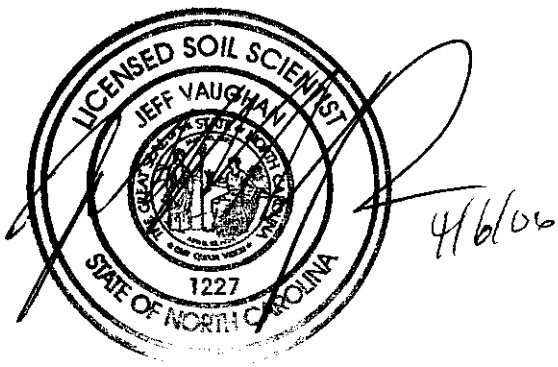
Agri-Waste Technology, Inc.
5400 Etta Burke Court
Raleigh, North Carolina 27606
Phone: (919) 859-0669
Fax: (919) 233-1970
Email: awt@agriwaste.com



Soil Suitability for Domestic Sewage Treatment and Disposal Systems

Near the Intersection of Tobacco Road and Roads End Subdivision, Chapel Hill, NC Chatham County

Prepared for: Mr. Randy Voller, Owner

Prepared By: Jeff Vaughan, Ph.D., L.S.S.
Senior Agronomist/Soil Scientist

Enrique Cachafeiro
Soils/GIS Specialist

Keith Carter
Soils Technician

Report Date: April 6, 2006

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PREPARED FOR: Mr. Randy Voller, Owner

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DATE: April 6, 2006

Soil suitability for domestic sewage treatment and disposal systems was evaluated on February 23 and 24, 2006, and April 1, 2006 for the property located near the intersection of Tobacco Road and Roads End Subdivision in Chapel Hill, NC (Chatham County). Jeff Vaughan, Enrique Cachafeiro, and Justin Ray of Agri-Waste Technology, Inc. (AWT) conducted the soil evaluation. Jeff Vaughan also accompanied Ms. Terri Ritter and Mr. Thomas Boyce of the Chatham County Health Department (CCHD) during their soil evaluation on February 28, 2006, and March 6, 2006. The detailed soil evaluation of the land area will follow. A property reference map, provided by Mr. Nathan Wieler, is in Attachment 1 for reference. 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.

The total property area is approximately 47 acres. The property is completely wooded with the exception of 2 cut/fill areas in the western and southwestern portion of the property (Attachment 3). There are large drainage features with steep slopes throughout the property and Wilkinson Creek is on the eastern property boundary (Attachment 3). The majority of the property is on the east side of Roads End Subdivision with a small area on the west side of Roads End Subdivision.

Soil Suitability for Domestic Sewage Treatment and Disposal Systems

The aerial maps in Attachment 3 detail the approximate property boundaries, drainage features, soil boring locations, location of provisionally suitable septic system areas, 5' contours, and soil types. Soil borings were flagged in the field with blue ribbon (provisionally suitable), red ribbon (unsuitable), or red and blue ribbon (marginally

suitable soils). The soil lines that delineate provisionally suitable soil from unsuitable soil for septic systems were flagged in the field with orange ribbon. Flagging that delineates the soil lines were numbered sequentially on the flagging material. The provisionally suitable soil areas are annotated with numbers (Areas 1 – 10) on the map along with the estimated square footage.

Approximately 150 soil borings were advanced within the property, either by CCHD or AWT personnel (Attachment 3). The overwhelming majority of the soil borings exhibited soil characteristics and soil depths (30" or greater) that are provisionally suitable for conventional or shallow conventional septic systems. Large parts of the property contained drainage features and/or complex topography and, thus, are unsuitable for septic systems. The best soil and landscape locations for septic systems were found between these drainage features and on hilltops or hillsides. However, this evaluation was merely a preliminary review to determine what potential this land might have for domestic sewage treatment and disposal systems. It is possible that some of the areas classified as unsuitable for septic systems may be re-classified as provisionally suitable for other types of septic systems (subsurface drip, pre-treatment, etc.). Additionally, 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 fully not considered. These things will need to be more fully considered as the plans develop for the potential future of this site. It is likely that additional soil evaluation 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.

Typical profile descriptions of the provisionally suitable for this property are in Attachment 4. Several distinct soil profiles were observed in the soil borings on the property, either a deep red clay subsoil, a shallower red subsoil with indications of saprolite beginning at approximately 20" (but not dominant until 30" or more) or a reddish-yellow subsoil.

The provisionally suitable soil borings had the following characteristics. No restrictive horizons were found in any provisionally soil borings within 30" of the soil surface. Soil texture was provisionally suitable and was estimated to be sandy loam to a silt loam near the soil surface (A and E horizons) and sandy clay loam to clay in the subsoil (B and BC horizons). Soil structure was provisionally suitable and was estimated to be granular near the soil surface (A and E horizons) and subangular blocky in the subsoil (B and BC 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. Indications of saprolite were detected in many soil borings, but saprolite was not dominant at 30" in most soil borings.

The major soil types on this property are Wedowee sandy loam (map symbols 37B, 37C, 37D) and Vance sandy loam (map symbol 57B). The Chatham County Soil Survey indicates that moderate limitations exist for septic systems installed in this soil type (Attachment 5).

The land area required for a conventional or 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/ft^2 based on the most restrictive soil texture in the subsoil. Table 1 below presents estimated conventional or shallow conventional septic system land area requirements for several home sizes and LTAR's on this property. The LTAR suggested by AWT for a majority of the provisionally suitable soil is 0.25 GPD/ft^2, but the final LTAR for specific septic system types and septic drainfield locations will be set by the Chatham County Health Department. The detailed computations are in Attachment 6.

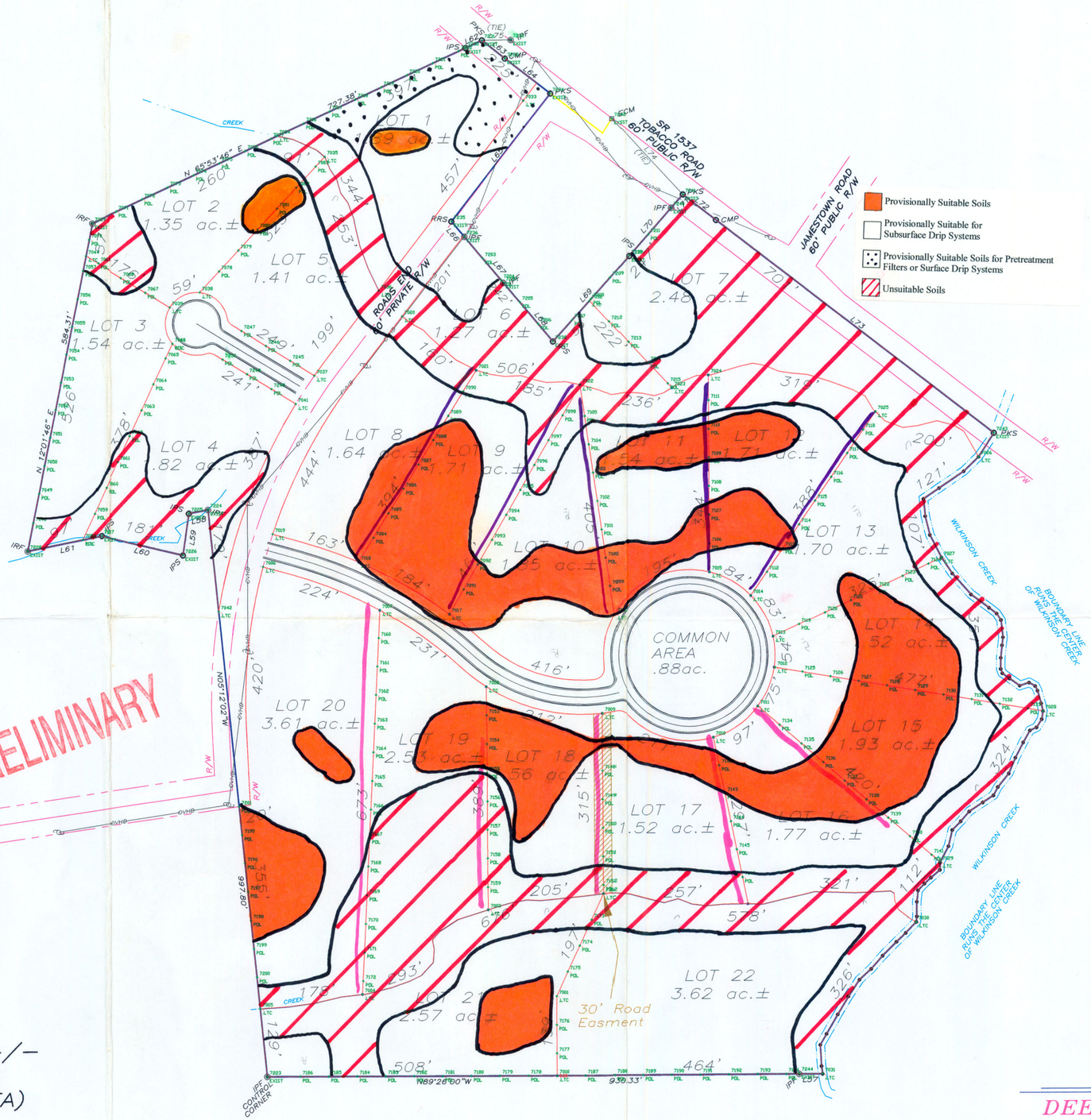
Table 1. Estimated Conventional Septic System Land Requirements (including repair area) for Several Home Sizes and Long-Term Acceptance Rates (LTAR) on this Property.

