4.6 ONSITE WASTEWATER LOADING RATES

The volume of wastewater that can be treated and disposed of by an onsite system is extremely important to the system user and to environmental health specialists. An onsite system that fails from too much wastewater application is a problem both for the user and environmental health specialist.

Estimating System Loading Rates

The loading rate of an onsite system is the amount of wastewater applied to a square foot of soil per day. This rate depends on a number of factors, including the long-term acceptance rate of the soil at the infiltrative surface, the type of onsite system, and the contents of the wastewater.

Detailed knowledge of the site is necessary to keep the system loading in a safe range. This section presents ideas for determining the loading rate for an onsite system.

The long-term acceptance rate (LTAR) is the amount of wastewater that can be applied each day over an indefinite period of time to a square foot of soil. Effluent from the onsite system is absorbed and properly treated—the LTAR and loading rate are the same in the NC Rules.

Long-Term Acceptance Rate of a Soil

The LTAR is determined by a number of factors. Certainly, the rate effluent can move through the most hydraulically limited soil horizon and has a great effect on the LTAR. The type of biomat that forms at the infiltrative surface and the type of system also affect the LTAR. A specific LTAR is based on the total soil and site evaluation.

Table 4.6.1 illustrates how soil texture affects the range of values for LTAR for conventional systems. The loading rate of Group I soils can be as much as 10 times of Group IV soils.

The LTAR rates presented in Table 4.6.1 are based on long term field experience and research which demonstrated systems function properly for many years when properly sized with the LTAR rates listed in Table 4.6.1.

An example of how the LTAR range is changed for some modified wastewater systems can be seen by comparing Table 4.6.1 and Table 4.6.2. For the same texture, the LTAR range for wastewater effluent application is always greater for a conventional onsite system installed in the soil solum (A, E, or B horizon) than for a system installed in saprolite. The reason for this difference is that saprolite materials usually have lower hydraulic conductivity than solum horizons of a comparable texture (Amoozegar et al., 1993).

For conventional systems or modified conventional systems, the LTAR is the rate per day that wastewater can be absorbed through the bottom of the infiltration trenches and underlying horizons. For low-pressure pipe (LPP) systems, the LTAR rate is the daily rate wastewater is absorbed through the entire drainfield area (trenches and the area between them).

Conventional Onsite Systems Loading Rates

Reference
15A NCAC 18A.1955(b)

Table 4.6.1 Long-Term Acceptance Rate for Conventional Onsite Systems

For conventional onsite systems the LTAR is based upon the most hydraulically limiting soil horizon within 3 feet of the soil surface or 1 foot below the trench bottom, whichever is deeper. Long-term acceptance rates for conventional onsite systems are presented in Table 4.6.1 for the four soil groups.

Table 4.6.1 Long-Term Acceptance Rate for Conventional On-Site Systems

Soil Group	Soil Texture Classes*	Long-Term Acceptance Rate gpd/ft^2
I	Sands Sand Loamy Sand	1.2 - 0.8
II	Coarse Loams Sandy Loam Loam	0.8 - 0.6
III	Fine Loams Sandy Clay Loam Silt Loam Clay Loam Silty Clay Loam Silt	0.6 - 0.3
IV	Clays Sandy Clay Silty Clay Clay	0.4 - 0.1

*Soil Texture Class for soils that have SUITABLE or PROVISIONALLY SUITABLE structure and clay mineralogy. (USDA Classification)

If grease accumulation is a problem, the LTAR cannot exceed the mean rate of application for any soil group. For example, a food service or meat market facility with a clay loam textured soil has a maximum wastewater loading rate of 0.45 gpd/ft^2.

With data from comparable facilities, effluent grease and oil content less than 30 mg/l and a chemical oxygen demand less than 500 mg/l. An LTAR increased to the maximum loading rate for the applicable soil's textural group can be used. If a significant pretreatment system is used at a business or public place, and assures consistent reduction of the wastewater strength comparable to a typical single family home, a loading rate greater than the mean for that soil group could logically be considered for that site. However, this would require a special application under *Rule 15A NCAC 18A.1948(d)* by the owner to the Health Department.

Using long-term acceptance rates to calculate the treatment and disposal field size. The following calculation of the treatment and disposal field area is for a conventional system.

