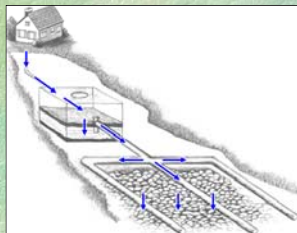


Septology 101



Multnomah
County
&
City of Portland
Erin Mick

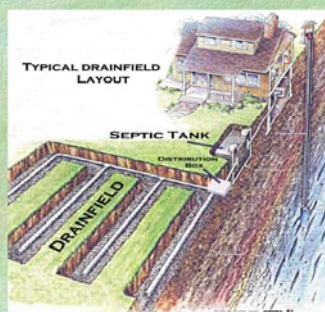
Septology 101

- Brief Overview of Septic Systems
- Site Evaluation
- Regulatory Approval
- Types of Septic Systems
- Maintenance of Existing Systems

What is a Septic System and How Does it Work?

A septic system is composed of two main parts.

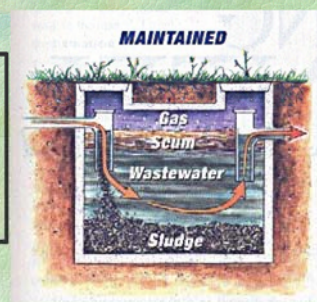
- Septic tank
- Drainfield



The Septic Tank

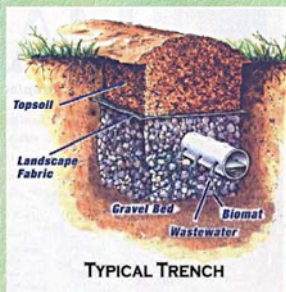
What the tank does.
It provides the waste:

- Retention time.
- Biological waste decomposition.
- Settling of the waste.



The Drainfield and its Function

- **Drainfield size** depends of the amount and strength of the wastewater to be treated. The soil provides:
- **mechanical** filtration,
- **biological** treatment, and
- **absorption** of the liquid.



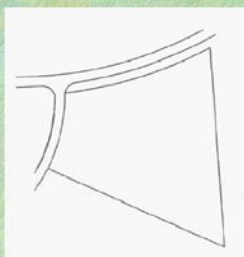
How the Septic Site Evaluation Process is Conducted (in a nutshell)

The major factor considered in the evaluation are:

- * **Soil** and **drainage** conditions.
- * **Setbacks** from wells and surface water.
- * Slope and **topographical** conditions.
- * **Space available** for the system.
(drainfield and replacement area)

First is the property outline

First, the property boundaries are looked at. This property is 2.44 acres. Now that's pretty **Big**.... Isn't it!



Now, the soil Evaluation.

The soil test pits provided are evaluated for the following:

- Soil texture and color
- Porosity
- Depth and overall drainage capability.



Soil colors are important in the evaluation.

Soil color, texture, and structure will tell much about the drainage and the sewage treatment capability of the site.



Soil colors are a good drainage indicator.

In general, the gray, darker, dull colored soils are more poorly drained.
The richer brown colors are usually better drained soils.



Close up of the soil shows the soil structure and pore development.

Look at the soil up close. The better drained soils have a well developed system of pores which allow water to pass thru.



Soil depth is considered.

To approve a site for a standard drainfield installation, a minimum of 30" of "effective soil depth" is required. This depth increases with greater slope.



Native vegetation is Considered.

Vegetation can tell a lot about the drainage of the site.



Poorly Drained Sites

Poor soil conditions often cause high water tables causing the septic system to work poorly or cause early system failure.



Avoid swales water moves from the higher areas to lower ground.

This worked up field demonstrates water saturating a swale. This may not be noticeable if tall grass covers this area.

Avoid!



Don't be fooled by a dry swale.

On a nice day this swale may not appear to be too much of a concern. After a rain things may be different!



“And a river runs thru it.”

This is what the swale looks like after a rain.



Next, we consider the property
contours and slopes.

Walking the property will show the “lay of the land”. How the site is contoured tells a lot about its drainage.



Property topography is evaluated.

The lot **topography** is one of the most important factors for drainage. Topography is evaluated for:

- Slope/landform and position
- Drainage
- Setbacks to waterways



Assuming the soils are adequate
and the Land Feasibility has been approved,

...

we can move to the planning phase

...

First, the Development Proposal is Submitted

- The development **site plan** shows:
Home site location.
- Wells & waterways** (proposed and existing).
- Topographic** features and **slopes**. Proposed drainfield and **test holes**.



Will it all fit on the lot?

