

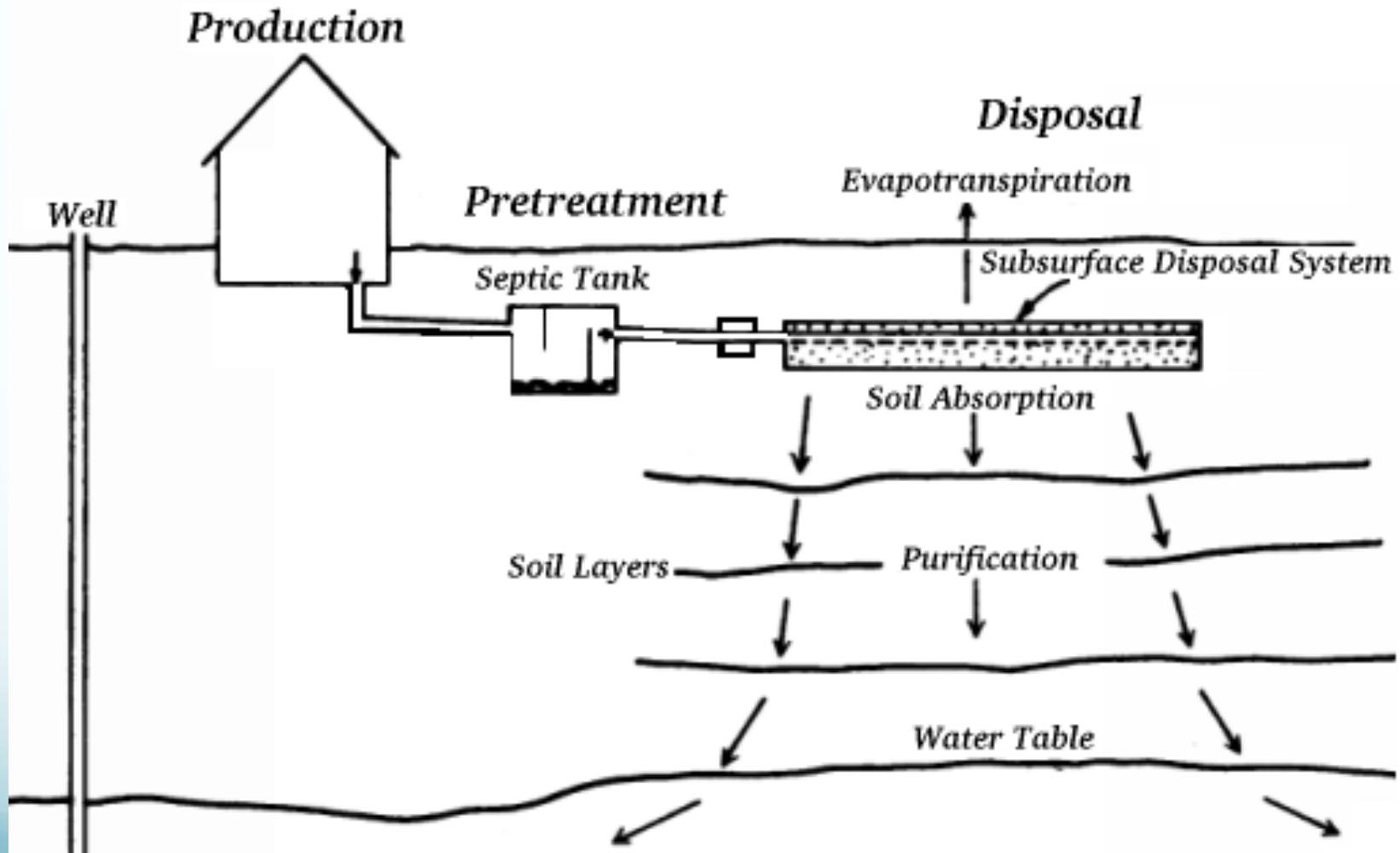
# Clackamas River Water Providers Septic Systems 101