Reference
15A NCAC 18A.1952(b)(1)

The amount of effluent that is expected to enter a septic tank each day is based on the type of facility, as stated in *15A NCAC 18A.1952(b)(1)*. In this example, a 3 bedroom house will be built on the site. The daily flow rate into the septic tank is designed for gallons per day for the whole house, or 120 gallons per bedroom per day.

The onsite system is to be sited on a soil whose most restrictive textural horizon within a foot of the trench bottom (or 3 feet from the ground surface) is Group IV. The LTAR for this soil texture ranges from 0.4-0.1 gpd/ft^2. For the purposes of this example we will select a LTAR of 0.4gpd/ft^2. This LTAR may be selected since the soil had excellent structure, and non-expansive clay minerals. These characteristics would lead the evaluator to conclude that the soil has good internal drainage and permeability. An LTAR at the upper end of the textural group, 0.4gpd/ft^2 would be justified.

The daily flow is divided by the LTAR to determine the trench bottom area: 360 gpd divided by 0.4 gpd/ft^2 equals a trench bottom area of 900 ft^2.

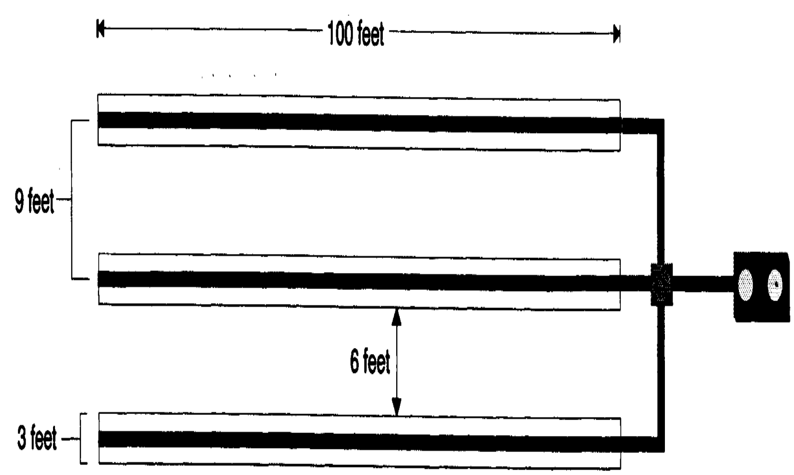
Reference
15A NCAC 18A.1952(b)(1)

In order to determine the length of trench from the trench bottom area, the trench bottom area is divided by the trench width: 900 ft^2 divided by a 3 foot trench width equals 300 linear feet of trench.

If the slope is uniform and there are to be 3 trenches, then each trench would be 100 feet long. The trenches must be on 9 foot centers since the trenches are 3 feet wide. (Note: the center to center spacing equals 3 times the design trench width.) Therefore, the minimum total area for installation of the nitrification area is 2,100 ft^2: the sum of 3ft + 6ft + 3ft + 6ft + 3ft times 100 ft long which equals 2,100 ft^2 (Figure 4.6.1). An equivalent area must be designated for replacement of the system if it should fail.

Figure 4.6.1
Total drainfield area
for a conventional system.

Figure 4.6.1 Total drainfield area
for a conventional system.



Modified Conventional Onsite Systems

If the slope is not uniform then the total installation area will have to be larger. In the above example, if the slope is not uniform, then trenches may have to be further apart than 9 feet centers so that each trench follows the contour of the slope.

Reference
15 NCAC 18A.1956(1)

For sites where the distance between the soil surface and a limiting soil condition of soil depth or soil wetness is less than 36 inches, the site can be reclassified to PROVISIONALLY SUITABLE for the installation of a modified conventional system. Shallow placement of treatment and disposal field trenches, the most hydraulically limiting soil, rock, or saprolitic horizon within at least 24 inches from the soil surface or at least 12 inches below the trench bottom, whichever is deeper, is used to determine the LTAR.

Onsite Systems Installed in Saprolite

Long-term acceptance rates have also been determined for saprolite that has been deemed acceptable for onsite system installation as stated in rules *15A NCAC 18A.1956(6)*.

For onsite systems installed in saprolite, the LTAR for the site is the LTAR of the most hydraulically limiting saprolite within a depth of 2 feet below the trench bottom. See Table 4.6.2 for values of LTAR for saprolite.