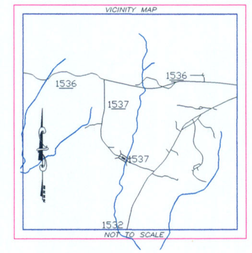
House Size	Long-Term Acceptance Rate (LTAR)	Area Required for Conventional Septic System	Minimum Area Required for Innovative Conventional Septic System
	-----GPD/ft^2-----	-----ft^2-----	-----ft^2-----
3 bedrooms	0.1 – 0.4	6,750 – 32,400	4,388 – 21,060
3 bedrooms	0.25	~10,800	~7,020
4 bedrooms	0.1 – 0.4	9,000 – 43,200	5,850 – 28,080
4 bedrooms	0.25	~14,400	~9,360
5 bedrooms	0.1 – 0.4	11,250 – 54,000	7,313 – 35,100
5 bedrooms	0.25	~18,000	~11,700

Based on the results of this evaluation, the installation of conventional or shallow conventional septic systems seems most probable on much of this property. We appreciate the opportunity to assist you in this matter. Please contact us with any questions, concerns, or comments.

voller

ATTACHMENT 1: Property Reference Map





PB 98 PG 199

TRACT 1
47.067 Ac+/-
GROSS
(TOTAL AREA)

SYMBOL LEGEND
IPS
IPF
RRS
RRF
ECM
CMP
OVHD
NCDOT

BOUNDARY SURVEY
FOR
WIELER DFG, LLC
DEED BOOK 1029 PAGE 841
PLAT BOOK 98 PAGE 199

BALDWIN TOWNSHIP ~CHATHAM COUNTY ~ NORTH CAROLINA

100 0 50 100 200 400

AUGUST 15, 2005 SCALE : 1 INCH = 100 FEET

PREPARED BY
ABSOLUTE LAND SURVEYING AND MAPPING, P.C.
(919)663-0099
117 NORTH CHATHAM AVENUE, SILER CITY, N.C. 27344
www.absoluteland.com

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ATTACHMENT 2: Review of Rules Pertaining to Domestic Sewage Treatment and Disposal Systems

Five categories of soil and landscape characteristics are evaluated to determine soil suitability for domestic sewage treatment and disposal systems and include: topography and landscape position, soil morphological characteristics, soil wetness conditions, soil depth, and restrictive horizons. The soil and landscape characteristics found in a particular location dictate the type(s) of domestic sewage treatment and disposal system that can be used on a parcel of land. The detailed rules can be found in Section .1900 – Sewage Treatment and Disposal Systems, but a general review of the five categories and other relevant rules can be found in the sections below.

.1940 TOPOGRAPHY AND LANDSCAPE POSITION

Uniform slopes less than 15 percent are considered suitable, uniform slopes between 15 and 30 percent are considered provisionally suitable, and slopes greater than 30 percent are considered unsuitable for domestic sewage treatment and disposal systems. Complex slope patterns and slopes dissected by gullies and ravines are considered unsuitable for domestic sewage treatment and disposal systems. Depressions and wetlands are also considered unsuitable for domestic sewage treatment and disposal systems.

.1941 SOIL MORPHOLOGICAL CHARACTERISTICS

Sandy and coarse loamy textured soils (sand, loamy sand, sandy loam, and loam) are considered suitable for domestic sewage treatment and disposal systems. Fine loamy and clayey textured soils (silt, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay) are considered provisionally suitable for domestic sewage treatment and disposal systems.

Crumb, granular, and single-grained soil structures are considered suitable for domestic sewage treatment and disposal systems. Blocky soil structures are considered provisionally suitable for domestic sewage treatment and disposal systems. Platy, prismatic, and massive soil structures are considered unsuitable for domestic sewage treatment and disposal systems.

Slightly expansive clay mineralogy is considered suitable for domestic sewage treatment and disposal systems. Slightly expansive clay minerals exhibit loose, very friable, friable, or firm moist soil consistence. Expansive clay mineralogy is considered unsuitable for domestic sewage treatment and disposal systems. Expansive clay minerals exhibit very firm or extremely firm moist soil consistence. Organic soils are considered unsuitable for domestic sewage treatment and disposal systems.

.1942 SOIL WETNESS CONDITIONS

Soil wetness conditions are caused by seasonal high water table, perched water table, tidal water, seasonally saturated soils, or lateral water movement. Soil wetness conditions are indicated by soil colors, either in mottles or mass, with a chroma of 2 or less according to the Munsell color charts. Soil wetness conditions detected 48 inches in depth or deeper are considered suitable for domestic sewage treatment and disposal systems. Soil wetness conditions detected between 36 to 48 inches in depth are considered provisionally suitable for domestic sewage treatment and disposal systems. Soil wetness conditions detected 36 inches in depth or shallower are considered unsuitable for domestic sewage treatment and disposal systems.

.1943 SOIL DEPTH
Soil depths to rock, parent material, or saprolite greater than 48 inches are considered suitable for domestic sewage treatment and disposal systems. Soil depths to rock, parent material, or saprolite between 36 and 48 inches are considered provisionally suitable for domestic sewage treatment and disposal systems. Soil depths to rock, parent material, or saprolite less than 36 inches are considered unsuitable for domestic sewage treatment and disposal systems. Saprolite has a massive, rock-controlled structure, and retains the mineral arrangement of its parent rock in at least 50 percent of its volume. Saprolite only forms from metamorphic and igneous rock parent materials and is typically referred to as "rotten rock".

.1944 RESTRICTIVE HORIZONS
Restrictive horizons are capable of perching ground water or sewage effluent and are strongly compacted or cemented. Restrictive horizons resist soil excavation or augering. Soils with restrictive horizons three inches or more in thickness at depths greater than 48 inches are considered suitable for domestic sewage treatment and disposal systems. Soils with restrictive horizons three inches or more in thickness at depths between 36 and 48 inches are considered provisionally suitable for domestic sewage treatment and disposal systems. Soils with restrictive horizons three inches or more in thickness at depths less than 36 inches are considered unsuitable for domestic sewage treatment and disposal systems.

