



SOIL SERVICES, PLLC

PO BOX 91115 ♦ RALEIGH, NC ♦ 27675

July 2, 2025
Project No. 2169-1

Jeffrey Sharp
2000 Chichester Ct
Raleigh, NC 27615

**Re: Detailed Soil/Site Evaluation
Mt Vernon Ch Rd Property (Approx. 3 Acres)
3028 Mt Vernon Church Rd, Raleigh, Wake County
PIN No. 0881-91-8573**

Dear Mr. Sharp:

Soil Services, PLLC completed a detailed soil/site evaluation for the Mt Vernon Church Rd property was completed on June 30, 2025. The evaluation was performed during moist soil conditions in accordance with 15A NCAC 18E "Laws and Rules for Sewage Treatment and Disposal Systems" and "Regulations Governing Sewage treatment and Disposal in Wake County" and/or Local Regulations for preliminary planning purposes.

Soil characteristics and landscape suitability relative to on-site wastewater systems were evaluated through hand auger borings and ground-truthing. Auger boring locations and suitable soil lines were flagged in the field with flagging tape. Field data was used to generate the attached Soil/Site Evaluation map. Representative soil borings are attached and were described in accordance with criteria found in the USDA-NRCS "Field Book for Describing and Sampling Soils."

Results

The project site is located in the Piedmont region. The predominant upland soil series found on-site were Cecil and Wake series. The Cecil series has a clay subsurface with a sandy loam surface. These series contain 24-36 inches or more of suitable soil and are potentially suitable for conventional, modified conventional, ultra-shallow or low pressure pipe subsurface septic systems. The Wake soil has an expansive clay subsurface with sandy loam surface. These soils have shallow wetness condition and are not considered suitable for conventional, modified conventional, ultra-shallow or low pressure pipe subsurface septic systems. The soil areas with less than 24 inches of suitable soil are potentially suitable for alternative systems such as pretreatment systems, subsurface drip irrigation, or surface drip or spray irrigation systems. Soil Services can provide additional information about these systems upon request.

The potentially suitable soil areas are depicted on the Soil/Site Evaluation Map in the hatched areas. The "UN" areas have less than 24 inches of suitable soil depth or contain other unsuitable features such as unsuitable landscape position, fill material, disturbed soil, streams, wetlands, existing structures, etc. These areas are typically considered unsuitable for conventional system types. As mentioned above, these areas may be suitable for alternative system types. Unit "NE" represents areas not evaluated due to vegetation thickness or existing structures (barn, workshop, gazebo, deck, etc). If these structures are

temporary (no permanent foundation), the structure may be removed or relocated in order to evaluate the underlying soil.

The suitable soil area should be taken into account during the planning process. Sufficient suitable soil should be designated for septic system and repair for each lot. Site elements such as house, garage, pool, driveway, walkway, etc. should be located outside of the suitable soil areas designated for the septic system and repair. Additional information about planning can be found in the Recommendations section of this report.

Final site planning and septic system permits are reviewed and obtained from Wake County Environmental Services. Each lot shall be reviewed and permitted through the Local County Health Department. Suitable soil areas should be protected. Any disturbance to these areas could render them unsuitable. Disturbance of the areas may include but is not limited to grading, filling, paving, tree/stump removal, construction, trafficking, etc. Soil services reserves the right alter the results of this report based on further investigation.

Wake County Regulations

Wake County requires a subdivision plan to be reviewed and sealed by a licensed soil scientist prior to submittal. The licensed soil scientist will need to complete the Wake County Subdivision Checklist and submit the appropriate information for preliminary site plan approval. This site is located in the Falls Lake watershed. Under Section V regulations, each lot utilizing an individual well require 40,000 square feet of suitable/useable soil. Subdivision plans utilizing a community well require 30,000 square feet of suitable/useable soil per lot. For lots that cannot meet this stipulation, a field layout of the system and repair can be performed to meet recordation requirements under Section VI. The septic system and repair will need to be represented on a detailed site plan prepared by you and your planner showing all existing and proposed site elements (house, driveway, pool, garage, well, etc).

