Hubbard County

Protecting Your Septic System Investment

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Minnesota Pollution Control Agency

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ONSITE SEWAGE TREATMENT PROGRAM

UNIVERSITY OF MINNESOTA
Driven to Discover℠

Minnesota Pollution Control Agency

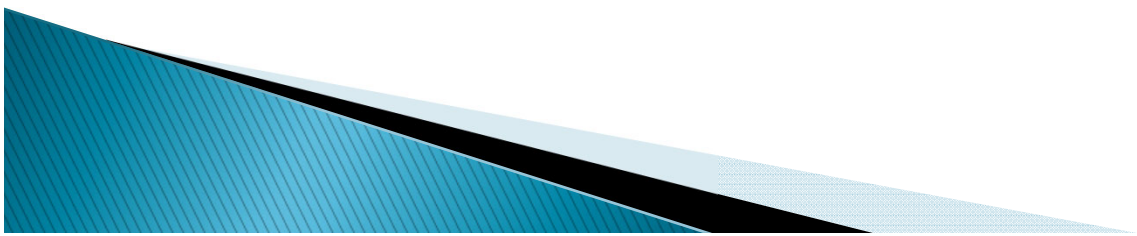
Hubbard County COLA

- Mission: Protect and improve the environment and enhance human health

- Our mission is to protect and enhance the quality of our lakes and rivers, preserve the economic, recreational and natural environmental values of our shore lands and promote the responsible use of our waters and related habitats.
- http://www.hubbardcolamn.org/index.html

What to expect…

- Overview of how septic systems work
- What is sewage?
- How is sewage treated?
- Common problems
- Home Management / Water Usage
- Tank Pumping
- Homeowner Tips

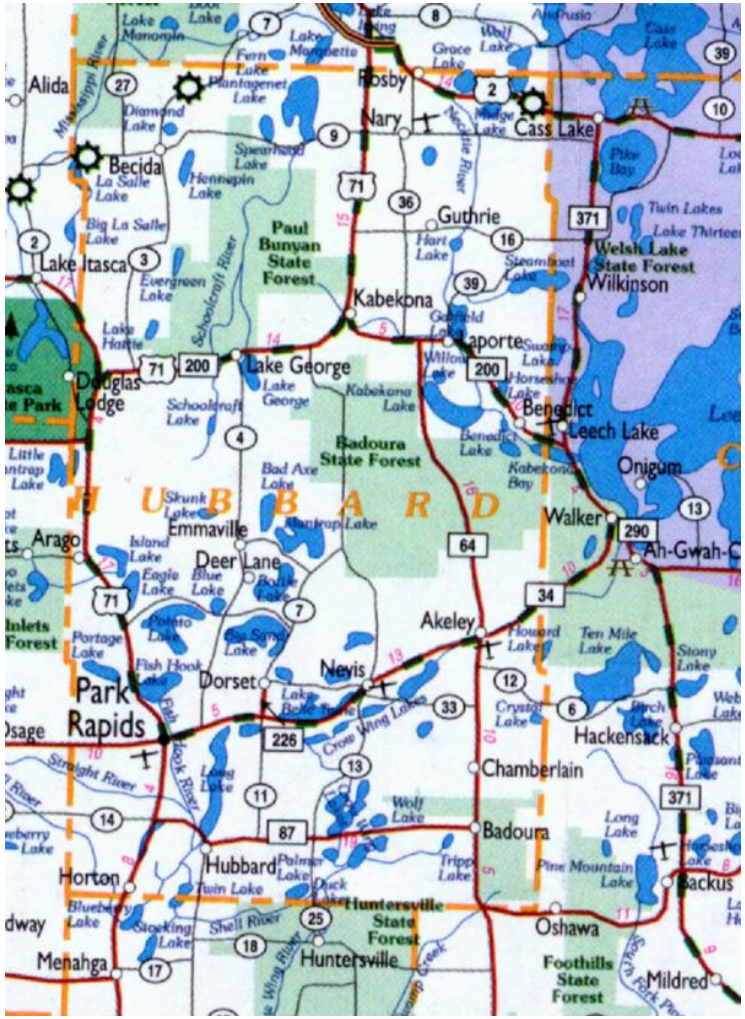


Why care about my septic system?

- **What you do affects your community**
- **To potentially save <u>your</u> money by following some <u>simple</u> practices**

Why care about my septic system?

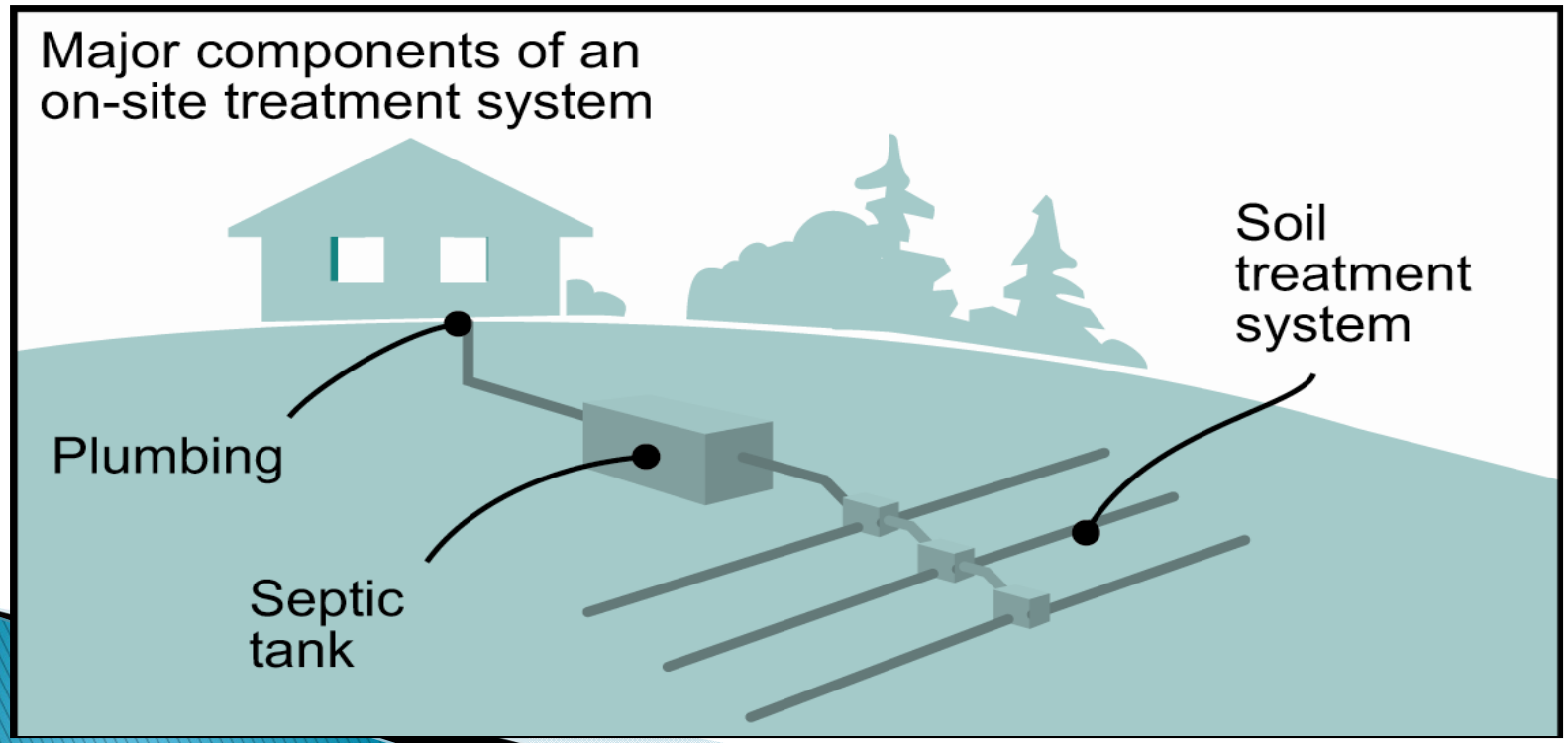
- **Clean water supports healthy communities and ecosystems.**