.1950 LOCATION OF SANITARY SEWAGE SYSTEMS
WAKE COUNTY DEPARTMENT OF ENVIRONMENTAL SERVICES NOTICE
No area for domestic sewage treatment and disposal system installation (or repair in Wake County) may be disturbed by clearing, excavation, filling, vehicle or equipment traffic, or storage of building materials.

.1947 DETERMINATION OF OVERALL SITE SUITABILITY
.1948 SITE CLASSIFICATION
All of the criteria for the five categories above are to be determined and classified as suitable, provisionally suitable, or suitable according to the respective rules described above. If all criteria are classified the same, that overall site classification will prevail. If there is a variation in the classification of several criteria, the most limiting classification will be used to determine the overall site classification.

A suitable classification generally indicates soil and landscape conditions favorable for the operation of a domestic sewage treatment and disposal system or slight limitations that can be readily overcome by proper design and installation. A provisionally suitable classification indicates soil and/or landscape conditions have moderate limitations for the operation of a domestic sewage treatment and disposal system, but modifications and careful planning, design, and installation can result in satisfactory system function. An unsuitable classification indicates severe soil and/or landscape limitations for the operation of a domestic sewage treatment and disposal system.

SUMMARY
Suitable/provisionally suitable landscapes and soils to a depth of 36 inches can, in general, be used for conventional gravity driven septic systems. Suitable/provisionally suitable landscapes

and soils to a depth of 24 –36 inches can, in general, be used for alternative septic systems such as shallow conventional and low pressure pipe systems, among others. All alternative systems for provisionally suitable landscapes and soils must be proposed to and approved by the Chatham County Health Department. Any landscapes or soils classified as unsuitable may be reclassified as provisionally suitable by the Chatham County Health Department after a site investigation by department personnel.

ATTACHMENT 3: Property Map Detailing Soil Suitability for Septic Systems and Soil Types

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Fax: 919-233-1970
www.agriwaste.com

N
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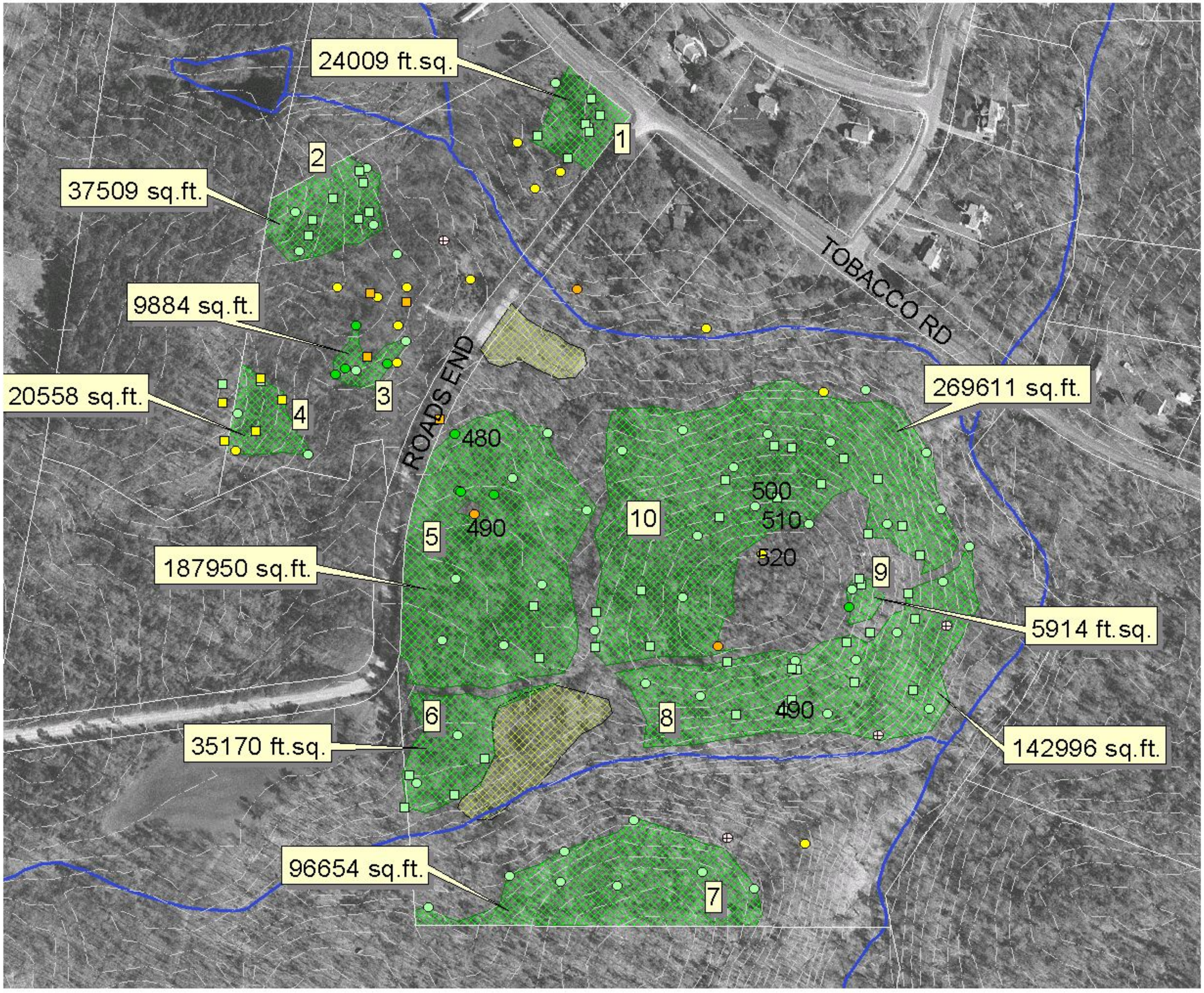
Voller Property

Chatham Co., NC



Legend

Silt Contours

Depth to Restrictive Features
- Auger Refusal
- 0 - 12 In.
- 12 - 18 In.
- 18 - 24 In.
- 24 - 36+ In.