Preliminary site plan approval under section V and VI does not guarantee final site plan approval or permit issuance. Individual application for improvement must be made to Wake County citing specific intended use and accompanied by a detailed site plan showing all existing and proposed site elements (e.g. house, garage, well, septic, driveway, walk way, etc.). A detailed site evaluation based on current regulations will be performed by a Wake County authorized agent. Final approval will be issued upon satisfactory completion of the site evaluation.

Recommendations

The efficacy of the usable soil area can depend on the size and configuration of the area as well as the location and configuration of the septic drainlines. The septic drainlines must run on contour throughout the length of the entire line (i.e. the septic line must stay on the same elevation throughout the length of the line). Therefore, topographic irregularities can greatly increase the minimum space requirements for any given system. Septic system size also vary based on the intended use of the system as well as the loading rate (LTAR) of the soil the system is cited within. Daily design flow rates are assigned to the intended use of the site and a cumulative design flow rate is used to size the system. The design flow for a single family residence is based on the number of bedrooms in the residence. Therefore a 4-bedroom residence would have a larger system than a 3-bedroom residence assuming all else is the same. The loading rate of a soil or long-term acceptance rate (LTAR) is assigned based upon soil characteristics of the site (texture, structure, mineralogy, porosity, etc.). A lower LTAR means the soil permeability is low which results in a larger system relative to a higher LTAR (more permeable soil). The septic system and repair must also meet all required setbacks from existing and proposed site element (see

15A NCAC 18E .0601 attached) which further increase the minimum space required for the septic system and repair.

A field layout of the system maybe completed to determine whether a suitable soil area(s) can potentially support the proposed intended use of the site. The intended use as well as the factors mentioned previously can be used to estimate the space required for septic system and repair A four-bedroom, single-family residence with a design flow of 480 gallons per day (120 gallons per bedroom per day) requires 12,000 to 16,000 square feet of useable soil area or 1,350 to 1,600 linear feet of conventional drain line (system and repair) or 1,280 to 2,000 linear feet of low pressure pipe (LPP) drain line (system and repair). Estimates reference the “Laws and Rules for Sewage Treatment and Disposal Systems” and are based on an LTAR range of 0.25 to 0.30 gallons per day per square foot (gpd/ft²) for conventional and modified conventional drain line and 0.10 to 0.15 gpd/ft² for LPP drain line. Actual drain field may require more area and/or linear footage of drain line depending upon site conditions. The final LTAR is assigned to a site/lot by the Wake County Environmental Services after their detailed site evaluation.

Conclusion

This report discusses potentially suitable/useable soil areas found on this site and does not guarantee or imply any approval or permit will be given by local, County and/or State governing agencies. Soil Services specializes in the evaluation of soils for the purpose of wastewater treatment/disposal systems as well as the layout and design of such systems. Soil Services is contracted for its professional opinion and cannot ensure the client will obtain any or all of the permit or approvals needed from the local, County and/or State governing agencies.

Anyone making financial investments/commitments should be fully aware of all permit requirements for this tract prior to final dedication. Each lot requires a septic permit prior to obtaining a building permit. The County Health Department will conduct a detailed site evaluation for each lot to determine the location of site elements as well as septic system and repair type and location. After the detailed site evaluation is complete, the County Health Department will make a final determination. Soil Services can assist you in the field layout of the wastewater treatment system, subdivision recordation, and/or the individual permitting process if requested.

Soil Services, PLLC would be pleased to assist you in any future site analysis needs. Please contact Sarah I. Menser at (919) 745-1928 with any requests, questions or concerns.