Table 4.6.2 Long-Term Acceptance Rate for Saprolite

Table 4.6.2 Long-Term Acceptance Rate for Saprolite

Saprolite Group	Saprolite Textural Classes	Long-Term Acceptance Rate (gpd/ft^2)
I	Sands	
	Sand	0.8 - 0.6
	Loamy Sand	0.7 - 0.5
II	Loams	
	Sandy Loam	0.6 - 0.4
	Loam	0.4 - 0.2
	Silt Loam	0.3 - 0.1

Calculations for the treatment and disposal field area are the same for saprolite as they are for a conventional system, except the loading rates are lower. Use the appropriate long-term acceptance rates for Class I and Class II texture saprolite in Table 4.6.2.

Gravelless Trench Systems

For trenches without gravel, including prefabricated, permeable block panel onsite systems and large diameter pipe systems, the LTAR is determined from the appropriate table (Table 4.6.1 or 4.6.2), but is restricted to 0.8 gallons per day per square foot.

Reference
15A NCAC 18A.1956(3)

Several trench products which serve as an alternative to gravel have been approved in the state. Sizing of these products is based on a percentage of that required for conventional gravel trenches.

Low-Pressure Pipe Onsite Systems

This requirement for sizing can be found in the approval of each product and is not found in the rules.

Reference
15A NCAC 18A.1957(a)(3)

If a low-pressure pipe onsite system is used at a particular site, then the wastewater loading rate for that site must be matched to the LTAR for this type of system. The LTAR selected is based on the most limiting soil horizon that occurs within 2 feet of the soil surface or 1 foot below the trench bottom, whichever is deeper. The LTARs for low-pressure pipe onsite systems are presented in Table 4.6.3 for the four soil groups.

The LTAR for any soil group cannot exceed the mean rate of application if the grease accumulation will become problematic. For example, a food service or meat market facility cannot install an onsite system on a loamy sand soil using a wastewater loading rate exceeding 0.5 gpd/ft^2.

For facilities with data from comparable facilities that indicate the grease and oil content of the effluent will be less than 30 mg/l and the chemical oxygen demand is less than 500 mg/l, an LTAR up to the maximum for the applicable soil's textural group can be used. Otherwise, if a significant pretreatment system will be used that can assure consistent reduction of the wastewater strength to that of domestic sewage, then a loading rate greater than the mean for that soil group could logically be considered for that site.

Table 4.6.3
Long-Term Acceptance Rate
For Low-Pressure Pipe Systems

Table 4.6.3 Long-Term Acceptance Rate for Low-Pressure Pipe Systems

Soil Group	Soil Textural Classes (USDA Classification)	Acceptance Rate (gpd/ft^2)
I	Sands Sand Loamy Sand	0.6 - 0.4
II	Coarse Loams Sandy Loam Loam	0.4 - 0.3
III	Fine Loams Sandy Clay Loam Silt Loam Clay Loam Silty Clay Loam Silt	0.3 - 0.15
IV	Clays Sandy Clay Silty Clay Clay	0.2 - 0.05

*Soil Texture Class for soils that have SUITABLE or PROVISIONALLY SUITABLE structure and clay mineralogy. (USDA Classification)

Using Long-term Acceptance Rates to Calculate the Treatment and Disposal Field Size.

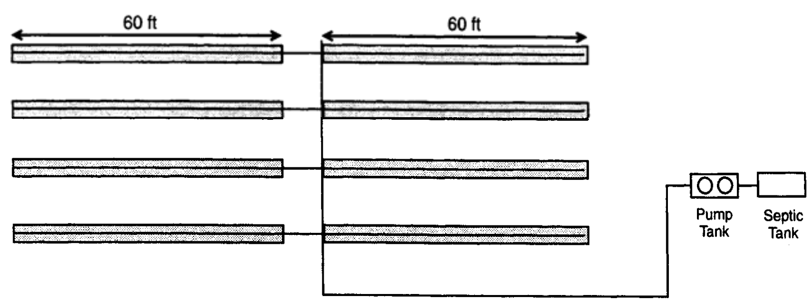
Unlike conventional systems where the loading rate is based on the trench bottom area, the loading rate for a low-pressure pipe system is based on the total area of the treatment and disposal field.