Health Department Borings
- 0 - 12 In
- 12 - 18 In
- 18 - 24 In
- 24 - 36 In

Fill Areas

Prev. Suitable Area

Parcels

Surface Waters

Drawn By:
Enrique Cachafeiro
Revised By:
Jeff Vaughan
Date:
02/27/2006

300 0 300 600 Feet

Scale: 1:3600
1 inch = 300 feet

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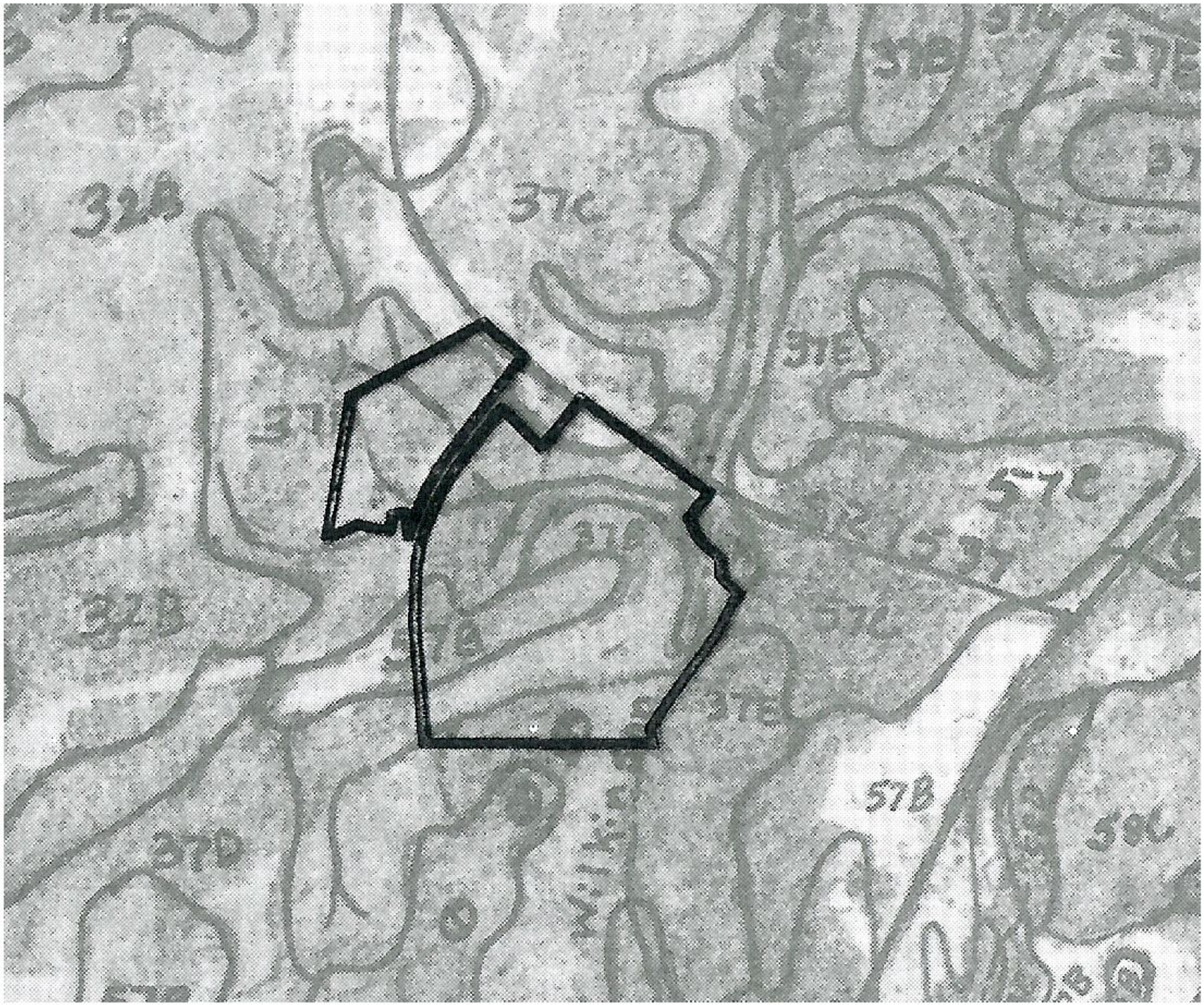

Soil Types:
37B,C,D -Wedowee sandy loam
57B- Vance sandy loam

Drawn By:
Enrique Cachafeiro
Revised By:
Jeff Vaughan
Date:
04/04/2006

ATTACHMENT 4: Typical Profile Description of Provisionally Suitable Soil

Property ID#:_____
Property Recorded:_____
County: Chatham

SOIL/SITE EVALUATION
FOR
ON-SITE WASTEWATER SYSTEM

Applicant: Mr. Randy Voller
Address: 15 Chatham Forest Road
Pittsboro, NC, 27312

Owner:___ Agent: X Phone: (919)949-1274
Dates Evaluated: 2/23/06, 2/24/06, 2/28/06, 3/6/06, & 4/1/06
Proposed Facility: Residential
Property Size: Approximately 47 acres

Location Site: Near intersection of Tobacco Road and Roads End Subdivision Road in Chatham County, NC
Water Supply: On Site Well X Comm. Well___ Public___ Other___ Evaluation Method: Auger Boring X Pit___Cut___.

TYPICAL PROFILE (Area Northwest of Roads End Subdivision Road)

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 4/4**	**None**	**None**	**SL**	**GR**	**SEXP**	**NS, NP**	**VFr**
Bt1 8-28"	**2.5YR 5/8**	**None**	**None**	**C**	**SBK**	**SEXP**	**S, P**	**Fi**
BC 28-36"	**2.5YR 5/8**	**10R 3/6; 10YR 8/2**	**2, D, m**	**SCL-C**	**SBK**	**SEXP**	**S, P**	**Fr**

.1940 Landscape Pos/Slope %	Suitable	Profile LTAR	0.1 – 0.4 GPD/ft^2
.1942 Wetness Condition	Suitable	System Type	Conventional or shallow conventional
.1943/.1956 Saprolite	Suitable		
.1944 Restrictive Horizon	Suitable		
.1948 Profile Classification	Provisionally suitable		

Comments: Chroma 2's appeared to mainly be due to parent material.

TYPICAL PROFILE (Area Northwest of Roads End Subdivision Road)

Horizon/ Depth (IN)	Matrix	Mottles	Mottle Abundance/ Contrast	(a)(1) Texture	(a)(2) Structure	(a)(3) Mineralogy	Consistence Wet	Consistence Moist
A 0-8"	**10YR 4/4**	**None**	**None**	**SL**	**GR**	**SEXP**	**NS, NP**	**VFr**
Bt1 8-22"	**10YR 6/8**	**None**	**None**	**SCL-C**	**SBK**	**SEXP**	**SS, SP**	**Fr**
Bt2 22-30"	**10YR 6/8**	**10YR 8/1; 5YR 4/8**	**2, m, D**	**SCL-C**	**SBK**	**SEXP**	**SS,SP**	**Fr**
BC 30-36" or AR	**10YR 6/8**	**10YR 8/1; 5YR 4/8**	**3, p, C**	**SCL**	**SG**	**SEXP**	**NS,NP**	**Fr**

.1940 Landscape Pos/Slope %	Suitable	Profile LTAR	0.1 – 0.4 GPD/ft^2
.1942 Wetness Condition	Suitable	System Type	Provisionally suitable for shallow conventional or low pressure pipe septic systems.
.1943/.1956 Saprolite	Suitable		
.1944 Restrictive Horizon	Suitable		
.1948 Profile Classification	Provisionally suitable		

Comments:

EVALUATED BY: **Jeff Vaughan, Enrique Cachafeiro, Justin Ray**
COMMENTS:

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

TEXTURE GROUP

I
II
III
IV

TEXTURE CLASS

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

.1955 LTAR (gal/day/sqft)

1.2 - .08
0.8 - 0.6
0.6 - 0.3
0.4 - 0.1

STRUCTURE

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

MOIST CONSISTENCE

Vfr - Very Friable
Fr - Friable
Fi - Firm
Vfi - Very Firm
Efi - Extremely Firm

MOTTLES

1 - Few
2 - Common
3 - Many

F - Faint
D - Distinct
P - Prominent

f - Fine
m - Medium
c - Coarse

WET CONSISTENCE

NS - Non Sticky
SS - Slightly Sticky
S - Sticky
VS - Very Sticky

NP - Non Plastic
SP - Slightly Plastic
P - Plastic
VP - Very Plastic

Property ID#:_____.
Property Recorded:_____.
County:___Chatham_____.

SOIL/SITE EVALUATION
FOR
ON-SITE WASTEWATER SYSTEM

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Address: 15 Chatham Forest Road
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Proposed Facility: Residential
Property Size: Approximately 47 acres

Location Site: Near intersection of Tobacco Road and Roads End Subdivision Road in Chatham County, NC
Water Supply: On Site Well X Comm. Well___ Public___ Other___ Evaluation Method: Auger Boring X Pit___Cut___.