Sincerely,

Soil Services, PLLC



Sarah I. Menser, LSS
NC License No. 1304

7/2/25

Attachments:

- Site Analysis Summary
- Soil Profile Description(s)
- Detailed Soil/Site Evaluation Map

Soil/Site Evaluation Summary

15A NCAC 18E

.0502 Slope:

- ☒ <65% (S) ☐ >65% (U) ☐ Wetlands (U)
☐ Gullies/Ravines (U) ☐ Depression (U)

.0503 (1) Texture Group:

- Group I (S): ☐ Sand ☐ Loamy Sand
Group II (S): ☐ Sandy Loam ☐ Loam
Group III (S): ☐ Silt ☐ Silt Loam
 ☐ Sandy Clay Loam ☐ Clay Loam
 ☐ Silty Clay Loam
Group IV (S): ☐ Sandy Clay ☐ Silty Clay
 ☒ Clay

(2) Structure:

- ☐ Crumb/Granular (S) ☒ Block Like < 1" (S)
☐ Block Like > 1" (U) ☐ Prismatic < 2" (S)
☐ Prismatic > 2" (U) ☐ Platy (U)
☐ Single Grain (S) ☐ Massive (U)

(3) Clay Mineralogy:

- ☒ Slightly Expansive(S) ☐ Expansive (U)

.0504 Depth to Soil Wetness (Chroma 2 Indicator):

- ☒ >12" (Group 2-4) & >18" (Group 1) (S)
☐ <12" (Group 2-4) & <18" (Group 1) (U)

.0505 Soil Depth:

- ☒ >18" (S) ☐ <18" (U)

.0506 Saprolite:

- ☐ Not Present (S) ☒ Present & Minimum Separation Met (S)
☐ Present & Minimum Separation Not Met (U)

.0507 Restrictive Horizon (3" thick or more):

- ☒ >18" (S) ☐ <18" (U)

.0508 Available Space (only if layout has been done):

- System and Repair Available? ☒ Yes ☐ No ☒ NA

.0509 Overall Site Suitability:

- ☒ S ☐ U

.0601 Location of Sanitary Sewage Systems

(a) Every wastewater system shall be located the minimum setbacks from the site features specified in Table IX. The setback shall be measured on the ground surface, unless otherwise specified in this Rule, from the nearest wastewater system component sidewall or as otherwise specified in a system specific rule or PIA Approval.

Any transient or non-transient non-community water supply well, community well, shared water supply well, well that complies with 15A NCAC 18A .1700, or water supply spring	100
A private drinking water well or upslope spring serving a single family dwelling unit	50
Any other well or source not listed in this table, excluding monitoring wells	50
Surface waters classified WS-I, from ordinary high-water mark	100
Waters classified SA, from mean high-water mark	100
Any Class I or Class II reservoir, from normal water level	100
Lake or pond, from normal water level	50
Any other stream, non-water supply spring, or other surface waters, from the ordinary high-water mark	50
Tidal influenced waters, such as marshes and coastal waters, from mean high-water mark	50
Permanent stormwater retention basin, from normal water level	50
Any water line, unless the requirements of Paragraph (i) have been met	10
Closed loop geothermal wells	15
Building foundation and deck supports	5
Patio, porch, stoop, lighting fixtures, or signage, including supporting structures such as posts or pilings	1
Any basement, cellar, or in-ground swimming pool	15
Buried storage tank or basin, except stormwater	10
Above ground swimming pool and appurtenances that require a building permit	5
Top of slope of embankment or cuts of two feet or more vertical height with a slope greater than 50 percent	15
Top of slope of embankment or cuts of two feet or more vertical height with a slope greater than 33 percent and less than or equal to 50 percent	15
If the site has suitable soil depth that extends for a minimum horizontal distance of 15 feet from the edge of the dispersal field, no minimum setback is required.	
Top of slope of embankment or cuts of two feet or more vertical height with a slope less than 33 percent	0
Groundwater lowering system, as measured on the ground surface from the edge of the feature	25
Downslope interceptor drains and surface water diversions with a vertical cut of more than two feet, as measured on the ground surface from the edge of the feature	15
Upslope and sideslope interceptor drains and surface water diversions with a vertical cut of more than two feet, as measured on the ground surface from the edge of the feature	10
A stormwater collection system as defined in 15A NCAC 02H .1002(48), excluding gutter drains that connect to a stormwater collection system, with a vertical cut of more than two feet as measured from the center of the collection system	10
Bio-retention area, injection well, infiltration system, or dry pond	25
Any other dispersal field, except designated dispersal field repair area for project site	20
Any property line	10
Burial plot or graveyard boundary	10
Above ground storage tank from dripline or foundation pad, whichever is more limiting	5
Utility transmission and distribution line poles and towers, including guy wires, unless a greater setback is required by the utility company	5
Utility transformer, ground-surface mounted	5
Underground utilities	5

