

September 18, 2025

TO: Land Legends, LLC  
Brian Puebla  
7754 Lakeside Blvd., Apt 422  
Boca Raton, FL 33434

RE: Preliminary soil and site suitability evaluation and mapping of the 1.90ac tract off McGowan Rd., Jacksonville, Onslow County, NC. Parcel #: 052414. Job #:P.ENV0006263

Dear Brian,

On Wednesday September 17<sup>th</sup>, 2025, Davey Resource Group (DRG) evaluated the parcel off McGowan Rd., Jacksonville, Onslow County, NC. The purpose of the evaluation was to determine the suitability of the soil resources for onsite wastewater for a residential dwelling on the property. Multiple shallow auger borings were observed, and limited soil information was collected. The property corners were not marked in the field. Accordingly, a GIS tax parcel boundary along with a hand-held GPS was utilized to determine the location of review during the evaluation. We utilized the 15A NCAC 18A .1900 laws and rules for subsurface wastewater application and the Southeast Regional Supplement to the US Army Corps of Engineers Wetland Manual as guides. Per NC State regulations, soil evaluations include and must meet the following for a location to be deemed suitable for subsurface onsite septic systems- landscape position, soil characteristics (structure, color, and minerology), soil wetness condition (SWC), restrictive horizons, and available space. The findings for this evaluation are cursory only. This information is our best professional judgement on whether septic system(s) for residential home(s) are feasible for this property. Accordingly, I offer the following guidance.

## **Generalized Septic System Requirements**

Each septic system drain field type requires different soil characteristics and has limiting soil conditions. In sandy soils a shallow conventional gravel system, chambers, and EZ Flow polystyrene require 30 inches of suitable soil and depth to the soil wetness condition (SWC). Loamy or clayey soils require 24 inches to the SWC for conventional systems. Low pressure pipe (LPP) requires 24 inches to SWC. T&J Panel Block is an alternative gravel aggregate that reduces the drain field area by 50% and requires 26 inches to SWC for all soil types. Fill mounds for both gravel, T&J Panels, or LPP require 12 inches to SWC and 18 inches of suitable structure. Drip irrigation requires 13 inches to SWC and 18 inches of suitable structure.

Reduction systems and configurations such as T&J Panels, Chambers, EZ Flow, or bed configurations may be considered to reduce the overall size of the drain field. These system types can reduce the amount of linear line length and field area by 25% to 50%.

Additional note on drip irrigation systems: while they can be a way to maximize the suitable soil area on a lot, also they are costly to maintain, require a pump and bi-yearly maintenance contract.

A residential structure will have a flow rate of 120 gallons per day (gpd) per bedroom. For example, a 3-bedroom home will have a residential flow rate of 360 gpd. Any lot in North Carolina recorded after January 1, 1983, requires area for an initial system to be installed and repair field area to be set aside in the instance of failure of the initial. The gallons per day of a home along with the estimated long-term acceptance rate (LTARs) and depth to the soil wetness condition (SWC) of the soil are used to calculate the size and parameters of a system for the different soils identified on the lot that will be described below.

## **Description**

The tract that was evaluated is approximately 1.9 acres and shown in the red outline in Figure 1. The property contained moderate to thick vegetation across most of the tract. The topography of the tract was mostly flat with slight lows towards the middle and rear of the parcel with the highest elevation being toward the back half. A shallow ditch cuts into the parcel about midway.

## **Soil Evaluation**

The soils identified on the site can generally be grouped into 3 types identified by the green, yellow, and red map units as seen in Figure 1. Suitable soils for any type of onsite wastewater are within the green

and yellow units. Soils in the green unit are coarse loams over fine loams with a 24-40in depth to soil wetness indicators (SWC) from the existing surface. This unit of soil has an estimated long-term acceptance rate (LTAR) of 0.55 to 0.7 gpd/ft<sup>2</sup> with an LTAR of 0.6 gpd/ft<sup>2</sup> and 26in to the SWC being the most common. Soils in the yellow unit are coarse loams over fine loams with a 12-24in depth to soil wetness indicators (SWC) from the existing surface. This unit of soil has an estimated long-term acceptance rate (LTAR) of 0.6 to 0.7 gpd/ft<sup>2</sup> with an LTAR of 0.6 gpd/ft<sup>2</sup> and 22in to the SWC being the most common.

The red soil map unit would be considered unsuitable for onsite wastewater. This map unit contained soils that did not appear to meet the minimum separation to the SWC and/or were in unsuitable landscape positions. Portions of this soil were coarse and fine loams that had soil colors of 2 or less chroma and would be considered unsuitable for any type of subsurface wastewater system design as per rules .0504 and/or .0502.

## **Project Discussion**

The green soil map unit may provide a good option for an onsite wastewater system and represents soils that may be suitable for shallow conventional septic systems and other innovative systems. A shallow conventional gravel system for a 4-bedroom system, designed with the most limiting LTAR for the green map unit on site (0.55 gpd/ft<sup>2</sup> LTAR) would be approximately 49ft x 49ft for (6) 49ft gravel drain lines for a full-sized initial and the same area set aside for the repair. This area can be represented as the purple rectangle in Figure 1. To reduce the area needed a T&J Panel Block system could likely be utilized on the lot for either both initial and repair or as the repair area only. T&J Panel Block is an alternative gravel aggregate that reduces the drain field area by 50%. A T&J Panel Block system can be seen as the aqua rectangle in Figure 1. The aqua rectangle represents the size of an initial or repair area that would be required for a 4-bedroom home on the site at 21ft x 49ft for 3, 49ft lines.

Systems of this type can likely be placed anywhere within the green map unit with respect to parcel boundary setbacks and topography. Our office can assist with permitting if desired, however, no guarantees can be made without a more detailed site investigation.

The soil in the yellow map unit may also provide potential options for an onsite wastewater system and may be suitable for a modified fill mound system. Fill systems require a large quantity of sand and material and can be costly but provide a reliable way of utilizing areas of marginal soils for a wastewater system. To reduce the area needed a T&J Panel Block in fill system could possibly be utilized on the lot. The size of each an initial and repair area that would be required for a 4-bedroom home would be 49ft x 79ft for 3, 45ft lines.

Figure 1. Soil testing area, soil units, and potential system configurations



\*Google Earth Imagery with Parlay GIS Taxparcel Boundaries and DRG site testing Overlay

**Summary**

In summary the tract off McGowan Rd. in Jacksonville was evaluated for the placement of an wastewater system for a 4-bedroom residential dwelling. It is possible that the property will be able to support a system within the green or yellow mapping unit. Any proposed well must maintain 50 feet from adjacent septic systems and components and 25 feet from any house foundation. The findings listed in this report are based upon limited ground truthing, available records and our best professional judgement. This report does not guarantee a wastewater permit as all areas are subject to review and approval by the appropriate local and/or state permitting agency. Please be advised that editing a document sealed by a licensed soil scientist is illegal and may result in legal action. Any unauthorized modification, alteration, or revision of a sealed document is strictly prohibited per NC Code Chapter 89F-19 (a). If you have any questions about this report or need any additional information, I may be reached at 910-452-0001, 910-471-0505, or at [nicholas.howell@davey.com](mailto:nicholas.howell@davey.com) .

Sincerely,



C. Purdy  
Environmental Scientist



Nicholas "Nick" P. Howell  
NC Licensed Soil Scientist #1294

