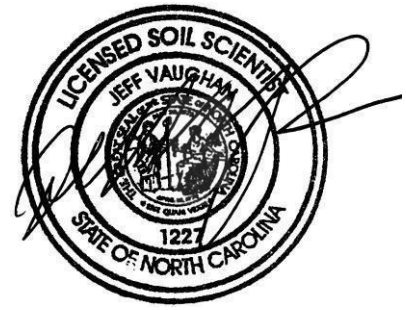




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Soil Suitability for Domestic Sewage Treatment and Disposal Systems

Fred Burns Rd.
Holly Springs,
NC 27540

Harnett County PIN: 0625-65-7785.000

Prepared For:	Alex Freeman, Client
Prepared By:	Jeff Vaughan, Ph.D., L.S.S. Senior Agronomist/Soil Scientist Brent Purdum, Assistant Soil Scientist
Report Date:	March 15, 2023



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Soil Suitability for Domestic Sewage Treatment and Disposal Systems Fred Burns Rd. Holly Springs, NC 27540

PREPARED FOR: Alex Freeman, Client

PREPARED BY: Jeff Vaughan
Brent Purdum

DATE: March 15, 2023

Soil suitability for domestic sewage treatment and disposal systems was evaluated on March 14, 2023, for property located at Fred Burns Rd. (PIN: 0625-65-7785.000). Brent Purdum, of Agri-Waste Technology, Inc. (AWT) conducted the soil evaluation. The detailed soil evaluation of the land area will follow. Property reference maps are in Attachment 1. A review of the soil and landscape characteristics that dictate soil suitability for domestic sewage treatment and disposal systems can be found in Attachment 2.

Approximately 1.3 acres of the property were evaluated. The property is in a wooded area with mature trees. (Attachment 1).

Soil Suitability for Domestic Sewage Treatment and Disposal Systems

The aerial map in Attachment 1 details the approximate property boundaries, soil boring locations, soil types, and soil areas for septic systems. Numerous soil borings were advanced on the property (Attachment 1). A portion of the property contained drainage features, complex topography, and/or unsuitable soils and, thus, are unsuitable for septic systems. However, this evaluation was merely a preliminary review to determine what potential this land might have for domestic sewage treatment and disposal systems. Therefore, specific types of septic systems, exact locations of future drainfields and repair areas, plus buffers from property lines (current and potential future lot lines), building foundations, wells, etc. are not fully considered. These things will need to be more fully considered as the plans develop for the potential future of this site. It is possible that additional soil evaluations will be required once lot layouts are considered and developed for this property so that septic system types and the location of a septic drainfield can be more fully and appropriately considered.

One area (see map in Attachment 1) evaluated on the property exhibited soil characteristics and soil depths (24" or greater) that are provisionally suitable for conventional trench or drip septic systems.

Typical profile descriptions of the provisionally suitable soil for this property are in Attachment 4. One distinct soil profile was observed in the soil borings on the property: a deep reddish subsoil with parent material.

The provisionally suitable soil borings had the following characteristics. No restrictive horizons were found in any provisionally suitable soil borings within 24" of the soil surface. Soil texture was provisionally suitable and was estimated to be sandy loam near the soil surface (A horizons) and clay in the subsoil (B horizons). Soil structure was provisionally suitable and was estimated to be granular near the soil surface (A horizons) and subangular blocky in the subsoil (B horizons). Clay mineralogy was provisionally suitable with very friable to firm moist soil consistence and non-sticky to sticky and non-plastic to plastic wet soil consistence.

The predominantly mapped soil type on this property is a Cecil fine sandy loam. The Harnett County Soil Survey indicates that moderate limitations exist for septic systems installed in these soil types (Attachment 4).

The land area required for a shallow conventional septic system is calculated based on the size of the proposed home and the Long-Term Acceptance Rate (LTAR) of the soil. The LTAR range for the provisionally suitable soils on this property is 0.1 – 0.4 GPD/ft² for shallow conventional septic systems based on the most restrictive soil texture in the subsoil. The LTAR suggested by AWT is 0.275 GPD/ft², but the final LTAR for specific septic system types and septic drainfield locations will be set by the Wake County Health Department. The detailed computations are in Attachment 6. Typically, the area required for a septic system is 3,000 – 5,000 ft² (initial and repair) per bedroom.

