S&EC

Soil & Environmental Consultants, PA

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sandec.com

Marthas Investment LLC
Attn: Ping Chen
205 Ivyshaw Road
Cary, NC 27519

October 1, 2018
S&EC Project #13544.S1

Re: Soil/Site Evaluation at 3609 NC HWY 751, 2582 Marthas Chapel Road, and 2042 Hollands Chapel Road totaling 207-acres, Chatham County, NC

Dear Ms. Chen:

Soil & Environmental Consultants, PA (S&EC) performed a preliminary soil and site evaluation on the above referenced tract. This was performed at your request as part of the preliminary planning process in order to determine areas of soil that have potential for subsurface and surface wastewater disposal per our agreement from September 9, 2018. Fieldwork was performed in September, 2018.

S&EC traversed the property and observed landforms (slope, drainage patterns, past use, etc.) as well as soil conditions (depth, texture, structure, seasonal wetness, restrictive horizons, etc.) through the use of hand auger borings. The site was evaluated during dry soil conditions. From these observations, an evaluation of the site was developed, relative to subsurface and surface disposal of wastewater. Soil areas were estimated in the field. The soil/site evaluation criteria used is that contained in 15 A NCAC 18A .1900 "Laws and Rules for Sewage Treatment and Disposal Systems" and NCDWR Subchapter .02T-Waste not Discharged to Surface Waters.

FINDINGS

This site is located in the Triassic Basin region of Chatham County. The upland soils on this tract are similar to the White Store and Creedmoor soil series. The White Store and Creedmoor soil series have a sandy surface material over a brownish yellow or pale brown, heavy clay/ sandy clay loam subsoil. These soils are typically 12 inches deep to prohibitive soil characteristics and have the potential for pretreatment surface drip and spray irrigation septic systems. Several areas across the property are less than 12 inches to prohibitive soil characteristics but have the potential for surface septic systems if NCDWR approved soil fill material is brought in to meet the vertical separation requirements.

The blue hatched units indicate areas of soils which have potential for a pretreatment surface drip and/or pretreatment spray irrigation septic system with a state approved soil cap on top of the existing soil surface. Unit "UN" on the attached map indicates areas of soils that are unsuitable due to landscape position, topography, and/or regulated wetland and creek buffers.

S&EC encountered numerous areas of thick vegetation and may require additional clearing or hydro axe paths in order to further evaluate the soils on the property. Two areas on the property contain existing structures and a well. These areas are indicated on the map with the leaders pointing to the general vicinity of those structures. If the wells on the property are properly abandoned, then the septic setbacks from the wells can be reduced to 15 feet from the well. The existing home on the northern side of the property also has an existing septic system located behind the house.

The site plan for each lot must ensure that adequate soil area for the system is unaffected by site elements (house placement, driveway, wells, patios, decks, etc.) on that or adjacent lots. The area ultimately designated by NCDWR on the site plan for the septic system must remain undisturbed (no mechanical clearing, excavation, heavy traffic or other significant site disturbing activities) until authorization is granted. A lot with initially adequate useable soil area may be rendered unusable as a result of improper site planning and/or disturbance. A field layout of the proposed septic systems may be required as part of the individual lot development process.

GENERAL WASTEWATER CONSIDERATIONS

Once potentially useable areas are located through vertical borings, the next consideration is the horizontal extent of those areas. The size and configuration of the useable soil area dictate the utility of that area. The size of a surface disposal field is determined by: 1) the design flow from the source (120 gallons/bedroom/day in residences), and 2) the long term acceptance rate (LTAR) of the soil (based on the hydraulic conductivity of the soil, a function of the soil's texture, mineralogy, structure, porosity, etc.). The configuration must be such that an efficient layout of disposal lines is possible.

With respect to pretreatment surface systems, the LTAR is established by running multiple tests to measure the "saturated hydraulic conductivity" of each soil horizon of all soil series present on a site. Once these rates of water movement are established, the LTAR can be determined using calculations performed with the SFR Irrigation Area Calculation Worksheet (15A NCAC.02T.0600 only). Final LTAR approval will be determined by NC Division of Water Resources.