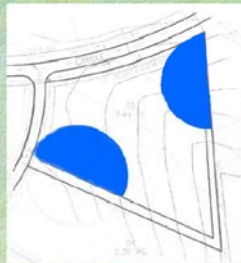
(You know I want a house too!!)

The site proposal is reviewed. Sometimes a **physical stakeout** of all proposed and required components may be necessary to **see if it will fit**.



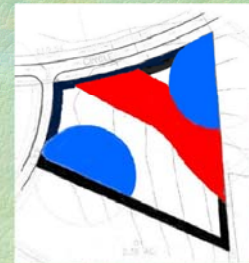
Remove the well and neighboring all neighboring wells.

Take out all the wells which eneroach onto the property. Now the Property begins to get smaller.



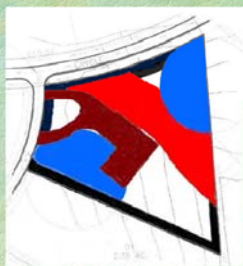
Eliminate streams, drainage ways and ponds. Keep a setback.

This drainage swale running thru the property will collect water from the higher ground. We don't want a septic system here.



Now, add the building envelope.

The final bite out of the property to determine what is really available, is the plan the owner wants to develop. What started out seeming to be a lot of room is now just a corner!



Site Approval Document

Once the site evaluation process is completed and the property is approved, a **specific site approval** plan is made. This drawing shows where the approval is located



Know the Type of Septic System

The basic system types. Some have pumps.

- **Standard** drainfield.
- **Capping fill** system.
- **Sand Filter** system.



Not all look like this.

Pumping to a Drainfield Some Distance Away.

You may think you know where the drainfield is located.

- The septic **drainfield** may be some **distance** from the septic tank with a **pump**.
- Know the drainfield **location**.



Some systems are very sophisticated.

Sand Filters are the most complicated of the currently approved residential septic systems. This system requires more maintenance than a standard system. ***You need to know the system type!***



The Pressure Distribution Network

This picture shows a pressure distribution network with orifice shields over the holes to deflect the "squirt".



Less is Sometimes More!

This is the inner workings of the new Textile filter. Much smaller and easier to service than the standard sand or gravel filters.



In The Future Complicated Systems will be Required to be Maintained

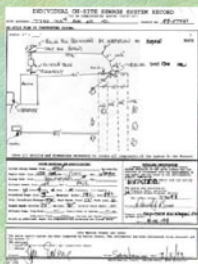
Some of the new technology in waste water treatment will **require maintenance as a condition for installation.**



A Detailed "As Built" Drawing

At the time of septic system inspection, a drawing of the system is made for the record.

Obtain a copy of the drawing for your or the homebuyers files.



Septic system installation

When the the septic system is **installed** it is **inspected** for **code conformance**. Corrections if required are made and the system approved.



The Often Overlooked:
Maintenance

Get a Copy of the "as built" Drawings For Your Record

- The **"as Built" drawing** will tell a lot about the system. It will tell you where it is and what kind of system it is.
- The **"as built" drawing** will assist with future development plans.



You Don't Want to Do This!

Knowing the Drainfield Location Is Important

- Don't guess where the system is located.
- The addition to this home cut into the drainfield line causing a **sewage leak** under the house addition.



Mechanical Damage Can Ruin the Drainfield

Lack of good planning caused severe damage to this drainfield. Repair of this type of damage can be expensive.



Consequences of Neglect

A standard septic needs little attention but if **neglected** this may happen.



Sludge in Drainfield

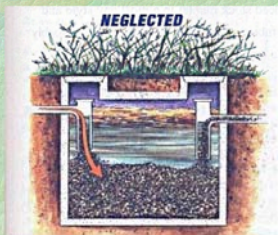
Locate the Septic Tank (it may not be as easy as you think!)

People forget where there septic tank is and can do things that make servicing it very difficult. Sometimes if they don't locate it a very expensive repair may result.



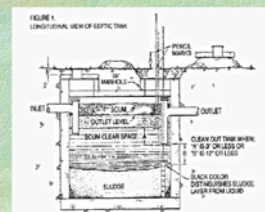
The Condition of the Tank is Important

The septic tank must be **pumped** on a **regular basis** to prevent early drainfield failure from solids getting into the drainfield.



Determine if Tank Needs Pumping

It may not be necessary to pump the tank but it needs to be **checked to find out**.