Conclusions

Based on the results of this evaluation, the installation of conventional septic systems seems very probable on this property in the areas designated on the map in Attachment 1.

We appreciate the opportunity to assist you in this matter. Please contact us with any questions, concerns, or comments.



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Preliminary Soil Evaluation

Alex Freeman
Harnett Co., NC
PIN: 0625-65-7785.000



Area for Septic: _____

~55,308 sq.ft.

Soil Types: _____

CeB/CeD: Cecil fine sandy loam

- Parcel
- Parcel Buffer 10 ft.
- Road
- 2 ft. Contour

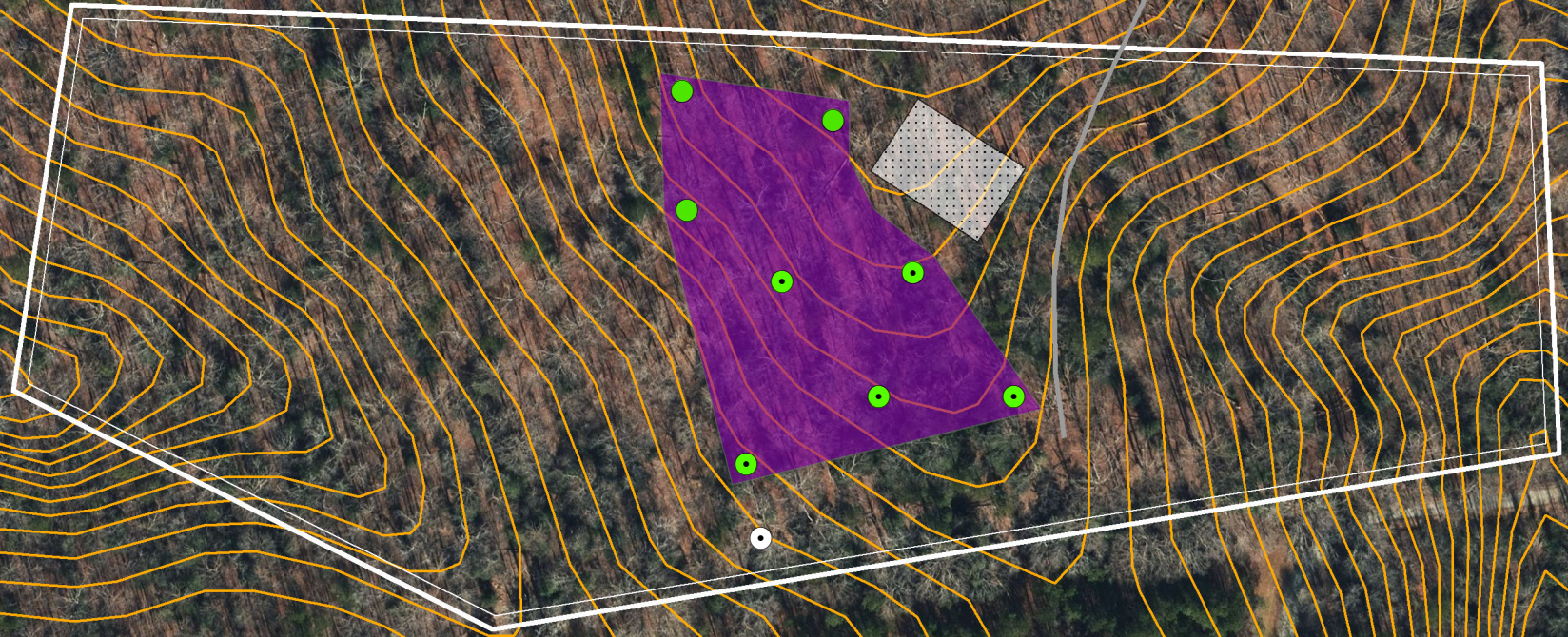
Evaluation Area

- Potential House Location
- Area for Septic

Soil Boring Depth (in.)