This report discusses the general location of potentially useable soils for on-site surface wastewater disposal and, of course, does not constitute or imply any approval or permit as needed by the client from NCDWR. S&EC is a professional consulting firm that specializes in the delineation of soil areas for wastewater disposal and the layout and design of wastewater treatment systems. As a professional consulting firm, S&EC is hired for its professional opinion in these matters. The rules governing wastewater treatment (interpreted and governed by local and state agencies) are evolving constantly and, in many cases, affected by the opinions of individuals employed by these governing agencies. Because of this, S&EC cannot guarantee that areas delineated and/or systems designed will be permitted by the governing agencies. As always, S&EC recommends that anyone making financial commitments on a tract be fully aware of individual permit requirements on that tract prior to final action.

An individual septic system permit will be required for each lot prior to obtaining a building permit. This will involve a detailed evaluation by the appropriate permitting agency to

determine, among other things, system size and layout, well, drive and house location. Only after developing this information can a final determination be made concerning specifics of system design and site utilization.

This report and site evaluation is not conformant to the Engineered Option Permit (EOP) process. Additional site testing and evaluations will be required to utilize the EOP process. The soil report and map associated with this project is for the exclusive use of the addressee and the use or reliance by all others is expressly denied without the written consent of S&EC.

We look forward to assisting in any site analysis needs you may have in the future. Please feel free to call with any questions or comments.

Sincerely,
Soil & Environmental Consultants, P.A.