Brannon Lamp, REHS

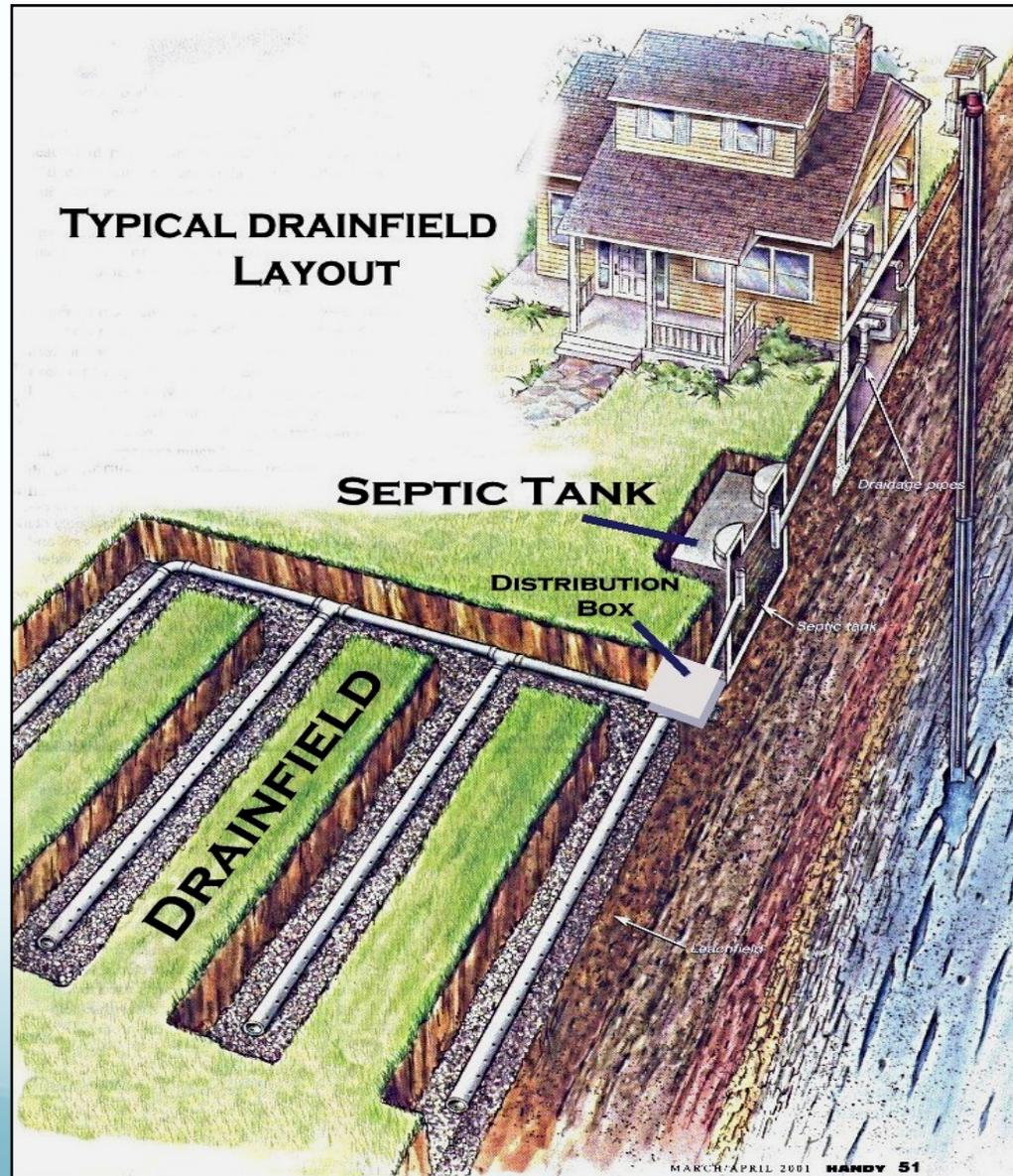
# What is a Septic System?

- Definition of ‘Septic’: Infected with Bacteria.  
Hmmm...
- What does a Septic System Do?
  - Treatment
  - ~~Disposal~~ Dispersal
  - Recycling
- So, is the term ‘Septic System’ accurate?