- <12"
- 30-35"
- 36"+

Drawn By: William Snoeyink
Reviewed By: Brent Purdum
Date: 3/14/2023





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Area for Septic: _____

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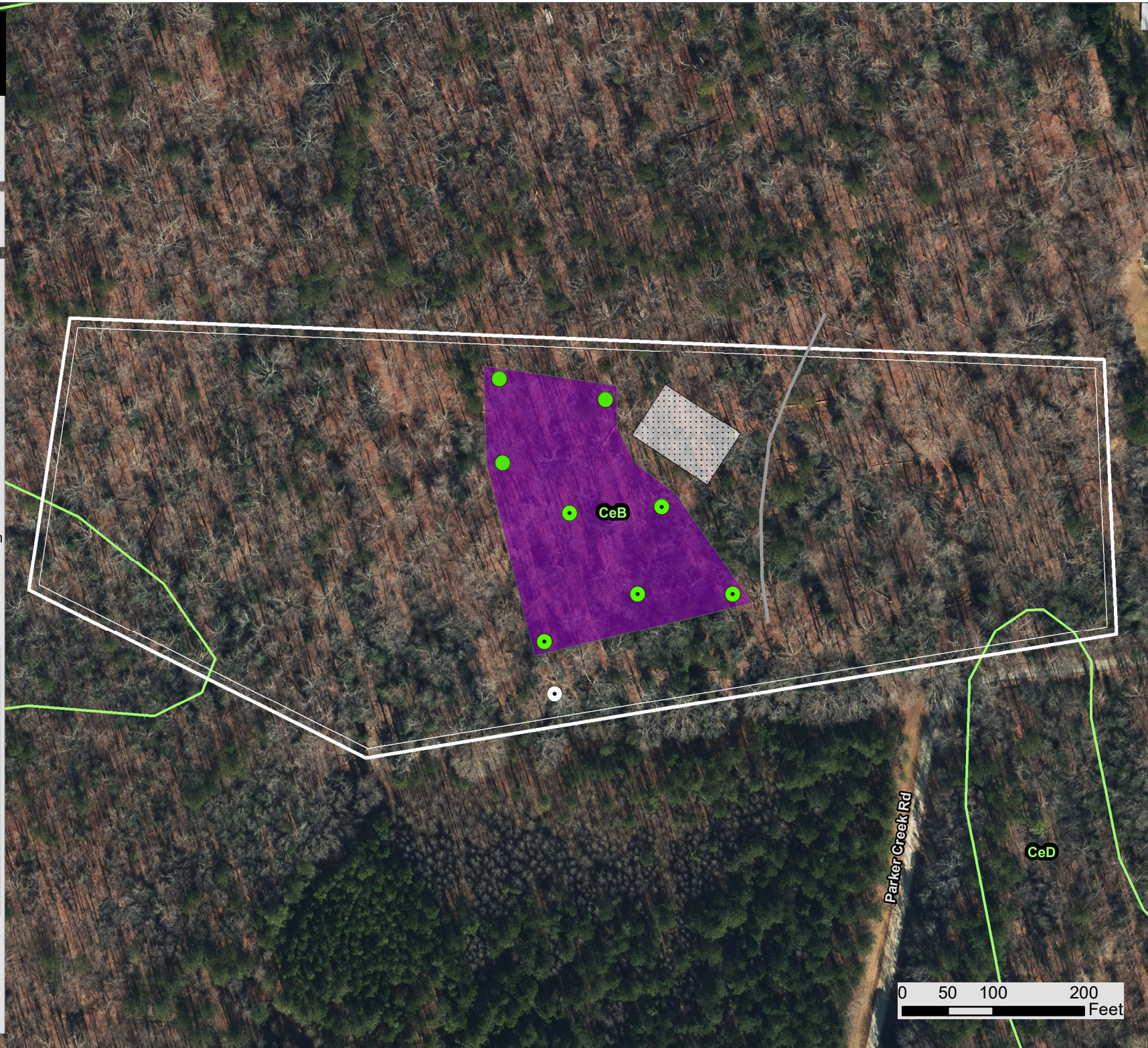
Evaluation Area

- Potential House Location
- Area for Septic

Soil Boring Depth (in.)

