

Soils Evaluation of TUMILA LLC in Southern Bledsoe County

This analysis is being submitted by Soils & Environmental Services. It is based on a preliminary soil mapping of approximately 25% of the total property area, excluding the 80 acre lake. The area mapped was randomly selected to give a typical cross section of the 1253 acre tract. A two foot topographical map was used to determine the location of soil boundaries.

The soils are typical of the Cumberland Plateau in Eastern Middle Tennessee. The geology is non-karst which requires 30 inches of soil material to rock to be suitable for conventional subsurface sewage disposal systems (ssd systems). Soils 24 - 30 inches in depth are generally suitable for modified conventional and low pressure pipe systems. Soils with depths from 20 - 24 inches are generally suitable for mound and drip irrigation systems. Soils with depths less than 20 inches are unsuitable for ssd systems.

There are six ssd system types that could be utilized on these soils. Two of these systems are classified as conventional (conventional and modified conventional) and the final four are alternative type systems. They include low pressure pipe, mound, drip irrigation, and drip irrigation step (centralized drip) systems.

Conventional systems pretreats sewage by use of a septic tank and applies effluent to the soil through disposal lines installed at a minimum depth of 24 inches in the soil through a 3 feet wide 1 foot deep gravel media. These systems require a 6 inch buffer from the bottom of the gravel media to rock or other restrictive layer. The size of the septic tank is determined by the number of bedrooms and the linear footage of the disposal lines is determined by the number of bedrooms and the absorption rate of the soils.

Modified Conventional systems are similar to conventional systems; however, they can be installed in nonkarst areas where soil depth is between 24 and 30 inches. Six inches of compatible top soil is applied over the disposal lines to insure that a six inch buffer of soil remains above the restrictive layer (rock) after disposal lines are installed.

Low Pressure Pipe and Mound systems differ from conventional systems in that they have uniform distribution of effluent. They require dosing and resting cycles. The square footage of area required for the system can be reduced as much as 44 percent. The low pressure system requires a minimum depth of 24 inches and a mound system requires a minimum depth of 20 inches in nonkarst topography.

Individual Residential Drip Irrigation: A new draft of the subsurface regulations for the State of Tennessee have been under development for the past 12 to 18 months. These regulations will allow the use of advanced treatment systems and disposal of effluent into the soil by drip tubing for individual residential homes. Individual drip systems will require depths of only 20 inches to restrictive layers and require less disposal line area than either low pressure or

mound systems. These new regulations should be effective in the latter part of November 2009.

Centralized Drip Irrigation System: This system uses advanced treatment of sewage and allows for treated effluent to be disposed into drip irrigation tubing in areas of suitable soil in a centralized location to serve numerous households. This allows for areas that have unsuitable soil to be used for home sites. The advantage of this system is that small areas of suitable soils can yield many home sites; for example 5 acres of suitable soil (Lily) can yield 155 lots or home sites, 20 acres can yield 620 lots and so on. Maximum lot density can be obtained by use of this system.

The most prevalent Soil Series of this property include: Gilpin, Hendon, Lily, Lonewood, Ramsey, Shelocta, and Tilsit. An evaluation of these soil series and the official soil series descriptions for each soil follows.

A few general; possibly redundant, but hopefully helpful statements of soil factors: Suitable soils have an absorption rate of 15 - 75 min./ inch.

Unsuitable soils have an absorption rate of more than 75 min./ inch.

Soils such as Gilpin that have absorption rates more than 75 min./ inch may have standardized percolation test ran if they have depth greater than 24 inches.

Ramsey soils are unsuitable due to depth less than 20 inches.

Tilsit soils are unsuitable due to wetness.

The findings of this soil evaluation of TUMILA LLC show that the soil is suitable for developing. A large variety of layouts and lot schemes could be employed on this property. Ridges and gentle slopes on this tract are mostly suitable, with Lonewood and Lily soils. Steep side slopes are generally Lily, Schelocta, Gilpin, and Ramsey. Schelocta being the best on these slopes. Toe slopes are generally Ramsey and Lily. Bottoms and concave areas are mostly Hendon and Tilsit. There is a high percentage of suitable soils on the areas mapped, this indicates that the quantity and size of the lots can be dictated by the developer not by the soils.