

Shaffer Soil Services
685 Sanford Road
Pittsboro, NC 27312

February 24, 2006

Mr. Mike Perry
108 Tulliallan Lane
Cary, NC 27511

Subject: Site Evaluation and Soil Mapping
Jane Doby and Martha Blount Properties
Parcels Numbered 8639363604 and 8639186708 - Randolph County, NC
Parcel Number 0012675 - Chatham County, NC

In February, 2006 you and I performed site and soil evaluations on the above named parcels of land. The purpose of the evaluations was to generally assess the site's soil resources and to evaluate the potential for development with on-site (septic) wastewater systems. Hand auger borings were advanced over the properties at a level of intensity dictated by you to evaluate the soil characteristics for the above stated purposes.

The soils were evaluated for general suitability for home siting and landscape position to determine wetness or flooding hazard. With respect to the on-site wastewater systems, the evaluation focused on the soil and site conditions as required by the State Division of Environmental Health and the Chatham or Randolph County Boards of Health. Soil profiles were evaluated for depth to seasonal high water table, depth to bedrock or other limiting layer, texture, structure, consistence, color, clay mineralogy, slope and topography, and where all conditions were determined to be either suitable or provisionally suitable, available space as required by 15 A NCAC 18A .1945. The remainder of this report details the specific findings of the site evaluation for each respective parcel.

Parcel No. 8639363604 - Randolph County.

The intent of this tract evaluation was to locate 1 suitable septic system area. A number of soil borings were performed before an acceptable location was found. Attached site map A depicts the relative location of the area that is proposed for the septic system. The majority of the property was not evaluated, as the intent was to locate 1 site only. As the vegetation was dense in the area of the proposed septic system, two methods were used to be able to relocate that site. First, I took a GPS coordinate reading in the center of the proposed septic site. It is: 35°39.784' Latitude and 79°33.515' Longitude. Further, the entire perimeter of the proposed septic site has been flagged with pink flagging. Each soil boring (a total of 10 borings represent the septic system area) is flagged with both pink and orange flagging.

The soils in this area are in the Nason soil series. The following describes the average condition encountered in this area. The topsoil is dark brown loam from 5 to 8 inches thick. The subsoil to a depth of 25 to 32 inches is reddish brown clay and clay loam with friable to firm consistence, moderate subangular blocky structure, and slightly sticky to sticky moist consistence. At a depth

Parcel No. 0012675 – Chatham County.

The goal on this parcel was to do a relatively thorough canvassing of the tract to define as many potential septic sites as possible. A recommendation of a 100 foot by 100 foot grid was given to perform this task. After consultation with the landowner, you recommended making the grid spacing approximately 100 feet by 200 feet. This scale is adequate to perform a general canvassing of the tract but results in a higher possibility that suitable soils areas may not be seen.

The majority of the tract based on the scale of site evaluation of 100 feet by 200 feet, has soils unsuitable for septic systems. These soils are in the Cid and Orange soil series, along with related variants. These soils have either expansive clay or seasonal high water table, or both, within 18 inches of the soil surface, and often within 12 inches of the soil surface.

Three distinct areas were noted with better soil conditions. Please refer to site maps C, D, and E. Site map C is the aerial photo of the tract, and shows only the better soils areas. Site map D shows the topography of the tract and depicts each unsuitable soils boring that was made and its relative location, along with the location of the better soils areas. Site map E is an expansion of site map D and shows the relative location of the better soils areas along with the numbered soils borings in each area. Please note that these numbered soil borings only represent the original site canvassing, and that many additional soils borings were performed to better define these areas and assess their extent. Site map E also shows the relative location of an off-site area that was evaluated that was found to have provisionally suitable soils. I will discuss each area separately as it relates to development potential.

Area 1: This area is in the far southwest corner of the property. It is on a high ridge and sloping sidelopes. Soils in this area are in the Nason and Georgeville soil series. The area is defined by soils borings numbered 23, 24, and 25 and marked correspondingly in the field with numbered orange flagging. These soils are well drained with a clay subsoil. The limitation in this area is depth to weathered bedrock (saprolite) from depths of 27 inches to 36 inches. These soils classify as provisionally suitable and are acceptable for a shallow placement type of septic system. As the best soils are on the highest elevation, a pump system must be employed to use this area. The area is adequate for one 3-bedroom septic system (including repair area), and possibly up to a 4-bedroom system. A detailed layout was not performed, nor did I flag the boundary of the suitable soils. This area has open vegetation and can easily be re-located.

Area 2: The area is long and narrow along the southern property line. It is defined by approximately 15 soils borings (not numbered) marked with blue flagging. Surrounding unsuitable soil borings are marked with orange or pink flagging.