- <12"
- 30-35"
- 36"+

Drawn By: William Snoeyink
Reviewed By: Brent Purdum
Date: 3/14/2023



0 50 100 200
Feet

Surface water and/or bad topo areas have not been officially evaluated for stream ID according to local regulatory requirements. This map is intended for preliminary purposes only and not to be used as a plat/survey or can it be assumed all streams are identified on this property.

Property ID#: 0625-65-7785.000
Property Recorded: _____
County: Harnett

**SOIL/SITE EVALUATION
FOR
ON-SITE WASTEWATER SYSTEM**

Applicant: Alex Freeman
Address: 300 Ramblewood Dr. Raleigh, NC 27540

Owner: _____ Agent: _____ Phone: _____
Date Evaluated: March 14, 2023
Proposed Facility: Residential
Property Size: 10.28 acres (1.3 evaluated)

Location Site: Fred Burns Rd. Holly Springs, NC 27540

Water Supply: On Site Well ☐ Comm. Well ☐ Public ☐ Other ☒ Evaluation Method: Auger Boring ☒ Pit ☐ Cut ☐

TYPICAL PROFILE

Horizon/ Depth (IN)	Matrix	Mottles	Mottle Abundance / Contrast	(a)(1) Texture	(a)(2) Structure	(a)(3) Minerology	Consistence Wet	Consistence Moist
Ap 0-8"	10YR 4/4	None	None	SL	GR	NEXP	NS, NP	Vfr
Bt1 8-30"	10R 4/8	None	None	C	SBK	SEXP	S, P	Fr
Bt2 30-36+"	10R 4/8	5YR 5/8	None	C	SBK	SEXP	S, P	Fi

.1940 Landscape Pos/Slope %	- Suitable, <15%	Profile LTAR	- 0.4 – 0.1 GPD/ft ²
.1942 Wetness Condition	- Suitable	System Type	- Provisionally suitable for shallow conventional systems due to texture, structure, and depth.
.1943/.1956 Saprolite	- Suitable		
.1944 Restrictive Horizon	- Suitable		
.1948 Profile Classification	- Provisionally suitable		

Comments:

EVALUATED BY: Brent Purdum

COMMENTS: _____

LEGEND OF ABBREVIATIONS FOR SITE EVALUATION FORM

<u>LANDSCAPE POSITION</u>	<u>TEXTURE GROUP</u>	<u>TEXTURE CLASS</u>	<u>.1955 LTAR</u> (gal/day/sqft)
CC - Concave Slope CV - Convex Slope DS - Debris Slump D - Depression DW - Drainage Way FP - Flood Plain FS - Foot Slope H - Head Slope I - Interflueve L - Linear Slope N - Nose Slope P - Pocosin R - Ridge S - Shoulder T - Terrace	I II III IV	S - Sand LS - Loamy Sand SL - Sandy Loam L - Loam SCL - Sandy Clay Loam CL - Clay Loam SiL - Silt Loam Si - Silt SiCL - Silt Clay Loam SC - Sandy Clay C - Clay SiC - Silty Clay O - Organic	1.2 - .08 0.8 - 0.6 0.6 - 0.3 0.4 - 0.1
<u>STRUCTURE</u>	<u>MOIST CONSISTENCE</u>	<u>MOTTLES</u>	<u>WET CONSISTENCE</u>
G - Single Grain M - Massive CR - Crumb GR - Granular SBK - Subgranular Blocky ABK - Angular Blocky PL - Platy PR - Prismatic	Vfr - Very Friable Fr - Friable Fi - Firm Vfi - Very Firm Efi - Extremely Firm	1 - Few 2 - Common 3 - Many F - Faint D - Distinct P - Prominent f - Fine m - Medium c - Coarse	NS - Non Sticky SS - Slightly Sticky S - Sticky VS - Very Sticky NP - Non Plastic SP - Slightly Plastic P - Plastic VP - Very Plastic