TYPICAL PROFILE (Cental and Southern Area of Property)

Horizon/ Depth (IN)	Matrix	Mottles	Mottle Abundance / Contrast	(a)(1) Texture	(a)(2) Structure	(a)(3) Minerology	Consistence Wet	Consistence Moist
A 0-6"	**10YR 3/4**	**None**	**None**	**SiL**	**GR**	**SEXP**	**NS, NP**	**VFr**
Bt1 6-36"+	**5YR 5/8**	**None**	**None**	**C**	**SBK**	**SEXP**	**S, P**	**Fi**

.1940 Landscape Pos/Slope %	Suitable	Profile LTAR	0.1 – 0.4 GPD/ft^2
.1942 Wetness Condition	Suitable	System Type	Conventional or shallow conventional
.1943/.1956 Saprolite	Suitable		
.1944 Restrictive Horizon	Suitable		
.1948 Profile Classification	Provisionally suitable		

Comments: Chroma 2's appeared to mainly be due to parent material. AR was encountered in some holes. Numerous large rocks and boulders throughout area, especially at higher elevations.

TYPICAL PROFILE (Cental and Southern Area of Property)

Horizon/ Depth (IN)	Matrix	Mottles	Mottle Abundance/ Contrast	(a)(1) Texture	(a)(2) Structure	(a)(3) Mineralogy	Consistence Wet	Consistence Moist
A 0-6"	**10YR 3/4**	**None**	**None**	**SiL**	**GR**	**SEXP**	**NS, NP**	**VFr**
E 6-15"	**10YR 6/4**	**None**	**None**	**SL**	**GR**	**SEXP**	**NS, NP**	**VFr**
Bt1 15-30"	**10YR 5/6**	**None**	**None**	**CL-C**	**SBK**	**SEXP**	**S, P**	**Fr**
Bt2 30-36"	**10YR 5/6**	**10R 4/6**	**2, m, D**	**C**	**SBK**	**SEXP**	**S, P**	**Fr**

.1940 Landscape Pos/Slope %	Suitable	Profile LTAR	0.1 – 0.4 GPD/ft^2
.1942 Wetness Condition	Suitable	System Type	Provisionally suitable for shallow conventional or low pressure pipe septic systems.
.1943/.1956 Saprolite	Suitable		
.1944 Restrictive Horizon	Suitable		
.1948 Profile Classification	Provisionally suitable		

Comments: Chroma 2's appeared to mainly be due to parent material. AR was encountered in some holes. Numerous large rocks and boulders throughout area, especially at higher elevations.

EVALUATED BY: **Jeff Vaughan, Enrique Cachafeiro, Justin Ray**
COMMENTS:

LEGEND OF ABBREVIATIONS FOR SITE EVALUATION FORM

LANDSCAPE POSITION	TEXTURE GROUP	TEXTURE CLASS	.1955 LTAR (gal/day/sqft)
CC - Concave Slope	I	S - Sand	1.2 - .08
CV - Convex Slope		LS - Loamy Sand	
DS - Debris Slump			
D - Depression	II	SL - Sandy Loam	0.8 - 0.6
DW - Drainage Way		L - Loam	
FP - Flood Plain			
FS - Foot Slope	III	SCL - Sandy Clay Loam	0.6 - 0.3
H - Head Slope		CL - Clay Loam	
I - Interflueve		SiL - Silt Loam	
L - Linear Slope		Si - Silt	
N - Nose Slope		SiCL - Silt Clay Loam	
P - Pocosin			
R - Ridge	IV	SC - Sandy Clay	0.4 - 0.1
S - Shoulder		C - Clay	
T - Terrace		SiC - Silty Clay	
		O - Organic	

STRUCTURE	MOIST CONSISTENCE	MOTTLES	WET CONSISTENCE
G - Single Grain	Vfr - Very Friable	1 - Few	NS - Non Sticky
M - Massive	Fr - Friable	2 - Common	SS - Slightly Sticky
CR - Crumb	Fi - Firm	3 - Many	S - Sticky
GR - Granular	Vfi - Very Firm		VS - Very Sticky
SBK - Subgranular Blocky	Efi - Extremely Firm	F - Faint	
ABK - Angular Blocky		D - Distinct	NP - Non Plastic
PL - Platy		P - Prominent	SP - Slightly Plastic
PR - Prismatic			P - Plastic
		f - Fine	VP - Very Plastic
		m - Medium	
		c - Coarse	

ATTACHMENT 5: Soil Survey Information

37B=Wedowee sandy loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont uplands, mainly in the northern part of the county south of Chapel Hill
Landform: Ridges and side slopes
Shape of areas: Irregular
Size of areas: 5 to 100 acres

Composition

Wedowee and similar soils: 81 percent
Dissimilar soils: 19 percent

Typical Profile

Surface layer:
0 to 5 inches=yellowish brown sandy loam
Subsoil:
5 to 28 inches=strong brown clay that has yellowish red mottles
28 to 60 inches=reddish yellow clay loam saprolite that has yellow and very pale brown mottles

Soil Properties and Qualities

Depth class: Very deep
Agricultural drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate to high
Depth to seasonal high water table; kind: More than 6.0 feet below the soil surface
Shrink-swell potential: Low
Hazard of flooding: None
Surface runoff: Low
Hazard of water erosion: Moderate
Parent material: Residuum weathered from felsic high-grade metamorphic or igneous rock
Depth to bedrock: More than 60 inches

Minor Components

Dissimilar:
Random areas of the slowly permeable Vance soils
The moderately well drained Helena soils at heads of drainageways and along drainageways
Random areas of Rion soils that have less clay in the subsoil
Widely scattered surface cobbles, stones and boulders are shown with special symbols

Similar:

Random areas of Pacolet soils that have red subsoils
Appling soils that have a thicker subsoil on the more level parts of the map unit

Land Use

Dominant uses: Woodland, pasture and hayland, and urban development
Other uses: Cropland

Agricultural Development

Cropland
Suitability: Well suited
Commonly grown crops: Tobacco, corn, soybeans and small grain
Management concerns: Erodibility
Management measures and considerations:
Resource management systems that include terraces and diversions, stripcropping, contour tillage, no-till farming, and crop residue management help to control soil erosion and surface runoff and maximize the infiltration of rainfall

Pasture and hayland
Suitability: Well suited
Commonly grown crops: Tall fescue, orchardgrass and clover
Management concerns: Erodibility
Management measures and considerations:
Preparing seedbeds on the contour or across the slope helps to control soil erosion and increase germination
Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation

Woodland
Suitability: Well suited
Productivity class: Moderately high for loblolly pine
Management concerns: No significant limitations affect woodland management.
Management measures and considerations:
Leaving a buffer zone of trees and shrubs adjacent to streams helps to reduce siltation and improve aquatic habitat by providing shade for the water surface

Urban Development

Dwellings
Suitability: Well suited
Management concerns: No significant limitations affect dwellings
Management measures and considerations:
Vegetating disturbed areas and providing erosion-control structures, such as sediment fences and catch basins, help to keep eroding soil on site

Septic tank absorption fields
Suitability: Moderately suited
Management concerns: Restricted permeability
Management measures and considerations:
The Chatham County Health Department should be contacted for guidance on sanitary facilities

Increasing the size of septic tank absorption field helps to improve performance.
Installing septic system distribution lines only during dry periods helps to reduce smearing and sealing of trench walls

Local roads and streets
Suitability: Moderately suited
Management concerns: Low strength
Management measures and considerations:
Incorporating sand and gravel with the soil material and compacting roadbeds helps to improve soil strength
Vegetating cut and fill slopes as soon as possible after construction helps to stabilize the soil and prevent excessive soil erosion

Recreational Development

Camp areas
Suitability: Well suited
Management concerns: No significant limitations affect camp areas
Management measures and considerations:
Vegetating cleared and graded areas as soon as possible helps to maintain soil stability and prevent erosion

Picnic areas
Suitability: Well suited
Management concerns: No significant limitations affect picnic areas.
Management measures and considerations:
Vegetating cleared and graded areas as soon as possible helps to maintain soil stability and prevent erosion