# What is a Septic System?



# What is a Septic System?

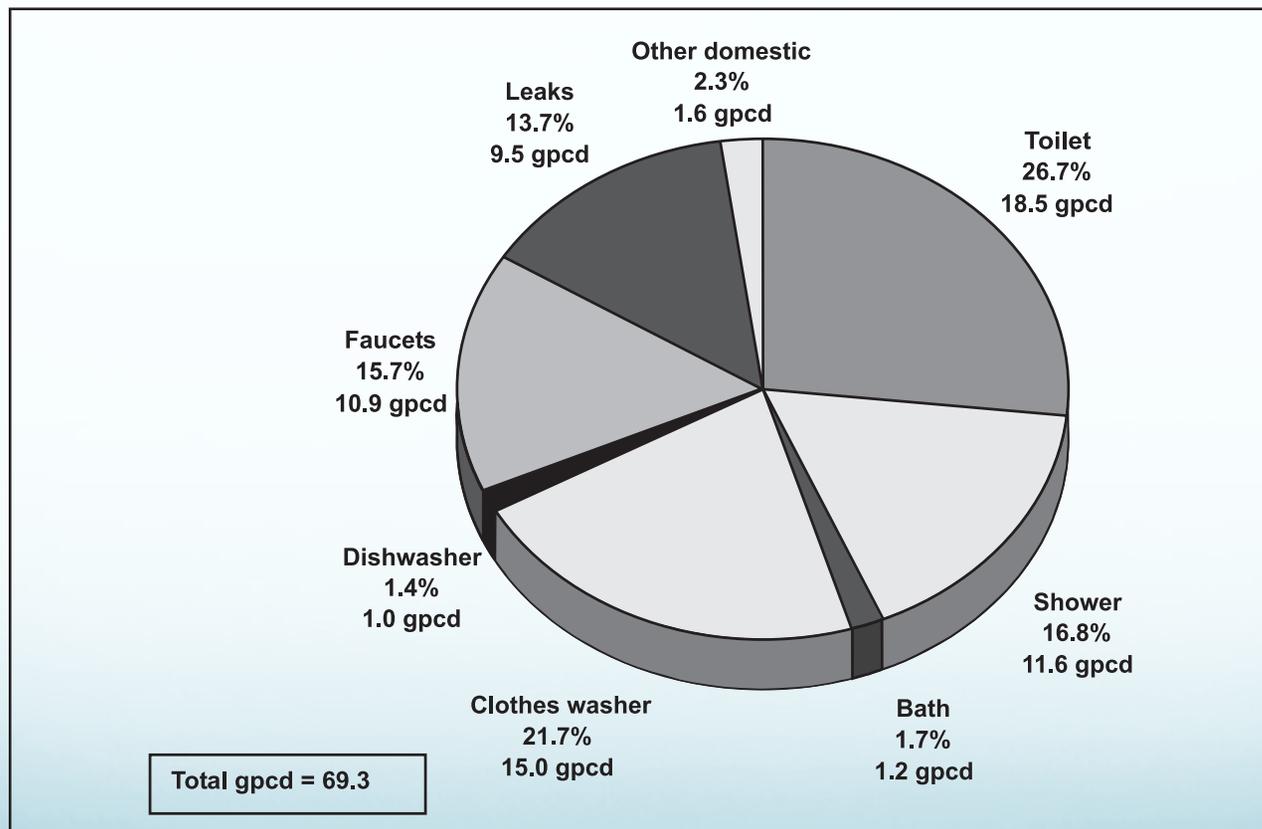


# What is a Septic System?

- What is sewage?
- What different kinds of sewage are there? (Be careful when answering this!)
  - Blackwater
  - Greywater
- Your household generates sewage. Guess how much?
  - Generally 50-90 gallons per person per day

# What is a Septic System?

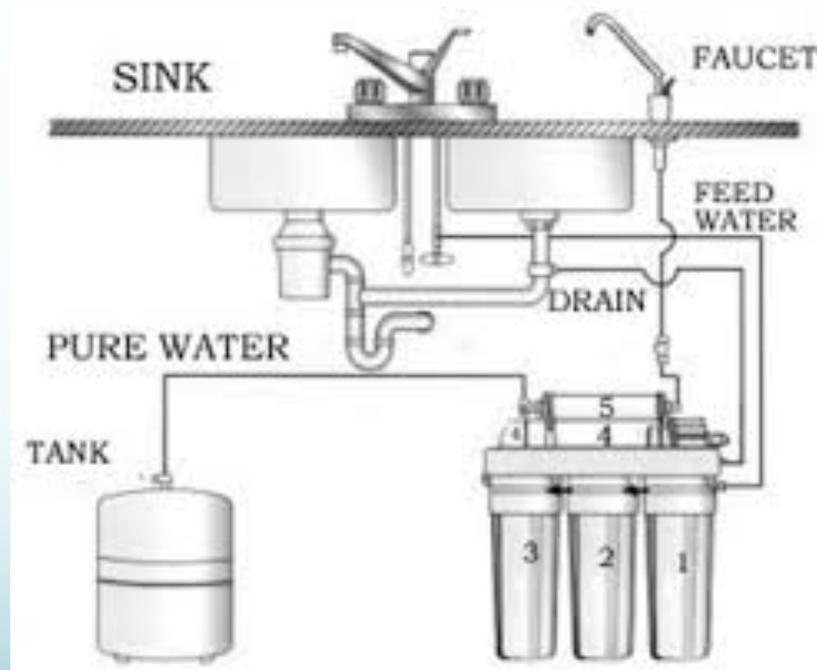
- Household Sewage Generation



<sup>a</sup> gpcd = gallons per capita (person) per day  
Source: Mayer et al. 1999.

# What is a Septic System?

- Water Use
- “You learn something new every day”
  - 3-9 gallons used in addition to each gallon treated!



