



**Kendall County Health Department  
Environmental Health Unit  
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## **A Developer's Guidance Document – Planning Subdivisions Utilizing Onsite Wastewater Disposal (i.e. Septic Systems)**

The Kendall County Health Department, Environmental Health Unit, in response to suggestions from developers and members of the platting, zoning and planning communities, has developed the following guidance document. This is an attempt to assist subdivision developers with the task of reasonably ascertaining that each lot of a proposed subdivision will be able to support the installation and subsequent use of an approved private sewage disposal system as defined in the Illinois Private Sewage Disposal Licensing Act and Code, and a potable water well as defined in the Illinois Water Well Construction Code.

The hope is that this information is used by developers in the concept planning phase to develop a general sense as to how much septic area (unencumbered, useable soil) might be required on individual lots throughout different regions of the proposed development for the proper installation and safe operation of onsite wastewater disposal systems. At the root of the planning process and a focus of this guidance document is the soil test.

### **Gathering Information**

Site and soil information plays a vital role in determining the feasibility of a parcel of land to accommodate the proper installation and safe operation of onsite wastewater treatment and disposal systems, and onsite potable water supplies. As part of the initial site investigation, the developer is required to have performed a broadcast soil testing of the subject parcel with wastewater treatment and disposal in mind. This testing is to be performed by a state licensed soil scientist, and involves the scientific analysis of soil borings (or pits) excavated to a depth of 60" across a 200' grid (a broad and general representation of the entire parcel); the final product being a collection of soil reports prepared by the soil scientist. Ideally, this soil information will drive the design of the subdivision.

Every soil report is the soil scientist's interpretation of the individual soil borings taken throughout the proposed subdivision. Within each report one would see the different soil horizons broken down and interpreted along with other important features of a particular soil boring (i.e. the presence of bedrock, water tables, dense clay layers, etc.).

Each soil horizon is categorized by a "design group" and/or a "loading rate". Either category may be used to predict soil permeability. Soil design groups are expressed in roman numerals I-XII. As the number increases, the soil becomes less permeable, therefore requiring a larger septic field. A soil design group of XII is considered unsuitable for subsurface disposal of effluent (as is the design group I). Conversely, as a septic loading rate number decreases, the soil becomes less permeable, therefore requiring a larger field area. Please note that the soil design group and the loading rate are inversely related. As the soil design group number rises the loading rate for the particular hole falls.

The Kendall County Health Department reads each soil report on the premise of the worst case scenario (least permeable) soil profile down to a minimum of 42” below grade. This soil design group or loading rate number is then considered to represent the soil boring. The Department then attempts to identify soil trends throughout the subdivision to help determine the predominant soil types by which we make our recommendations.

### Applying the Information

County and State code provides for the sizing of onsite wastewater treatment and disposal systems (septic systems) based on the combination of soil permeability and the number of bedrooms in a home for each given lot. According to code, a single bedroom is estimated to generate 200 gallons of wastewater per day (gpd). Therefore, a 3 bedroom home will generate an estimated 600 gallons per day (3 bedrooms x 200 gpd), whereas a 4 bedroom home will generate an estimated 800 gallons per day (4 bedrooms x 200 gpd). If larger homes will be permitted in the proposed subdivision, it is important to remember that the septic systems will also need to be increased in size in order to compensate for the potential increase in wastewater volume.

