

This book is intended to assist property owners by informing them that there are numerous types of sewage disposal systems available.

# How to Choose the Right Sewage Disposal System for Your Property



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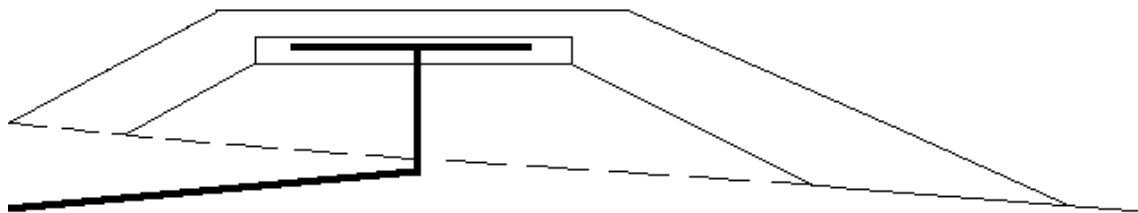
# How to Choose the Right Sewage Disposal System for Your Property

Dingman Township is not served by central sewage (city sewers). As such, you will need to construct a sewage disposal system on your own property.

It is the purpose of this document to provide the reader with information to assist in making an informed decision about which type of sewage disposal system is best suited for their property. The document was intended for use by the layman, particularly those who have no prior experience with on-lot sewage disposal systems. The reader is advised to seek professional guidance (eg. attorney, soil scientist, engineer, etc.) as may be required prior to applying for a sewage permit.

## The Sandmound Myth.

It is commonly believed that the elevated sandmound is the only sewage disposal system that may be used in Dingman Township. Nothing could be further from the truth. After sewage testing is performed on the property, the property owner may choose from a menu of sewage options based on the test results. In the past, the menu was quite limited and the elevated sandmound was usually the least expensive, least obtrusive, and best functioning system that was available at that time. Today, the property owner has over 50 types of sewage disposal systems (including variations) to choose from, many of which are quite superior to the sandmound.

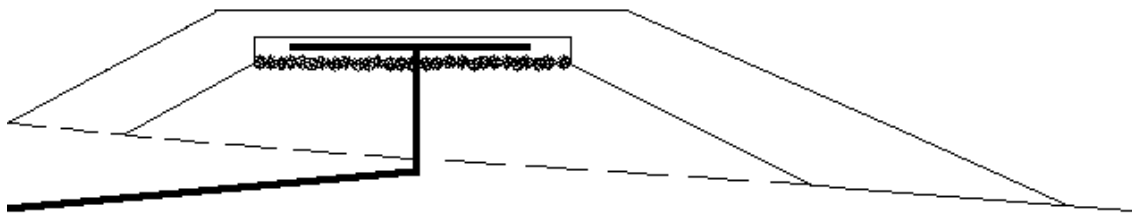


**SIDE VIEW - ELEVATED SANDMOUND**

## Why Not a Sandmound?

Most people agree that the elevated sandmound is ugly and obtrusive. But the biggest drawback is not as obvious. When the sewage effluent is pumped into an elevated sandmound, it often contains suspended solids. The solids pass through the aggregate and are filtered out by the sand. Under normal circumstances, the sand holds these solids while decomposition takes place. If the suspended solids collect at a rate greater than they can decompose, a semi-permeable bio-mat develops. As the effluent flow is restricted, pressure builds in the mound. Eventually the effluent will push through the point of least resistance and a leak develops. The mound can be repaired, but such repairs are costly and often result in destruction to the property's lawn and landscaping.

Many of today's systems employ a filter between the septic tanks and the dosing tank. The filter catches suspended solids before they get to the aggregate. In the event that the accumulation of solids exceeds the rate in which the solids decompose, the filter can be cleaned --- a relatively inexpensive procedure.



ELEVATED SANDMOUND WITH BIO-MAT

## Why are Sandmounds So Common?

There are three reasons why elevated sandmounds remain the sewage disposal system that is permitted most often in Dingman Township.

1. Property owners are not aware that they have other options.
2. Real estate salespeople and housing contractors are more familiar with the elevated sandmound and are more comfortable promoting systems that they are familiar with.
3. Sewage system designers often promote the elevated sandmound over other systems because they are easier to design.