# What is a Septic System?

- What are the primary contaminants of concern in sewage?
  - Pathogens-bacteria & viruses
  - Nutrients-Nitrogen & Phosphorous
    - Nitrate is of particular concern for water quality
  - Residual chemicals/toxics/pharmaceuticals
    - Whatever goes down the drain becomes sewage

# What is a Septic System?

- What are the main concerns regarding Septic Systems?
  - Public Health
  - Environmental Health
- Common Perceptions/Drawbacks
  - Pollution—Yuck factor
  - Land Development
- What are the benefits of Septic Systems?
  - Decentralized Concept
  - Cost effectiveness
  - Environmentally friendly?
  - Hydrology

# Why am I on a Septic System?



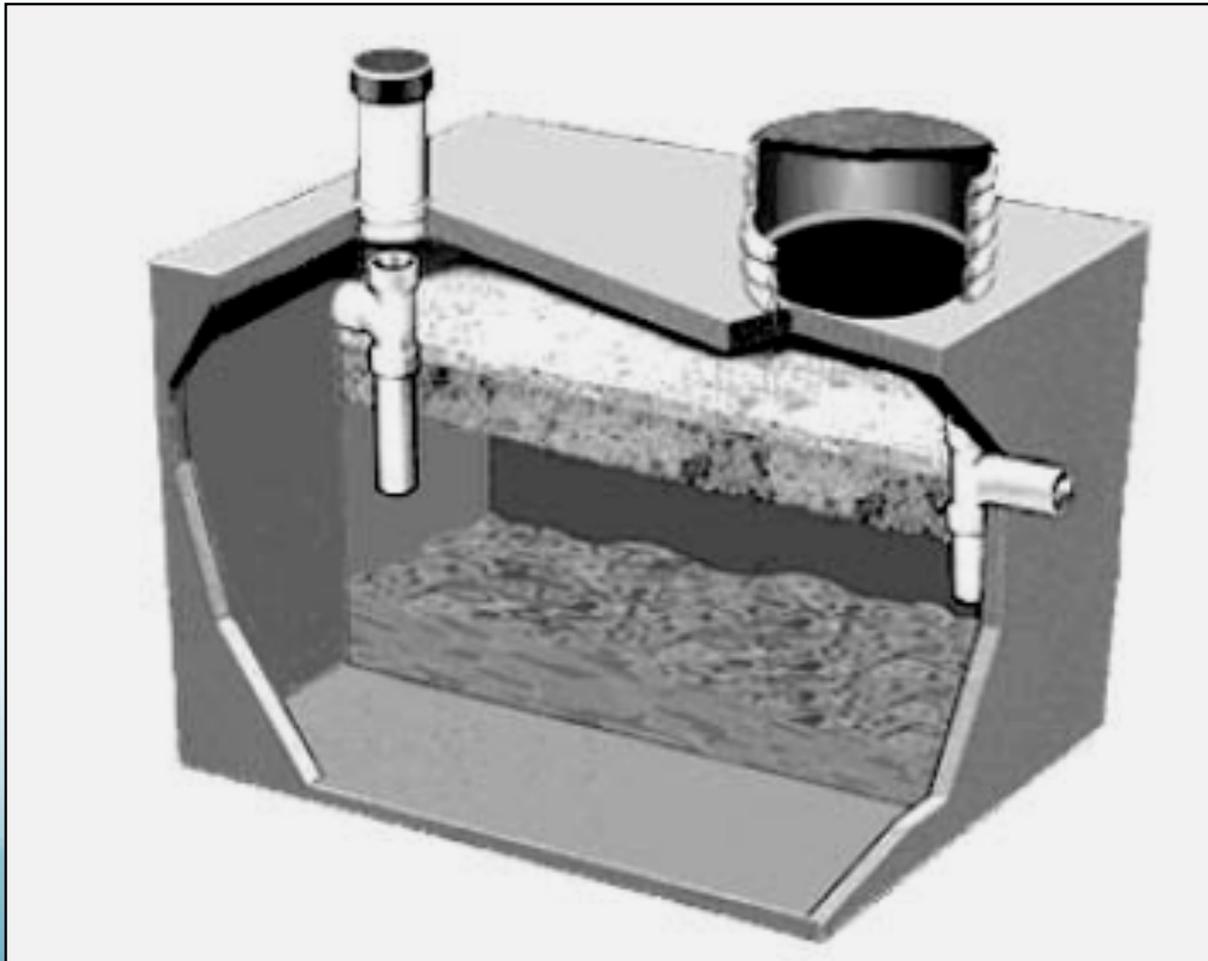
- Wastewater Treatment Plant Capacity
- System Development Charges
- Sewer Construction Costs
- Land Use Regulations
- Economies of Scale (\$\$\$)

# Why am I on a Septic System?

- You are not alone
  - Nationwide statistics indicate that 25% of the U.S. is served by Onsite Systems
  - 30% of Oregon's population is served by Onsite Systems
- Can I get rid of my Septic System and voluntarily opt-in for sewer service? Probably not.