The following calculation of treatment and disposal field area is for a low-pressure pipe system:

- ► The estimated LTAR is 0.15 gpd/ft^2 for this site where a low-pressure pipe onsite system is to be installed. 360 gpd of wastewater effluent will flow daily to the treatment and disposal field. The amount of treatment and disposal field area needed is calculated as 360 gpd divided by 0.15 gpd/ft^2 which equals a total of 2,400 gpd/ft^2. If the trenches for the drainfield are spaced a distance of 5 feet from each other then the total trench length needed is 480 feet, or 2,400 ft^2 divided by 5 equals 480 feet. Trenches should be no longer than 70 feet to avoid uneven dispersal of the wastewater, because friction head losses increase as pipe length increases. An acceptable design is therefore, 8 trenches, each 60 feet long, to achieve the total trench length of 480 ft required for this system (Figure 4.6.2). Again, this example is for a site with a uniform slope. More space may be required for sites with non-uniform slope patterns.

Figure 4.6.2
Total drainfield area
For a low-pressure pipe system.

Figure 4.6.2 Total drainfield area for a low-pressure pipe system.



Area-Fill Onsite Systems

Reference
15 NCAC 18A.1957(b)(1)(D)

For area-fill systems that meet the requirements of *15A NCAC 18A.1957(b)(1)(A)*, the lowest LTAR for the applicable soil group of the most hydraulically limiting soil horizon within 18 inches of the naturally occurring soil surface or to a depth of one foot below the trench bottom, whichever is deeper, must be used to design the system.

The fill used to construct area-fill systems must be sand or loamy. The fill serves to pre-treat the sewage prior to entering the upper 18 inches of naturally occurring soil upon which the fill is placed. The lowest LTAR found in Table 4.6.1 that would normally be assigned to the most limiting soil group found in that 18 inches of soil, is used to size the fill system to insure that:

1.) The sewage receives adequate treatment prior to entering the naturally occurring soil.
2.) There is sufficient absorptive capacity under the fill to prevent the effluent from breaking out at the natural ground surface adjacent to the fill. There are two exceptions to this requirement.

Individual Aerobic Sewage Treatment Units (ATUs)

Reference
15A NCAC 18A.1957(c)(5)(C)

- If group I soil is found within 18 inches of the naturally occurring soul surface, an LTAR of 1.0 gallons per day per square foot may be assigned at the fill system with conventional gravity distribution trenches instead of an LTAR of 0.8 that would be required if the lowest LTAR for a Group I soil was used.
- If Group I soil is found within 18 inches of the naturally occurring soil surface, an LTAR of 0.5 gallons per day per square foot may be assigned a fill system with low pressure pipe distribution trenches instead of an LTAR of 0.4 that would be required of the lowest LTAR for a Group I soil was used.

The LTAR for ATUs may be increased 25percent for Group I or Group II soils. For example, the LTAR of Group I soils ranges from 1.2-0.8 gpd/ft^2 for a conventional onsite system. If an ATU system was planned for Gorup I soils, the LTAR range would be 1.5-1.0 gpd/ft^2—a 25 percent increase.

Large Onsite Systems

Large onsite systems require a more-detailed site evaluation to accurately determine the LTAR. One cannot realistically expect to take the design guidelines for a residence and simply multiply them by 100 to design a large sewage absorption system for a 100 unit subdivision. Scale matters when it comes to treatment and hydrology considerations. A standard description of what a site and soil evaluation would be for a large system is not possible. Rather, this section describes a typical scenario that can aid in understanding the correct approach to large system site investigations.

The site and soil investigation must include more detailed descriptions and assessments of soil morphology and measurements of the saturated hydraulic conductivity (Ksat) of one or more soil horizons at that site. The location and number of Ksat measurements will vary with each site, depending upon the site conditions and the water flow regime at the site. See Section 4.5 under Additional evaluation factors — Large onsite systems for more details on using either the constant-head permeameter test or the auger-hole pump-out test to measure Ksat. Other tests may also be appropriate, such as aquifer pump tests, for large systems in coastal areas. The first part of Section 4.5, Guidelines for a site evaluation, provides guidance for performing a site evaluation for a large system.