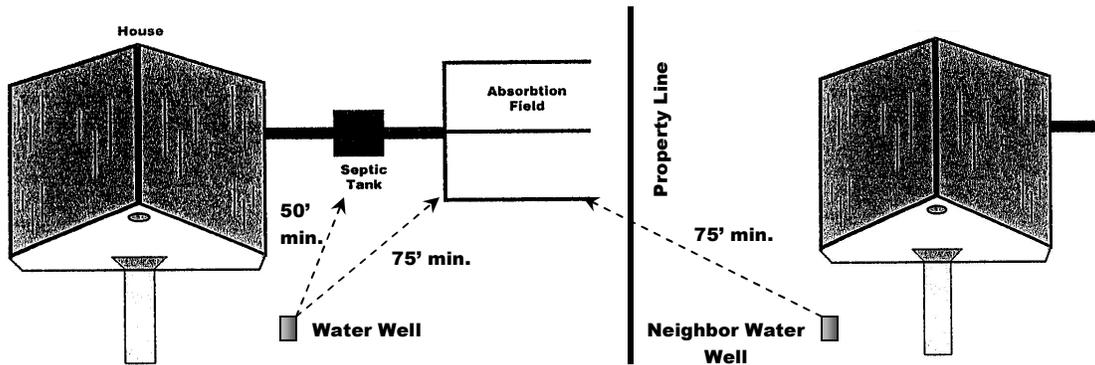
The following chart represents the average amount of combined space used for a primary septic system and secondary leach field utilizing a **conventional, non-mechanical septic tank and a standard gravel drain field**. These figures have been calculated for 3, 4, or 5 bedroom homes and contain a 10% “insurance factor”.

SOIL DESIGN GROUP/ LOADING RATE	AVERAGE LAND SPACE RECOMMENDED*		
	3 BEDROOMS	4 BEDROOMS	5 BEDROOMS
XI / 0.27	20,000 ft <sup>2</sup>	22,000 ft <sup>2</sup>	24,000 ft <sup>2</sup>
X / 0.40	13,513 ft <sup>2</sup>	14,864 ft <sup>2</sup>	16,216 ft <sup>2</sup>
IX / 0.45	12,027 ft <sup>2</sup>	13,229 ft <sup>2</sup>	14,432 ft <sup>2</sup>
VIII / 0.52	10,405 ft <sup>2</sup>	11,356 ft <sup>2</sup>	12,486 ft <sup>2</sup>
VII / 0.62	8,783 ft <sup>2</sup>	9,662 ft <sup>2</sup>	10,541 ft <sup>2</sup>
VI , 0.69	7,838 ft <sup>2</sup>	8,621 ft <sup>2</sup>	9,405 ft <sup>2</sup>
V / 0.75	7,162 ft <sup>2</sup>	7,878 ft <sup>2</sup>	8,595 ft <sup>2</sup>
IV / 0.84	6,486 ft <sup>2</sup>	7,135 ft <sup>2</sup>	7,784 ft <sup>2</sup>

*\*Note: “Average Land Space” is not to be considered as lot size, but the area potentially necessary to accommodate a conventional septic system, with room for future expansion - under ideal conditions.*

Although the Department considers one design group or loading rate number to represent each boring, it is important to note that other factors may influence the proper installation and safe operation of individual septic systems.

If larger homes, swimming pools, tennis courts or outbuildings, etc. are anticipated to be constructed, or if trees would interfere with installation of an on-site sewage disposal system, larger lots might be recommended to assure ample, useable soil area. It is also important to consider that a 75 foot radius must be maintained between the well and any subsurface seepage field (including those wells established on neighboring lots). The private water well alone has the potential to take up to 17,663 ft<sup>2</sup> of lot space (based on the requirement to maintain prescribed setback distances from the components of septic systems), further shrinking the available space necessary to accommodate a primary and secondary septic field area. See the illustration below.



**Caution:** The septic field areas (or “envelopes”) must be protected at all times from construction traffic and building materials – including soil spoilage.

Driving heavy construction equipment or piling excavated soil over the proposed septic field location can have detrimental and lasting effects on the permeability of the soil. It is the owner’s responsibility to insure that the septic field area is roped off to protect it from this construction activity. Therefore, small lot sizes with roped-off septic areas can potentially limit the mobility of equipment during the construction of the new home making it more difficult to complete some aspects of the home building project.

### Special Considerations

The required area for a septic system may be reduced by using different septic system materials or components (i.e. chamber leach line systems, aerobic treatment units, raised filter beds, etc.). Although this may be the case, this Department wants to stress that, due to other lot constraints not considered in the generation of this data, septic systems on many lots may require more area than anticipated at the preliminary stages of planning the development.