# Factors to Consider when Choosing a Sewage Disposal System

Soil testing is performed on the property in the area where the system is to be sited. After the soil testing is completed, the property owner should examine the available system options and investigate the following points:

**Construction Costs** – Some system types can cost significantly more than others.

**Affect on Property Values** – Some systems will greatly increase the resale value of the property. In some cases, more expensive systems will more than pay for themselves in increased property value.

**Aesthetics** – Some systems are lower to the ground than others. In fact, some systems are totally in the ground.

**Space Intensiveness** – Some systems are not suitable for small properties or properties where space is at a premium. Others can be fit into smaller spaces maximizing yard space for other uses.

**Ease of Operation** – There are no “flush it and forget it” systems. However, maintenance requirements can vary greatly between systems.

**Reliability** – Some systems have a greater failure rate than others.

**Efficiency** – Some systems do a better job in renovating the effluent.

**Warranties** – Some systems or system components carry warranties guaranteeing that the system or component will function properly.

# A Brief Review of Some of the Options Available

The following is a list of just some of the systems available that may be used in place of an elevated sandmound. The information has been kept general as each site must be evaluated on a case-by-case basis.



## 1. At-Grade Bed

This system requires a primary treatment tank (septic or aerobic), a dosing tank and a bed of aggregate placed directly on the ground. The aggregate may either be placed to level the slope, or it may be placed with the top of the aggregate parallel to the ground.

Basic Requirements		
	At-Grade	Elevated Sandmound
Limiting Zone	48" min.	20" min.
Average Perk Rate	3 – 180	3 – 180
Slope	15% max.	12% max.

### End View Comparison



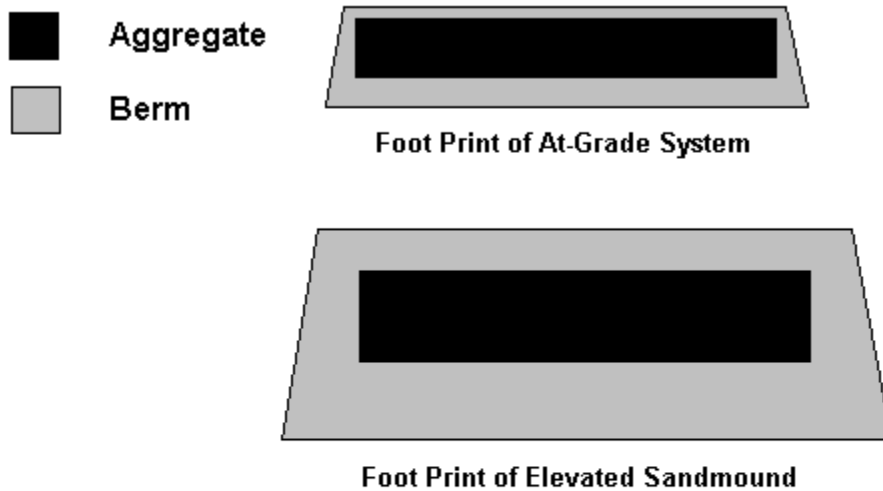
-  **Elevated Sandmound**
-  **At-Grade Option A**

TO SCALE

## 2. At-Grade Bed with a Peat or Coco Bio-Filter

This system is the same as the At-Grade system previously discussed with one major difference. A bio-filter is located between the primary treatment tank and the dosing tank. The bio-filter is essentially a box filled with specially graded peat or coco fiber. The effluent is filtered through the fiber which provides a very high level of treatment.

Basic Requirements		
	At-Grade with Bio-filter	Elevated Sandmound
Limiting Zone	20" min.	20" min.
Average Perk Rate	3 – 180	3 – 180
Slope	15% max.	12% max.



### Comparison of System Types Showing Differences in Area Required

Drawn to Scale - Based on the requirements for a 4 bedroom house

Limiting Zone 24 inches      Average Perk Rate 29      Slope 8%

## At-Grade Bed with Other Proprietary Products

There are products approved for use in Pennsylvania that may replace the septic tank and treat the effluent to a quality that would permit the use of At-Grade Systems. These products are often used in environmentally sensitive areas where denitrification is required.

