S&EC

Soil & Environmental Consultants, PA

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October 25, 2021
S&EC Project #13615.S2

N. Truett McGee
7905 T Mac Road
Wendell, NC 27591

Re: Soil/Site Evaluation on the McGee Tracts, 28.25-Acre Site at 8132 Fowler Road, Wake County, NC

Dear Mr. McGee:

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 wastewater disposal per our contract from August 27, 2021. Fieldwork was performed on October 19, 2021.

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 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 "Regulations Governing Sewage Treatment and Disposal in Wake County".

FINDINGS

This site is located in the acid crystalline region of Wake County. The upland soils on this tract are similar to the Wedowee, Appling, Durham, and Helena soil series. The Wedowee, Durham, and Appling soil series has a sandy surface material over a clayey subsoil. These soils are at least 22 inches deep to prohibitive soil characteristics and are generally useable for subsurface septic systems. The Helena soils have shallow unsuitable soil characteristics and are generally unsuitable for conventional subsurface septic systems. Some areas have shallow saprolite (soft weathered rock material) that could potentially be used for subsurface septic systems, the saprolite would need to be evaluated through backhoe pit evaluations to determine its suitability at the time of permitting.

The accompanying AutoCAD sketch map indicates the estimated areas with potential use for subsurface wastewater disposal. The red cross hatched units indicate areas of soils which are at least 24 to 36+ inches deep to prohibitive soil characteristics and these areas have potential for a conventional septic system, a modified conventional (shallow placed lines with or without fill required over the disposal area), low profile chamber, and/or a low pressure pipe (LPP) septic system. There may be areas within the red cross hatched areas that will need backhoe pit evaluations due to inclusions of shallow saprolite. The blue hatched units indicate areas of soils which are at least 22 to 28+ inches deep to prohibitive soil characteristics and these areas have potential for a low profile chamber, subsurface drip, and/or a low pressure pipe (LPP) septic system. The magenta hatched unit indicates an area of shallow saprolite; this area will need to be evaluated through backhoe pit evaluations to determine if and what type(s) of subsurface septic systems are suitable for this area. Unit "UN" on the attached map indicates areas of

soils that are less than 22 inches to prohibitive soil characteristics and are generally unsuitable for the type of systems mentioned above. Unit "NE" on the attached map indicates areas that were not evaluated due to the inadequate area to fit a conventional type septic system (Wake County has a 50' line length minimum for conventional type septic drain lines) and not evaluated due to an overhead power lines easement. S&EC recommends to evaluate the potential septic area on the 2 parcels south of Fowler Road with backhoe pit evaluations due to shallow depths to saprolite, hard weathered rock (unsuitable material), and hard rock.

The site plan for each lot must ensure that adequate soil area for system and repair is unaffected by site elements (house placement, driveway, wells, patios, decks, etc.) on that or adjacent lots. The area ultimately designated by the health department on the site plan for the septic system and repair must remain undisturbed (no mechanical clearing, excavation, heavy traffic or other significant site disturbing activities) until authorized by the health department. 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.

WAKE COUNTY REGULATIONS

Additional fieldwork may be necessary for any subdivision plan with proposed lots less than 10-acres in size. This additional fieldwork will include flagging the boundary between the useable and unusable soils and locating that boundary either by GPS or a survey. That additional fieldwork will provide an accurate base map for a subdivision plan, especially where maximum lot yield is desired. Upon completion of a subdivision plan, S&EC will need to review the plan before submittal to Wake County. Wake County has set forth a checklist that must be followed by a licensed soil scientist in order to seal a subdivision plan. This property is located within the Little River watershed. Under Section V regulations, Wake County requires lots within a watershed with individual wells must have 40,000 square feet of useable soil per lot for recordation. Lots within a watershed with a community well or municipal water supply require 30,000 square feet of useable soil per lot for recordation. In those instances where the required square footage of useable soil cannot be met (Section VI regulations), a layout of system and repair can be performed utilizing a site plan showing house, deck(s), garage, well, driveway etc. that is prepared by you or your planner.

It is important to note that any preliminary certification that a subdivision plan meets the criteria in Section V or VI does not represent approval or a permit for any site work, nor does it guarantee issuance of an improvement permit for any lot. Final site approval for issuance of improvements is based on regulations in force at the time of permitting and is dependent on satisfactory completion of individual site evaluations following application for an improvement permit detailing a specific use and sitting.

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 subsurface 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 (on contour) is possible. An additional consideration is the required setbacks for the system from various elements such as wells (50' to 100'), streams and ponds (50') or more (depending on watershed regulations), property lines (10'), top of embankment (15'), watershed buffers, etc. (see Attachment 1).

The utility of a potential useable soil area for a subsurface system is most accurately determined by an on-ground layout of the proposed system. The total area needed for system and repair areas will depend upon the system type, the layout of that system and the total design flow (factors mentioned above).