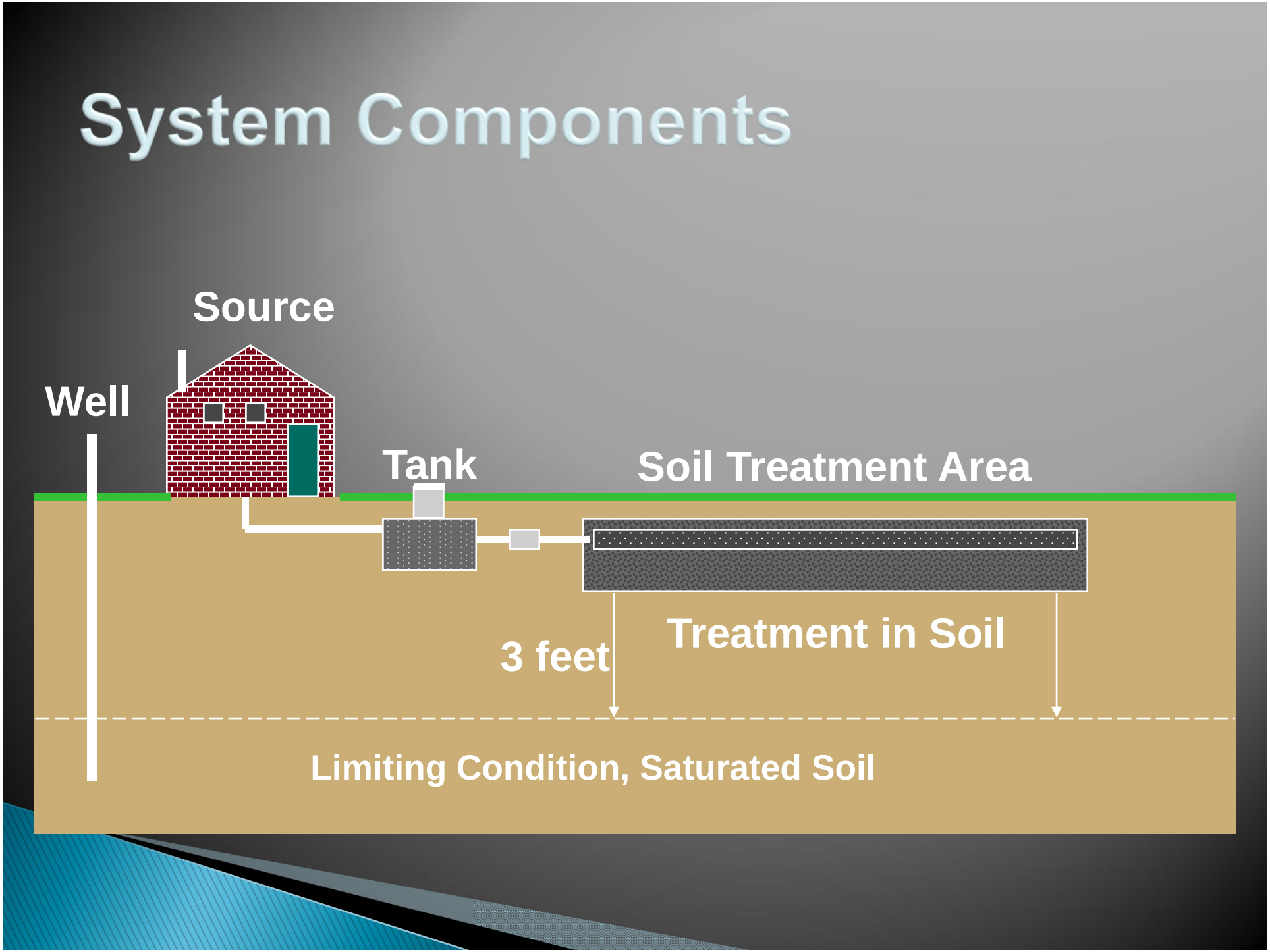
Anatomy of a Septic System

SSTS = Subsurface Sewage Treatment System

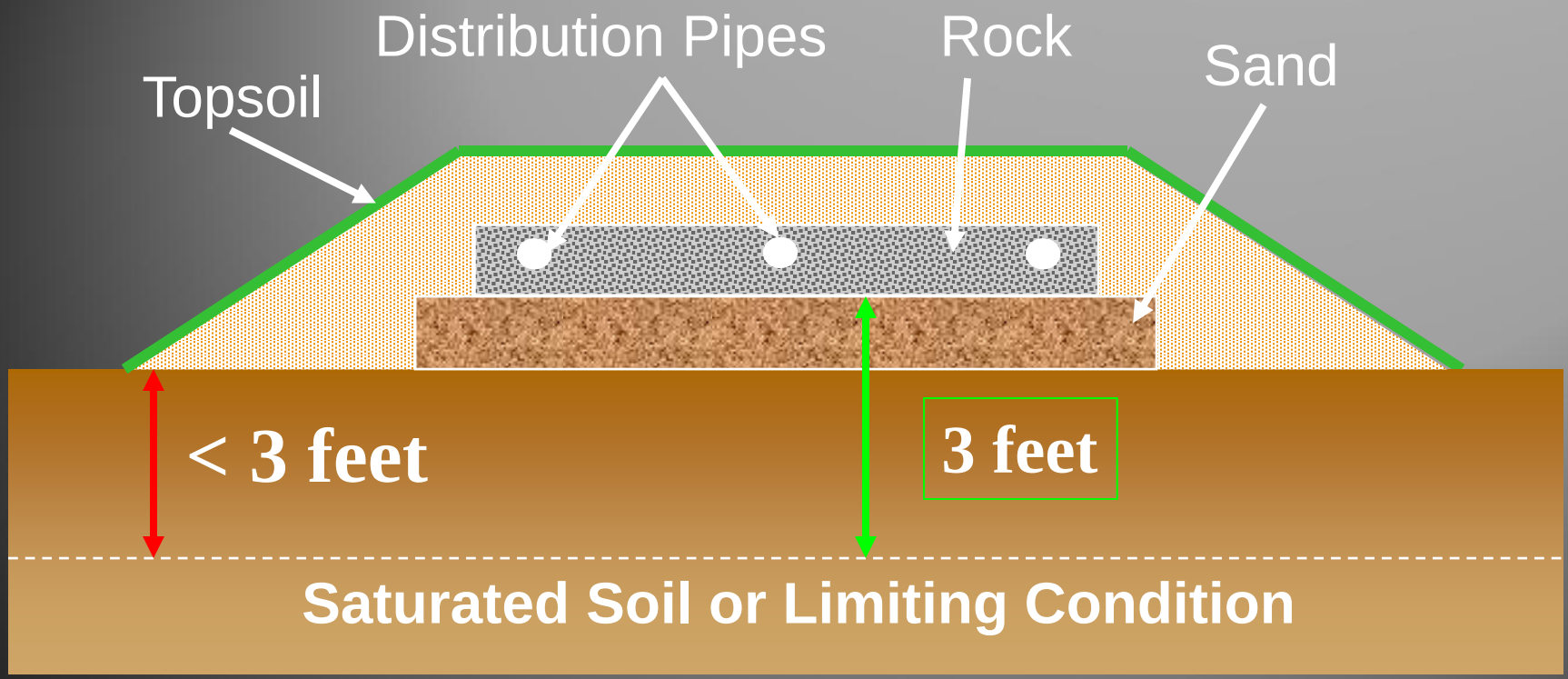
1. **Plumbing**: wastewater collection
2. **Septic tank**: primary treatment
3. **Soil treatment area**: final treatment and dispersal