Figure 4.6.3
Schematic illustrating depth of proposed trenches relative to soil horizons at a site being evaluated for a large drainfield.

Figure 4.6.3 Schematic illustrating depth of proposed trenches relative to soil horizons at a site being evaluated for a large drainfield.

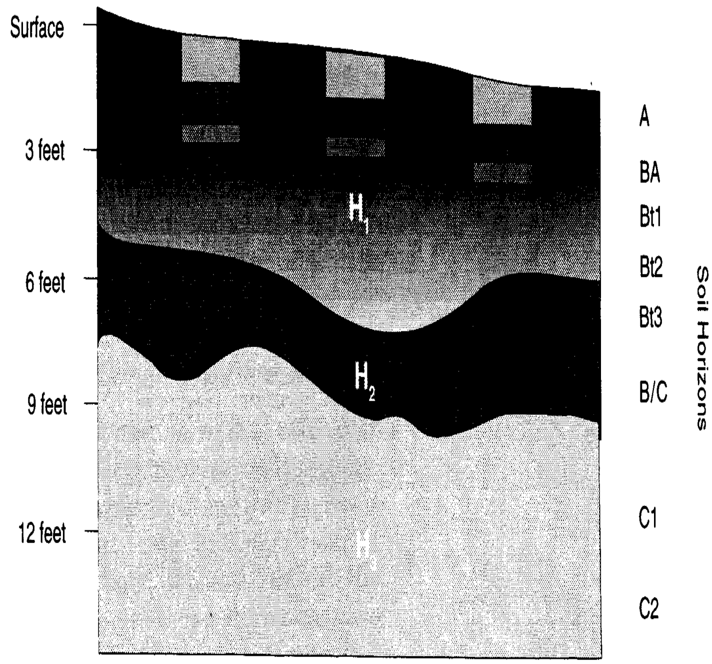


Figure 4.6.3 illustrates a typical site in the Piedmont or Mountain region where a large onsite system is proposed. The soil here is deep and well drained. It has eight soil horizons down to a depth of 12 feet below the ground surface. The landscape position is an interfluve with a 4 percent slope of the ground surface.

A large, modified conventional system with trenches 2 feet to 3 feet deep is proposed for the site. A much deeper than usual assessment of soil properties is required—down to 12 feet—than is necessary for small, single-family systems (usually only to 4 feet).

The horizons should be grouped on the basis of the similarity of their characteristics. For this example, there would be three major horizon groupings: horizon H^1 (the Ap, BA, Bt1, and Bt2 horizons), horizon H^2 (includes the Bt3 and B/C horizons) and horizon H^3 (includes the C1 and C2 horizons).

The three factors that could control the direction and quantity of flow of effluent from the proposed system were identified at this site:

1.) The first factor is the rate of sewage effluent that can leave the trenches through the biomat at the infiltrative surface. This rate is determined by the LTAR of the biomat that forms in the BA and Bt1 horizons. The LTAR can be estimated from Tables 4.6.1, 4.6.2, or 4.6.3, or it can be estimated by measuring the Ksat of the horizons at the infiltrative surface (the BA and Bt1 horizons) and by assuming a percentage reduction in Ksat due to the biomat. Biomats typically reduce flow rates to 1-10 percent of the saturated hydraulic conductivity, although the percentage reduction can be even greater on some rapidly permeable sands. The amount of infiltrative surface (in this case, the amount of trench bottom area) needed to accommodate the maximum design flow from the proposed facility after a biomat forms should be determined. If pretreatment (such as a pressure-dosed sand filter) is used to reduce BOD and suspend solids, the biomat will not form as extensively and the LTAR can be increased for the infiltrative surface. Likewise, if waste strength will exceed that of typical domestic wastewater, such as at food service facilities, the LTAR should be decreased.

2.) Next, the most slowly permeable horizon in the soil should be identified because this horizon will potentially control the flow of wastewater through the site. In this example, the bottom of the Bt horizon and the transitional B/C horizon were identified as the horizons most restrictive to vertical water movement. Therefore, Ksat measurements should be made in these horizons. Since the soil is well-drained and these horizons are well above the water table, the constant-head permeameter test would be an appropriate method to measure Ksat. The number of Ksat measurements required will depend upon the degree of variability of the soil horizons of interest (in this case, the Bt3 and B/C). If there is only a small amount of soil variability, then one to two Ksat measurements for each 1,000 ft^2 of total drainfield area (not trench bottom area) may be sufficient. This is, however, just an estimate of the number of measurements needed for a site where a large system is proposed. Each site will be different.