Under Section VI guidelines, a typical area needed for a 3 bedroom residence is approximately 11,000 to 14,000 ft^2 (could be more depending on site features & system type) or 600 to 720 linear feet of conventional type line (system and repair using a 25% reduction product) or 800 to 960 linear feet of low profile chamber line (system and repair). These estimates reference Laws and Rules for Sewage Treatment and Disposal Systems for North Carolina and use a LTAR of 0.225 to 0.4 gpd/ft^2 for conventional septic systems (.1955), a LTAR of 0.225 to 0.4 gpd/ft^2 for modified conventional & low profile chamber (.1956), 0.1 to 0.15 gpd/ft^2 for LPP & drip septic systems (.1957a), and 0.2 to 0.4 gpd/ft^2 for saprolite modified conventional systems (.1956). The ultimate LTAR will be determined by the health department after their lot evaluation. S&EC will be glad to assist in any system layout or sizing calculations if requested.

This report discusses the general location of potentially useable soils for on-site subsurface wastewater disposal and, of course, does not constitute or imply any approval or permit as needed by the client from the local health department. 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 local health department 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) or LSS option permit process. Additional site testing and evaluations will be required to utilize the EOP or LSS option permit 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.

Soil & Environmental Consultants, PA is pleased to be of service in this matter and 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, PA

LICENSED SOIL SCIENTIST
CORY A. CONNELL
1343
STATE OF NORTH CAROLINA

10-25-2021

Cory Connell
NC Licensed Soil Scientist #1343

Encl: Attachment 1
Soil Suitability Map

Attachment 1

.1950 Location of Sanitary Sewage Systems

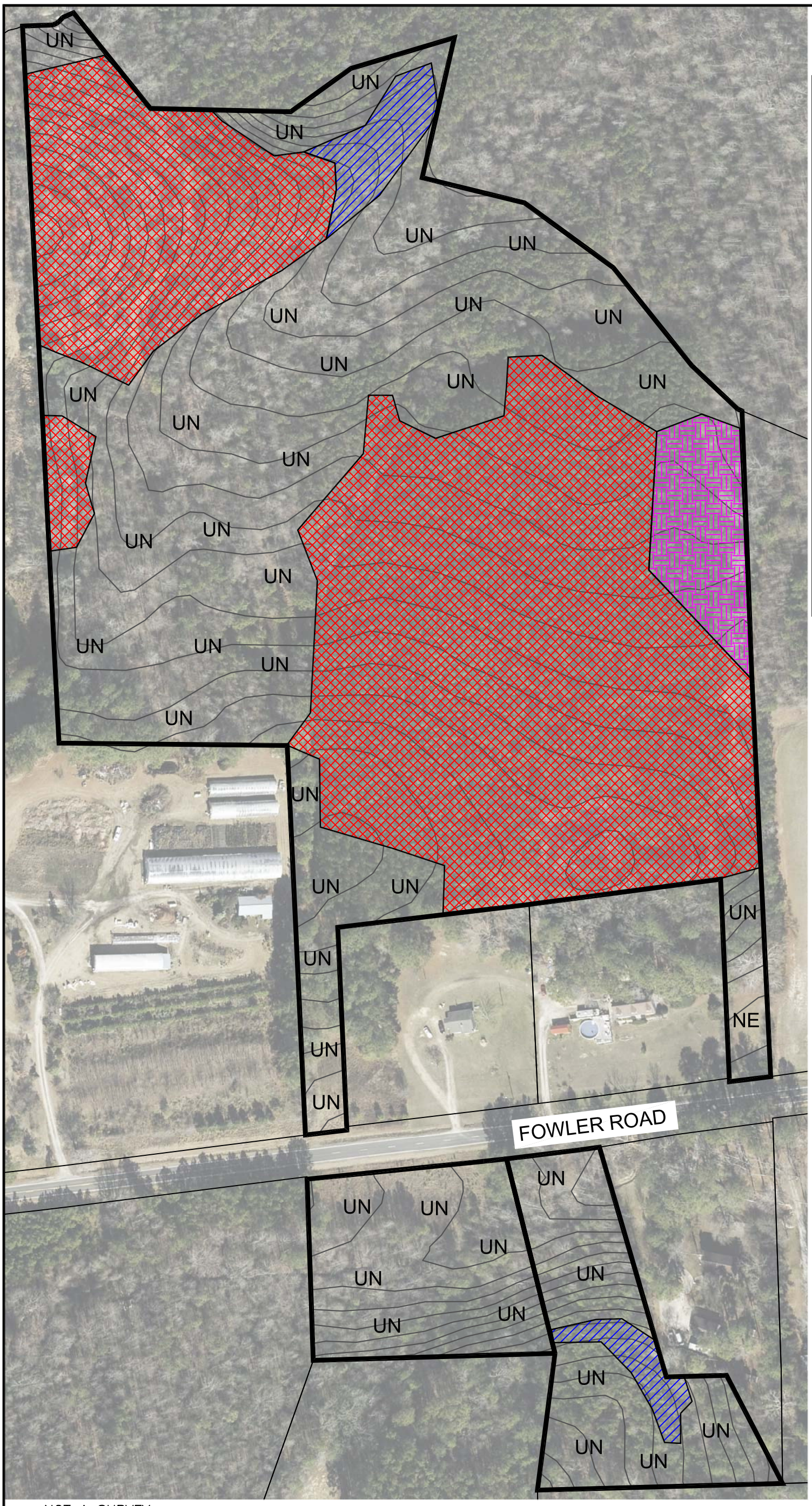
(c) Every sanitary sewage treatment and disposal system shall be located at least the minimum horizontal distance from the following:

