

RECONNAISSANCE SOIL & SITE EVALUATION

Alston Road
Chatham County, NC

Prepared For:

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Prepared By:



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November 23, 2015



INTRODUCTION & SITE DESCRIPTION

A Reconnaissance Soil & Site Evaluation was performed on an approximately 19-acre tract located on the east and west side of Alston Road in Chatham County, NC (PIN: 0703-23-3506.000). Thompson Environmental Consulting (TEC) was retained to identify areas that are suitable for placement of on-site subsurface septic systems for two four-bedroom single-family residences and a dog kennel with 8 employees. The property was evaluated in accordance with North Carolina statutes for waste disposal ("Laws and Rules for Sewage Treatment and Disposal Systems", amended June 2011).

The study area consists of open pasture, woods, and timbered areas. Numerous mechanical ruts were observed in the timbered areas. A gully was located in the middle of the parcel. The parcel was previously permitted for two subsurface septic systems in by Chatham County Environmental Health (CCEH) and their locations shown on the attached figure.

INVESTIGATION METHODOLOGY

Soil borings were advanced with a hand-auger and soil color was determined with a Munsell Soil Color Chart. Observations of the landscape (slope, drainage patterns, etc.) as well as soil properties (depth, texture, structure, soil wetness, restrictive horizons, etc.) were recorded. Each soil boring was located in the field using a hand-held GPS unit with sub-meter accuracy and marked with red flagging.

FINDINGS

The field survey was conducted on November 16, 2015, by John C. Roberts, LSS #1292 and Evan Morgan, SSIT. Thirty-four (34) soil borings were advanced, logged, and their locations noted on Figure 1. Detailed soil boring descriptions are attached.

Soil borings 2, 5, 6, 14, 16, 19, 20, 22, 26, and 28 were rated as Provisionally Suitable for Pretreated Subsurface Drip Systems. These soils typically exhibited very friable or friable, sandy loam, sandy clay loam, or loam textured surfaces with weak, medium, granular structure or subangular blocky and ranged in depth from 4 to 16 inches. Subsurface horizons exhibited a firm, clay or sandy clay loam texture with weak, medium, subangular blocky structure ranging in depth from 14 to 20 inches. The limiting factor was depth to soil wetness, massive soil structure and expansive clay mineralogy.

The remaining soil borings were rated as Potentially Suitable for Surface Drip Systems due to soil wetness, massive structure, and expansive clay mineralogy occurring within 12 inches of the existing soil surface. Unsuitable landscape features were noted throughout the study area that included gullies and mechanical ruts.

DISCUSSION

Ten (10) borings were rated as Provisionally Suitable for Pretreatment Subsurface Drip Systems. These borings typically occurred on gently sloping, linear landscape positions. Usable soil depths varied over short distances to the extent that a homogenous soil unit could

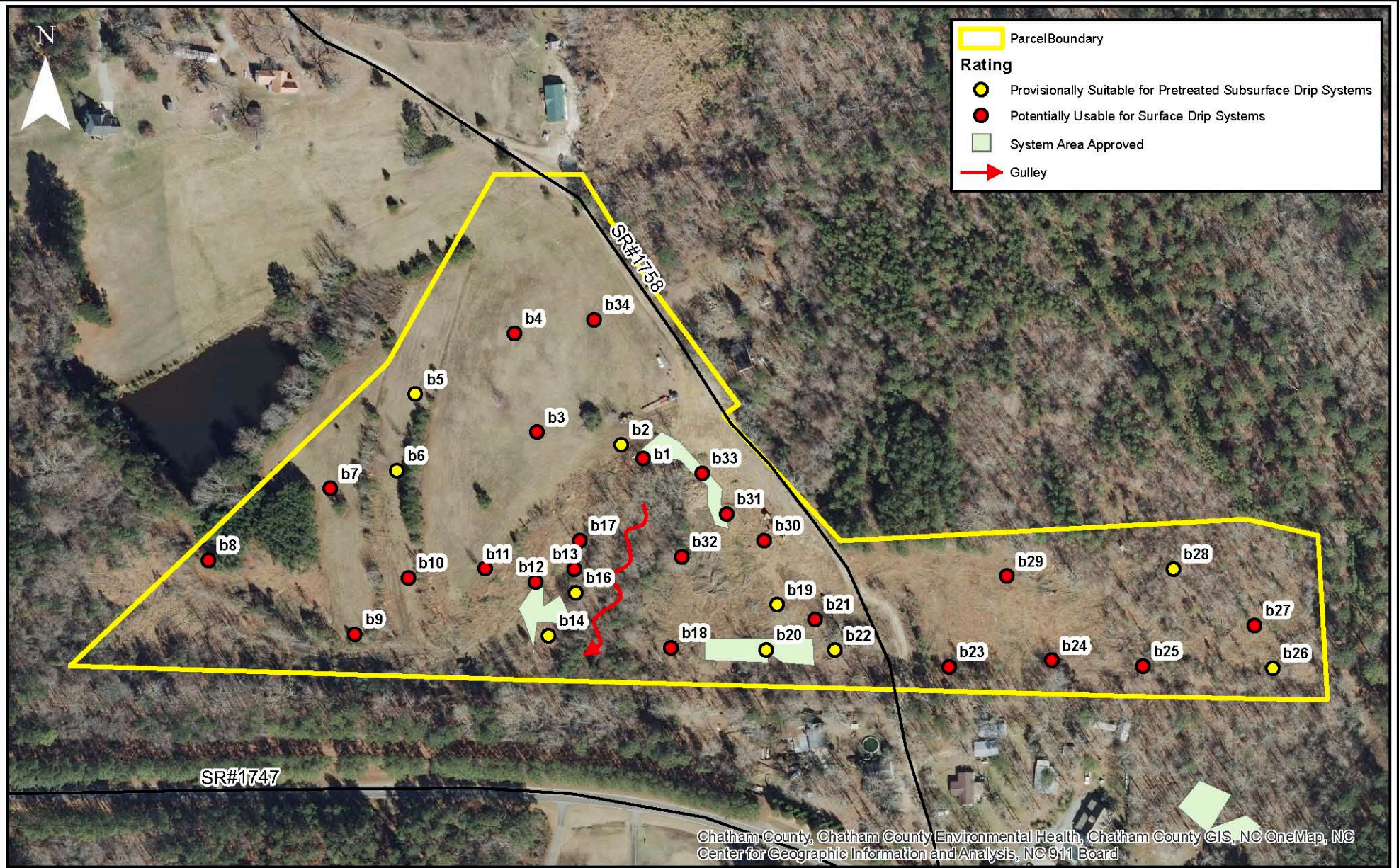
not be mapped. The logging operation that occurred on this parcel has had a significant detrimental impact on the previously permitted septic areas (Figure 1). Compaction by mechanical equipment has caused water to perch within the areas and mutilated the surface topography to the extent the areas can no longer be utilized for subsurface wastewater application.