- The measure–Ksat values in the most slowly permeable horizon (H_2 in this example) should be compared to the estimated LTAR of the horizon where the infiltrative surface will be placed (H_1 in this example). If the LTAR of H_1 is more than three times greater than the Ksat of H_2 then the ultimate rate of flow through the soil would be controlled by saturated flow through H_2, not wastewater infiltration into H_1. Therefore, the system size should be increased beyond the size indicated by the LTAR of H_1. On the other hand, if the LTAR of H_1 is nearly equivalent to or less than the Ksat of H_2, then the ultimate rate of flow through the soil would be controlled by saturated flow through the biomat at the infiltrative surface, and all vertical flow through H_2 and H_3 below the infiltrative surface would occur as unsaturated down to the groundwater table. In this case, the system size would be determined by the LTAR of H_1.

3) The third factor may be identified as potentially controlling flow at this site is the rate of lateral flow through H_1 in the downslope direction. Water perching on a slowly permeable horizon and flow over that horizon is more likely to occur as the Ksat of H_2 becomes smaller in comparison to the Ksat of H_1. Usually a 10 fold reduction in Ksat over a short vertical distance will cause some water to perch within and on the more slowly permeable layer. A 100 fold or greater reduction in Ksat will lead to more substantial perching of water. Both the slope of the slowly-permeable horizon and the amount of effluent proposed for disposal on a common slope must be considered, in addition to the horizon's LTAR rates, while evaluating the site's suitability for the system.

   - At this site the soil evaluation revealed that an approximate 10 fold reduction or less would be expected in the Ksat of H_2 when compared to H_1. However, close examination of the soil horizon boundaries in a backhoe pit indicated that no significant perching was currently occurring under natural rainfall conditions. While some perching on the H_2 horizon could occur at low loading rates, it would be temporary and inconsequential since an adequate aerobic vertical separation would persist beneath the infiltrative surface. However, at high loading rates, one would expect more substantial perching to occur. In this case, the horizontal Ksat of H_1 would need to be measured to allow calculation of the height of the perched water mound over H_2 and the transmissivity of H_1.

In summary, measured Ksat values of the most slowly permeable horizon should be compared to estimated LTAR at the infiltrative surface. The lower of the 2 values should be used to determine the site loading rate. Examples are presented below.

Example 1. The most slowly permeable horizon of the soil being evaluated is the lower B horizon, which has a clay texture. The estimated LTAR at the infiltrative surface in Table 4.6.1 is 0.1 gpd/ft^2. However, the average Ksat value of the most slowly permeable horizon is measured to be 0.024 gpd/ft^2 (0.1 cm/day). Because the Ksat value is considerably lower than the LTAR value, this site would be unsuitable for siting an onsite system using the LTAR from Table 4.6.1. The lower B horizon, although not a restrictive horizon, transmits water too solely for an onsite system to function suitably in this soil at a loading rate of 0.1 gpd/ft^2.

Example 2. At another site, which is similar to the site in Example 1, the average Ksat value for the lower B horizon is 0.24 gpd/ft^2 or 10 cm/day. The LTAR for this site is estimated as 0.1 gpd/ft^2. Because the Ksat of the lower B horizon is greater than the LTAR, an onsite system could be installed at this site, assuming all other site evaluation factors are suitable. The estimated loading rate would be 0.1 gpd/ft^2.

Problems with Overestimation or Underestimation of LTAR

Most Of the onsite systems have a range of LTARs, depending on the most limiting soil textural grouping. Estimating the LTAR can be difficult because not only must the texture of the most limiting horizon be classified correctly, but "the right rate" must be estimated from a range of rates. Experience with a number of sites and numerous soils will aid in determining a proper value for LTAR. By misclassifying the limiting soil textural horizon or by estimating the wrong LTAR, the entire calculation for the treatment and disposal field area can be altered.