System Components



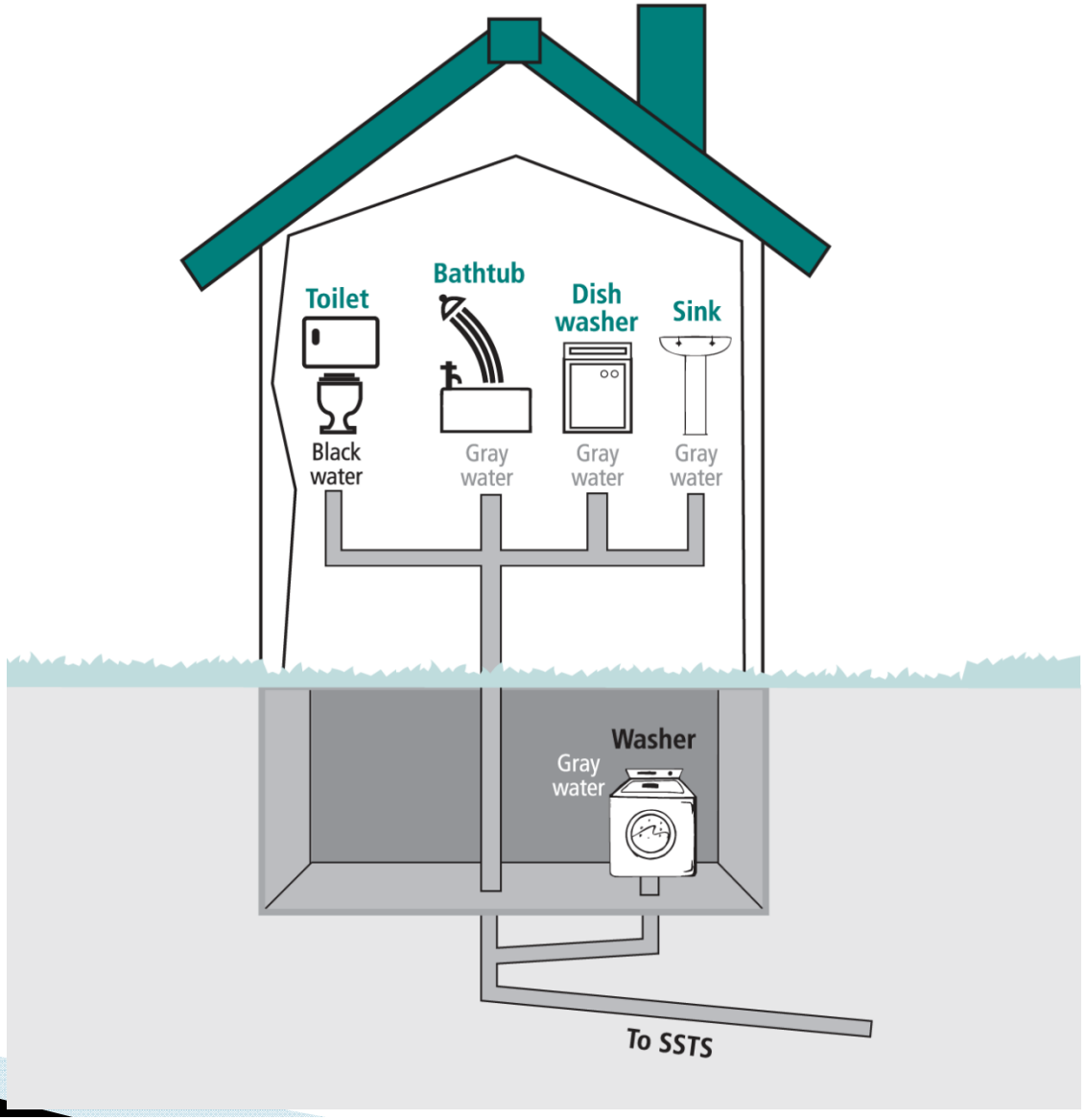
Mound System



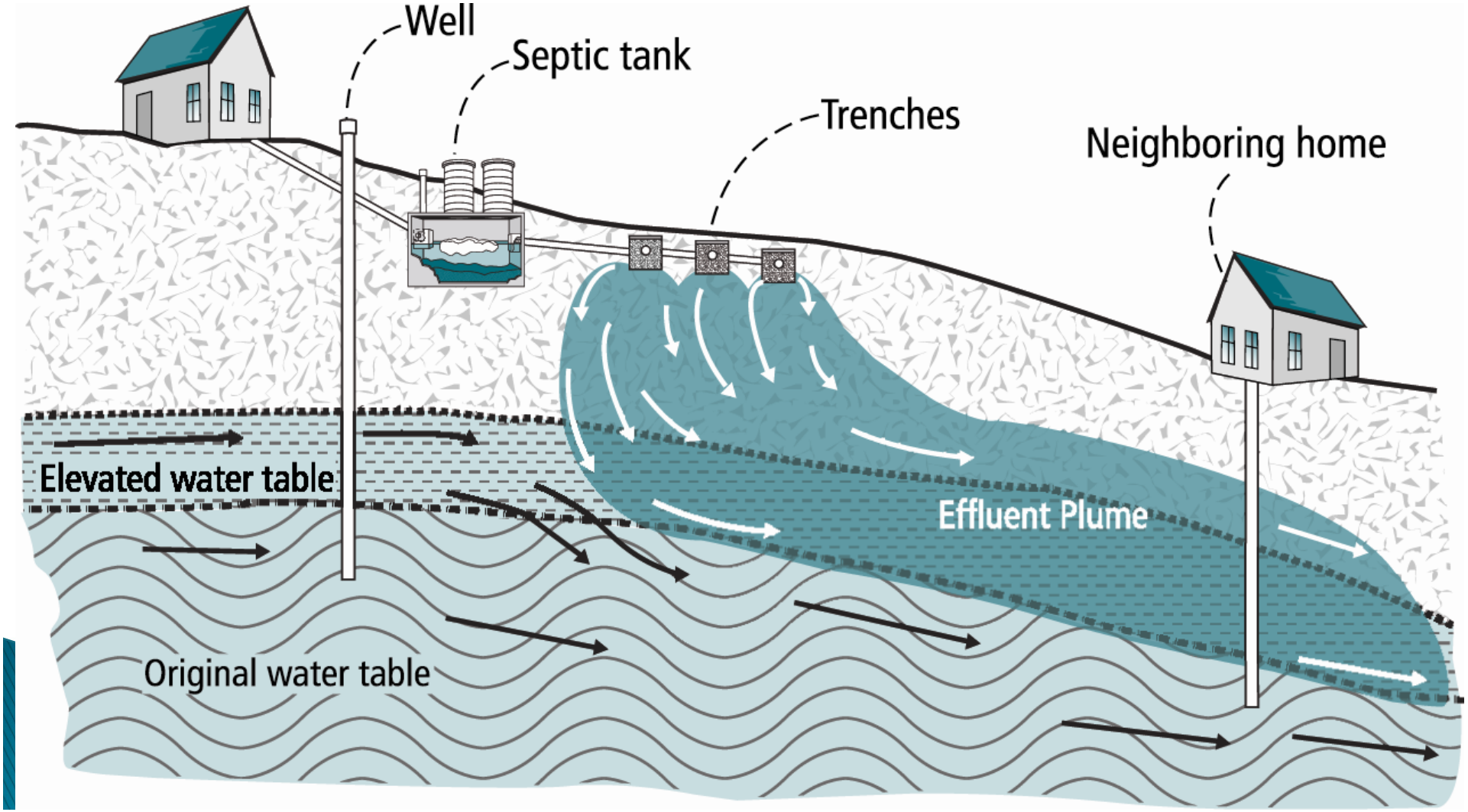
What is Sewage?

What do we add to the water?

- **Pathogens**
  - Virus, Bacteria
- **Solids**
  - Organic
  - Inorganics
- **Nutrients**
  - Phosphorus
  - Nitrogen
  - Micro-Nutrients
- **Chemicals**
  - Cleaning products
  - Water treatment
  - Medications

