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Project # 24-006

3/27/2024

Liberty Land Group, LLC  
[elise@libertylandsales.com](mailto:elise@libertylandsales.com)

RE: Preliminary Lot Evaluation in Halifax County off Captains Road (Parcel Number 0804022)

Dear Liberty Land Group, LLC:

The following Preliminary Lot Evaluation technical report is submitted to assist in the development of the 1.71-acre tract of land off Captains Road (Parcel Number 0804022) in Halifax County, North Carolina.

Triangle Soil Consulting, PLLC conducted the preliminary lot evaluation on March 24<sup>th</sup>, 2024, to attempt to delineate an area of potentially suitable soil for subsurface on-site wastewater systems that would support a single-family, residential dwelling. The property was traversed and soil borings were conducted with a hand auger in suitable topographic areas. The topography and vegetation communities were considered to postulate any possible consistent soil patterns. The soil was evaluated for the following morphological characteristics: soil texture, soil structure, soil depth, depth and thickness of any restrictive horizon(s), soil wetness conditions, soil mineralogy, topography, and landscape position. With these factors considered the areas evaluated were judged based on the "North Carolina Laws and Rules for Wastewater Treatment and Dispersal Systems (15A NCAC 18E)".

The above referenced parcel is located in the Coastal Plain physiographic region of North Carolina and located in the Coastal Plain geologic region (Yorktown & Duplin Formation) of Halifax County. The soils that have formed on the parcel evaluated by Triangle Soil Consulting are similar to the Goldsboro and Lynchburg soil series. The attached soils map indicates the areas of potentially suitable soils. The Goldsboro soil series is generally suitable for shallow placed subsurface wastewater systems. That is, the morphology of the soils contain characteristics that would support shallow placed subsurface septic systems due to the presence of a soil wetness condition. The Lynchburg soil series is generally unsuitable for subsurface wastewater systems. That is, the morphology of the soils contain characteristics that would not support septic systems due to the presence of a shallow soil wetness condition.

Estimated design sewage flow from a house is 120 gallons per bedroom per day. The available space needed is a function of trench length, grade, and topographic features. It would be our

suggestion to allocate at least 3,000 to 4,000 square feet of usable soil area per bedroom for the design and layout of residential septic system areas. This square footage will also allow and include sufficient area for a repair field of equal size for use in the future. The soil areas labeled as "A1" and "B1" offer the greatest potential for meeting the development goals for this project. 3,000 square feet per bedroom is usually sufficient for a level site. 4,000 square feet per bedroom is typically needed for a sloping site, terraced sites, sites with large trees and root mass, and sites with large surface boulders to work around. So, for example a three-bedroom dwelling, 9,000 to 12,000 square feet of usable soil are needed for conventional gravel trenches. These soil area estimates are based upon soil application rates for a clay textured subsoil with a site LTAR of 0.25-0.30 gallons per day/square foot for conventional type systems. The ultimate application rate will be assigned by the local county health department based on an individual soil & site evaluation of the lot. If the water supply is proposed to be well water, well setbacks must meet 15A NCAC 02C .0107 requirements, 15A NCAC 18E .0600 setback requirements to septic systems and any local well regulations.

### **Typical Septic Systems in the Coastal Plain of NC:**

The most common septic systems used in the North Carolina Piedmont are listed with the corresponding minimum usable soil depth required and any trench length reduction if allowed noted in parentheses: conventional (30"), shallow conventional systems (24" with soil cap), chamber systems (24" with soil cap and 25% drain field reduction), polystyrene systems (24" with soil cap and 25% drain field reduction), horizontal panel block systems (requires at least 26" of usable soil and allows 50% drain field reduction), low pressure pipe (24"), low profile chamber (20"), and anaerobic drip irrigation (18"). A pump can be used to deliver effluent to the usable soil area if gravity flow cannot be achieved. Also, a pump is needed on any system with over 750' of drain field. The percent reduction means the amount of drain field trench length reduction allowed for that product as compared to conventional trenches. Certain models of chamber systems and polystyrene bundle systems are considered accepted trench products. Accepted trench products can be substituted in lieu of conventional gravel trenches and receive the 25% drain field reduction.

### **Septic System Location & Setbacks:**

The location of a septic system shall comply with the setback requirements of 15A NCAC 18E .0601 LOCATION OF WASTEWATER SYSTEMS.

### **Findings:**

The tract is undeveloped and mostly wooded, with the exception of two overhead power lines that encumber portions of the front and rear of the tract and an existing dirt road running along the southern property line. Soil borings were advanced in multiple locations across the project site. Once the soil borings are completed, areas are delineated based on the potentially usable soil depths. Soils with depths of 30" or more are potentially usable for conventional, shallow trench conventional systems, chamber systems (25% drain field reduction), polystyrene systems

(25% drain field reduction) and panel block systems (requires at least 36" of usable soil and allows 50% drain field reduction). These borings are flagged with red survey ribbon on the property. Soils with depths between 24-29" are potentially usable for shallow/ultra shallow conventional and/or LPP systems and are flagged in the field with red and white striped survey ribbon. These systems would require a soil cap when used with shallow/ultra shallow conventional type trenches. Soils with usable depths 30" and greater would be used as is.