# Septic System Components

- All Septic Systems in Oregon have a Septic Tank (well, almost all)

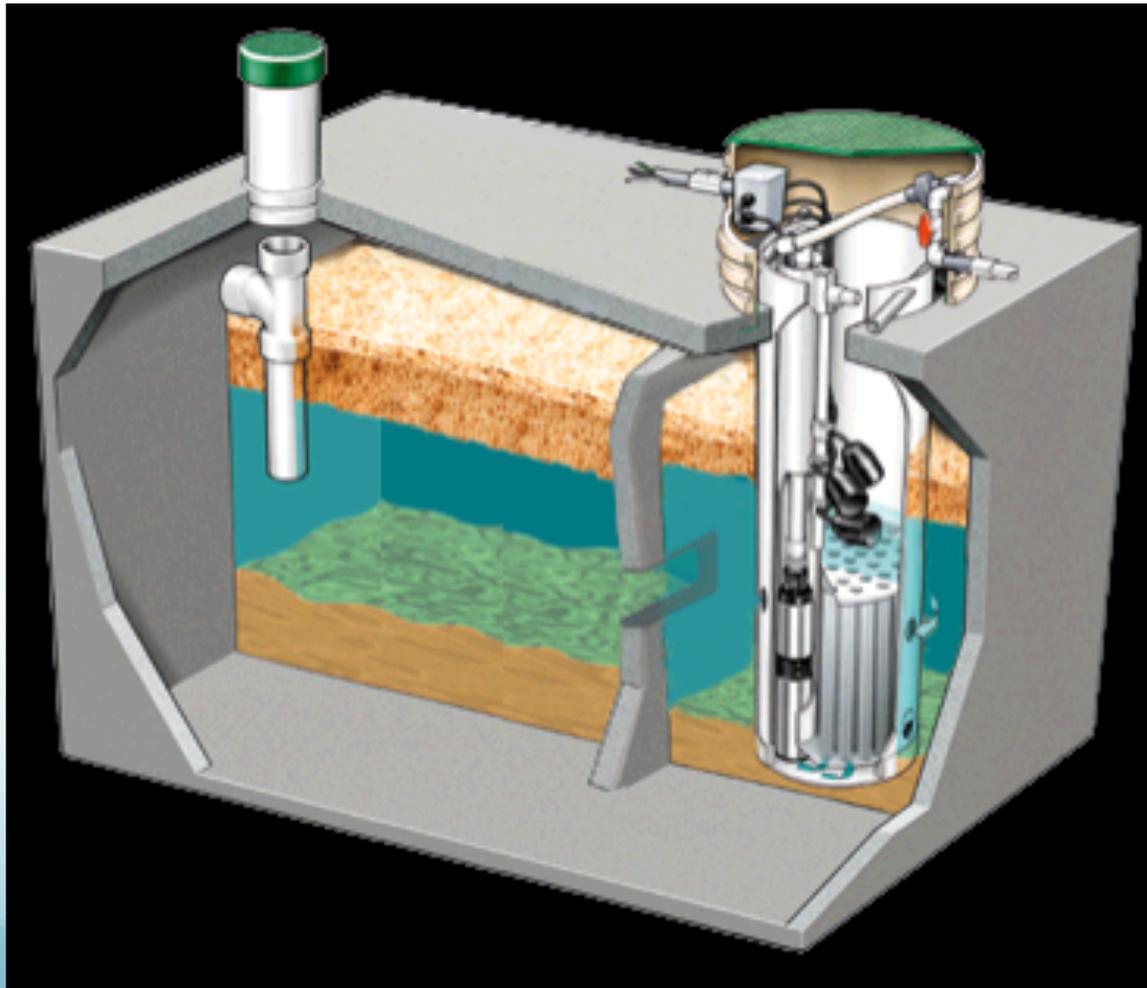


# Septic System Components

- To recap, what does a septic tank do?
  - Mechanical separation of solids (specific gravity)
  - Flow attenuation
  - Provides PRIMARY (anaerobic) treatment of sewage
  - Reduces waste strength, generally by 50-70%
  - Allows for periodic removal of solids
- What is the one magic trick a septic tank can't do that people often think that it does?

# Septic System Components

- Some Septic Tanks have a pump system



# Septic System Components

- A septic tank 'in the wild'