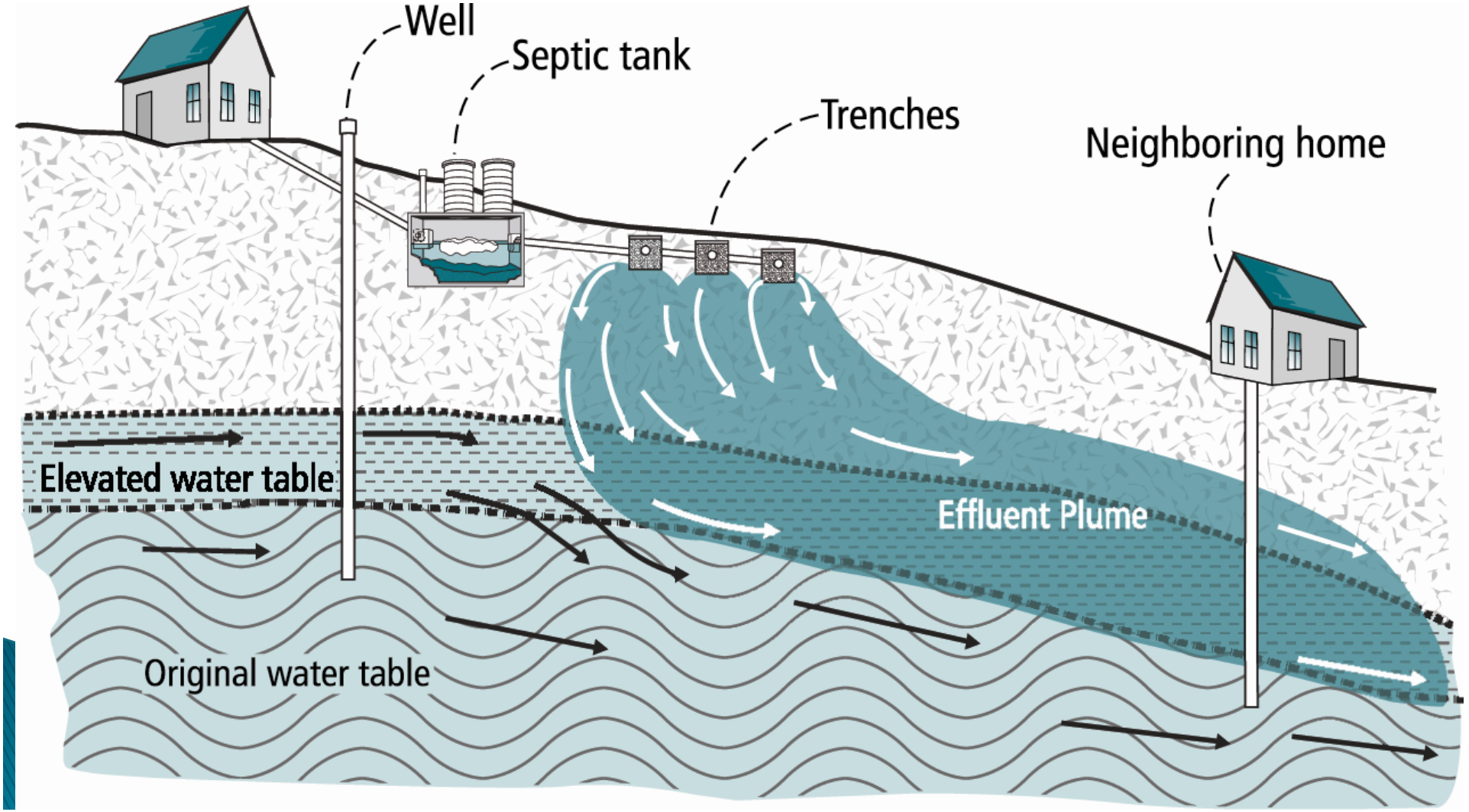


All wastewater must be treated



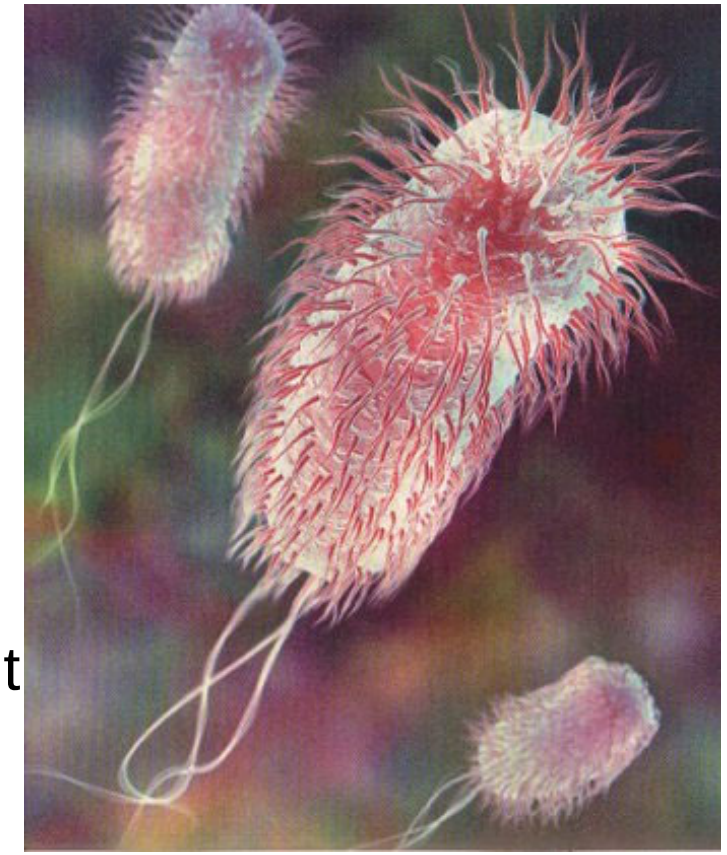
Where are pathogens treated?

Tank? Soil? How do they die?



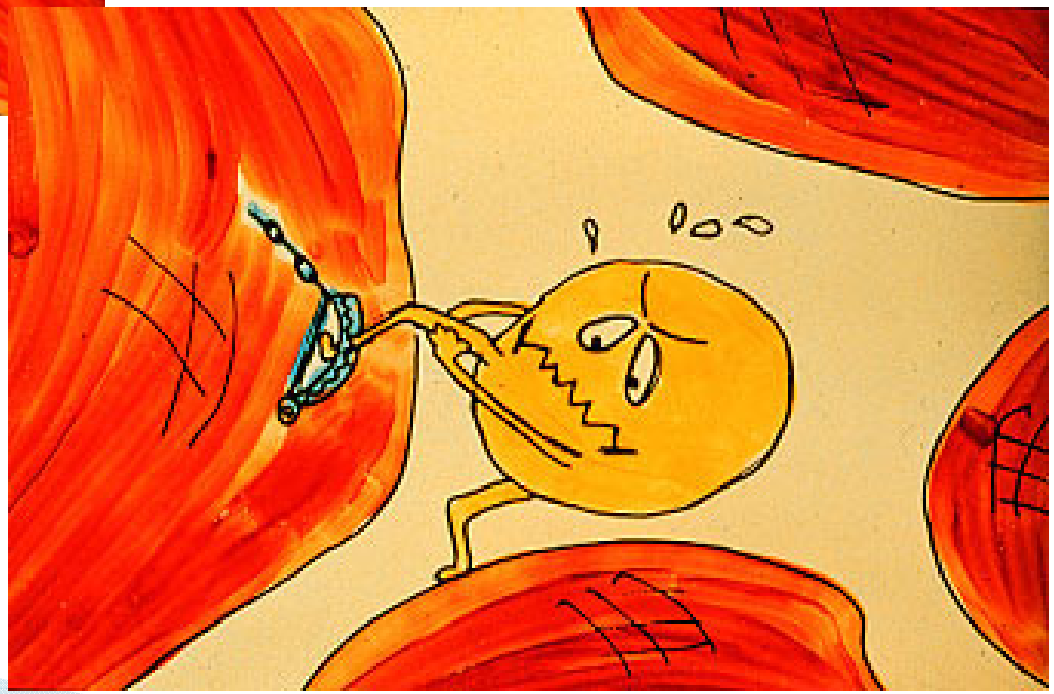
Pathogens

- What?
  - Virus, bacteria, helminths (worms), protozoa
- Impacts?
  - Human health
- How treated?
  - Difficulty living in oxygen rich environments
  - Removal and die off in soil treatment system
    - 3 feet of soil treatment key



