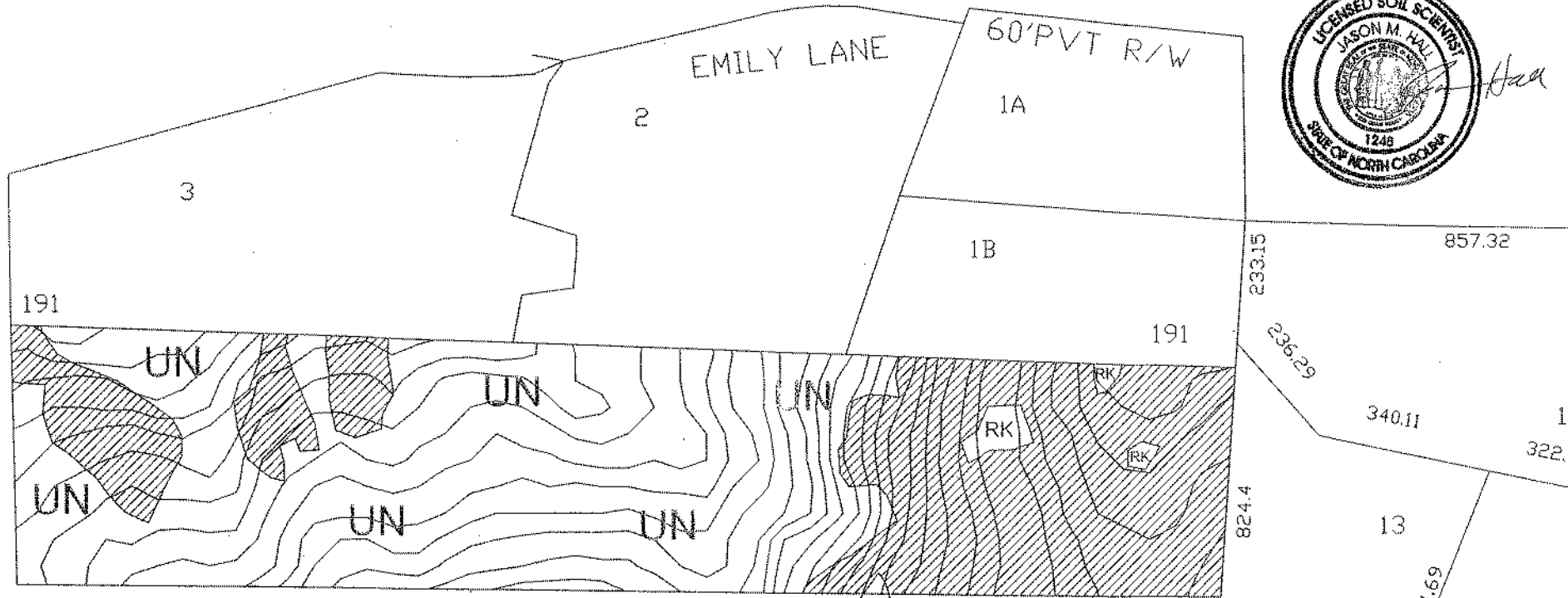


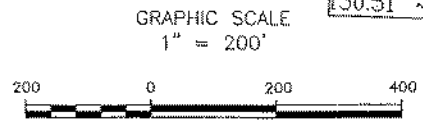
Detail Soils Evaluation  
 ~25-acres  
 Chatham County, NC  
 Lewis-Metty Development Group



- \*Detail Soils Evaluation
- \*Soil boundary was flagged in the field and located via GPS receivers
- \*Not a Survey.
- \*Septic system setbacks listed below for new lots.
  - 1) 10' from property lines.
  - 2) 100' from wells for primary systems.
  - 3) 50' from wells for repair systems.
  - 4) 50' from surface waters (streams, ponds, lakes).
- \*Any mechanical disturbances such as grading, cutting and filling of the suitable soil areas can render areas unsuitable for future septic systems.
- \*See accompanying report for additional information.
- \*Base map taken from Chatham County GIS Website, not a survey

LEGEND	
	Areas contain soils with 1/4 to 30 inches or more of vesicle material and have potential for conventional, modified conventional, LPP or ultra-shallow conventional septic systems.
UN	Unsuitable areas.
RK	Unsuitable areas due to exposed rock.

There will be large rocks in the areas mapped as suitable and may require backhoe pits for the local health department to evaluate the soils.