TABLE 10.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AnB----- Alpin	Slight-----	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
AtA----- Altavista	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness, too clayey.
Au----- Augusta	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
AyA----- Aycock	Severe: percs slowly.	Moderate: seepage, wetness.	Moderate: too clayey.	Slight-----	Fair: too clayey.
AyB----- Aycock	Severe: percs slowly.	Moderate: seepage, slope, wetness.	Moderate: too clayey.	Slight-----	Fair: too clayey.
Bb----- Bibb	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
BnB----- Blaney	Severe: percs slowly, poor filter.	Severe: seepage.	Slight-----	Severe: seepage.	Good.
BnD----- Blaney	Severe: percs slowly, poor filter.	Severe: seepage, slope.	Moderate: slope.	Severe: seepage.	Fair: slope.
CaB----- Candor	Slight-----	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
CaD----- Candor	Moderate: slope.	Severe: seepage, slope.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
CeB----- Cecil	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey, hard to pack.
CeD----- Cecil	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope, hard to pack.
Ch*: Chewacla-----	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.

See footnote at end of table.

Conventional Septic System Area Computation

Created by: JV
Created on: 6/20/2001
Updated on: 8/16/2022

Client Name: *Freeman, Alex*
Number Bedrooms: 3
Design Flow (gal/day): 360 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.225
Trench Bottom Area (ft²): 1600 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 533.3333

Minimum Field Area Required (ft²): 4800 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 3600 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 12000 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 9000 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 14400 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 10800 (25% reduction from above)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Client Name: *Freeman, Alex*
Number Bedrooms: 3
Design Flow (gal/day): 360 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.25
Trench Bottom Area (ft²): 1440 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 480

Minimum Field Area Required (ft²): 4320 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 3240 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 10800 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 8100 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 12960 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 9720 (25% reduction from above)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Client Name: *Freeman, Alex*
Number Bedrooms: 3
Design Flow (gal/day): 360 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.275
Trench Bottom Area (ft²): 1309.091 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 436.3636

Minimum Field Area Required (ft²): 3927.273 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 2945.455 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 9818.182 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 7363.636 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 11781.82 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 8836.364 (25% reduction from above)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Conventional Septic System Area Computation

Created by: JV
Created on: 6/20/2001
Updated on: 8/16/2022

Client Name: *Freeman, Alex*
Number Bedrooms: 4
Design Flow (gal/day): 480 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.225
Trench Bottom Area (ft²): 2133.333 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 711.1111

Minimum Field Area Required (ft²): 6400 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 4800 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 16000 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 12000 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 19200 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 14400 (25% reduction from above)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Client Name: *Freeman, Alex*
Number Bedrooms: 4
Design Flow (gal/day): 480 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.25
Trench Bottom Area (ft²): 1920 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 640

Minimum Field Area Required (ft²): 5760 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 4320 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 14400 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 10800 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 17280 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 12960 (25% reduction from above)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Client Name: *Freeman, Alex*
Number Bedrooms: 4
Design Flow (gal/day): 480 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.275
Trench Bottom Area (ft²): 1745.455 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 581.8182

Minimum Field Area Required (ft²): 5236.364 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 3927.273 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 13090.91 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 9818.182 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 15709.09 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 11781.82 (25% reduction from above)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Conventional Septic System Area Computation

Created by: JV
Created on: 6/20/2001
Updated on: Freeman, Alex

Client Name: *Freeman, Alex*
Number Bedrooms: 5
Design Flow (gal/day): 600 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.225
Trench Bottom Area (ft²): 2666.667 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 888.8889

Minimum Field Area Required (ft²): 8000 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 6000 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 20000 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 15000 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 24000 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 18000 (25% reduction from above)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Client Name: *Freeman, Alex*
Number Bedrooms: 5
Design Flow (gal/day): 600 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.25
Trench Bottom Area (ft²): 2400 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 800

Minimum Field Area Required (ft²): 7200 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 5400 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 18000 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 13500 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 21600 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 16200 (25% reduction from above)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Client Name: *Freeman, Alex*
Number Bedrooms: 5
Design Flow (gal/day): 600 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.275
Trench Bottom Area (ft²): 2181.818 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 727.2727

Minimum Field Area Required (ft²): 6545.455 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 4909.091 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 16363.64 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 12272.73 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 19636.36 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 14727.27 (25% reduction from above)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.