10/1/18

LICENSED SOIL SCIENTIST
RICHARD A. PONTELLO
1232
STATE OF NORTH CAROLINA

Ricky Pontello
NC Licensed Soil Scientist #1232

Jacob McGaughey
Soil Scientist in Training

Encl: Attachment 1
Soil Suitability Map

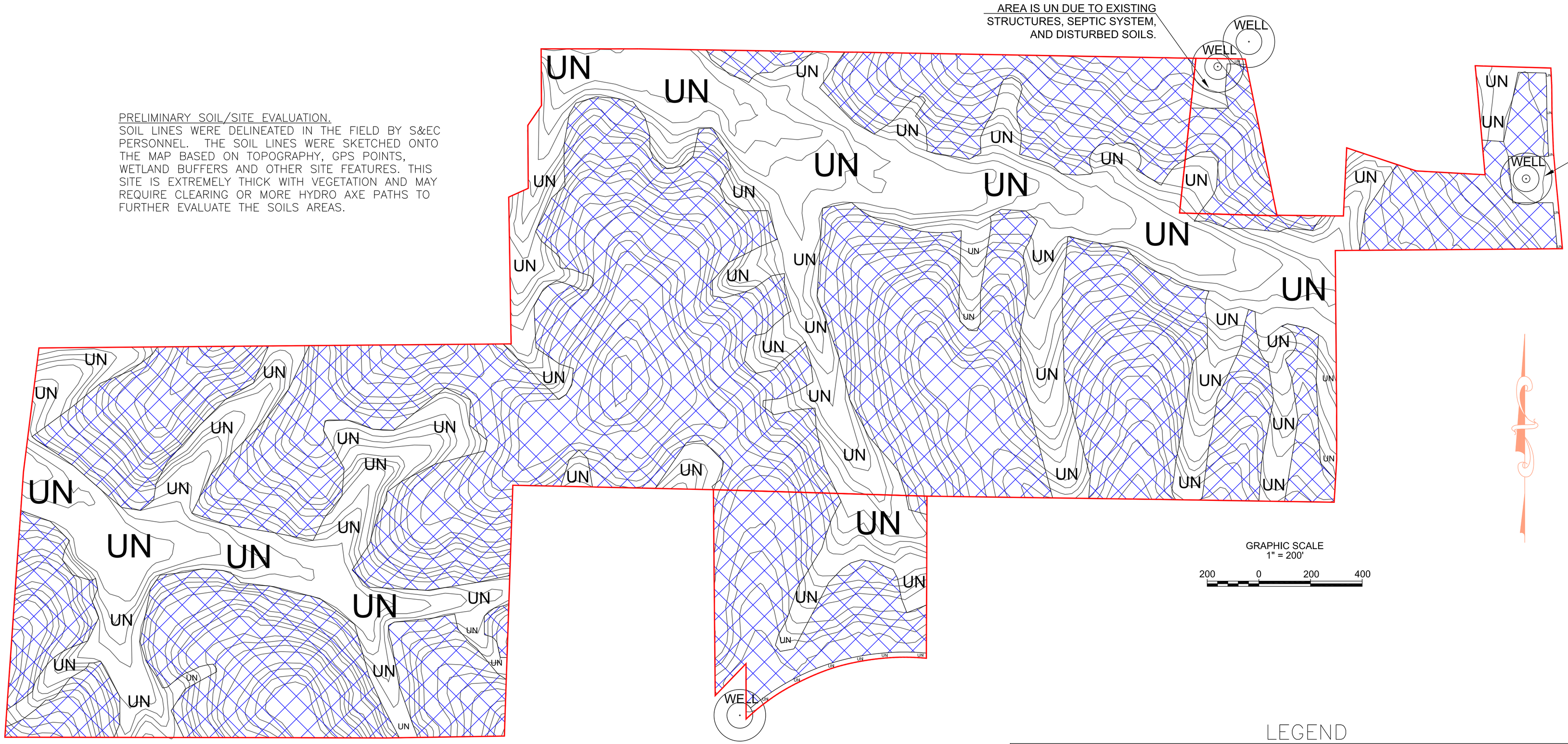
Attachment 1

SETBACKS FOR SURFACE DRIP AND SPRAY IRRIGATION

DRIP	SPRAY	PARAMETER
10'	100'	INTERCEPTOR DRAINS, AND SURFACE WATER DIVERSIONS (UPSLOPE FROM SYSTEM).
15'	200'	RESIDENCE FOUNDATION/BASEMENT
15'	15'	2' CUT EMBANKMENT.
25'	100'	INTERCEPTOR DRAINS, SURFACE WATER DIVERSIONS, AND GROUND WATER LOWERING/SURFACE DRAINAGE DITCHES (DOWNSLOPE FROM SYSTEM).
50'	50'	PUBLIC RIGHT-OF-WAY SURFACE DISPOSAL
50'	150'	ANY PROPERTY LINE
100'	400'	PLACE OF PUBLIC ASSEMBLY OR HABITABLE RESIDNECE OFF PROPERTY.
100'	100'	ANY SWIMMING POOL, ANY WELL, ANY PUBLIC OR PRIVATE WATER SUPPLY, AND ANY LAKE OR IMPOUNDMENT.

- **SOME COUNTIES MAY HAVE ADDITIONAL FOUNDATION SETBACK REQUIREMENTS.**
- **ANY OR ALL OF THESE SETBACKS MAY BE VARIED IF THE ADJACENT PROPERTY OWNERS SIGN A WAIVER/PERMISSION NOTICE.**

PRELIMINARY SOIL/SITE EVALUATION.
SOIL LINES WERE DELINEATED IN THE FIELD BY S&EC PERSONNEL. THE SOIL LINES WERE SKETCHED ONTO THE MAP BASED ON TOPOGRAPHY, GPS POINTS, WETLAND BUFFERS AND OTHER SITE FEATURES. THIS SITE IS EXTREMELY THICK WITH VEGETATION AND MAY REQUIRE CLEARING OR MORE HYDRO AXE PATHS TO FURTHER EVALUATE THE SOILS AREAS.



GRAPHIC SCALE
1" = 200'
200 0 200 400

**THIS MAP AND CORRESPONDING SITE EVALUATION IS NOT CONFORMANT TO THE ENGINEERED OPTION PERMIT (EOP) PROCESS. ADDITIONAL SITE TESTING AND EVALUATIONS WILL BE REQUIRED TO UTILIZE THE EOP PROCESS.

**SUITABLE FOR PRELIMINARY PLANNING PURPOSES ONLY. SITE WILL REQUIRE APPROVAL BY THE NC DIVISION OF WATER RESOURCES 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 TANK SYSTEMS. SOME OTHER CONSIDERATIONS THAT AFFECT SITE SUITABILITY THAT SHOULD BE CONSIDERED IN DEVELOPMENT DESIGN ARE:

1) 50'-150' SETBACK FROM PROPERTY LINE FOR SURFACE SEPTIC SYSTEMS
2) 100' SETBACK FROM ANY WELL
3) 15' SETBACK FROM ANY ABANDONED WELL
4) 25' SETBACK FROM DRAINAGE DITCHES.