The soils in this area are in the Nason soil series. The following describes the average condition encountered in this area. The topsoil is dark brown loam from 6 to 9 inches thick. The subsoil to a depth of 28 to 32 inches is reddish brown clay and clay loam with friable to firm consistence, moderate subangular blocky structure, and slightly sticky to sticky moist consistence. At a depth ranging from 28 to 32 inches is partially weathered parent material referred to as saprolite. Adjacent soils are in the Cid soil series with associated drainage problems, and soils on the periphery of this proposed site may exhibit seasonal wetness conditions as shallow as 24 inches. This depth is the limiting feature on this site. The soils are well-drained to moderately well-drained and topography is suitable, with slopes ranging from 3 to 6 percent across the proposed septic site. As such, the site rates as provisionally suitable for a shallow placement system. Depending on the average depth noted by the Chatham County Health Department during its site evaluation,

additional soil cover may be required to maintain all required separation distances and final cover requirements. My findings note that the average soil depth is 27 inches, therefore 3 inches of off-site final cover over the septic trenches may be required. The loading rate assigned should be in the range of 0.25 to 0.30 gallons per day per square foot. My estimate of the dimensions of this area are 70 feet by 170 feet, or approximately 11,900 square feet, so this area can handle a 3-bedroom system. This includes the required repair area. Reduced system size, or increased flow may be obtained by the use of innovative trench technologies which are now commonly approved and are similar in cost to conventional, gravel-filled septic trenches.

Area 3: This is a relatively large contiguous area of approximately 2 acres in the central part of the tract and bordering on an adjacent tract. This area is defined by many (50+) soil borings and a detailed line was flagged to assess the maximum useable area possible. Soil borings classifying as provisionally suitable are flagged with blue flagging. These borings are in the Nason soil series as described above. Depth to seasonal wetness is as shallow as 24 inches where this area adjoins the neighboring Cid soils. The majority of this area has depth to seasonal wetness exceeding 34 inches. Depth to saprolite ranges from 26 to 36 inches, averaging 32 inches. These soils classify as provisionally suitable for a shallow placement system as described above, with a loading rate in the range of 0.25 to 0.30 gallons per day per square foot. Neighboring unsuitable soils are flagged with orange or pink flagging. There is a narrow strip within the better soils of unsuitable soils. The entire perimeter of the provisionally suitable soils area has been flagged with blue/white striped flagging. This line can be surveyed in for better accuracy of the suitable area. My estimate of the extent of the area, excluding the unsuitable strip within it, is about 74,000 square feet.

Additional comments on this area:

- 1) There was some discussion of acquiring a portion of the neighboring tract to include with this tract. This will eliminate the 10-foot property buffer setback and result in an addition of an area of 10 feet by 100 feet along the western property line (total 1000 square feet) and an addition of 10 feet by 200 feet along the southern property line (total 2000 square feet) for total gain of 3000 square feet of provisionally suitable soils.
- 2) A section of the adjoining tract was found to also have provisionally suitable soils (see site map E, area noted as "off-site area"). The estimate of its area is 9750 square feet. It is marginally suitable in area for a 3-bedroom septic system (including repair area), but additional area could be added from the reference tract to insure a 3 bedroom system or enlarge it to a 4-bedroom system.
- 3) The vegetation in the overall area is too dense to allow for septic system layout. With only an estimate as to the total available area, I can only make general comments as to the number of potential septic systems that could be accommodated in this area. The topography is relatively smooth with slopes of 1 to 5 percent so topographic losses are not serious. Assuming each building lot is served by its own septic system, a preliminary estimate is that 3 to 4 septic systems can be sited in this area. This of course includes the 20-foot wide buffer between each system as would be required with the property line separation. In order to achieve a better handle on this figure, some clearing of vegetation would be required. I also would need a definite recommendation from you or the owner/developer as to the number of bedrooms proposed for the homes on the site, and whether innovative trench type systems could be used. To maximize the potential number of systems, this is recommended.
- 4) To totally maximize the useable soil area, a community septic system should be used. This will eliminate the separation of the better soil areas by property lines and associated required buffers. It is possible that 6 to 7 homes may be served by this soils area if maximum design and efficiency considerations are employed. A community system would require setting up

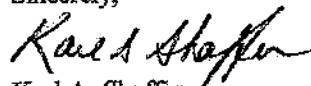
some type of legal structure such as a homeowners association or public utility to manage the sewage system, which would be common property. Design of such a septic system would require some engineering considerations, and the management would require a state-certified septic system operator.

As you can see, there are a number of ways in which tract development could be approached for this site. The ultimate number of potential homes depends on how the tract is to be subdivided and how efficiently the better soils areas are managed.