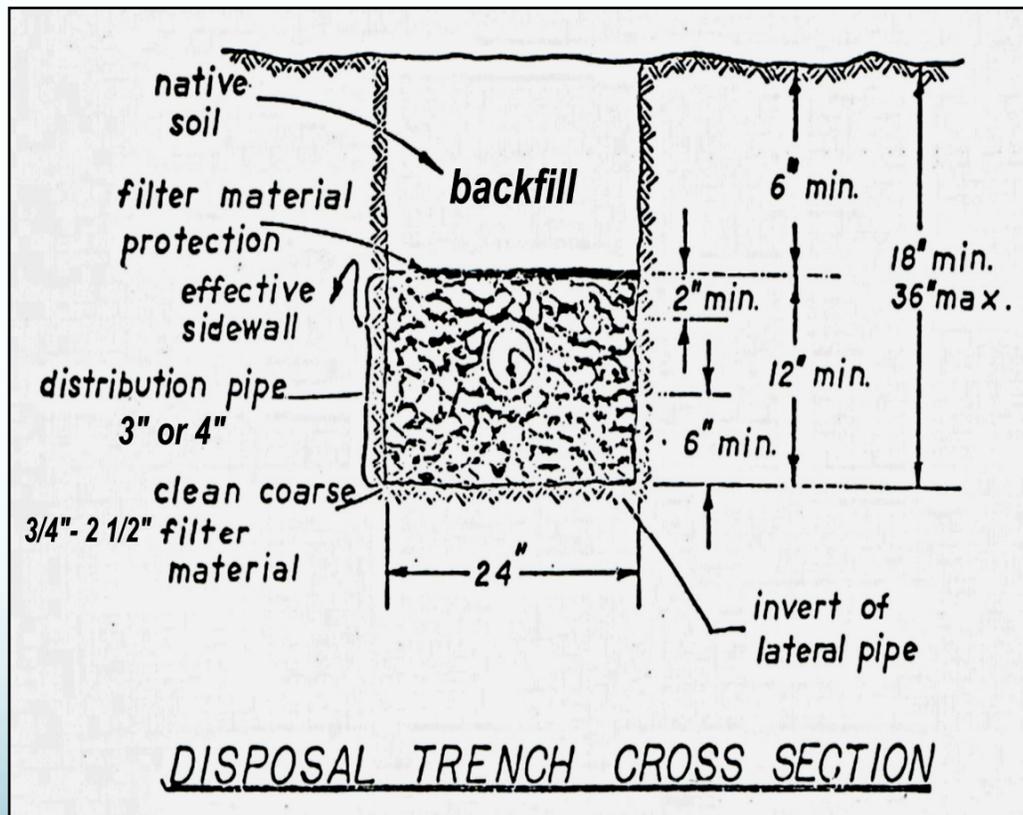
# Septic System Components

- What is this?



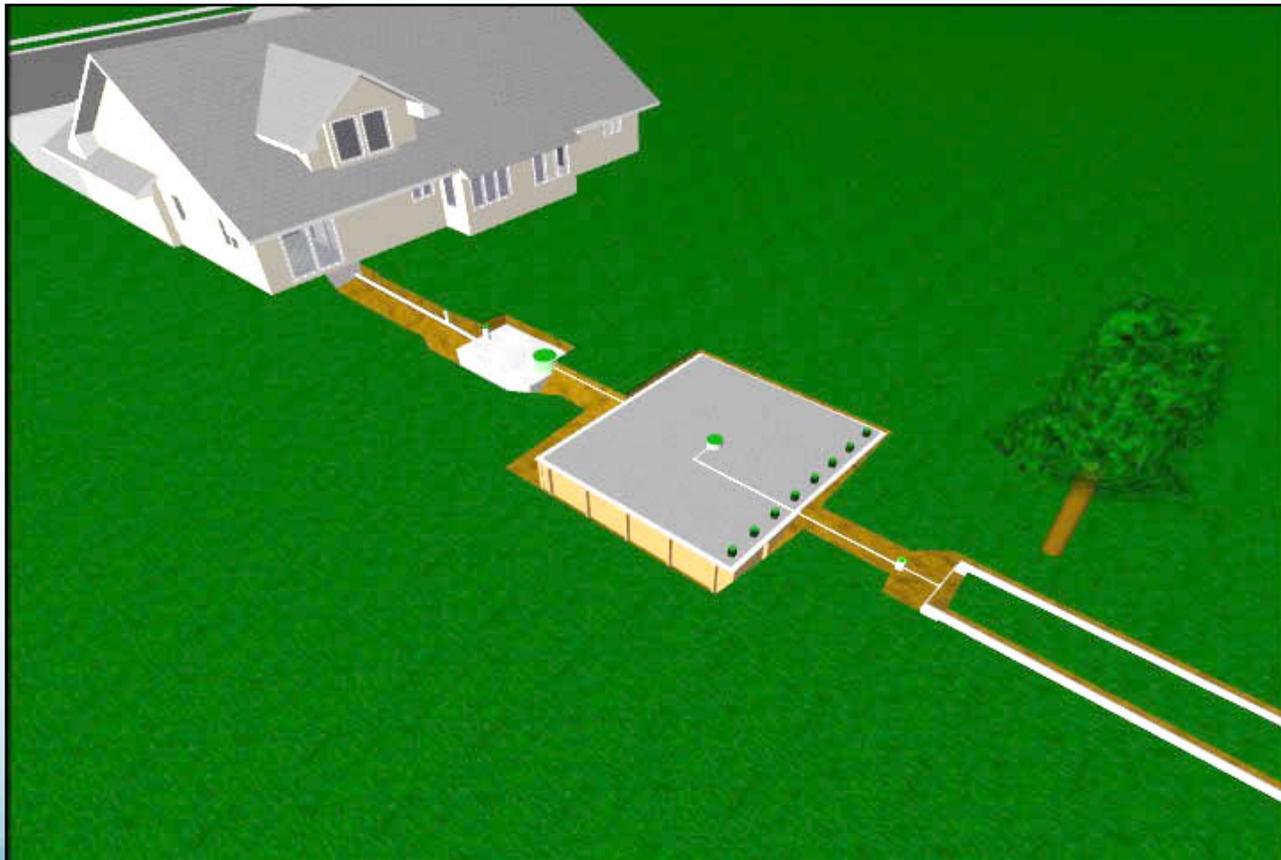
# Septic System Components

- All Septic Systems in Oregon have a Drainfield (well, almost all)