Playgrounds
Suitability: Moderately suited
Management concerns: steepness of slope
Management measures and considerations:
Cutting, filling, or grading only areas requiring excavation improves soil stability and reduces equipment limitations caused by the slope
Vegetating cleared and graded areas as soon as possible helps to maintain soil stability and prevent erosion
Leaving a buffer zone of grass, trees, and shrubs adjacent to streams and drainageways helps to reduce siltation and provides shade

Paths and trails
Suitability: Well suited
Management concerns: No significant limitations affect paths and trails.
Management measures and considerations:
Designing paths and trails on the contour and providing adequate water-control structures, such as culverts, help to maintain the stability of trails

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 8A for loblolly pine

37C=Wedowee sandy loam, 6 to 10 percent slopes

Setting

Landscape: Piedmont uplands, mainly in the northern part of the county south of Chapel Hill
Landform: Ridges and side slopes
Shape of areas: Irregular
Size of areas: 5 to 100 acres

Composition

Wedowee and similar soils: 80 percent
Dissimilar soils: 20 percent

Typical Profile

Surface layer:
0 to 5 inches=yellowish brown sandy loam
Subsoil:
5 to 28 inches=strong brown clay that has yellowish red mottles
28 to 60 inches=reddish yellow clay loam saprolite that has yellow and very pale brown mottles

Soil Properties and Qualities

Depth class: Very deep
Agricultural drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate to high
Depth to seasonal high water table; kind: More than 6.0 feet below the soil surface
Shrink-swell potential: Low
Hazard of flooding: None
Surface runoff: Moderate
Hazard of water erosion: Moderate
Parent material: Residuum weathered from felsic high-grade metamorphic or igneous rock
Depth to bedrock: More than 60 inches

Minor Components

Dissimilar:
Random areas of the slowly permeable Vance soils
The moderately well drained Helena soils at heads of drainageways and along drainageways
Random areas of Rion soils that have less clay in the subsoil
Widely scattered surface cobbles, stones and boulders are shown with special symbols

Similar:

Random areas of Pacolet soils that have red subsoils
Appling soils that have a thicker subsoil on the more level parts of the map unit

Land Use

Dominant uses: Woodland, pasture and hayland, and urban development
Other uses: Cropland

Agricultural Development

Cropland
Suitability: Moderately suited
Commonly grown crops: Tobacco, corn, soybeans and small grain
Management concerns: Erodibility
Management measures and considerations:
Resource management systems that include terraces and diversions, stripcropping, contour tillage, no-till farming, and crop residue management help to control soil erosion and surface runoff and maximize the infiltration of rainfall.

Pasture and hayland
Suitability: Well suited
Commonly grown crops: Tall fescue, orchardgrass and clover
Management concerns: Erodibility
Management measures and considerations:
Planting adapted species helps to ensure the production of high-quality forage and minimize soil erosion.
Preparing seedbeds on the contour or across the slope helps to control soil erosion and increase germination.
Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
The timely removal of livestock from pastures so that forage plants can recover before winter dormancy helps to maintain pasture and increase productivity.
Rotational grazing and a well planned clipping and harvesting schedule help to maintain pasture and increase productivity.

Woodland
Suitability: Well suited
Productivity class: Moderately high for loblolly pine
Management concerns: No significant limitations affect woodland management.
Management measures and considerations:
Leaving a buffer zone of trees and shrubs adjacent to streams helps to reduce siltation and improve aquatic habitat by providing shade for the water surface.

Urban Development

Dwellings
Suitability: Moderately suited
Management concerns: Steepness of slope
Management measures and considerations:
Designing structures that conform to the natural slope helps to improve soil performance

Grading or shaping land prior to construction helps to reduce damage from surface water and prevent soil erosion
Vegetating disturbed areas and providing erosion-control structures, such as sediment fences and catch basins helps to keep eroding soil on site

Septic tank absorption fields
Suitability: Moderately suited
Management concerns: Restricted permeability and steepness of slope
Management measures and considerations:
The Chatham County Health Department should be contacted for guidance on sanitary facilities
Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields
Increasing the size of septic tank absorption field helps to improve performance.
Installing septic system distribution lines only during dry periods helps to reduce smearing and sealing of trench walls

Local roads and streets
Suitability: Moderately suited
Management concerns: Low strength and steepness of slope
Management measures and considerations:
Incorporating sand and gravel with the soil material, compacting roadbeds, and designing roads that conform to the natural slope help to improve soil strength
Vegetating cut and fill slopes as soon as possible after construction helps to stabilize the soil and prevent excessive soil erosion

Recreational Development

Camp areas
Suitability: Moderately suited
Management concerns: Steepness of slope
Management measures and considerations:
Designing roads and trails on the contour and locating camping facilities in the less sloping areas helps to overcome the slope limitation.
Providing a level pad that has a gravel surface helps to improve the suitability of these soils for tents and other facilities.
Vegetating cleared and graded areas as soon as possible helps to maintain soil stability and prevent erosion.

Picnic areas
Suitability: Moderately suited
Management concerns: Steepness of slope
Management measures and considerations:
Providing a level pad that has a gravel surface for picnic tables and other facilities helps to improve soil performance.
Vegetating cleared and graded areas as soon as possible helps to maintain soil stability and prevent erosion.

Playgrounds
Suitability: Poorly suited
Management concerns: steepness of slope

Management measures and considerations:
Extensive grading, including cutting and filling slopes may be required.
Cutting, filling, or grading only areas requiring excavation improves soil stability and reduces equipment limitations caused by the slope.
Vegetating cleared and graded areas as soon as possible helps to maintain soil stability and prevent erosion.
Leaving a buffer zone of grass, trees, and shrubs adjacent to streams and drainageways helps to reduce siltation and provides shade.

Paths and trails
Suitability: Well suited
Management concerns: No significant limitations affect paths and trails.
Management measures and considerations:
Designing paths and trails on the contour and providing adequate water-control structures, such as culverts, help to maintain the stability of trails.

Interpretive Groups

Land capability classification: IIIe
Woodland ordination symbol: 8A for loblolly pine

37D=Wedowee sandy loam, 10 to 15 percent slopes

Setting

Landscape: Piedmont uplands, mainly in the northern part of the county south of Chapel Hill
Landform: Narrow ridges and side slopes
Shape of areas: Long and narrow, or irregular
Size of areas: 5 to 100 acres

Composition

Wedowee and similar soils: 95 percent
Dissimilar soils: 5 percent

Typical Profile

Surface layer:
0 to 5 inches=yellowish brown sandy loam
Subsoil:
5 to 28 inches=strong brown clay that has yellowish red mottles
28 to 60 inches=reddish yellow clay loam saprolite that has yellow and very pale brown mottles

Soil Properties and Qualities

Depth class: Very deep
Agricultural drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate to high
Depth to seasonal high water table; kind: More than 6.0 feet below the soil surface
Shrink-swell potential: Low
Hazard of flooding: None
Surface runoff: Rapid
Hazard of water erosion: Severe
Parent material: Residuum weathered from felsic high-grade metamorphic or igneous rock
Depth to bedrock: More than 60 inches

Minor Components

Dissimilar:
Random areas of Saw soils with weathered bedrock at a depth of 20 to 40 inches
The moderately well drained Helena soils at heads of drainageways and along drainageways
Random areas of Rion soils that have less clay in the subsoil
Widely scattered surface cobbles, stones and boulders are shown with special symbols

Similar:

Random areas of Pacolet soils that have red subsoils
Random areas of Appling soils that have thicker subsoils

Land Use

Dominant uses: Woodland, pasture and hayland, and urban development
Other uses: Cropland

Agricultural Development

Cropland
Suitability: Moderately suited
Commonly grown crops: Tobacco, corn, soybeans and small grain
Management concerns: Erodibility and equipment use
Management measures and considerations:
Resource management systems that include terraces and diversions, stripcropping, contour tillage, no-till farming, and crop residue management help to control soil erosion and surface runoff and maximize the infiltration of rainfall.
Applying lime and fertilizer according to recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.