This report represents my professional opinion. The recommendations given in this report will not insure that permits would be either issued or denied for any particular part of any of the tracts or any given number of lots, and likewise will not insure that a specific type and size of wastewater system will be allowed. These decisions will be made by the staff of the local health department. Also, this report does not indicate any guarantee that an installed system will function properly for a specified amount of time. Proper function of wastewater systems is dependent on installation procedures as well as owner maintenance. In soils such as those existing on these properties, installation should take place under relatively dry conditions to minimize the effect of soil clogging and smearing which would reduce the soil permeability.

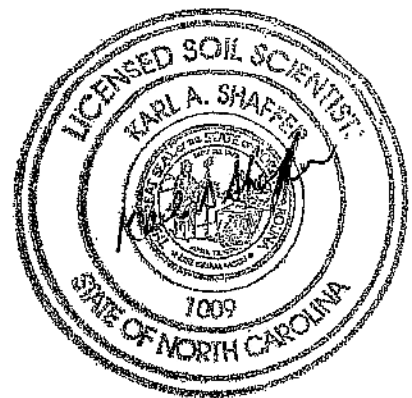
If you have any questions concerning this report or require further assistance, please do not hesitate to contact me. Thank you for the opportunity to perform this service for you.

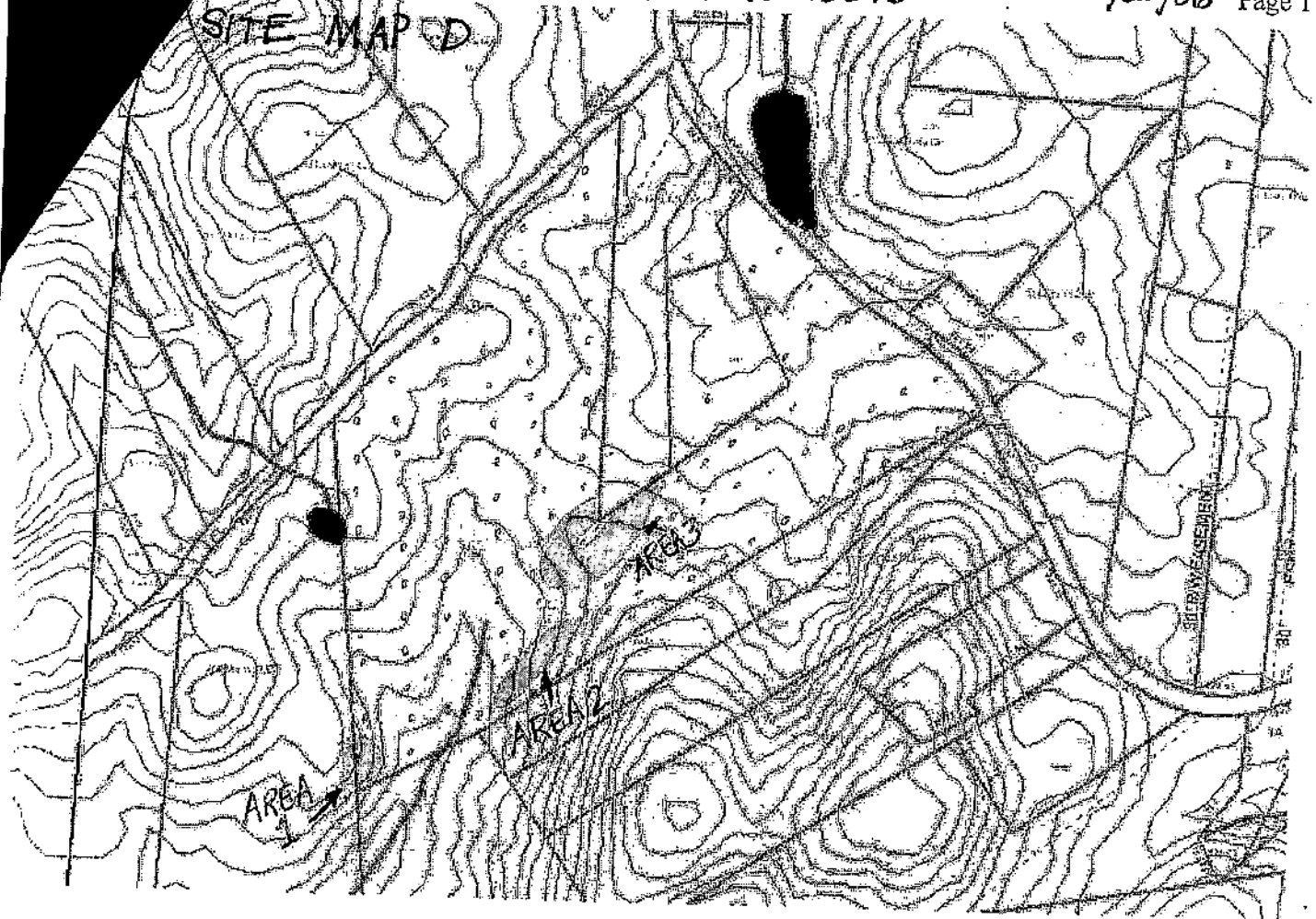
Sincerely,



Karl A. Shaffer
NC Licensed Soil Scientist
Certificate No. 1009

Attachments: Site maps (5)
Invoice

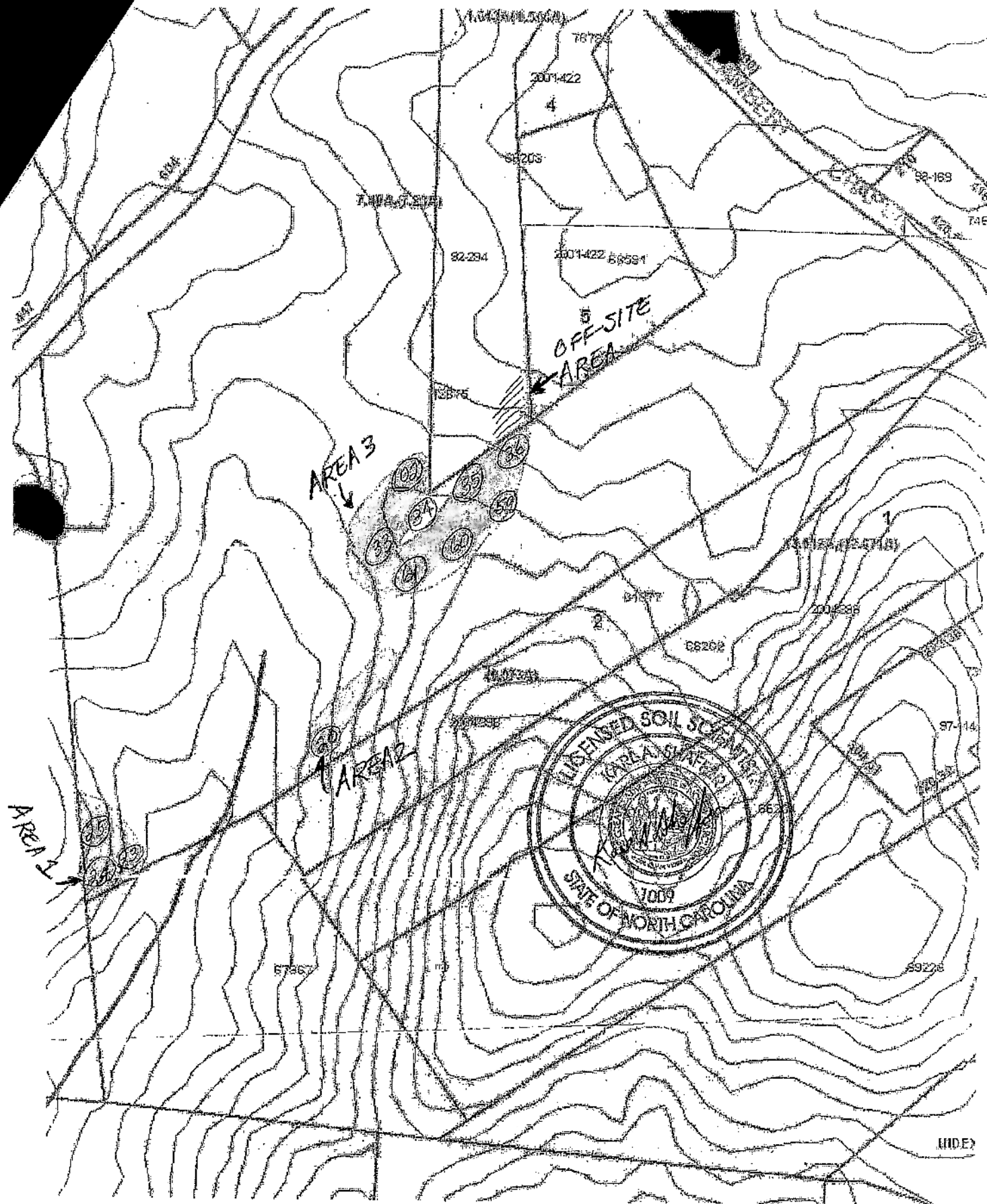




LEGEND:

- = PROVISIONALLY SUITABLE SOILS AREA
- = RELATIVE LOCATION OF UNSUITABLE SOIL BORING





② = PROVISIONALLY SUITABLE SOILS AREA

②③ = RELATIVE LOCATION OF NUMBERED SOIL BORING