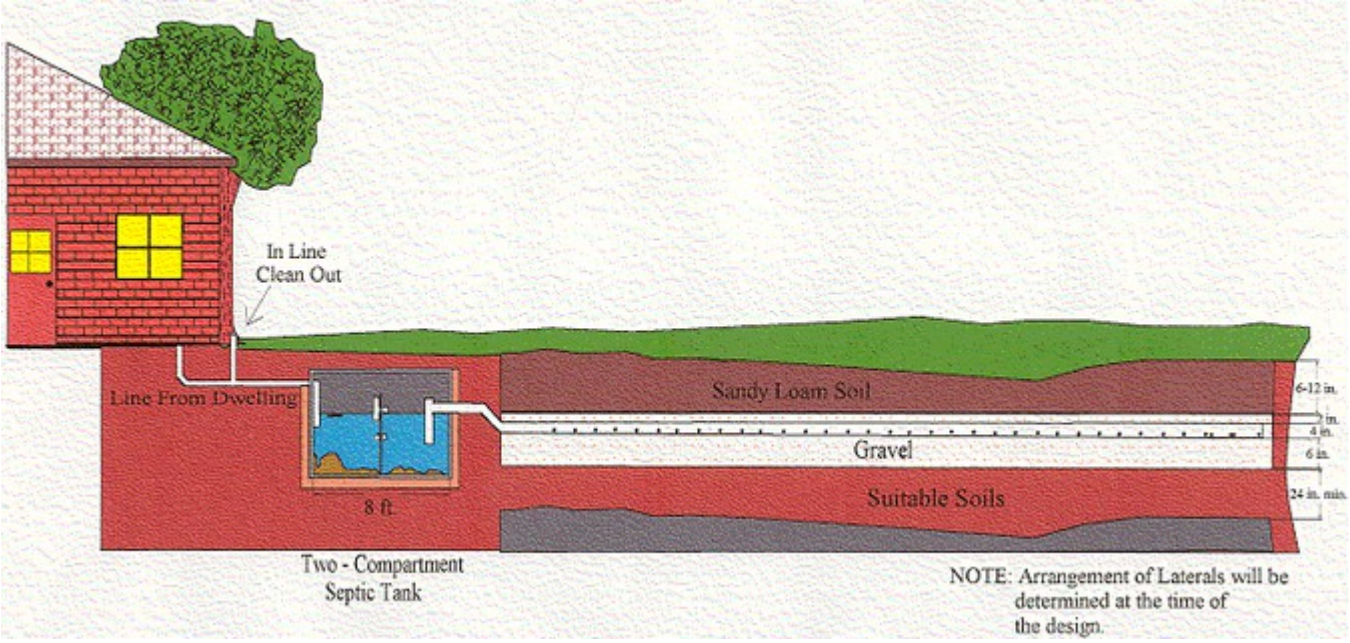
Standard Septic System



A standard wastewater system with soil absorption system is the most cost efficient method available to treat residential wastewater. But for it to work properly, you need to choose the right kind of septic system for your household size and soil type, and you need to maintain it regularly.

What size septic tank do I need?
The size of the septic tank you need depends on the number of bedrooms in the home, number of people living there, the home's square footage and whether or not water saving fixtures are used. You can use the table below to get some idea of what size septic tank your home requires.

# Bedrooms	Home Square Footage	Tank Capacity
1 or 2	Less than 1,500	750
3	Less than 2,500	1,000
4	Less than 3,500	1,250
5	Less than 4,500	1,250
6	Less than 5,500	1,315

How often should my tank be pumped?
To keep your system working and treating sewage efficiently, you need to have the tank pumped periodically. As the septic system is used, sludge accumulates in the bottom of the septic tank. As sludge level increases, wastewater spends less time in the tank, and solids are more likely to escape into the absorption area. If sludge accumulates too long, no settling occurs, the sewage goes directly to the soil absorption area, and little is treated.

Properly sized tanks generally have enough space to accumulate sludge for at least 3 years. Use the table below to see how often you should have your tank pumped.

Household Size (Number of people)										
Tank Size	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
500	5.8	2.6	1.5	1.0	.07	.04	.03	.01		
750	9.1	4.2	2.6	1.8	1.3	1.0	.07	.06	0.4	0.3
1,000	12.4	5.9	3.7	2.6	2.0	1.5	1.2	1.0	0.8	0.7
1,250		7.5	4.8	3.4	2.6	2.0	1.7	1.4	1.2	1.0
1,500		9.1	5.9	4.2	3.3	2.6	2.1	1.8	1.5	1.3
1,750			6.5	5.0	3.9	3.1	2.6	2.0	1.9	1.6

It is important to know that the soil absorption field will not fail immediately if you don't pump your tank. However, the septic tank is no longer protecting the soil absorption field from solids. If you neglect the tank for long, you may have to replace the soil absorption field.