Central Carolina  
 Soil Consulting  
 919-784-9449  
 Project # 52



## Central Carolina Soil Consulting, PLLC

6325-9 Falls of Neuse Rd., PMB#341

Raleigh, NC 27615-6809

919-790-1083

April 6, 2005

Job # 52

The Tuscan Group, Inc.  
Attention: Kirk Metty  
9308 Foxburrow Court  
Raleigh, NC 27603

RE: Preliminary soil/site evaluation on ~180-acres in Chatham County, NC

Dear Mr. Metty:

Central Carolina Soil Consulting, PLLC conducted a preliminary soil evaluation on the parcels listed above to determine the areas of soils that are suitable for subsurface wastewater disposal systems. The soil/site evaluation was performed using hand auger borings, under moist soil conditions, based on the criteria found in the State Subsurface Rules, 15ANCAC 18A .1900 "Laws and Rules for Sewage Treatment and Disposal Systems". From this evaluation, CCSC sketched the boundary between the suitable soils and unsuitable soils onto an aerial and topographic map of the property.

The above referenced parcels are located north of Lamont Norwood Road and southeast of Jones Ferry Road in northern Chatham County. This area lies in the mixed mafic and felsic crystalline geologic unit, where soils have formed from residual parent material such as gneiss, schist and diorites. The soils that have formed on this parcel are similar to the Pacolet, Appling, Wedowee, Helena, Louisburg and Chewacla soil series. The attached soils map indicates the areas of suitable vs. unsuitable soils. The Appling, Wedowee and Pacolet soil series are generally suitable for subsurface wastewater systems. That is, the morphology of the soils contain suitable characteristics that would support subsurface septic systems such as clay to sandy clay textured subsoils that are not considered expansive, blocky structure and no indicators of restrictive characteristics within 24 inches of the soil surface. The remaining soil series are considered unsuitable in regards to subsurface wastewater disposal systems. The Helena soils contain expansive clays and indicators of a perched water table, while the areas of Louisburg soils are shallow to bedrock. The Chewacla soils are located in drainage ways and floodplains.

The attached soils map indicates the areas of soils which are suitable for subsurface wastewater systems. The "hatched soil units" on the attached map indicates the areas of soils that have 24 to 30+ inches or more of suitable soil material. These areas have potential for conventional, modified conventional, LPP or ultra-shallow conventional septic systems. Unit "UN" on the attached map indicates areas of unsuitable soils that are located in unsuitable soils or topography and cannot be used for the systems

mentioned above. Unit "RK" on the attached map indicates unsuitable soil areas due to exposed rock. Some of these areas may be evaluated with the use of backhoe pits to expand the areas of suitable soils. Unit "NE" on the attached map indicates areas of soils that were not evaluated.

### **Future Subdivision Considerations**

Several factors should be considered before a final subdivision plan is created for any property. One consideration is that each proposed lot shall contain an adequate amount of suitable soils, which can support a primary septic system along with a repair septic system. The suitable soil areas cannot be affected by future homes, driveways, patios, excavation or filling activities and if an on-site well is used then a 100' setback is required around the well head. An exact square footage of suitable soils required per lot to obtain a permit cannot be given due to soil variability and topographic characteristics on each lot. The amount of suitable soils required to support a 3-bedroom residence will range between 15,000 ft<sup>2</sup> - 19,000 ft<sup>2</sup> (could be more or less) per lot. These soil area estimates are based upon soil application rates for a clay to a sandy clay textured subsoil with a range of 0.25 gallons per day/square foot and 0.32 gallons per day/square foot for conventional type systems 0.1 gallons per/day/square foot for low pressure pipe septic systems. The ultimate application rate will be assigned by the Chatham County Health Department based on a detailed evaluation.

Due to the limited areas of suitable soils for subsurface septic systems on these parcels you may want to consider maximizing the areas of suitable soils for septic system easements. This would allow you to maximize the total number of lots the two parcels can support for subsurface wastewater disposal. A detailed soils evaluation would need to be completed before a final plan is developed.

During the road construction process of a subdivision it is important not to impact any suitable soil areas with such activities as excavating or filling. Only the actual roadways and required drainage ditches and/or sediment basins should be constructed during this process. If the contractor requires a staging area to place fill from the construction process, then areas of unsuitable soils on the property should be utilized as long as they are not state/county buffers, jurisdiction wetlands or other areas protected by local zoning regulations. If this is not possible, then the disturbed areas should be minimized as much as possible. The same precautions should be taken when the individual lots are cleared for home sites. Only the vegetation should be removed in the areas of the proposed drain fields on lots to prevent any disturbance of the naturally occurring soil. A lot with adequate areas of suitable soils can be deemed unsuitable due to poor planning or site disturbance. Central Carolina Soil Consulting recommends that all lot clearing activities are delayed until a permit is issued by the local health department, with the exception of clearing thick vegetation to access the lot.