### 3. Drip Irrigation

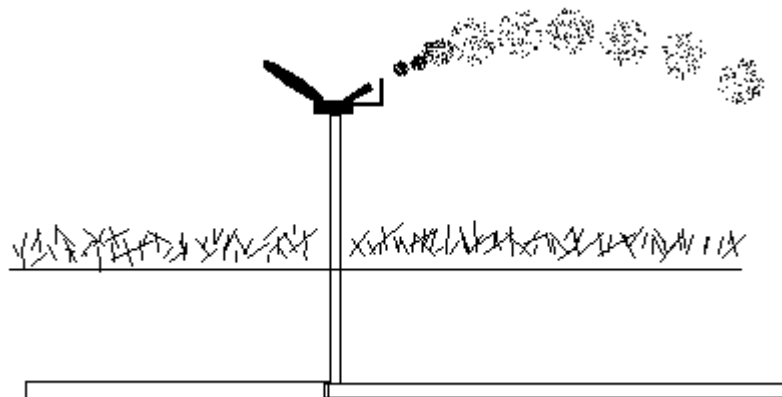
There are many ways to design a drip irrigation system. Some employ septic tanks, others aerobic tanks. Some employ sandfilters. Others do not. All systems utilize a hydraulic unit, dosing tank, and drip tubes. The system has three big advantages. First, the drip tubes are completely buried – no unsightly mound! Second, there is very little digging. A slit is cut into the ground, the drip tube is placed in the slit, and then the slit is closed. Trees, rocks, etc. are left in place keeping the natural beauty of the woods. Finally, the tubing may be laid in a myriad of shapes allowing the system to be sited in areas that may otherwise not permit a system to be sited.

Basic Requirements		
	Drip Irrigation	Elevated Sandmound
Limiting Zone	20" min.	20" min.
Average Perk Rate	not required	3 – 180
Slope	25% max.	12% max.

### 4. Individual Residential Spray Irrigation System

Individual Residential Spray Irrigation Systems (IRSIS) filter then chlorinate the sewage. The treated sewage is then sprayed onto the natural vegetation. The biggest drawback to the use of this system is that it requires a fairly large property. Spray field size varies based on the amount of usable soil, the slope of the land, and the type of vegetation growing on the site. The minimum spray field would be 10,000 square feet.

Basic Requirements		
	IRSIS	Elevated Sandmound
Limiting Zone	10" min.	20" min.
Average Perk Rate	not required	3 – 180
Slope	25% max.	12% max.



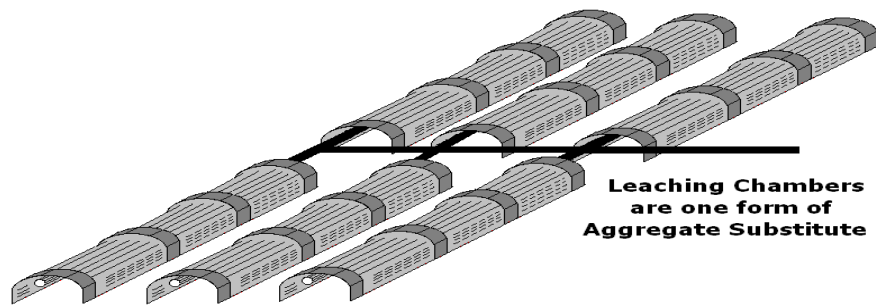


## 5. Proprietary Aggregate Replacements

Although the result would still be a sandmound, there are proprietary devices approved to replace the aggregate (stone) in a sandmound. These devices are intended to extend the life of the sandmound by filtering or by adding additional air to the effluent. Most also allow for a reduction in the size (but not the height) of the sandmound.

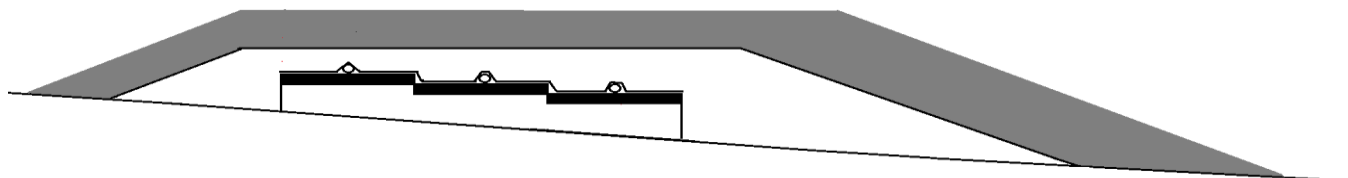
### Leaching Chambers:

Leaching chambers work by increasing the air that contacts the effluent creating greater aerobic activity and by allowing the effluent to flow more evenly across the sand. While the height of the mound may be the same, the area of the mound may be reduced up to 40%



### Geo-Textile Sand Filters:

Geo-Textile Sand filters replace the aggregate with a filter bed of artificial material. The filter bed filters the effluent and allows for greater aeration. Each filter is placed on a 12 inch layer of sand reducing the height compared to a sandmound. A geo-textile sand filter can also reduce the area of the system.