Pathogens - captured by the soil

Soil is Sticky



Electrical charges

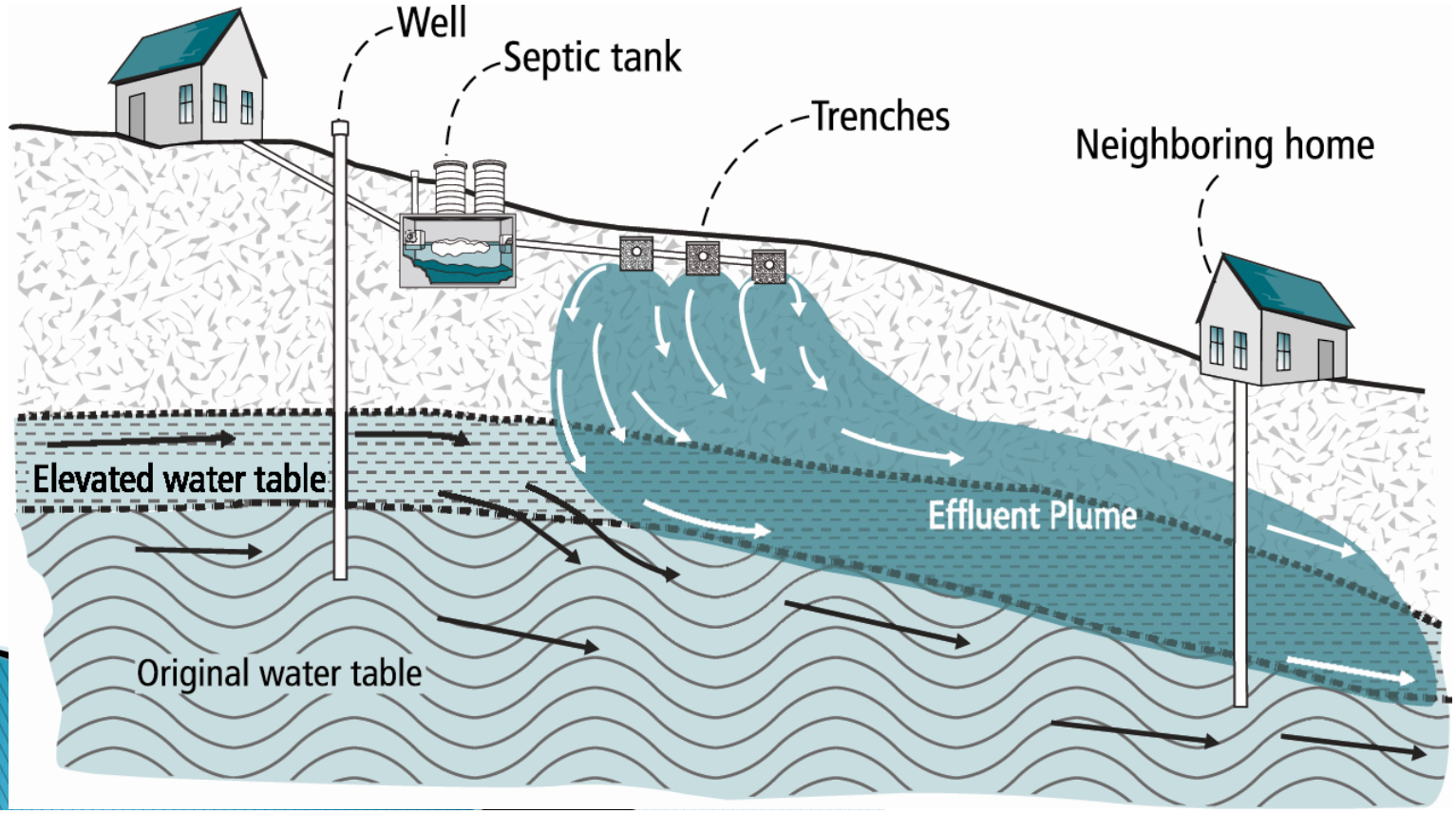
Aerobic soil bacteria snacks!

Held long enough to starve!

Where are solids treated?

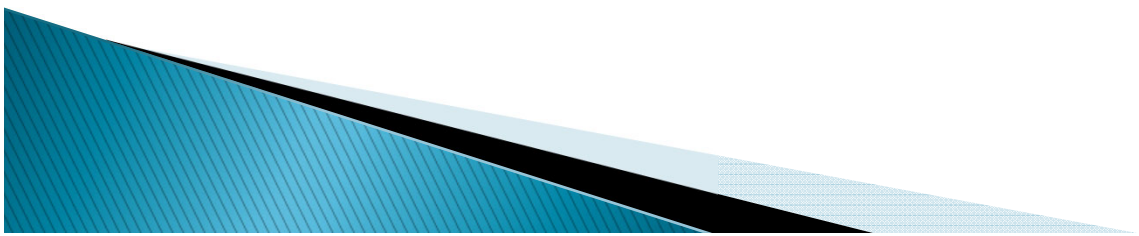
Solids {Organics and Inorganics}

Tank? Soil? What happens to them?

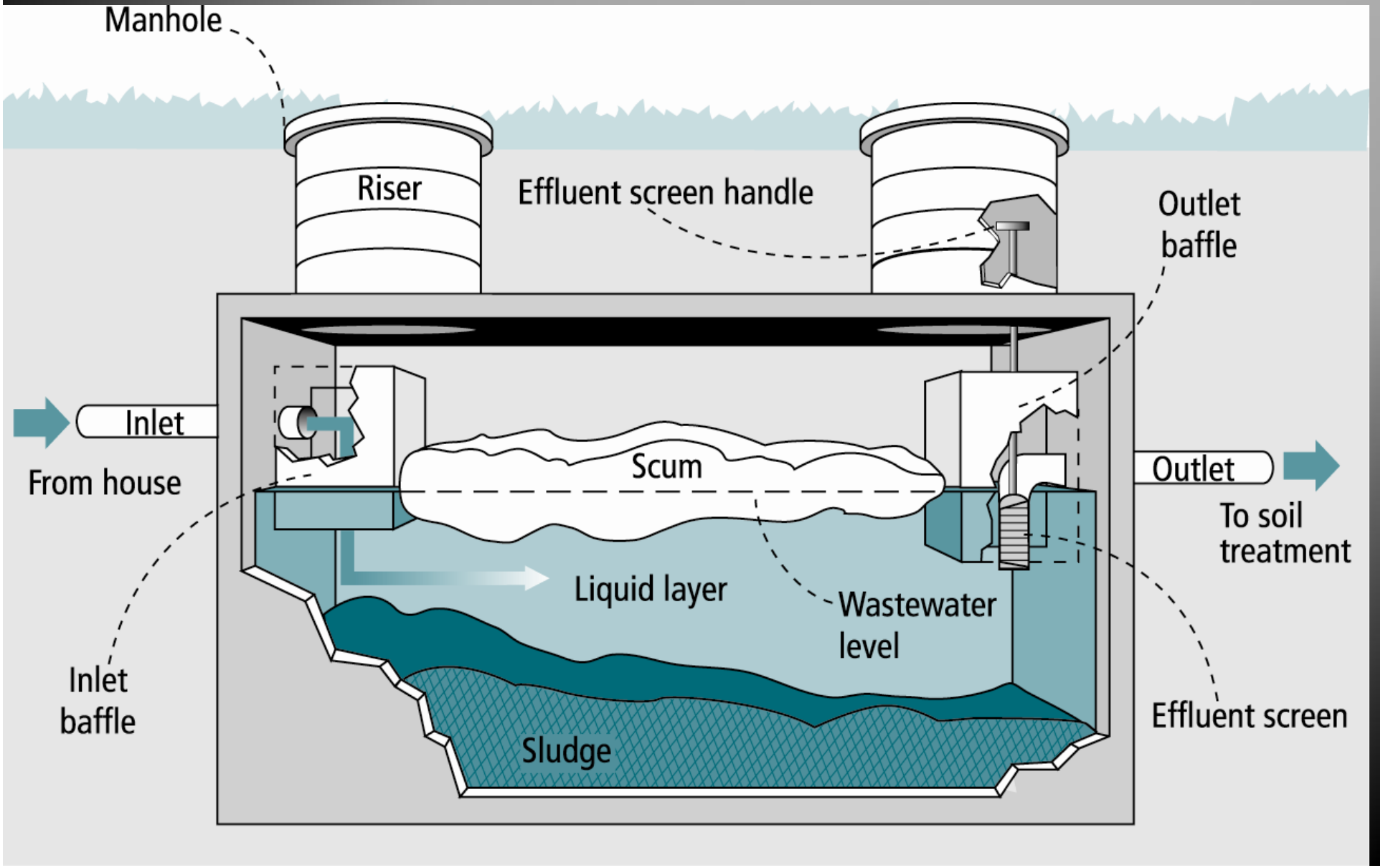


Septic Tank: Primary Treatment

- **Job of tank: catch the solids**
  - Decompose organic solids
    - Digested and undigested animal and vegetable material, Synthetic (artificial) organic compounds
  - Store inorganic solids
    - Minerals , metals and salts from soil material, plumbing, make-up
- Anaerobic bacteria breakdown organic solids