The majority of soil borings are deemed unsuitable for any type subsurface septic system and rated as Potentially Suitable for Surface Drip Systems. Surface drip wastewater application systems can be utilized on soils deemed unsuitable for subsurface disposal and appears to be the only viable option for this site. State regulations require a minimum separation of 12 inches from the soil surface to a perched water table, 18 inches to an apparent water table, and a 50 foot setback from property lines for surface drip disposal systems. Sandy textured soil cover will likely need to be placed over any proposed surface application area in order to meet the minimum separation distance to the perched water table. It is anticipated that 25,000 to 30,000 ft² would be required to support a surface drip application system for a four bedroom home. Additional work would need to be completed to determine the exact area requirement that would include saturated hydraulic conductivity (K_{SAT}) measurements and a water balance based on the site specific climatic observations. Lastly, all surface drip systems require a Professional Engineer to design the systems storage and mechanics.

CONCLUSIONS

The findings presented herein represent TEC's professional opinion based on our Reconnaissance Soil and Site Evaluation and knowledge of the current laws and regulations governing on-site wastewater systems in North Carolina. The site is dominated by soils exhibiting unsuitable soil characteristics within 12 inches of the surface. As such, a surface drip disposal system is likely the only feasible wastewater application option for this site. Additional work will need to be performed to determine the exact soil area required to support the proposed number of homes and commercial facility. Any surface disposal area will likely require a sandy soil cover to maintain the required minimum separation from the soil surface to the perched water table.

Soils naturally change across a landscape and contain many inclusions. As such, attempts to quantify them are not always precise and exact. Due to this inherent variability of soils and the subjectivity when determining limiting factors, there is no guarantee that a regulating authority will agree with the findings of this report.



Soil Evaluation Form

Three Oaks Engineering|The Catena Group
1000 Corporate Drive, Suite 101
Hillsborough, NC 27278
919.732.1300

Sheet 1 of 4
Job: 7683 Chatham Wastewater
County: Chatham
Date: 11-16-15

Soil Borings

	1	2	3	4	5	6	7	8	9	10
Landscape Position										
Slope (%)										
Horizon 1 Depth	5	12	4	4	16	14	3	8	8	4
Texture	L	SL	SL	SL	SCL	SL	SL	SL	SC	SL
Consistence	VFR	VFR	VFR	VFR	FR	VFR	VFR	FR	FR	FR
Structure	SBK	SBK	SBK	SBK	SBK	SBK	SBK	SBK	SBK	SBK
Clay Mineralogy	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Horizon 2 Depth	SL	16	12	12	14	14	6	16	12	14
Texture	IO	SCL	C	C	C	SCL	SCL	SCL	C	C
Consistence	FI	FI	VFI	VFI	FI	FR	FR	FI	VFI	VFI
Structure	SBK	SBK	OM	OM	OM	SBK	SBK	SBK	OM	OM
Clay Mineralogy	SE	SE	E	E	E	SE	SE	E	E	E
Horizon 3 Depth	10+	24+					14+			
Texture	SCL	C					C			
Consistence	FI	VFI					VFI			
Structure	SBK	OM					OM			
Clay Mineralogy	SE	E					E			
Horizon 4 Depth										
Texture										
Consistence										
Structure										
Clay Mineralogy										
Horizon 5 Depth										
Texture										
Consistence										
Structure										
Clay Mineralogy										
Soil Wetness	10					19				
Restrictive Horizon		16	12	12	16		6	8	8	4
Saprolite										
Other										
CLASSIFICATION	u	U/PS-Drip	u	ce	U/PS-Drip	U/PS-Drip	u	u	u	u
LTAR (gpd/ft ²)										