# Septic System Components

- Some septic systems in Oregon have a SECONDARY treatment component



# Septic System Components

- Other Secondary Treatment System examples



# Using your Septic System

- So, you're on a septic system. Does it work?
- I've learned over the years that there are actually two definitions of work:
  - Definition 1: "My septic system works great! Our family has lived here for 30 years and we've never had a problem. By golly, we've never even had to have it pumped!"
  - Definition 2: "My septic system works great! It provides excellent treatment and dispersal of sewage and does not pollute surface or groundwater, and recharges the aquifer." Question: Why does it work?

# Using your Septic System

- Per DEQ rules:
  - "Failing System" means any system that discharges untreated or incompletely treated sewage or septic tank effluent directly or indirectly onto the ground surface or into public waters or that creates a public health hazard.
- What are public waters?
  - "Water" or "the waters of the state" include lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Pacific Ocean within the territorial limits of the State of Oregon, and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters which do not combine or effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction.

# Using your Septic System

- Failing Drainfields



# Using your Septic System

- What can I do to operate my septic system properly?
  - Conserve water
  - Repair any and all leaking fixtures
  - Remember, one thing that a septic system absolutely cannot do is to cause water to cease to exist

# Using your Septic System

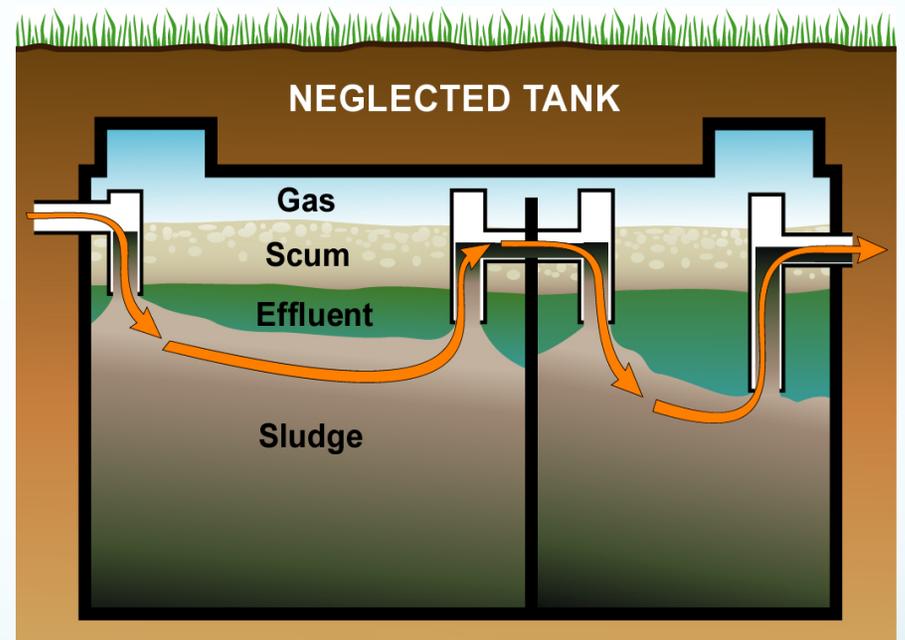
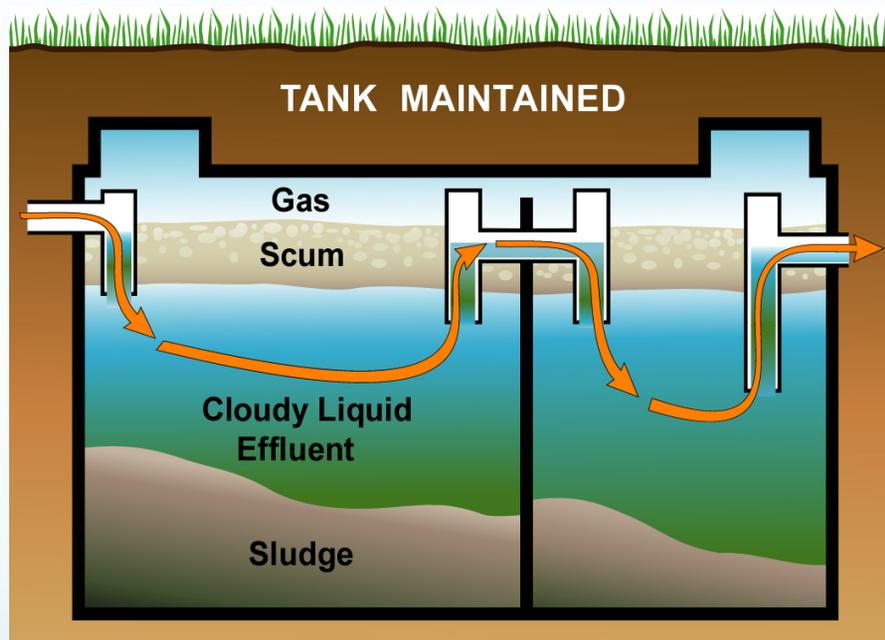
- What can I do to operate my septic system properly?
  - Be conscientious as to what you should and should not put down the drain. Common sense prevails.
  - Do not damage the drainfield area by vehicular or large animal traffic. Do not add or remove soil or otherwise alter the drainfield area. Do not over-irrigate in the drainfield area.
  - Should I use additives? (This question comes up often, and the answer is always ???)