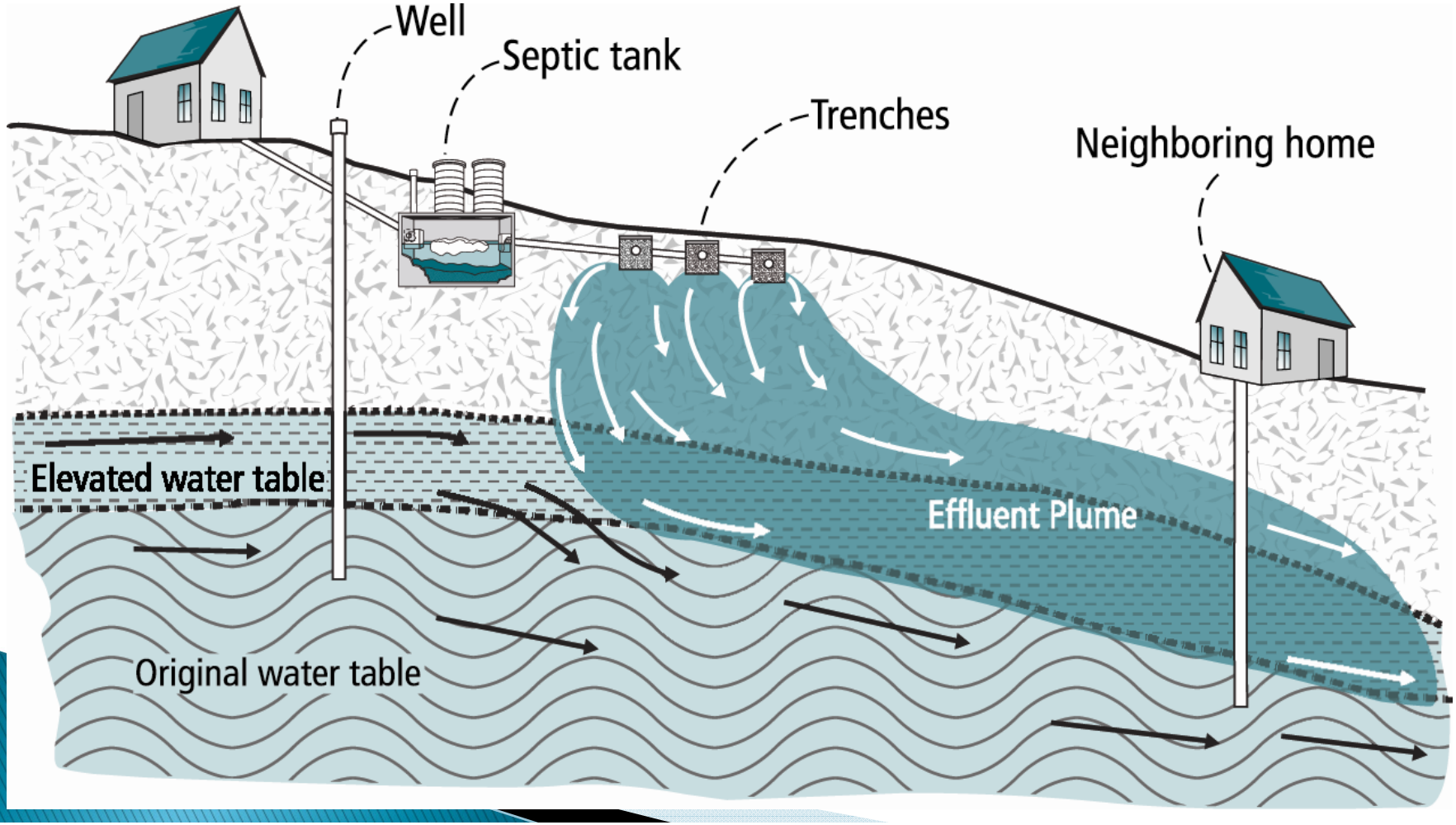


Septic Tank


Manhole
Riser
Effluent screen handle
Outlet baffle
Inlet
From house
Scum
Outlet
To soil treatment
Liquid layer
Wastewater level
Inlet baffle
Effluent screen
Sludge

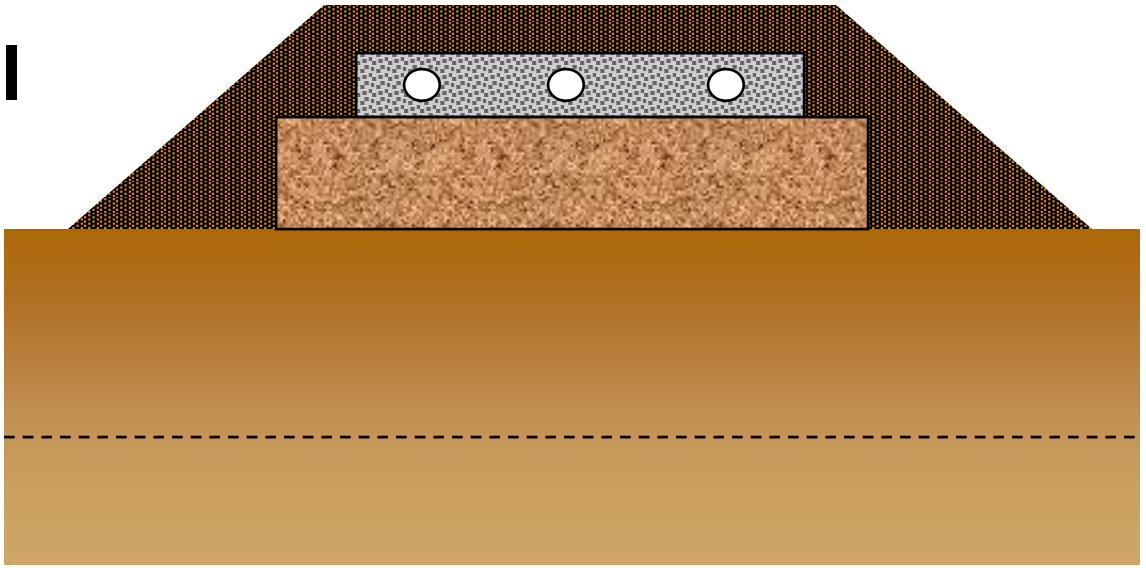
Where are nutrients treated?

Tank? Soil? What happens to them?



Where are nutrients treated?

- **Phosphorus**
  - **Soil:**
    - **Attach to soil particles**
- **Nitrogen**
  - **Soil:**
    - **Lost to air**
    - **Dilution**
    - **Used by plants**



Phosphorus

- What?
  - Nutrient
  - From:
    - Urine
    - Food
    - Household detergents
- Impacts?
  - Weed & algal growth in lakes, ponds, and streams
- How treated?
  - Removed in the soil treatment system

Nitrogen

- What?
  - Nutrient
  - From
    - Urine and food breakdown
    - Household cleaners and chemicals
- Impacts?
  - Drinking water quality, weed and algal growth
- How treated?
  - Variable removal in septic tank and soil system
  - Diluted in groundwater (well setbacks important)
  - Advanced systems need in sensitive areas

Chemicals

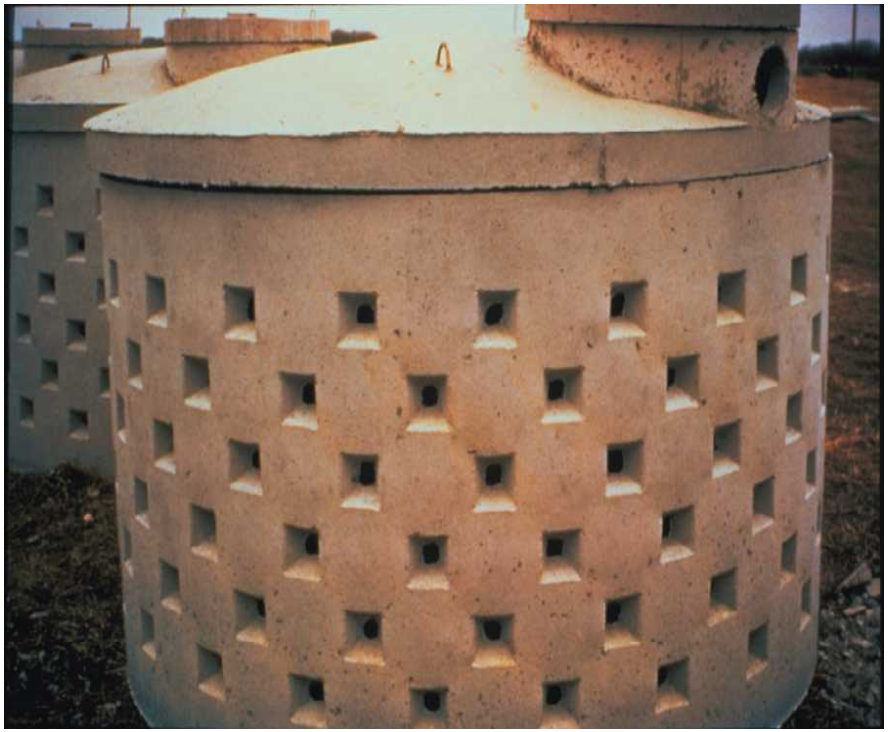
- What?
  - Hazardous: Illegal!
  - Cleaners
  - Medications

  } Limited!
- Impacts?
  - Can harm your septic system
  - Aquatic food chain, species reproduction, drinking water quality
- How treated?
  - Stored in tank until pumped
  - Variable removal in septic tank and soil system

What Kind of Systems are Problems?