Comments:

Evaluated by : JCR

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Sheet 2 of 4

Job: 7683 Chatham Wastewater

County: Chatham

Date: 11-16-15

Soil Borings

	11	12	13	14	15	16	17	18	19	20
Landscape Position										
Slope (%)										
Horizon 1 Depth	8	12	12	13	8	12	8	11	12	13
Texture	SL	SL	SL	SL	SL	SL	SL	SL	SL	SL
Consistence	FR	FR	FR	FR	FR	FR	FR	FR	FR	FR
Structure	SBR	SBR	SBR	SBR	SBR	SBR	SBR	SBR	SBR	SBR
Clay Mineralogy	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Horizon 2 Depth	20	14	14	16	11	18	11	14	24	16
Texture	C	C	C	C	C	SCL	C	C	SCL	C
Consistence	VFI	VFI	VFI	VFI	VFI	FI	VFI	VFI	FI	VFI
Structure	OM	OM	OM	OM	OM	SBR	OM	OM	SBR	OM
Clay Mineralogy	E	E	E	E	E	SE	E	E	SE	E
Horizon 3 Depth						18				
Texture						C				
Consistence						VFI				
Structure						OM				
Clay Mineralogy						E				
Horizon 4 Depth										
Texture										
Consistence										
Structure										
Clay Mineralogy										
Horizon 5 Depth										
Texture										
Consistence										
Structure										
Clay Mineralogy										
Soil Wetness		12	12					11	18	
Restrictive Horizon	8	12	12	13	8	18	8	11		13
Saprolite										
Other										
CLASSIFICATION	u	u	u	u/PS-Drip	u	u/PS-Drip	u	u	u/PS-Drip	u/PS-Drip
LTAR (gpd/ft ²)										

Comments:

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Sheet 3 of 4

Job: 7683 Chatham wastewater

County: Chatham

Date: 11-16-15

Soil Borings

	21	22	23	24	25	26	27	28	29	30
Landscape Position										
Slope (%)										
Horizon 1 Depth	8	14	2	11	10	5	8+	4	6	6
Texture	SL	SL	SL	SL	SCL	SL	SCL	L	SL	SL
Consistence	VFR	VFR	VFR	VFR	FR	VFR	VFR	VFR	VFR	VFR
Structure	SBK	SBK	SBK	SBK	SBK	SBK	SBK	SBK	SBK	SBK
Clay Mineralogy	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Horizon 2 Depth	11	19	13	14	14	14	12	20	12	10
Texture	C	SCL	SCL	C	C	SCL	C	CL	C	C
Consistence	VFI	VFI	VFI	VFI	VFI	FI	VFI	FI	VFI	VFI
Structure	OM	SBK	OM	OM	OM	SBK	OM	OM	OM	OM
Clay Mineralogy	E	SE	E	E	E	SE	E	SE	E	E
Horizon 3 Depth						18+				
Texture						C				
Consistence						VFI				
Structure						OM				
Clay Mineralogy						E				
Horizon 4 Depth										
Texture										
Consistence										
Structure										
Clay Mineralogy										
Horizon 5 Depth										
Texture										
Consistence										
Structure										
Clay Mineralogy										
Soil Wetness	11	17					8		10	9
Restrictive Horizon			10	11	10	18	8	20	6	6
Saprolite										
Other										
CLASSIFICATION	U	U/PS-Drip	U	U	U	U/PS-Drip	U	U/PS-Drip	U	U
LTAR (gpd/ft ²)										

Comments:

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Sheet 4 of 4
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Soil Borings

	31	32	33	34					
Landscape Position									
Slope (%)									
Horizon 1 Depth	6	11	6	6					
Texture	SL	SL	SL	SL					
Consistence	UFR	UFR	VFR	VFR					
Structure	SBK	SBK	SBK	SBK					
Clay Mineralogy	SE	SE	SE	SE					
Horizon 2 Depth	8 ⁺	11 ⁺	12 ⁺	10 ⁺					
Texture	C	C	C	C					
Consistence	VFI	VFI	VFI	VFI					
Structure	OM	OM	OM	OM					
Clay Mineralogy	E	E	E	E					
Horizon 3 Depth									
Texture									
Consistence									
Structure									
Clay Mineralogy									
Horizon 4 Depth									
Texture									
Consistence									
Structure									
Clay Mineralogy									
Horizon 5 Depth									
Texture									
Consistence									
Structure									
Clay Mineralogy									
Soil Wetness	6	11	10	8					
Restrictive Horizon									
Saprolite									
Other									
CLASSIFICATION	u	u	u	u					
LTAR (gpd/ft ²)									

Comments:

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