SEE ACCOMPANYING S&EC REPORT.

NOT A SURVEY.
2-FOOT CONTOURS FROM NCDOT GIS. PARCEL BOUNDARIES FROM CHATHAM COUNTY GIS.

LEGEND

Areas of soils which have potential for pretreatment surface drip and/or pretreatment spray irrigation septic systems with a NCDWR approved soil cap on top of the existing soil surface. The amount of fill needed for each surface septic system in these areas will vary across the overall property.

UN — Unsuitable areas due to landscape position, topography, and/or wetland and creek buffers.

Existing private well, (100' system & 50' repair) septic system setback.

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Location: CHATHAM CO., NC
Client: MARTHAS INVESTMENT LLC
Project: HIGHWAY 751 SITE
Sheet Title: PRELIMINARY SOILS MAP
Project No.: 13544.51
Project Manager: RP
Drawn: JM
Field Work: JM, JL
Date: 10/01/18
Sheet No.: 1 of 1

SECTION 11 **APPENDIX A: CERTIFICATION FORMS FOR INITIAL AND FINAL APPROVALS**

FIRST PLAT

Form 1

ADEQUATE SOILS
CERTIFICATION OF REVIEW BY LICENSED SOIL SCIENTIST
1-40 SERVED BY TS-II PRETREATMENT SURFACE DRIP SYSTEMS

I HEREBY CERTIFY THAT LOT(S) WITH INCORPORATED NCDWR APPROVED FILL MATERIAL SHOWN ON THIS PLAT FOR FOLKNER BRANCH SUB. HAVE BEEN REVIEWED AS APPROPRIATE AND WITH RESPECT TO THE REQUIREMENTS SET FORTH IN 15A NCAC 2T .0600 FOR SINGLE-FAMILY RESIDENCE WASTEWATER IRRIGATION SYSTEMS AS AMENDED FROM TIME TO TIME. AS OF THIS DATE, AND BASED ON THIS REVIEW OF EXISTING SITE CONDITIONS THE LOT (S) NUMBERED ABOVE ON THIS PLAT MEETS THESE REGULATIONS.

CERTIFICATION DOES NOT REPRESENT APPROVAL OR A PERMIT FOR ANY SITE WORK. THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, DIVISION OF WATER QUALITY HAS THE AUTHORITY FOR THE REVIEW, APPROVAL, OR DENIAL OF APPLICATIONS FOR NON-DISCHARGE PERMITS. THE ISSUANCE OF NON-DISCHARGE PERMITS IS BASED ON REGULATIONS IN FORCE AT THE TIME OF PERMITTING AND IS DEPENDENT ON THE SATISFACTORY COMPLETION OF A PERMIT APPLICATION AND ALL REQUIRED SUPPORTING INFORMATION.

ANY CHANGE IN USE OR ANY SITE ALTERATION MAY RESULT IN SUSPENSION OR REVOCATION OF CERTIFICATION.

05/24/19
DATE

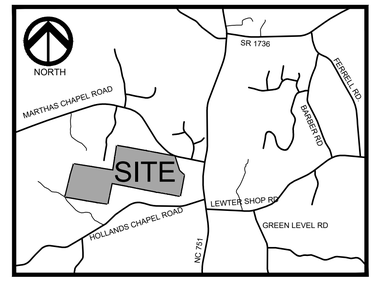
NC LICENSED SOIL SCIENTIST (SEAL)