- Leaky Tanks
- Surfacing to ground
- Surfacing to water body
- Inadequate vertical separation to limiting condition

Leaky Tanks



Construction Depth

A Surfacing System:
An imminent public health threat

Surfacing to water

Common Causes of Problems

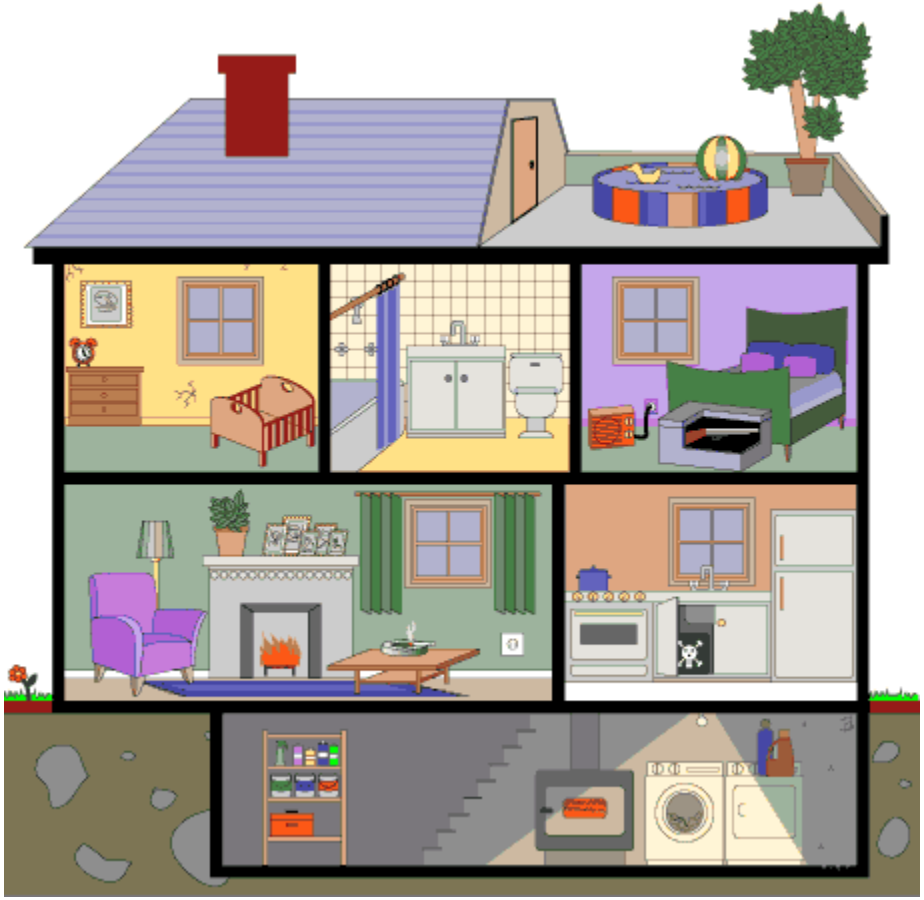
- Overloading the System
  - Water
  - Organics
- Lack of maintenance
- Excessive chemicals
- Wrong choice of system design

Soil Treatment System Maintenance

- Compaction is BAD – keep traffic off system
- Watching for inappropriate activity
- Establish vegetative cover - Grass, mow regularly, no fertilizer, no deep rooted plants near system. Watch for gophers!
- Channel rain and snow melt runoff away from drainfield
- Inspect regularly for changes
- Protect you system from Freezing!


Continual traffic is a problem

Home Management tips



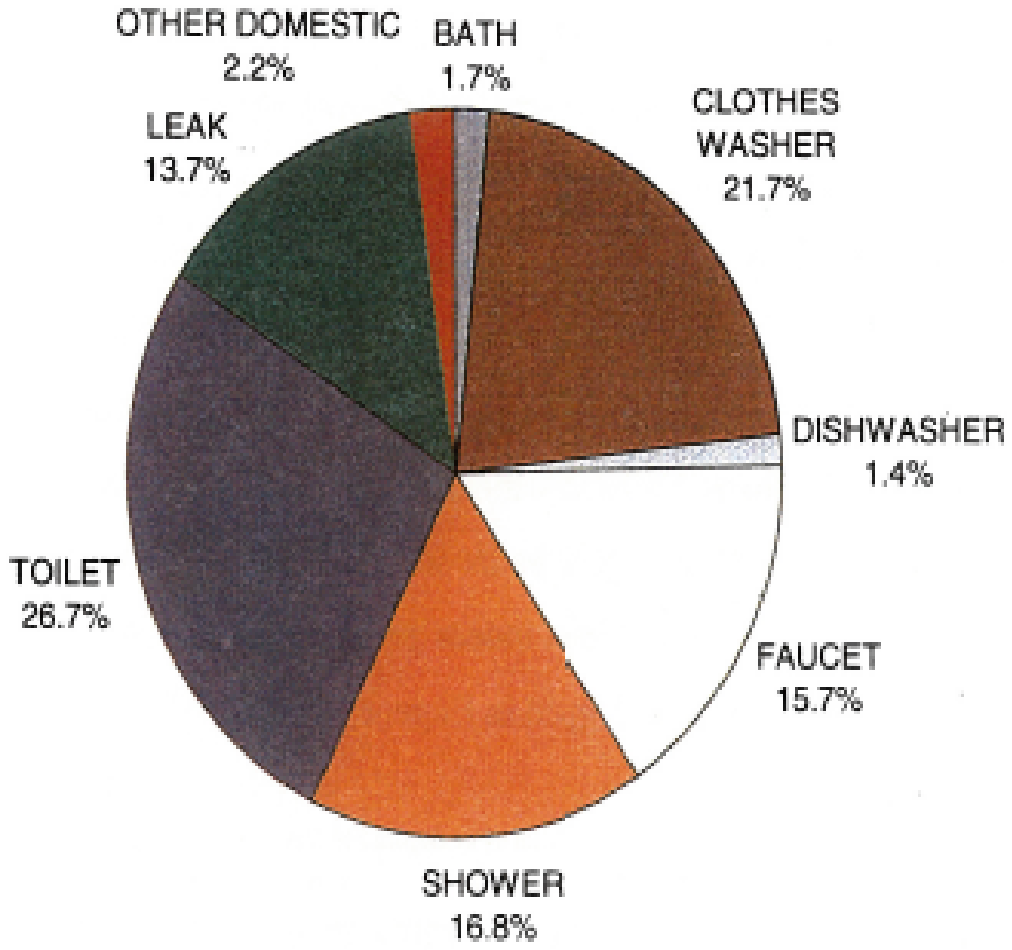
- Typical water use
- Room-by-room:
  - Bathrooms
  - Laundry
  - Kitchen
  - Other water using devices
- Tank pumping
- Soil treatment area

Typical water use

- 150 gallons per day per bedroom
  - Assumes 2 people per bedroom
- 50-80 gallons/person/day
- Annual estimates of use
  - Per person per year = 28,000 gal
  - Typical home ~ 3 persons = 82,000 gal/yr
  - 250 homes in a township = 20 million gallons/year

Where is the Water Used?

- Water use:
  - Bathroom = 60%
    - Toilet = 27%
    - Bathing = 19%
    - Faucets = 8%
  - Laundry = 22%
  - Kitchen = 10%
  - Leaks = 14%



Mayer, et al.
Residential End Uses of Water. 1999.

