4.50	\$ 123,750.00
4. STEP Assembly	125	EA	\$3,000.00	\$ 375,000.00
6. STEP Assembly Connection to Mainline	125	EA	\$700.00	\$ 87,500.00
7. Electrical	1	LS	\$54,788.96	\$ 54,788.96
8. Security Fencing	537	LF	\$25.00	\$ 13,425.00
9. Roadway Stone	300	TN	\$60.00	\$ 18,000.00
10. Seeding & Mulching	1	LS	\$15,975.00	\$ 15,975.00
11. Erosion Control	1	LS	\$5,974.50	\$ 5,974.50
12. Wetland Construction	1	LS	\$72,129.00	\$ 72,129.00
Subtotal Construction			\$	1,210,792.46
10% Construction Contingency			\$	121,079.25
Equipment			\$	25,000.00
Boundary & Topographic Survey			\$	8,018.00
Wetland Delineation			\$	5,018.00
ADEM Stormwater Permitting and Monitoring			\$	7,500.00
ADEM NPDES Permit Modification			\$	15,000.00
Engineering Design (6.58% based on USDA Fee)			\$	79,670.14
Resident Project Representative			\$	50,406.00
Total Estimated Project Cost - Town of Faunsdale			\$	1,522,483.85

Master Plan



Decision Tree

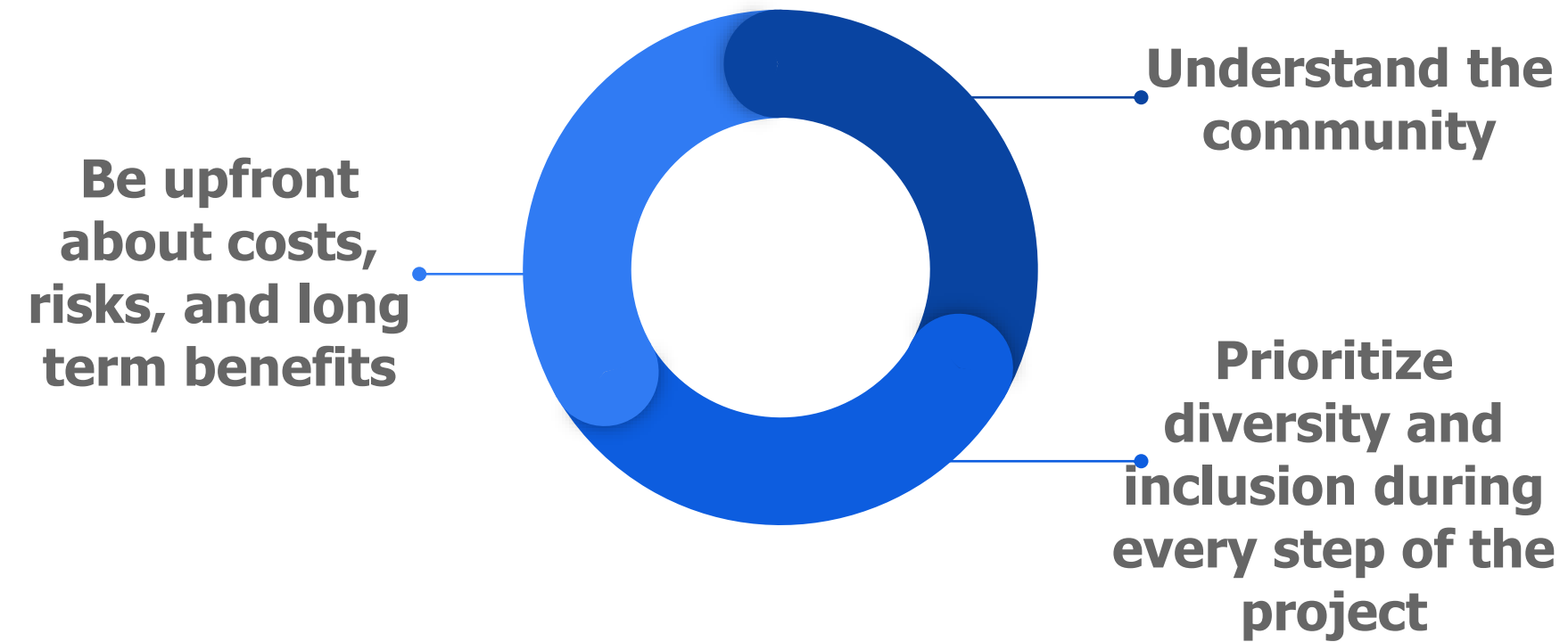


Funding Plan (USDA)

Jack Water Systems Inc.		
Total Loan	Total Grant	Number of People
\$675,000	\$507,000	1,138
Wilcox County Water Authority		
Total Loan	Total Grant	Number of People
\$2,065,000	\$5,905,738	1,868

Average Loan Per Person	Average Grant Per Person
\$911.51	\$2,133.31

Community Involvement



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Tiger Engineers for Rural Counties

DONUTS WITH DEVIN

Come join lead project engineer, Devin Owen, for donuts and conversation surrounding your new wastewater treatment system!

FIRST SATURDAY OF THE MONTH
May 2019- May 2020

Be a part of the conversation surrounding Marengo's improved wastewater infrastructure plan. Share your perspective and be updated on the progress of the project during every step.

(555) 867-5309