The attached soils map indicates the areas of soils which are potentially suitable for subsurface wastewater systems. Table 1 below, provides a list of the soil areas delineated with the approximate size of the soil areas expressed in square feet.

The "**red, square hatched soil units**" on the attached map indicate the areas of soils that have 30 inches or more of suitable soil material. These areas have potential for conventional, accepted, modified conventional septic systems and/or PPBPS. There may be inclusions of soils (24-29 inches) that may support LPP or shallow/ultra-shallow conventional septic systems in the areas mapped as conventional.

The "**green, block hatched soil units**" on the attached map indicate the areas of soils that have 24-29 inches of suitable soil material. These areas have potential for shallow/ultra-shallow conventional or LPP septic systems. There may be inclusions of soils (18-23 inches) that may support low-profile chamber or anaerobic drip septic systems in the areas mapped as shallow/ultra-shallow conventional or LPP.

TABLE 1		
Area ID	Possible System Type(s)	Size of Area (square feet)
A1	Conventional, Accepted, Modified Conventional, PPBPS	~7,909 ft <sup>2</sup>
B1	Shallow/Ultra Shallow Conventional & LPP	~2,891 ft <sup>2</sup>

Please note these potential areas may need additional refining with more soil work, field staking (layout) of the initial and repair systems in the field, and design of the septic system to determine system type combinations and final number of bedrooms. Triangle Soil Consulting cannot guarantee that every square foot of area shown as potentially suitable for septic systems will be permitted by the local health department due to the variability of naturally occurring soils.

## Conclusions:

This tract has good potential for further development using a septic system. Depending on the final house location and the extent of the easement for the overhead powerline in the rear of the property, the areas identified are potentially large enough to support a 3-bedroom, residential dwelling. Keep in mind that a residential dwelling can be built and the sewage can be pumped to the areas identified using a septic effluent pump if gravity flow cannot be achieved. Also, a pump is needed if more than 750' of drainfield is required. The development plan should include at least 3,000 to 4,000 square feet of usable soil per bedroom for the house. No driveways, grading or land disturbing activities should be allowed in the area where septic fields are proposed, as it will affect the site's suitability. The local planning and zoning authority prior to approval shall review and approve any proposed development site plan. The attached soil map is based on soil boring locations collected using an EOS Arrow 100 GPS, ArcGIS and/or AutoCAD. The coordinate system used was NC State Plane NAD 83 3200. The GPS locations can be accurate to submeter but should not be considered as accurate as survey located points. The soil map is scaled to print on 8.5 x 11 Letter type paper in portrait format.

In North Carolina, two primary options for septic system permitting exist. In the traditional option, the local county health department can evaluate and permit any site. NC Session Law 2023-90 now allows a "hybrid" version of the traditional permit. In this version, a NC Licensed Soil Scientist can evaluate a lot and submit soil information on each lot to the Health Department in lieu of the Health Department evaluation. If the soil scientist is also an Authorized Onsite Wastewater Evaluator (AOWE), then the soil scientist can prepare the design elements for a Construction Authorization. **This report does not meet the requirements for permitting under NC Session Law 2023-90, commonly referred to an "A2" permit.**

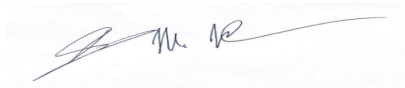
In the traditional permitting model, the local county health department in the form of an Improvement Permit grants site approval. A Construction Authorization for a Wastewater System is issued once building floor plans are reviewed and the Improvement Permit is issued. The county issues an Operation Permit after the system has been installed to meet the specifications of the Authorization to Construct. Septic layouts and system design can be performed as needed. The private permitting options are the Engineer Option Permit (EOP) and Authorized Onsite Wastewater Evaluator (AOWE). A NC Licensed Engineer, a NC Licensed Soil Scientist, NC Authorized Evaluator, and a NC Registered Septic Installer can evaluate, design, and install a septic system without Health Department involvement other than record keeping. **This report does not meet the requirements for private permitting under the Engineer Option Permit or Authorized Onsite Wastewater Evaluator permitting options.**

A preliminary lot evaluation is done as part of the due diligence process where the level of detail for an Improvement Permit is not desired. A preliminary is often done to determine if there are usable soils on property before purchasing. This preliminary evaluation was conducted using accepted soil science and environmental health practices. This does not guarantee that the local health department will agree with these findings since soil/site evaluations are an interpretation of the state regulations, but all current sampling methods, technologies, and

practices were used. Please be aware of any local codes, setbacks, ordinances, and existing easements along with any permitting requirements before making a financial commitment on a property. The soil map and report are provided to you as part of this evaluation. Please feel free to contact me if you have any further questions.