(1)	any private water supply source including a well or spring	100 feet
(2)	any public water supply source	100 feet
(3)	streams classified as WS-I	100 feet
(4)	water classified as S.A.	100 feet from mean high water mark
(5)	Other coastal waters	50 feet from mean high water mark
(6)	any other stream, canal, marsh, or other surface waters	50 feet
(7)	any Class I or Class II reservoir	100 feet from normal pool elevation
(8)	any permanent storm water retention pond	50 feet from flood pool elevation
(9)	any other lake or pond	50 feet from normal pool elevation
(10)	any building foundation	5 feet
(11)	any basement	15 feet
(12)	any property line	10 feet
(13)	top of slope of embankments or cuts of 2 feet or more vertical height	15 feet
(14)	any water line	10 feet
(15)	drainage systems:	
	(A) Interceptor drains, foundation drains and storm water diversions	
	(i) upslope	10 feet
	(ii) sideslope	15 feet
	(iii) downslope	25 feet
	(B) Groundwater lowering ditched and devices	25 feet
(16)	any swimming pool	15 feet
(17)	any other nitrification field (except repair area)	20 feet

(b) Ground absorption, sewage treatment and disposal systems may be located closer than 100 feet from a private well supply, except springs and uncased wells located downslope and used as a source of drinking water, repairs, space limitations and other site-planning considerations but shall be located the maximum feasible distance and, in no case, less than 50 feet.

(c) Nitrification fields and repair areas shall not be located under paved areas or areas subject to vehicular traffic. If effluent is to be conveyed under areas subject to vehicular traffic, ductile iron or its equivalent pipe shall be used. However, pipe specified in Rule .1955 (e) may be used if a minimum of 30 inches of compacted cover is provided over the pipe.

Note: Systems over 3000 GPD or an individual nitrification fields with a capacity of 1500 GPD or more have more restrictive setback requirements, see .1950 (a) (17) (d) for specifics.



LEGEND

Areas contain soils with 24 to 36 inches or more of useable material and have the potential for conventional, modified conventional, ultra–shallow conventional, low profile chamber, and/or low pressure pipe septic systems.

Area contains shallow soils to saprolite; this area will need to be evalauted through backhoe pit evaluations to determine if the saprolite is suitable for subsurface septic systems.

Areas contain soils with 22 to 28 inches or more of useable material and have the potential for low profile chamber, subsurface drip, and/or low pressure pipe septic systems.

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

NE Areas that were not evaluated

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

**SUITABLE FOR PRELIMINARY PLANNING PURPOSES ONLY. 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 TANK SYSTEMS. SOME OTHER CONSIDERATIONS THAT AFFECT SITE SUITABILITY THAT SHOULD BE CONSIDERED IN DEVELOPMENT DESIGN ARE:

1) 10' SETBACK FROM PROPERTY LINE
2) 50' TO 100' SETBACK FROM ANY WELL
3) 25' SETBACK FROM DRAINAGE DITCHES.

SEE ACCOMPANYING S&EC REPORT.

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, AND OTHER SITE FEATURES. AT THE TIME OF PERMITTING, SOME AREAS MAY NEED TO BE EVALUATED THROUGH BACKHOE PITS DUE TO DEPTH TO SAPROLITE AND ROCKY SOIL CONDITIONS. 10–25–2021

NORTH

GRAPHIC SCALE
1" = 150'

150 0 150 300

NOT A SURVEY.
PARCEL BOUNDARIES FROM WAKE COUNTY GIS. 2017 AERIAL AND 2–FT CONTOURS FROM NCONEMAP.COM.

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Project: McGee Tracts, 8132 Fowler Road			Project No.: 13615.52
		Project Manager: CC	Drawn: CC
Location: WAKE CO., NC	Client: McGEE	Scale: 1" = 150'	Field Work: CC,JM
Sheet Title: PRELIMINARY SOILS/SITE EVALUATION MAP			Sheet No.: 1 of 1