



Agri-Waste Technology, Inc.

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Soils & Site Evaluation Report – On-site Wastewater Systems

Kenneth Haggerty
Harnett County, NC
Nettie Weaver Road

Prepared for: Kenneth Haggerty, Client

Prepared by: Karl Shaffer, LSS
Senior Soil Scientist

Report date: May 10, 2018



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Agri-Waste Technology, Inc. (AWT) was contracted to perform a preliminary soils & site evaluation for a portion of the above named parcel in Harnett County, NC. Municipal water and wastewater services are not available at this property; therefore, on-site water (well) and wastewater (septic) will be required. Surrounding properties are served by on-site systems also; however, no significant setback adjustments are anticipated based on the location of their components. The following report and attachments summarize the findings of the evaluation performed by Karl Shaffer on May 9, 2018.

The subject property is approximately 30 acres in size. Only the section nearest the proposed dwelling was evaluated to assess its soil resources and potential for development with a home being served by on-site wastewater (septic) systems. The exact location of the soil borings can be found on the attached site and soils maps.

The following information describes the findings of the soil evaluation. The evaluated areas are in cleared fields. The areas evaluated have gentle sideslopes ranging from 4 to 8 percent.

Findings

The soils are formed in upper coastal plain sedimentary material. Topsoils are sandy with loamy sediments underlying the sand layers. The areas immediately adjacent to the proposed homesite were evaluated, as well as a section of a field area to the north. A 3-bedroom home is proposed for this property.

Please refer to the attached site maps. All discussion on septic system areas includes the space required for the repair area (all new septic permits have designed space for the primary-installed-septic system as well as a designated repair space for future use).

The soils in the field area adjacent to the proposed homesite, and north of the pond, are in the Noboco soils series. An attached soil description shows the average condition over this area. 9 soil borings were performed adjacent to the proposed homesite. These soils have the following general conditions:

Topsoil- loamy sand to a depth ranging from 12 to 30 inches
Subsoil – sandy clay loam (friable) to a depth over 44 inches
Depth to seasonal high water table- ranges from 32 to over 44 inches across this area
Other soil limitations: none

Site classification: suitable for conventional or shallow conventional septic systems

6 soil borings were performed downslope of the proposed homesite. This area encompasses approximately 10,000 square feet. You expressed the possibility of a garage building also in this area. Therefore, three additional borings were performed upslope of the proposed homesite for additional repair area, if needed.

For the proposed 3-bedroom home, using a LTAR of 0.30 GPD/Ft², 800 linear feet of septic trench at a 3-foot width is required. Using an accepted trench technology, the length can be reduced to 600 linear feet. Even with a garage in this area, there appears to be adequate space for both the primary and repair area. However, depending on the garage placement, additional repair area can be gained upslope with a pump to conventional repair area.

The soils in the field to the north were also evaluated as a septic option. These soils have seasonal wetness ranging from 15 to 24 inches and thus are not proposed to be used.

Conclusions

The soils immediately above and below the proposed home location are suitable for conventional or shallow conventional septic systems. Adequate space exists for the proposed 3-bedroom home.

We appreciate the opportunity to assist you. Please contact us with any questions, concerns, or comments upon review of this package.

Sincerely,

Karl Shaffer

Karl Shaffer, LSS

Summary of Attachments

Attachment 1: AWT Evaluation Maps

Attachment 2: Typical Soil Profile Description for suitable soils areas

Attachment 3: Example Loading Rate & Area Calculations

ATTACHMENT 1: AWT Evaluation Maps



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**Preliminary
Soil Evaluation Map**

Haggerty
Harnett Co., NC
PIN: 0681-76-4564.000



Suitable Area:
~ 40,162 sq. ft.