Cecil

Soil Profile Description

HORIZON	DEPTH (in)	MATRIX COLOR (MUNSELL)	MOTTLE COLOR (MUNSELL)	TEXTURE	STRUCTURE
Ap	0-8	10 YR 4/4	-	SL	WK M GR
Bt1	8-26	10 R 4/8	-	C	MO M SBK
Bt2	26-48	10 R 4/8	5 YR 5/8	C	MO M SBK

Notes:

- 1) Soil similar to the Cecil Soil Series.
- 2) Soil described from auger boring.

Wake

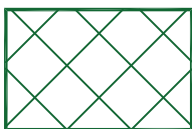
Soil Profile Description

HORIZON	DEPTH (in)	MATRIX COLOR (MUNSELL)	MOTTLE COLOR (MUNSELL)	TEXTURE	STRUCTURE
A	0-5	10 YR 3/4	-	LS	WK F GR
Bw	5-10	10 YR 4/6	-	LS	WK F SBK
C	10-14	10 YR 4/4	-	GR L CS	SG
R	14	-	-	-	-

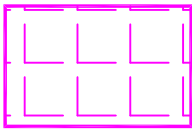
Notes:

- 1) Soil similar to the Wake Soil Series.
- 2) Soil described from auger boring.

LEGEND



Areas contain soils similar to Cecil soil series with 24 to 30 inches or more of useable material (clay texture) and have the potential for conventional, modified conventional, ultra-shallow or low pressure pipe septic systems . Total Area approximately 27,000 sf.



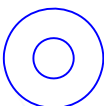
Areas contain soils similar to Wake soil series with 13 to 23 inches or more of useable material (clay texture) and have the potential for conventional, modified conventional, ultra-shallow or low pressure pipe septic systems . Total Area approximately 2,500 sf.

UN

Unsuitable areas due to soil wetness condition, soil depth, clay mineralogy, and/or landscape position.

NE

Areas that were not evaluated due to existing structures, drives, wells, septic system, etc.