RICHARD A. PONTELLO — LICENSED SOIL SCIENTIST — 1232 — STATE OF NORTH CAROLINA

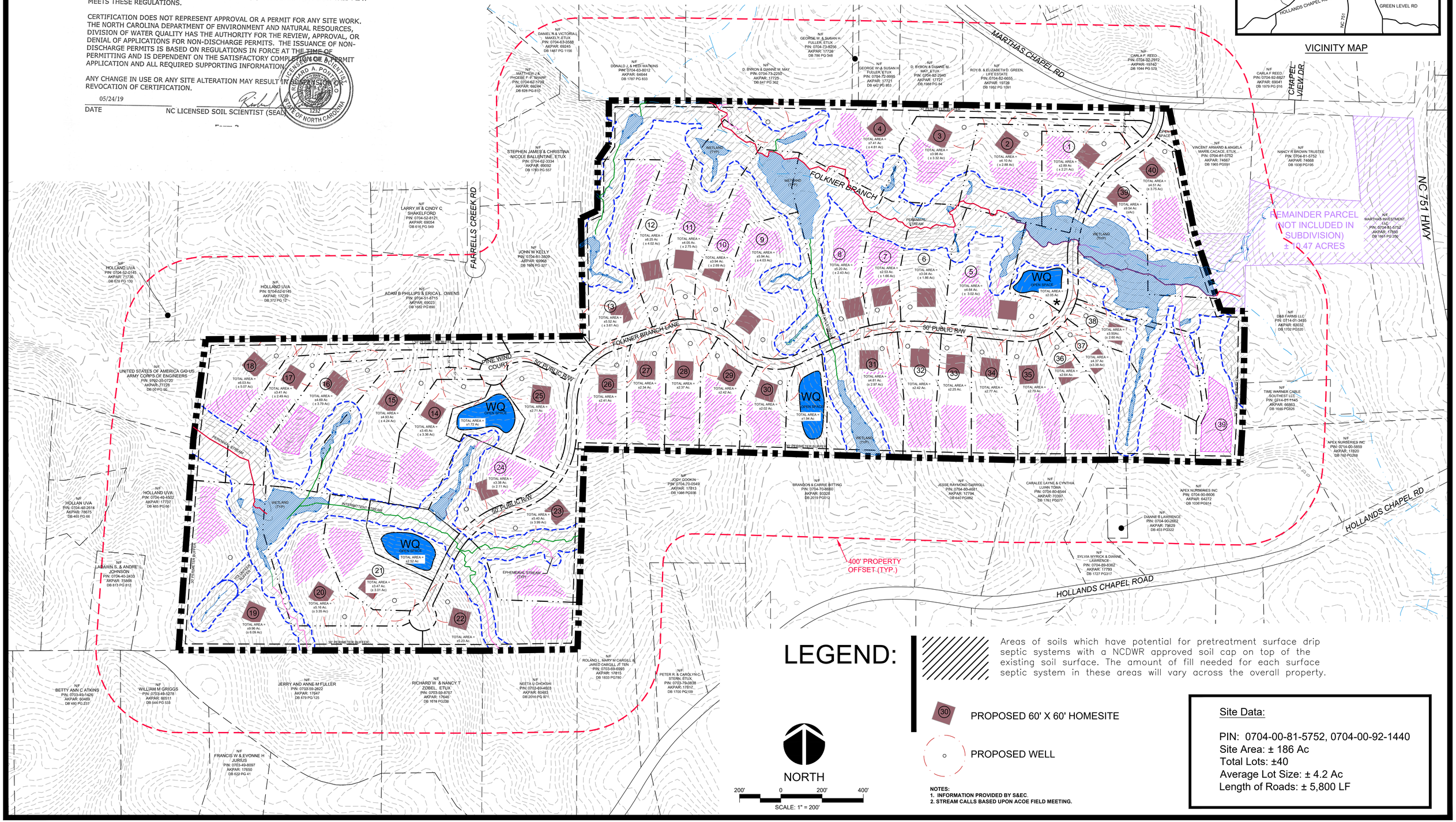
Form 2

FOLKNER BRANCH SUBDIVISION
PRELIMINARY SOILS EXHIBIT

CHATHAM COUNTY,NC
MAY 24TH, 2019
AKPAR 17850 &70380



VICINITY MAP



LEGEND:

Areas of soils which have potential for pretreatment surface drip septic systems with a NCDWR approved soil cap on top of the existing soil surface. The amount of fill needed for each surface septic system in these areas will vary across the overall property.

30 — PROPOSED 60' X 60' HOMESITE

PROPOSED WELL

NORTH

200' 0 200' 400'
SCALE: 1" = 200'

NOTES:
1. INFORMATION PROVIDED BY S&EC.
2. STREAM CALLS BASED UPON ACOE FIELD MEETING.

Site Data:

PIN: 0704-00-81-5752, 0704-00-92-1440
Site Area: ± 186 Ac
Total Lots: ±40
Average Lot Size: ± 4.2 Ac
Length of Roads: ± 5,800 LF