Soil Types:
Bb-Bibb soils
DtB-Dothan gravelly loamy sand
GoA-Goldsboro loamy sand
WaB/WaC-Wagram loamy sand

Drawn By: Julie Davidson
Reviewed By: Karl Shaffer
Date: 5/11/18



*** This map was created for proposed planning purposes only. It is not intended to be used as a plat or survey map of any type.***



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**Preliminary
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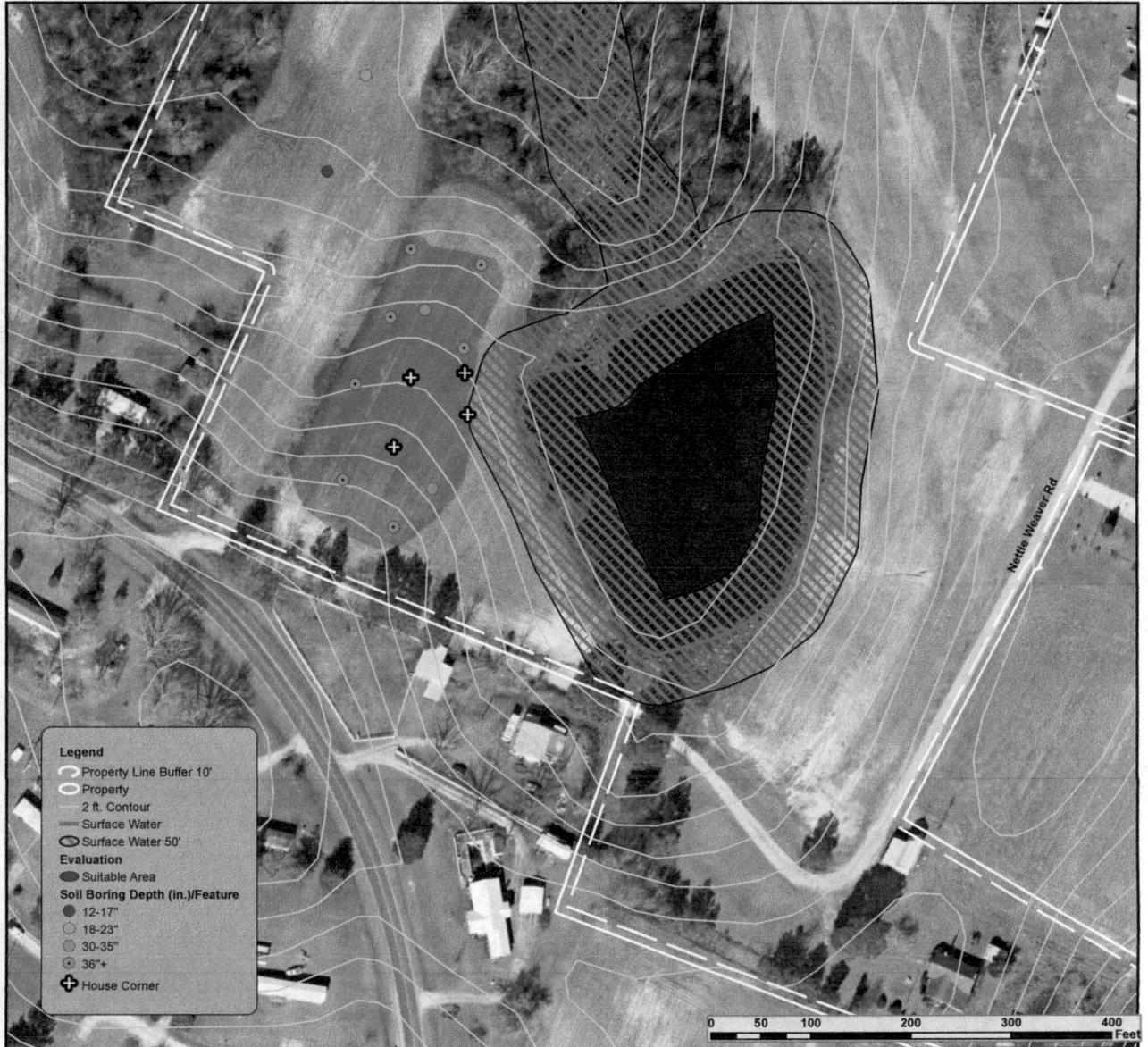
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ATTACHMENT 2: Typical Soil Profile Description

Location: Nettie Weaver Road

County: Harnett

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

Client: Kenneth Haggerty

Owner: _____ Agent: _____ Buyer: X

Address: 1426 Park Summit Blvd.
Apex, NC 27523

Proposed Facility: Residences: 1
Property Size: ~30 acres

Location Site: Nettie Weaver Road

Water Supply: On-Site Well X Comm. Well _____ Public _____ Other _____ Evaluation Method: Auger Boring X Pit _____ Cut _____