Pasture and hayland
Suitability: Well suited for pasture; moderately suited for hayland
Commonly grown crops: Tall fescue, orchardgrass and clover
Management concerns: Erodibility and steepness of slope
Management measures and considerations:
Planting adapted species helps to ensure the production of high-quality forage and minimize soil erosion.
Preparing seedbeds on the contour or across the slope helps to control soil erosion and increase germination.
When establishing, maintaining, or renovating hay and pasture, applying lime and fertilizer according to recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
In the steeper areas the slope may limit the use of equipment for harvesting hay crops.
The timely removal of livestock from pastures so that forage plants can recover before winter dormancy helps to maintain pasture and increase productivity.
Rotational grazing and a well planned clipping and harvesting schedule help to maintain pasture and increase productivity.
Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.

Woodland
Suitability: Well suited
Productivity class: Moderately high for loblolly pine
Management concerns: No significant limitations affect woodland management.
Management measures and considerations:
Planting the appropriate species, as recommended by a forester, helps to achieve maximum productivity and ensure planting success.
Leaving a buffer zone of trees and shrubs adjacent to streams helps to reduce siltation and improve aquatic habitat by providing shade for the water surface.

Urban Development

Dwellings
Suitability: Moderately suited
Management concerns: Steepness of slope.
Management measures and considerations:
Designing structures that conform to the natural slope helps to improve soil performance.
Grading or shaping land prior to construction helps to reduce damage from surface water and prevent soil erosion.
Vegetating disturbed areas and providing erosion-control structures, such as sediment fences and catch basins helps to keep eroding soil on site.

Septic tank absorption fields
Suitability: Moderately suited
Management concerns: Restricted permeability and steepness of slope
Management measures and considerations:
The Chatham County Health Department should be contacted for guidance on sanitary facilities.
Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
Increasing the size of septic tank absorption field helps to improve performance.
Installing septic system distribution lines only during dry periods helps to reduce smearing and sealing of trench walls.

Local roads and streets
Suitability: Moderately suited
Management concerns: Low strength and steepness of slope
Management measures and considerations:
Incorporating sand and gravel with the soil material, compacting roadbeds, and designing roads that conform to the natural slope help to improve soil strength.
Using a geotextile fabric filter cloth between the roadbed and the soil surface helps to minimize the loss of stone into the soil.
Constructing roads on the contour and providing adequate water-control structures, such as culverts, help to maintain road stability.
Vegetating cut and fill slopes as soon as possible after construction helps to stabilize the soil and prevent excessive soil erosion.

Recreational Development

Camp areas
Suitability: Moderately suited
Management concerns: Steepness of slope
Management measures and considerations:
Designing roads and trails on the contour and locating camping facilities in the less sloping areas helps to overcome the slope limitation.
Providing a level pad that has a gravel surface helps to improve the suitability of these soils for tents and other facilities.
Vegetating cleared and graded areas as soon as possible helps to maintain soil stability and prevent erosion.

Picnic areas
Suitability: Moderately suited
Management concerns: Steepness of slope
Management measures and considerations:
Providing a level pad that has a gravel surface for picnic tables and other facilities helps to improve soil performance.
Designing roads and trails on the contour and locating picnic facilities in the less sloping areas helps to overcome the slope limitation.
Vegetating cleared and graded areas as soon as possible helps to maintain soil stability and prevent erosion.

Playgrounds
Suitability: Poorly suited
Management concerns: Steepness of slope
Management measures and considerations:
This map unit has severe limitations affecting playgrounds. A site on better suited soils should be selected.
Extensive grading, including cutting and filling slopes may be required.
Vegetating cleared and graded areas as soon as possible helps to maintain soil stability and prevent erosion.
Leaving a buffer zone of grass, trees, and shrubs adjacent to streams and drainageways helps to reduce siltation and provides shade.

Paths and trails
Suitability: Well suited
Management concerns: No significant limitations affect paths and trails.
Management measures and considerations:
Designing paths and trails on the contour and providing adequate water-control structures, such as culverts, help to maintain the stability of trails.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 8A for loblolly pine

57B=Vance sandy loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont uplands, mainly in the northern part of the county south of Chapel Hill
Landform: Ridges and side slopes
Shape of areas: Irregular
Size of areas: 5 to 120 acres

Composition

Vance and similar soils: 66 percent
Dissimilar soils: 44 percent

Typical Profile

Vance soils
Surface layer:
0 to 8 inches=dark yellowish brown sandy loam
Subsoil:
8 to 18 inches=strong brown clay that has red mottles
18 to 30 inches=strong brown clay that has red, yellowish red and light yellowish brown mottles
30 to 39 inches=yellowish red sandy clay that has pockets of sandy clay loam and strong brown and white mottles
Underlying material:
39 to 60 inches=yellowish red sandy clay loam saprolite that has strong brown and white mottles

Soil Properties and Qualities

Depth class: Very deep
Agricultural drainage class: Well drained
Permeability: Slow
Available water capacity: Moderate to high
Depth to seasonal high water table; kind: More than 6.0 feet below the soil surface
Shrink-swell potential: Moderate
Hazard of flooding: None
Surface runoff: Rapid
Hazard of water erosion: Severe
Parent material: Residuum weathered from felsic to mafic high-grade metamorphic or igneous rock
Depth to bedrock: More than 60 inches

Minor Components:

Dissimilar:
Moderately well drained Helena soils in low areas and at the head of drains

Random areas of Iredell soils that have a very high shrink-swell potential
Random areas of Rion soils that have less clay in the subsoil
Random areas of well drained Cecil soils that have red, moderately permeable subsoils
Random areas of well drained Wedowee and Appling soils that have moderately permeable subsoils

Similar:
Random areas of soils that have thicker subsoils

Land Use

Dominant uses: Woodland, pasture and hayland
Other uses: Urban development and cropland

Agriculture

Cropland
Suitability: Well suited
Commonly grown crops: Tobacco, corn, soybeans and small grain
Management concerns: Erodibility
Management measures and considerations:
Resource management systems that include terraces and diversions, stripcropping, contour tillage, no-till farming, and crop residue management help to control soil erosion and surface runoff and maximize the infiltration of rainfall.
Applying lime and fertilizer according to recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.

Pasture and hayland
Suitability: Well suited
Commonly grown crops: Tall fescue, orchardgrass and clover
Management concerns: Erodibility
Management measures and considerations:
Planting adapted species helps to ensure the production of high-quality forage and minimize soil erosion.
Preparing seedbeds on the contour or across the slope helps to control soil erosion and increase germination.
When establishing, maintaining, or renovating hay and pasture, applying lime and fertilizer according to recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
The timely removal of livestock from pastures so that forage plants can recover before winter dormancy helps to maintain pasture and increase productivity.
Rotational grazing and a well planned clipping and harvesting schedule help to maintain pasture and increase productivity.
Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
Preventing overgrazing or preventing grazing when the soil is wet helps to prevent soil compaction, a decrease in productivity, and a rough surface layer.
Installing and maintaining a subsurface drainage system help to improve the productivity of moisture-sensitive crops, such as alfalfa.

Woodland

Suitability: Well suited
Productivity class: Moderately high for loblolly pine
Management concerns: No significant limitations affect woodland management
Management measures and considerations:
Leaving a buffer zone of trees and shrubs adjacent to streams helps to reduce siltation and improve aquatic habitat by providing shade for the water surface.