The Importance of Correctly Estimating The Loading Rate

The LTAR must be estimated correctly in order for the treatment and disposal field size is large enough to perform properly:

- If the LTAR is underestimated, the size of the treatment and disposal field will be too small, which can invite early failure of the onsite system;
- If the LTAR is overestimated, the size of the treatment and disposal field will be too large, thus wasting resources because the onsite system will be underutilized and the construction cost of the site will be more than necessary; and
- If available space is limiting system installation, underestimation of the LTAR means that a larger treatment and disposal field will be required. This may erroneously produce an UNSUITABLE classification due to space limitations that would preclude the siting of an onsite system. The site might be able to accommodate an onsite system with a smaller treatment and disposal field.

Using Site Evaluation Factors to Choose a Proper Value for LTAR

The range of LTAR values listed in the tables reflects the influence that other site evaluation factors can have on the LTAR. By considering the other site characteristics, higher or lower values of LTAR can be selected to help fit the onsite system to the site.

Soil texture is the major soil characteristic that determines the LTAR for any given soil or saprolite. Estimates of LTAR from the LTAR range for a given soil textural class should then be based on site characteristics such as soil depth, structure, color, consistence, landscape position, and the type of wastewater effluent. The following factors influence the value assigned to LTAR for small wasteflows.

Table 4.6.4
Site and Soil Evaluation Factors that Influence Assigned LTAR

Table 4.6.4 Site and Soil Evaluation Factors That Influence Assigned LTAR

Site Evaluation	Higher LTAR	Average LTAR	Lower LTAR
Landscape position	Ridges or interfluve, shoulder and nose or convex slopes	Linear side slopes	Head, foot and toe slopes, or concave slopes
Soil structure	Crumb and granular, single-grained soils		Block-like structure
Clay mineralogy	No clay or little 1:1 clay	1:1 clay	Mixed clay or 2:1 clay
Organic matter	0%	2-5%	High organic matter indicates persistent wetness
Soil wetness	>48 inches deep	36-48 inches deep	36-24 inches
Soil depth	>48 inches deep	36-48 inches deep	36-24 inches
Restrictive horizons	>48 inches deep	36-48 inches deep	<36 inches deep if they are discontinuous

An example of the different soil and landscape characteristics to estimate LTAR is presented in Table 4.6.5 and the explanation following the table:

Table 4.6.5
Comparison of Two Similar Sites and the Effects of Soil Morphological Characteristics and Landscape Position on LTAR

Table 4.6.5 Comparison of Two Similar Sites and the Effects of Soil Morphological Characteristics and Landscape Position on LTAR

Soil A	Horizon	Soil B
Landscape position = ridge		Landscape position = lower side slope
Texture = sandy loam Structure = granular Consistence = friable	AE	Texture = sandy loam Structure = granular Consistence = friable
Texture = clay (non-expansive) Structure = strong, fine angular blocky Consistence = friable	B	Texture = clay (non-expansive with a slight influence of mixed mineralogy) Structure = moderate, medium angular blocky Consistence = firm
Texture = sandy loam Structure = moderate, medium subangular blocky Consistence = firm	BC	Texture = sandy clay loam Structure = weak, coarse subangular blocky Consistence = firm
Texture = loamy sand Structure = massive Consistence = friable	C	Texture = loam Structure = massive Consistence = very firm

These two soils are very similar. The most limiting horizon for both soils is the B horizon (clay texture). The LTAR range for soils with a clay horizon using a conventional onsite system is 0.4 – 0.1 gpd/ft^2.

Soil A has the more strongly developed structure in the B and C horizons, better landscape position on the ridge as opposed to on the side slope, and a lack of any mixed mineralogy influence. These factors indicate that Soil A is better suited for more rapid infiltration of wastewater than Soil B and thus should receive a higher LTAR value. Conversely, the weaker structure, mixed mineralogy, and poorer landscape position cause Soil B to receive an LTAR low in the range.

For this example, the LTAR of Soil A is estimated to be 0.4 gpd/ft^2, while the LTAR of Soil B is estimated at 0.1 gpd/ft^2.

References

Amoozegar, A., M.T. Hoover, H.J. Kleiss, W.R. Guertal, and J.E. Surbrugg. 1993.
Evaluation of Saprolite for Onsite Wastewater Disposal. (Water Resources Research Institute, The University of North Carolina. UNC-WRRI-93-279.)