TYPICAL PROFILE- PROVISIONALLY SUITABLE SOILS

Horizon/ Depth (IN)	Matrix	Mottles	Mottle Abundance / Contrast	(a)(1) Texture	(a)(2) Structure	(a)(3) Minerology	Consistence (Wet)	Consistence (Moist)
A 0-8"	10YR 4/3	N/A	N/A	LS	GR	NEXP	NS, NP	VFr
E 8-24"	10YR 6/4	NA	NA	LS	G.G.	NEXP	NS, NP	VFr
Bt1 24-38"	7.5YR 5/6	NA	NA	SCL	SBK	NEXP	SS,SP	Fr
Bt2 38-46"	7.5YR 5/6	C2D 10 YR 6/6, 10 YR 6/2, 5YR 5/8	20%	CL	SBK	NEXP	SS,SP	Fi

.1940 Landscape Pos/Slope %	convex ridge and sideslopes 2-6%	Profile LTAR (estimated)	0.30 GPD/FT ²
.1942 Wetness Condition	- PS (38 inches)	System Type	Conventional or shallow conventional for primary and repair (see report for details)
.1943/.1956 Saprolite	- PS	NA	
.1944 Restrictive Horizon	- PS	NA	
.1948 Profile Classification	- PS		

Depth to seasonal high water table in this area ranges from 32 to over 44 inches. Anticipated LTAR 0.30 to 0.35 GPD/ft²

LEGEND OF ABBREVIATIONS FOR SITE EVALUATION FORM

**LANDSCAPE
POSITION**

- 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

STRUCTURE

- SG - Single Grain
- M - Massive
- CR - Crumb
- GR - Granular
- SBK - Subgranular Blocky
- ABK - Angular Blocky
- PL - Platy
- PR - Prismatic

TEXTURE GROUP

I

TEXTURE CLASSS - Sand
LS - Loamy Sand**.1955 LTAR(gal/day/sqft)**

1.2 - .08

II

SL - Sandy Loam
L - Loam

0.8 - 0.6

III

SCL - Sandy Clay Loam
CL - Clay Loam
SiL - Silt Loam
Si - Silt
SiCL - Silt Clay Loam

0.6 - 0.3

IV

SC - Sandy Clay
C - Clay
SiC - Silty Clay
O - Organic

0.4 - 0.1

MOIST CONSISTENCEVfr - Very Friable
Fr - Friable
Fi - Firm
Vfi - Very Firm
Efi - Extremely Firm**MOTTLES**1 - Few
2 - Common
3 - ManyF - Faint
D - Distinct
P - Prominentf - Fine
m - Medium
c - Coarse**WET CONSISTENCE**NS - Non Sticky
SS - Slightly Sticky
S - Sticky
VS - Very StickyNP - Non Plastic
SP - Slightly Plastic
P - Plastic
VP - Very Plastic

ATTACHMENT 3: Example Loading Rate & Area Calculations

Conventional Septic System Area ComputationCreated by: KS
Created on: 5/9/2018
Updated on: NA

Client Name: *Haggerty*
Number Bedrooms: 3
Design Flow (gal/day): 360 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.3
Trench Bottom Area (ft²): 1200 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 400 (Conventional - Pipe & Gravel)

Minimum Field Area Required (ft²): 3600 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 2700 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 9000 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 6750 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 10800 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 8100 (25% reduction from above)

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

Client Name: *Haggerty*
Number Bedrooms: 4
Design Flow (gal/day): 480 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.3
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 (Conventional - Pipe & Gravel)

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: *Haggerty*
Number Bedrooms: 5
Design Flow (gal/day): 600 (120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft²): 0.3
Trench Bottom Area (ft²): 2000 (Design flow/LTAR)
Trench Width (ft): 3
On-center distance between trenches (ft): 9
Trench Bottom Length (ft): 666.6667 (Conventional - Pipe & Gravel)

Minimum Field Area Required (ft²): 6000 (Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft²): 4500 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 15000 (Minimum field area*2.5)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 11250 (25% reduction from above)
Total Field Area Required (ft²)⁽¹⁾: 18000 (Minimum field area*3)
Total Field Area Required (Innovative) (ft²)⁽¹⁾: 13500 (25% reduction from above)

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