Urban Development

Dwellings
Suitability: Moderately suited
Management concerns: Shrink-swell
Management measures and considerations:
Reinforcing foundations and footings or backfilling with coarse-textured material helps to strengthen buildings and prevent damage caused by wetness and shrinking and swelling.
Vegetating disturbed areas and providing erosion-control structures, such as sediment fences and catch basins helps to keep eroding soil on site.

Septic tank absorption fields
Suitability: Poorly suited
Management concerns: Restricted permeability
Management measures and considerations:
The Chatham County Health Department should be contacted for guidance on sanitary facilities.
Increasing the size of septic tank absorption fields and installing distribution lines on the contour helps to improve performance.
Installing septic system distribution lines only during dry periods helps to reduce smearing and sealing of trench walls.

Local roads and streets
Suitability: Poorly suited
Management concerns: Low strength
Management measures and considerations:
Incorporating sand and gravel with the soil material, compacting roadbeds, and designing roads that conform to the natural slope help to improve soil strength.
Using a geotextile fabric filter cloth between the roadbed and the soil surface helps to minimize the loss of stone into the soil.
Removing as much of the clay material as possible and increasing the thickness of the base aggravate helps to improve soil performance.
Vegetating cut and fill slopes as soon as possible after construction helps to stabilize the soil and prevent excessive soil erosion.

Recreational Development

Camp areas
Suitability: Moderately suited
Management concerns: Restricted permeability
Management measures and considerations:
Providing a gravel pad for tents and other facilities helps to overcome the restricted water movement in the soil.

Locating campsites in the higher areas allows better surface water runoff and helps to keep campsites drier during wet periods.
Vegetating cleared and graded areas as soon as possible helps to maintain soil stability and prevent erosion.

Picnic areas
Suitability: Moderately suited
Management concerns: Restricted permeability
Management measures and considerations:
Providing a gravel pad for picnic tables and other facilities helps to overcome the restricted permeability.
Vegetating cleared and graded areas as soon as possible helps to maintain soil stability and prevent erosion.

Playgrounds
Suitability: Moderately suited
Management concerns: Steepness of slope
Management measures and considerations:
Cutting, filling, or grading only areas requiring excavation improves soil stability and reduces equipment limitations caused by the slope.
Vegetating cleared and graded areas as soon as possible helps to maintain soil stability and prevent erosion.
Leaving a buffer zone of grass, trees, and shrubs adjacent to streams and drainageways helps to reduce siltation and provides shade.

Paths and trails
Suitability: Well suited
Management concerns: No significant limitations affect paths and trails
Management measures and considerations:
Designing paths and trails on the contour and providing adequate water-control structures, such as culverts, help to maintain the stability of trails.

Interpretive Groups

Land capability classification: IIIe
Woodland ordination symbol: 7A for loblolly pine

ATTACHMENT 6: Septic System Area Computation Spreadsheets

Conventional Septic System Area Computation

Created by: JV
Created on: 6/20/2001
Updated on: 4/5/2006

Client Name:	*Voller*	
Number Bedrooms:	*3*	
Design Flow (gal/day):	360	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	*0.1*	
Trench Bottom Area (ft^2):	3600	(Design flow/LTAR)
Trench Width (ft):	3	
On-center distance between trenches (ft):	9	
Trench Bottom Length (ft):	1200	
Minimum Field Area Required (ft^2):	10800	(Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft^2):	7020	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	27000	(Minimum field area*2.5)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	17550	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	32400	(Minimum field area*3)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	21060	(35% reduction from above)

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

Client Name:	*Voller*	
Number Bedrooms:	*3*	
Design Flow (gal/day):	360	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	*0.4*	
Trench Bottom Area (ft^2):	900	(Design flow/LTAR)
Trench Width (ft):	3	
On-center distance between trenches (ft):	9	
Trench Bottom Length (ft):	300	
Minimum Field Area Required (ft^2):	2700	(Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft^2):	1755	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	6750	(Minimum field area*2.5)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	4387.5	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	8100	(Minimum field area*3)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	5265	(35% reduction from above)

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

Client Name:	*Voller*	
Number Bedrooms:	*3*	
Design Flow (gal/day):	360	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	*0.25*	
Trench Bottom Area (ft^2):	1440	(Design flow/LTAR)
Trench Width (ft):	3	
On-center distance between trenches (ft):	9	
Trench Bottom Length (ft):	480	
Minimum Field Area Required (ft^2):	4320	(Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft^2):	2808	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	10800	(Minimum field area*2.5)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	7020	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	12960	(Minimum field area*3)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	8424	(35% 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: 4/5/2006

Client Name:	*Voller*	
Number Bedrooms:	*4*	
Design Flow (gal/day):	480	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	*0.1*	
Trench Bottom Area (ft^2):	4800	(Design flow/LTAR)
Trench Width (ft):	3	
On-center distance between trenches (ft):	9	
Trench Bottom Length (ft):	1600	
Minimum Field Area Required (ft^2):	14400	(Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft^2):	9360	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	36000	(Minimum field area*2.5)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	23400	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	43200	(Minimum field area*3)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	28080	(35% reduction from above)

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

Client Name:	*Voller*	
Number Bedrooms:	*4*	
Design Flow (gal/day):	480	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	*0.4*	
Trench Bottom Area (ft^2):	1200	(Design flow/LTAR)
Trench Width (ft):	3	
On-center distance between trenches (ft):	9	
Trench Bottom Length (ft):	400	
Minimum Field Area Required (ft^2):	3600	(Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft^2):	*2340*	*(35% reduction from above)*
Total Field Area Required (ft^2)$^{(1)}$:	9000	(Minimum field area*2.5)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	5850	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	10800	(Minimum field area*3)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	7020	(35% reduction from above)

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

Client Name:	*Voller*	
Number Bedrooms:	*4*	
Design Flow (gal/day):	480	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	*0.25*	
Trench Bottom Area (ft^2):	1920	(Design flow/LTAR)
Trench Width (ft):	3	
On-center distance between trenches (ft):	9	
Trench Bottom Length (ft):	640	
Minimum Field Area Required (ft^2):	5760	(Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft^2):	3744	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	14400	(Minimum field area*2.5)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	9360	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	17280	(Minimum field area*3)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	11232	(35% 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: 4/5/2006

Client Name:	*Voller*	
Number Bedrooms:	*5*	
Design Flow (gal/day):	600	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	*0.1*	
Trench Bottom Area (ft^2):	6000	(Design flow/LTAR)
Trench Width (ft):	3	
On-center distance between trenches (ft):	9	
Trench Bottom Length (ft):	2000	
Minimum Field Area Required (ft^2):	18000	(Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft^2):	11700	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	45000	(Minimum field area*2.5)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	29250	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	54000	(Minimum field area*3)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	35100	(35% reduction from above)

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

Client Name:	*Voller*	
Number Bedrooms:	*5*	
Design Flow (gal/day):	600	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	*0.4*	
Trench Bottom Area (ft^2):	1500	(Design flow/LTAR)
Trench Width (ft):	3	
On-center distance between trenches (ft):	9	
Trench Bottom Length (ft):	500	
Minimum Field Area Required (ft^2):	4500	(Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft^2):	2925	*(35% reduction from above)*
Total Field Area Required (ft^2)$^{(1)}$:	11250	(Minimum field area*2.5)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	7312.5	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	13500	(Minimum field area*3)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	8775	(35% reduction from above)

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

Client Name:	*Voller*	
Number Bedrooms:	*5*	
Design Flow (gal/day):	600	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	*0.25*	
Trench Bottom Area (ft^2):	2400	(Design flow/LTAR)
Trench Width (ft):	3	
On-center distance between trenches (ft):	9	
Trench Bottom Length (ft):	800	
Minimum Field Area Required (ft^2):	7200	(Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft^2):	4680	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	18000	(Minimum field area*2.5)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	11700	(35% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	21600	(Minimum field area*3)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	14040	(35% reduction from above)

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