# Maintaining your Septic System

- It is the responsibility of the property owner to make certain that their septic system is adequately maintained
  - Under normal use, Standard Gravity flow systems should be inspected every 3 years at a minimum (this does not necessarily mean it should be pumped out every 3 years, but...)
  - Any system that utilizes a pump should be inspected at least annually
  - Any system that utilizes a Secondary Treatment component should be inspected at least annually, or as per that system's manufacturer recommendations/requirements

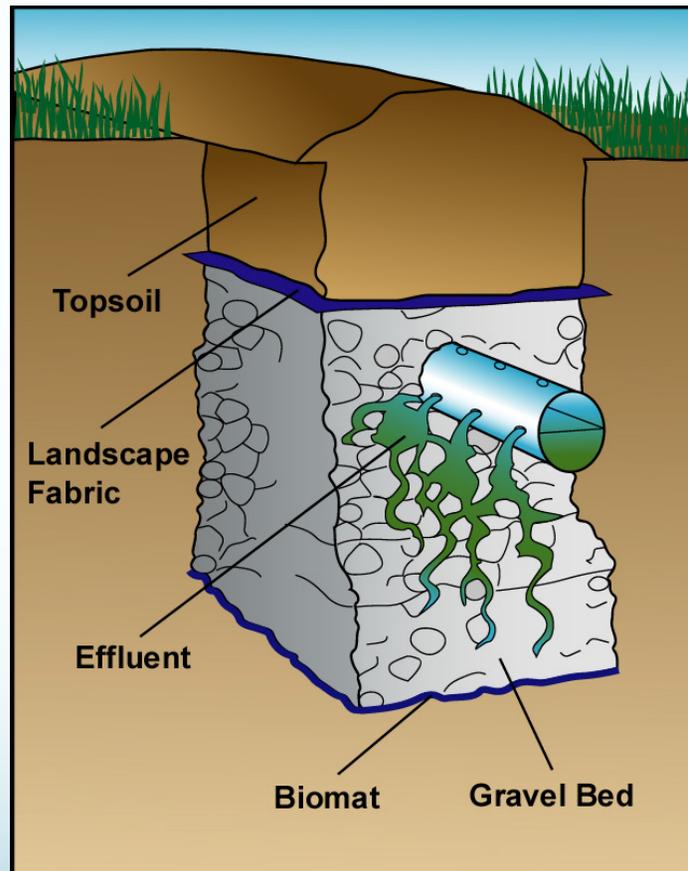
# Maintaining Your Septic System

- Septic Tank Pumping



# Maintaining Your Septic System

- Septic Tank Pumping



# Maintaining Your Septic System

- Septic Tank Pumping Interval (not very scientific)

Inhabitants

<b>Tank Size</b> <b>(gallons)</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>1000</b>	<b>12</b>	<b>6</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>1250</b>	<b>16</b>	<b>8</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>2</b>
<b>1500</b>	<b>19</b>	<b>9</b>	<b>6</b>	<b>4</b>	<b>3</b>	<b>3</b>

Years between pumpings

# Maintaining your Septic System

- Septic system 'Big 5'
  - A Septic System will work (Definition 2) indefinitely if success is achieved with each and every one of the following 5 items:
    1. Siting: The system must be sited properly on the landscape. Site, soil, and groundwater conditions must be conducive to the system parameters. All prudent setbacks must be maintained.

# Maintaining your Septic System

- Septic system 'Big 5'

2. Design. The system must be designed with the appropriate components and within the limits of any constraints of the site.

3. Construction. The system must be constructed as per the appropriate siting criteria and system design. Construction defects can easily compromise the system's function or longevity.

# Maintaining your Septic System

- Septic system 'Big 5'

4. Operation. The system must be operated as per the site and design constraints. This includes appropriate sewage quantity and quality loading, and ensuring that the system is not damaged or otherwise adversely affected.

5. Maintenance. The system must receive proper maintenance (including inspection and repairs as needed) on a consistent basis.

- If all 5 of these items are in place, your system will function (and will WORK-Def. #2) indefinitely. The good news is that the system user only needs to be concerned with items #4 & #5!