Sincerely,

Triangle Soil Consulting, PLLC

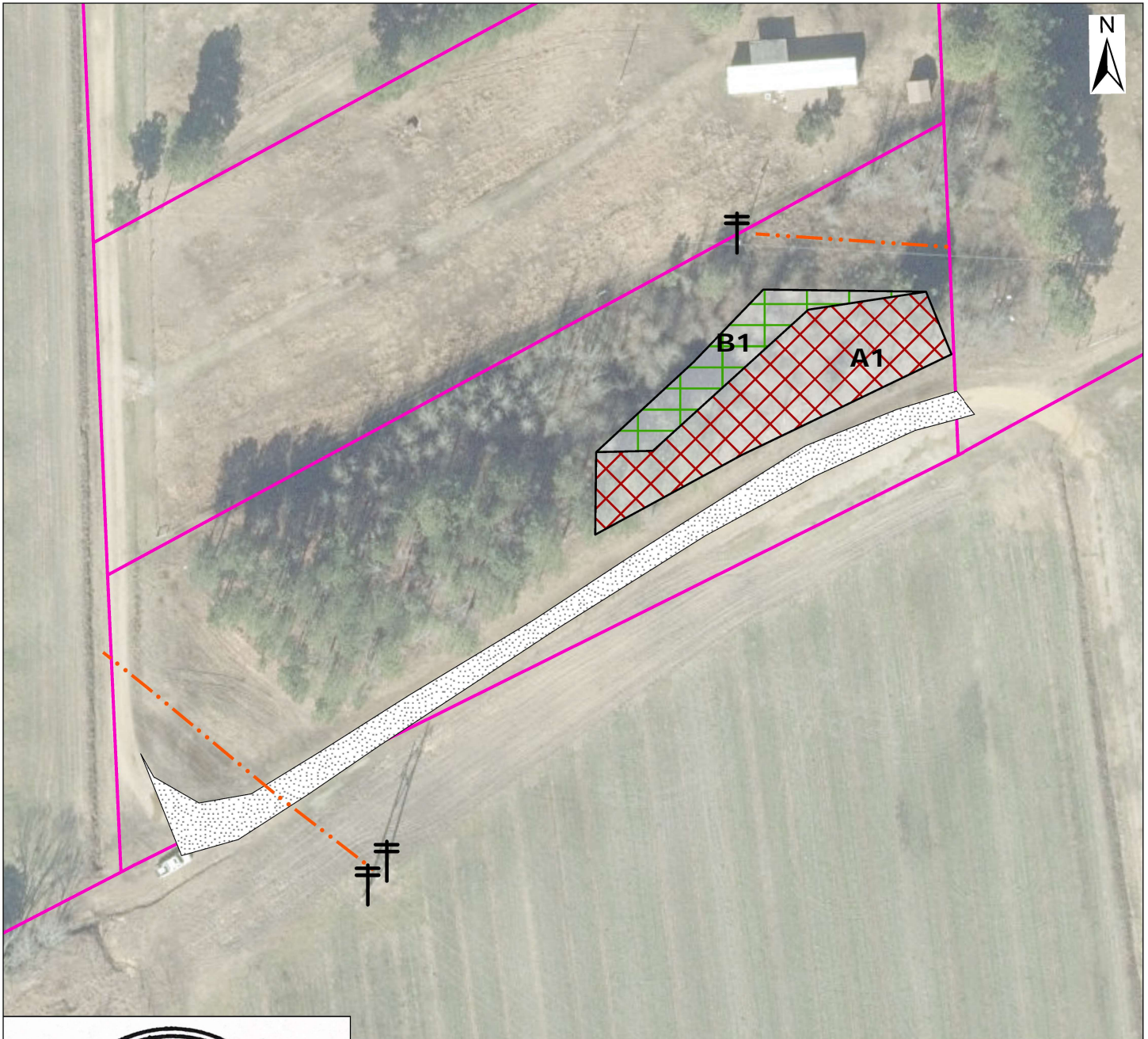


Justin M. Milstein, LSS, REHS  
Owner & Soil Scientist

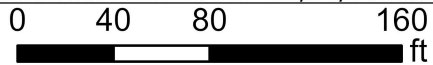








Encl.: Preliminary Lot Evaluation Map





*Justin M. Milstein*  
3/27/2024



-  Parcels
-  Conventional, Accepted, Modified Conventional, PPBPS
-  Shallow/Ultra Shallow Conventional & LPP
-  Power Pole
-  Utilities
-  Driveway



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Site Information	Lot: N/A	Draw Date: 3/27/2024
Project Name: Captains Rd		Project #: 24-006
County: Halifax	State: NC	Scale: 1" = 80'
Job Description:	Revision:	
Preliminary Lot Evaluation		Drawn By: JMM