Soil absorption fields need to be protected from solids and rainfall. If you don't pump the tank, solids can enter the field. Rainfall running off roofs or concrete areas should be drained around the soil absorption field to prevent the field from filling with water.

Fields that are saturated with rainwater are unable to accept wastewater. Planting cool-season grasses over the soil absorption field in winter can help remove water from the soil and help keep the system working properly.

Other maintenance
Another maintenance task you need to do periodically to keep the system from backing up is to clean the effluent filter, which is placed in the tank's outlet tee for additional filtering of wastewater. The effluent filter removes additional solids from the wastewater and keeps them from clogging the absorption field and causing it to fail prematurely.

You can clean it yourself by spraying it with a hose, or you can request that your maintenance provider clean the filter.

Two critical components
Standard treatment systems have two components: a septic tank and a soil absorption system.

Tank
The septic tank is an enclosed watertight container that collects and provides primary treatment of wastewater by separating the solids from the wastewater. It removes solids by holding wastewater in the tank and allowing the heavier solids to settle to the bottom of the tank while the floatable solids (oil and greases) rise to the top.

To provide time for the solids to settle, the tank should hold the wastewater for at least 24 hours. Some of the solids are removed from the water, some are digested, and some are stored in the tank.
Up to 50 percent of the solids retained in the tank decompose; the rest accumulate as sludge at the tank bottom and need to be removed periodically by pumping the tank.

Drainfield
The soil absorption field provides final treatment and distribution of the wastewater.
A conventional system consists of perforated pipes surrounded by such media as gravel and chipped tires, covered with geo-textile fabric and loamy soil. To treat wastewater, this system relies heavily on the soil, where microorganisms help remove the organic matter, solids, and nutrients left in the water.

As effluent continually flows into the soil, the microbes eating the components of the wastewater form a biological mat. The mat slows the water's movement through the soil and helps keep the area below the mat from becoming saturated. The water must travel into unsaturated soil so that the microbes there and in the mat can feed on the waste and nutrients in the effluent. The grass covering the soil absorption system also uses the nutrients and water to grow.

Septic tank types

There are three main types of septic tanks for on-site wastewater treatment:

- Concrete septic tanks — The most common.
- Fiberglass tanks — Used often in "hard to get to" locations because they are easy to carry.
- Polyethylene/plastic tanks — Like fiberglass tanks, these are light, one-piece tanks that can be carried to "hard to get to" locations.

All tanks must be watertight to prevent water from entering as well as leaving the system.

Factors in septic maintenance

A key factor in the septic tank's design is the relationships between how much surface area it has, how much sewage the tank can store, how much wastewater is discharged and how fast it exits. All affect the tank's efficiency and the amount of sludge it retains.

The greater the liquid surface area, the more sewage the tank can collect. As more solids collect in the tank, the water there becomes shallower, which requires that the discharge be slower to allow more time to separate the sludge and scum.

A key to maintaining a septic tank is placing risers on the tank openings. If a tank is buried more than 12 inches below the soil surface, a riser must be used on the openings to bring the lid to within 6 inches of the soil surface. Generally, the riser can be extended to the ground surface and protected with a good lid. These risers really make it easy to perform maintenance on the tank.

Soil types

There are three textures of soil—sand, silt, and clay—and they affect how fast wastewater filters into the soil (called hydraulic conductivity) and how big of an absorption field you need. Sand transmits water faster than silt, which is faster than clay.

Texas regulations divide these three soil textures into five soil types (Ia, Ib, II, III, IV). Sandy soils are in soil type I and clay soils are in soil type IV. A standard drain field cannot be used in a clay soil.

Also important to the design is the Hydraulic Loading, which is the amount of effluent applied per square foot of trench surface. Because water filters through clay soils more slowly than through sand or silt, the hydraulic loading rate is lower for clay than for sand. Because clay soils have a low conductivity, only nonstandard drain fields can be used in clay.

Reference: Lesikar, Bruce. Agricultural Communications, The Texas A&M University System. Septic tank/soil absorption field. Publication L-5227. 10 Apr. 2000.