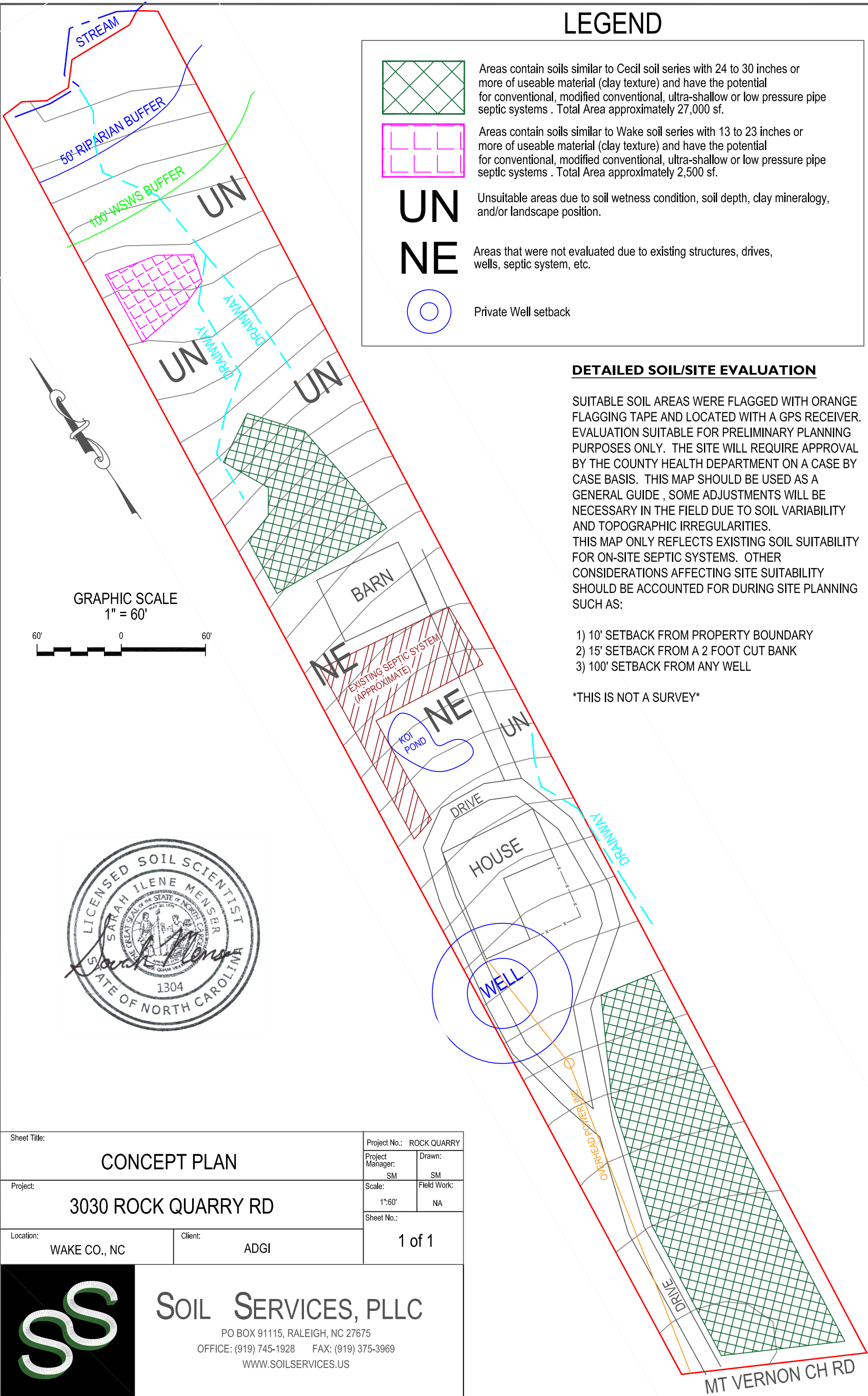
Private Well setback

DETAILED SOIL/SITE EVALUATION

SUITABLE SOIL AREAS WERE FLAGGED WITH ORANGE FLAGGING TAPE AND LOCATED WITH A GPS RECEIVER. EVALUATION SUITABLE FOR PRELIMINARY PLANNING PURPOSES ONLY. THE SITE WILL REQUIRE APPROVAL BY THE COUNTY HEALTH DEPARTMENT ON A CASE BY CASE BASIS. THIS MAP SHOULD BE USED AS A GENERAL GUIDE , SOME ADJUSTMENTS WILL BE NECESSARY IN THE FIELD DUE TO SOIL VARIABILITY AND TOPOGRAPHIC IRREGULARITIES. THIS MAP ONLY REFLECTS EXISTING SOIL SUITABILITY FOR ON-SITE SEPTIC SYSTEMS. OTHER CONSIDERATIONS AFFECTING SITE SUITABILITY SHOULD BE ACCOUNTED FOR DURING SITE PLANNING SUCH AS:

- 1) 10' SETBACK FROM PROPERTY BOUNDARY
- 2) 15' SETBACK FROM A 2 FOOT CUT BANK
- 3) 100' SETBACK FROM ANY WELL

THIS IS NOT A SURVEY



Sheet Title: CONCEPT PLAN		Project No.: ROCK QUARRY	
Project: 3030 ROCK QUARRY RD		Project Manager: SM	Drawn: SM
		Scale: 1":60'	Field Work: NA
Location: WAKE CO., NC		Client: ADGI	
		Sheet No.: 1 of 1	

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