A recommendation for larger lot sizes might be made when certain site conditions indicate the need to do so. Site conditions that could negatively impact the proper installation and safe operation of a septic system (dictating the need for additional septic area and/or the use of expensive, “alternative” septic systems), include but are not limited to:

- Shallow ground water or an observed groundwater table. Will there be a need for lot owners to install a curtain drain to lower the water table, and if so, how and where will the clear water be discharged? Are above grade systems an option (i.e. mounds or raised filter bed systems)?
- Lot topography (i.e., slope). Must the effluent be pumped under pressure to any part of the distribution system? Is only a small part of a lot suitable for a subsurface field?
- Proximity to flood plains, water sheds, and storm water retention ponds.
- Accessory structures. Some not only take up useable septic area, but have setback zones around them that must be kept free from any septic component (i.e. in-ground pools).
- The presence of shallow bedrock (less than 4’ from grade). This feature can eliminate the ability to perform subsurface disposal of wastewater effluent. Could above grade systems be an option?
- Heavily wooded areas. Ideally, a septic system should be installed in an area free from trees.
- Will homes in the subdivision be permitted to have garbage grinders? If so, an extra septic tank will be required and the septic field will need to be increased in size by 25% in order to meet state and county code.

- Will hot tubs (not whirlpool bathtubs) be permitted? If so, the system will need to be increased in size to accommodate the additional flow from the tub on a daily basis.

***Please be aware that individual wells and septic are not the only method of water supply and waste disposal. There may be advantages to using a community well and/or septic system. (Contact the Health Department for more information).***

**A Word of Advice:** The preliminary soil test information gathered at this early stage of the subdivision planning is really just preliminary data (recall that soil boring or pits are excavated and analyzed on a 200' grid stretched across the undivided parcel). It is not until the subdivision has been platted and recorded, a lot sold and an individual permit to construct a septic system is applied for, that more intensive soil testing takes place. When a septic system is proposed to be installed on an individual lot, three soil borings are taken in the area of the proposed septic field. The results from these more localized soil tests sometimes provide soil data different than that provided by nearby preliminary soil borings. Soil type can change dramatically over the course of just ten feet. Since lot-by-lot soil testing will not be performed until well after lot sizes have been established and the parcel subdivided and platted, it is imperative that any and all factors with the potential to negatively impact septic systems and water wells be given careful consideration, fully investigated and addressed accordingly.

## **The Disclaimer**

Please note that the information presented in this handout is general in nature and is to serve as a guidance document. Only after detailed information concerning individual lot conditions and homeowner preferences is gathered and properly assessed, can a septic system be accurately designed to serve a particular home and lot. There is great potential for a septic system to require more or less space than indicated in this document. This Department strongly recommends keeping lots as large as possible to insure that any and all obstacles to wastewater disposal that arise at the time of individual lot development be easily overcome.

Also, please be informed that septic system performance is directly related to unalterable site conditions (i.e. virgin soil type, tree cover, slope), individual system design and the care that these systems receive. If a site is not suitable for a septic system, the site limitations must be designed around. *The more complex a septic system becomes, the more maintenance that is required to keep it functioning and the greater the chance for breakdown.* We have found that many homeowners new to Kendall County come from communities on public sewer and therefore may not know how to best care for a septic system. This only increases the potential for multiple septic failures in a community, thereby causing surfacing sewage, noxious odors, and possible ground and surface water contamination within a subdivision. Therefore, giving full attention early in the subdivision planning process to the intricacies involved in planning and providing for the proper installation and safe operation of onsite wastewater treatment and disposal systems is essential. This will insure that, down the road, each individual lot in a platted subdivision will be given an opportunity to reasonably and affordably accommodate a septic system and water well without negative public health and environmental impacts.

***For questions or further information on the topic of planning and platting subdivisions intended to utilize onsite wastewater treatment and disposal, please feel free to call the Health Department at (630)553-9100 ext. 8026***