This report discusses the location of suitable soils for subsurface wastewater disposal systems and does not guarantee any permits or approval required by the local health department. Central Carolina Soil Consulting, PLLC is a professional consulting firm specializing in soil delineations and design for on-site wastewater disposal systems. The rules governing on-site wastewater disposal systems are complex and the

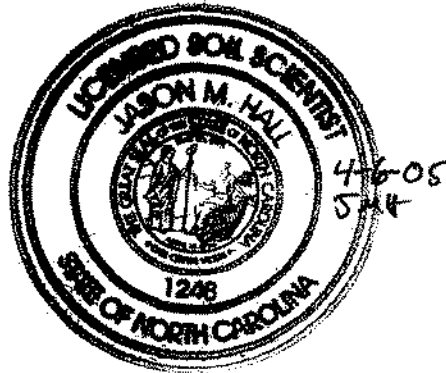
interpretation of the rules are based upon the opinions of regulators (state and county level). Due to the subjective nature of the permitting process, CCSC cannot guarantee that areas delineated as suitable for on-site wastewater disposal systems will be permitted by the governing agencies. These permitting considerations should be taken into account before a financial commitment is made on a tract of land.

If you have any questions regarding the findings on the attached map or in this report, please feel free contact me at anytime. Thank you allowing Central Carolina Soil Consulting to perform this site evaluation for you.