A geo-textile sand filter compared to an elevated sandmound on the same site.

## **Where to get further information.**

### **1. Information about available system types**

Your sewage system designer should be well versed on the types of sewage disposal systems that could be sited on your property. However, unless you bring up the subject, many are not very forthcoming. It is your property. You have the right to have the sewage disposal system that best meets your needs (subject to legal and site considerations). If your sewage system designer tells you that the elevated sandmound is your only option, consult another design firm for a second opinion. You may also contact the Dingman Township Sewage Enforcement Officer. Rare as it may be, there are occasions in which the sandmound is the only available. Still, it never hurts to get a second opinion.

### **2. Information about system pricing**

The construction costs of any particular type of sewage disposal system may vary greatly from site to site. For this reason, state law prohibits you from seeking bids until the permit is issued. However, in most cases a sewage system installer can give you an “idea” of what a particular system will run. If you know what type of system you are interested in, talk it over with your system installer. If the price seems more expensive than you expected, you should consider the following:

**Site considerations** - Some sites will cause a sewage disposal system to be more expensive. For example, the slope of the land would cause the price of a sandmound to increase. The steeper the land, the more sand and berm that would have to be used. Look into another location or choose a sewage disposal system type that better accommodates the slope.

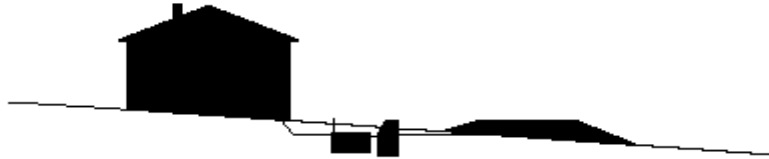
**Installer fears** – Many installers are afraid of sewage disposal system types that they have not previously installed. As a result, they will often “over bid” the job in the hopes that you either hire another installer or choose another disposal system type. If the bid seems too high, consider getting additional bids. Ask your sewage system designer for names of sewage system installers who have installed such systems. The manufacturers of proprietary equipment that is used in some sewage disposal systems (e.g. bio-filters and drip systems) often keep lists of installers who have installed their product.

### **3. Information about a sewage disposal system’s affect on property values**

The best people to talk to about property values are the real estate salespeople. Explain your building plans. Tell them where you would be placing the sewage disposal system (for example: front yard, back yard, side of house). Ask them what the property value of the land and house would be with an elevated sandmound. Then describe the alternatives you are considering and see if there is an appreciable difference.

# Typical Profiles

All profiles were drawn to same scale except as noted. For purposes of component illustration, all components are laid out horizontally.



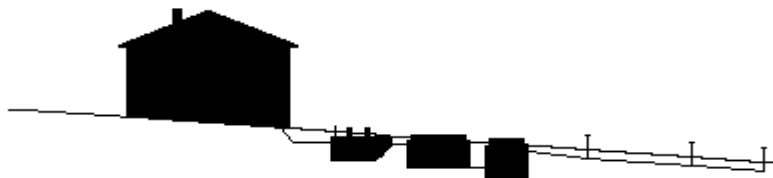
## Elevated Sandmound

House, septic tank, dosing tank, mound.



## At-grade with Bio filter

House, septic tank, bio filter, dosing tank, at-grade bed



## Individual Residential Spray Irrigation

House, aerobic tank, sandfilter, chlorine contact/dosing tank spray field

**Note:** Spray heads would normally be spaced 100 feet apart. Actual spray field would range from ¼ acre to 2 acres for a 3-bedroom house.

**Note:** Only tank accesses and spray heads are above ground.



## Drip Irrigation

House, treatment, dosing tank, hydraulic unit, drip field.

**Note:** Only tank accesses and hydraulic unit are visible above ground.

## **Some Final Thoughts**

- New system types are approved annually. If your permit is about to expire, check to see if a better option may be available.
- If you already have a permit for an elevated sandmound, you are not bound to that option. You may, at any time, acquire a permit for another system type.

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