Recommended Tank Pumping Frequency

Engineer, Oregon State University.
Table 1. ESTIMATED SEPTIC TANK PUMPING FREQUENCIES IN YEARS (FOR YEAR-ROUND RESIDENCE)

Tank Size (Gals)	Household Size (Number of People)									
	1	2	3	4	5	6	7	8	9	10
500	5.8	2.6	1.5	1.0	0.7	0.4	0.3	0.2	0.1	---
750	6.1	4.2	2.4	1.6	1.1	0.6	0.4	0.3	0.2	0.1
1000	11.4	5.9	3.7	2.4	1.6	1.1	0.7	0.5	0.3	0.2
1250	13.6	7.5	4.8	3.4	2.6	2.0	1.3	1.4	1.2	1.0
1500	15.9	9.1	5.9	4.2	3.3	2.6	2.1	1.8	1.5	1.3
1750	22.1	10.7	6.9	5.0	3.9	3.1	2.6	2.2	1.9	1.6
2000	24.4	12.4	8.0	5.9	4.5	3.7	3.1	2.6	2.3	2.0
2250	26.6	14.0	9.1	6.7	5.2	4.2	3.5	3.0	2.6	2.3
2500	28.9	15.6	10.2	7.5	5.9	4.8	4.0	3.5	3.0	2.6

Note: More frequent pumping needed if garbage disposal is used.



OREGON STATE UNIVERSITY EXTENSION SERVICE
FURTHER QUESTIONS? PLEASE CALL DESCHUTES
COUNTY ENVIRONMENTAL HEALTH - 388-6575

Surfacing Septic Tank Effluent

Septic tank effluent has backed up from the failed drainfield and **surfaced** above the septic tank. This is a public health threat.



For More Information

- Erin Mick
Senior Soils Inspector
(503) 823-5471

Maintaining your septic system

Alex Mauck,
Goodman Sanitation

Maintaining your septic system

- PUMP YOUR TANK!
- Keep your bacteria healthy and happy



UNCE, Reno, NV

Suggested pumping interval (years)

Tank Size (gallons)	1	2	3	4	5	6
	Number of people in your household					
1000	12	6	4	3	2	2
1250	16	8	5	3	3	2
1500	19	9	6	4	3	3

To pump... or not to pump

- Pumping costs about **\$350** for the average 1000-gallon tank, every three years
- A new leachfield costs from **\$5,000** to as much as **\$20,000** for an engineered field

Which would you choose?

East Multnomah
Soil & Water Conservation

What can I plant on or near my leachfield?

OK to Plant

- Grasses
- Perennial and annual flowers
- Many perennial groundcovers



East Multnomah
Soil & Water Conservation

Avoid Planting

- All trees
- Large shrubs



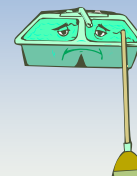
Other causes of septic failure

- Overloading.
Use water sparingly.
Do full loads of wash at off-peak times, and limit the number of loads daily.
- Water leaks
- Placement in poor drainage area
- Failure to install according to septic codes



Other causes of septic failure

- Pouring kitchen grease into drains
- Extensive use of garbage disposals
- Flushing cigarette butts, sanitary napkins or other inorganic materials down the toilet



Other causes of septic failure

- Use of salts and chemicals from water softeners and washing machines
- Driving over the drainfield
- Livestock



What about additives?

- Enough bacteria are present in the tank from normal bodily wastes
- Additives cost \$\$\$ and may actually increase the solid material in the tank by producing inert ingredients
- There is no substitute for pumping!

Tips to keep your septic system working well

- Don't water the leachfield
- Don't flood the system with excessive water use
- Keep excess solids out of the system and avoid flushing toxins down the drain

Tips to keep your septic system working well

- Avoid using your garbage disposal to process large quantities of wastes
- Regularly pump out the septic tank and inspect the physical components of the system
- Don't park or drive over the leachfield

Avoid products with the following warnings on the labels:



- "Harmful if swallowed"
- "Avoid contact with the skin"
- "Do not get in open cuts or sores"
- "If product comes in contact with eyes, call a physician immediately"

Always read the product label!

Questions?



East Multnomah
Soil & Water Conservation District

Upcoming Workshops

Got Mud?

Thursday, March 6, 2008

Controlling Weeds on Small Acreages

Thursday, April 10, 2008 • 7:00 - 9:00pm

Healthy Horses and Pastures Workshop and Tour

May, 2008

Improving Streamside Areas

July, 2008

Pasture Management

September, 2008

Check our website for details!



East Multnomah
Soil & Water Conservation District

Contact us at..

(503) 222-7645

www.emswcd.org