Sincerely,

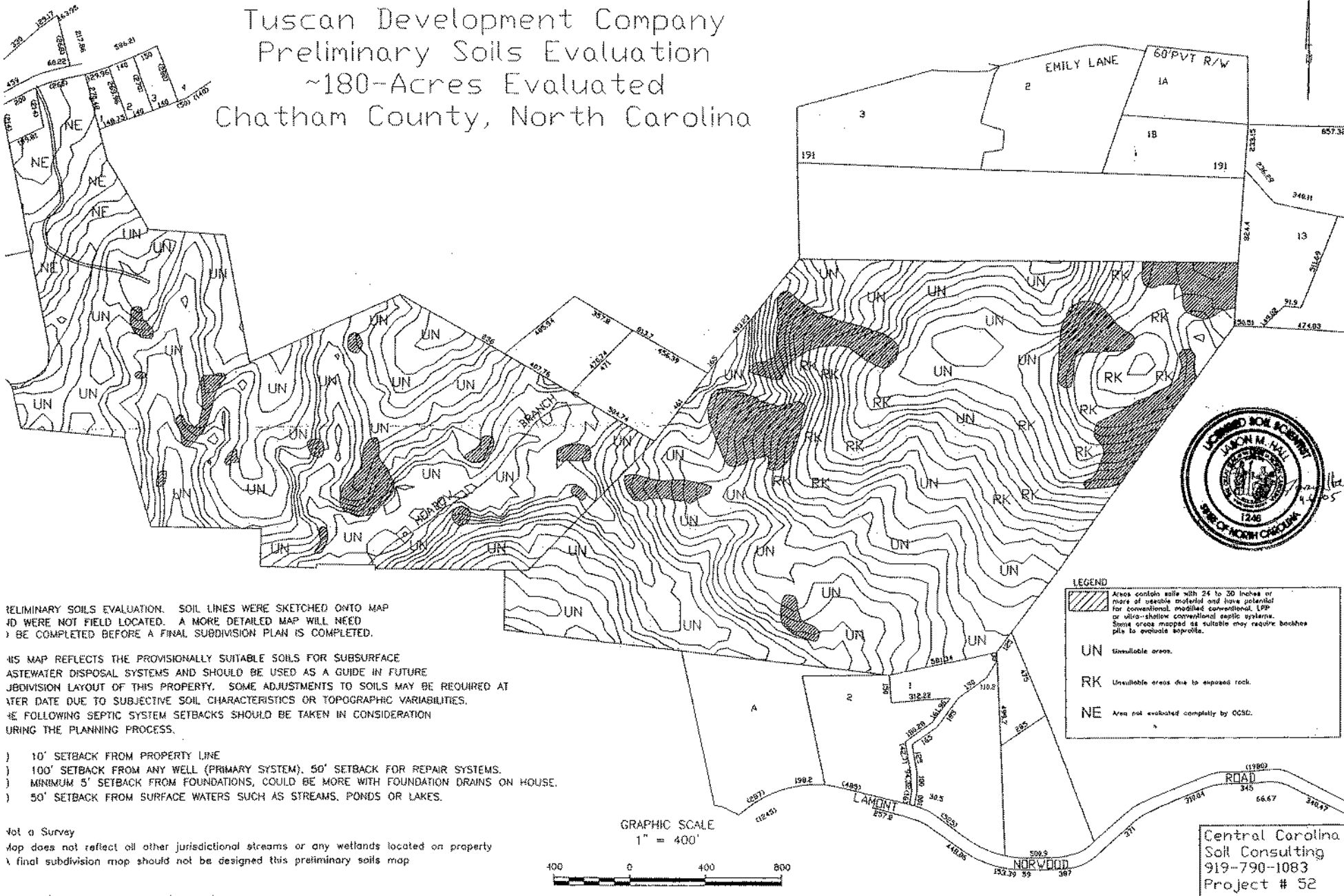


Jason Hall  
NC Licensed Soil Scientist #1248



Encl: Soil Map

# Tuscan Development Company Preliminary Soils Evaluation ~180-Acres Evaluated Chatham County, North Carolina



PRELIMINARY SOILS EVALUATION. SOIL LINES WERE SKETCHED ONTO MAP AND WERE NOT FIELD LOCATED. A MORE DETAILED MAP WILL NEED TO BE COMPLETED BEFORE A FINAL SUBDIVISION PLAN IS COMPLETED.

THIS MAP REFLECTS THE PROVISIONALLY SUITABLE SOILS FOR SUBSURFACE WASTEWATER DISPOSAL SYSTEMS AND SHOULD BE USED AS A GUIDE IN FUTURE SUBDIVISION LAYOUT OF THIS PROPERTY. SOME ADJUSTMENTS TO SOILS MAY BE REQUIRED AT A LATER DATE DUE TO SUBJECTIVE SOIL CHARACTERISTICS OR TOPOGRAPHIC VARIABILITIES.

THE FOLLOWING SEPTIC SYSTEM SETBACKS SHOULD BE TAKEN IN CONSIDERATION DURING THE PLANNING PROCESS.

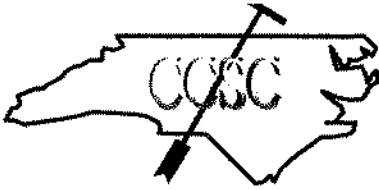
- ) 10' SETBACK FROM PROPERTY LINE
- ) 100' SETBACK FROM ANY WELL (PRIMARY SYSTEM). 50' SETBACK FOR REPAIR SYSTEMS.
- ) MINIMUM 5' SETBACK FROM FOUNDATIONS, COULD BE MORE WITH FOUNDATION DRAINS ON HOUSE.
- ) 50' SETBACK FROM SURFACE WATERS SUCH AS STREAMS, PONDS OR LAKES.

Note: This map does not reflect all other jurisdictional streams or any wetlands located on property. A final subdivision map should not be designed this preliminary soils map.

**LEGEND**

- Areas contain silt with 24 to 30 inches or more of useable material and have potential for conventional, modified conventional, LPP or ultra-shallow conventional septic systems. Some areas mapped as suitable may require backhoe pits to evaluate septic.
- UN Unsuitable areas.
- RK Unsuitable areas due to exposed rock.
- NE Area not evaluated completely by CCSI.

Central Carolina  
Soil Consulting  
919-790-1083  
Project # 52



## Central Carolina Soil Consulting, PLLC

6325-9 Falls of Neuse Rd., PMB#341  
Raleigh, NC 27615-6809  
919-784-9449

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March 28, 2006  
Job # 152

Lewis-Metty Development Group  
Attention: Kirk Metty  
9308 Foxburrow Court  
Raleigh, NC 27613

RE: Detailed soil/site evaluation on ~25-acres adjacent to Emily Lane in Chatham County.

Dear Mr. Metty:

Central Carolina Soil Consulting, PLLC conducted a detailed soil evaluation on the parcel listed above to determine the areas of soils that are suitable for subsurface wastewater disposal systems. The soil/site evaluation was performed using hand auger borings based on the criteria found in the State Subsurface Rules, 15ANCAC 18A .1900 "Laws and Rules for Sewage Treatment and Disposal Systems". From this evaluation, CCSC flagged the boundary between the suitable soils and unsuitable soils, then located them utilizing GPS technology.

The above referenced parcel is located in the north central portion of Chatham County. This area lies in the mixed mafic and felsic crystalline geologic unit, where soils have formed from residual parent material such as gneiss, schist and diorites. The soils that have formed on this parcel are similar to the Pacolet and Wedowee, Helena and Louisburg soil series. The attached soils map indicates the areas of suitable vs. unsuitable soils. The Pacolet and Wedowee soil series are generally suitable for subsurface wastewater systems. That is, the morphology of the soils contain suitable characteristics that would support subsurface septic systems such as clayey textured subsoils that are not considered expansive, blocky structure and no indicators of restrictive characteristics within 24 inches of the soil surface. The Helena soil series has a combination of expansive clays and a perched water table within 24 inches of the soil surface. The Louisburg soils have bedrock within 24 inches of the soils surface and are unsuitable for conventional & LPP subsurface septic systems.

The attached soils map indicates the areas of soils which are suitable for subsurface wastewater systems. The "hatched soil units" on the attached map indicates the areas of soils that have 24 to 30+ inches of suitable soil material. These areas have potential for conventional, modified conventional, LPP or ultra-shallow conventional septic systems. Unit "UN" on the attached map indicates areas of unsuitable soils that contain restrictive soil characteristics less than 24 inches. Unit "RK" indicates areas of unsuitable soils due to exposed rock.

## **Future Subdivision Considerations**

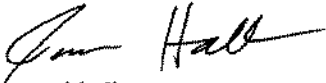
Several factors should be considered before a final subdivision plan is created for this property. One consideration is that each proposed lot shall contain an adequate amount of suitable soils, which can support a primary septic system along with a repair septic system. The suitable soil areas cannot be affected by future homes, driveways, patios, excavation or filling activities and if an on-site well is used then a 100' setback is required around the well head. An exact square footage of suitable soils required per lot to obtain a permit cannot be given due to soil variability and topographic characteristics on each lot. The amount of suitable soils required to support a 3-bedroom residence will range between 10,000 ft<sup>2</sup> -13,000 ft<sup>2</sup> (could be more or less) per lot. These soil area estimates are based upon soil application rates for a clayey textured subsoil with a range of 0.25 gallons per day/square foot and 0.33 gallons per day/square foot for conventional type systems and 0.1 to 0.13 gallons per/day/square foot for low pressure pipe septic systems. The ultimate application rate will be assigned by the Chatham County Health Department based on a detailed evaluation on each proposed lot.

During the road construction process of a subdivision it is important not to impact any suitable soil areas with such activities as excavating or filling. Only the actual roadways and required drainage ditches and/or sediment basins should be constructed during this process. If the contractor requires a staging area to place fill from the construction process, then areas of unsuitable soils on the property should be utilized as long as they are not state/county buffers, jurisdictional wetlands or other areas protected by local zoning regulations. If this is not possible, then the disturbed areas should be minimized as much as possible. The same precautions should be taken when the individual lots are cleared for home sites. Only the vegetation should be removed in the areas of the proposed drain fields on lots to prevent any disturbance of the naturally occurring soil. A lot with adequate areas of suitable soils can be deemed unsuitable due to poor planning or site disturbance. Central Carolina Soil Consulting recommends that all lot clearing activities are delayed until a permit is issued by the local health department, with the exception of clearing thick vegetation to access the lot.

This report discusses the location of suitable soils for subsurface wastewater disposal systems and does not guarantee any permits or approval required by the local health department. Central Carolina Soil Consulting, PLLC is a professional consulting firm specializing in soil delineations and design for on-site wastewater disposal systems. The rules governing on-site wastewater disposal systems are complex and the interpretation of the rules are based upon the opinions of regulators (state and county level). Due to the subjective nature of the permitting process and soil/topographic variability, CCSC cannot guarantee that areas delineated as suitable for on-site wastewater disposal systems will be permitted by the governing agencies. These permitting considerations should be taken into account before a financial commitment is made on a tract of land.

If you have any questions regarding the findings on the attached map or in this report, please feel free contact me at anytime. Thank you allowing Central Carolina Soil Consulting to perform this site evaluation for you.

Sincerely,



Jason Hall  
NC Licensed Soil Scientist #1248



Encl: Soil Map