Toilet - 27%

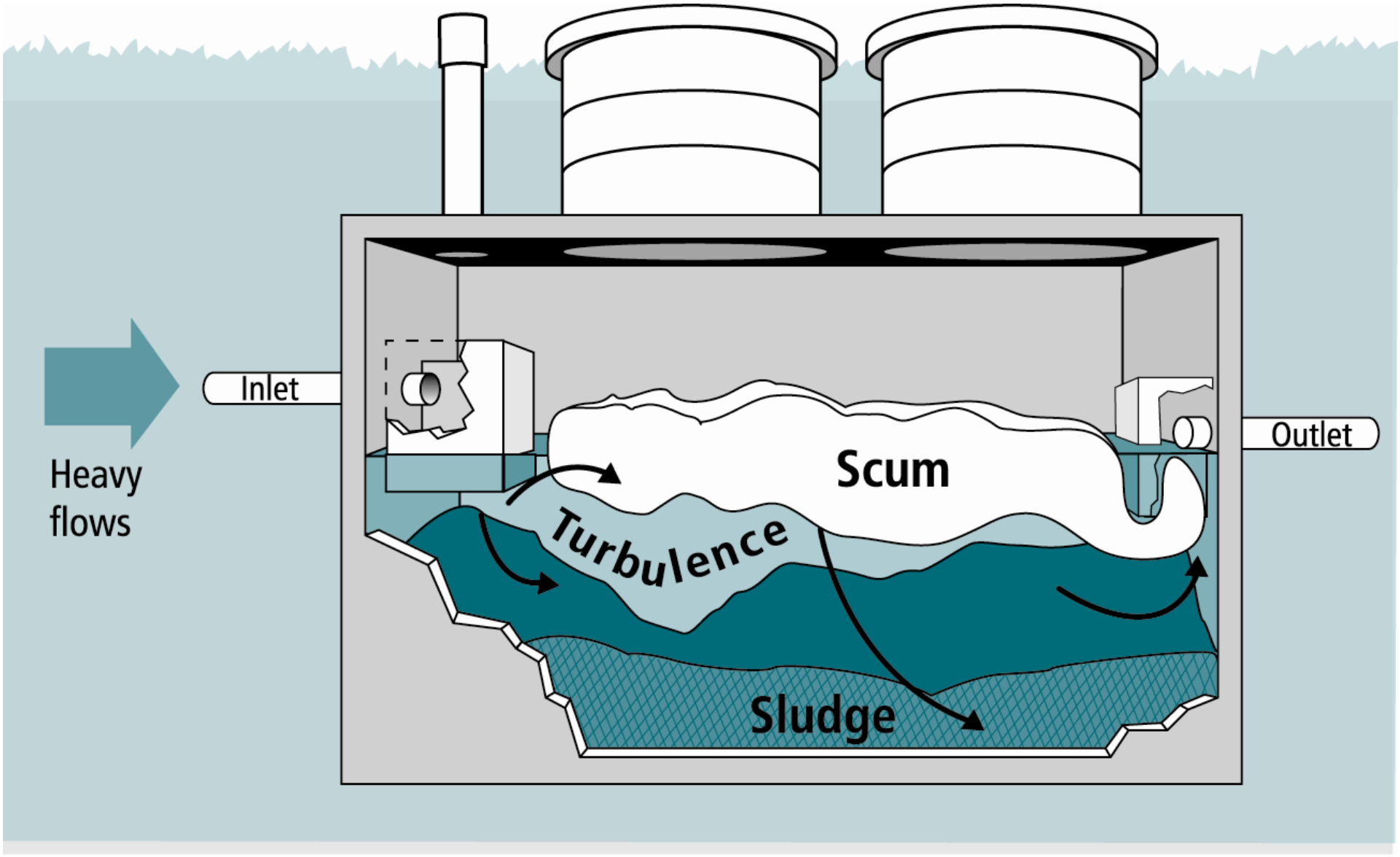
- Low flow – High quality
- Leaking problems
  - Gaskets & “running”
- No other products
  - Tissue, napkins, butts (cigarettes), hair, cotton balls FLUSHABLE WIPES are NOT flushable.
- Cleaners
  - NOT Automatic
  - Small amount with “elbow grease”

Bathing – 19%

- Leaks
- Low flow
- Limit:
  - Cleaners
    - Daily cleaners are hard on system
  - Anti-bacterial soaps
  - Shaving, bath oils hard on system

Laundry – 22%

- Install front loading machines
  - 65% less water
  - 12 – 20 gallons
  - Less electricity to dry clothes
- Spread out loads
  - think even
  - throughout week
  - throughout day
- Limit bleach use
- Use low water level setting for small loads


Heavy
flows
Inlet
Scum
Turbulence
Sludge
Outlet

Kitchen – 10%

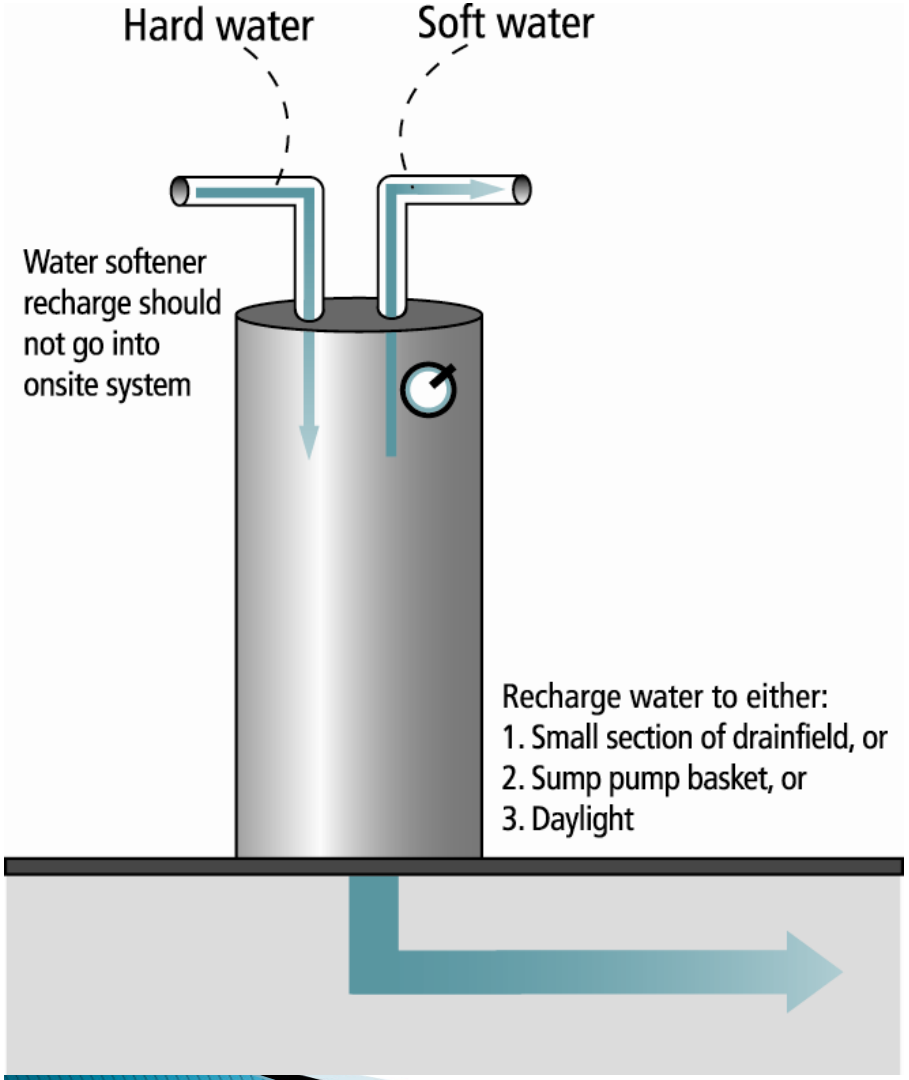
Dishwashing

- Scrape plates in garbage/compost
- **Dishwasher**:
  - Full loads
  - Detergents
    - Use No/Low Phosphorus
    - New gels – less filler
  - Scrape plates
- **Sink**:
  - Rinsing
  - Leaks
  - Fats and Oils are solid waste!

Garbage Disposal

- Problems:
  - Adds more solids
  - Undigested food
  - Chopped into small pieces
  - More water
- Recommendation/requirements
  - Don’t install one
  - Don’t use it if you have one

Water Softener



- Doesn't require treatment
- **Impact**:
  - Adds water
  - Chloride is not easily treated.
    - 1tsp pollutes 5 gallons
- **Management** –
  - Discharge to different place old drainfield/cesspool
  - Reduce recharge frequency

Tank Pumping- what to expect

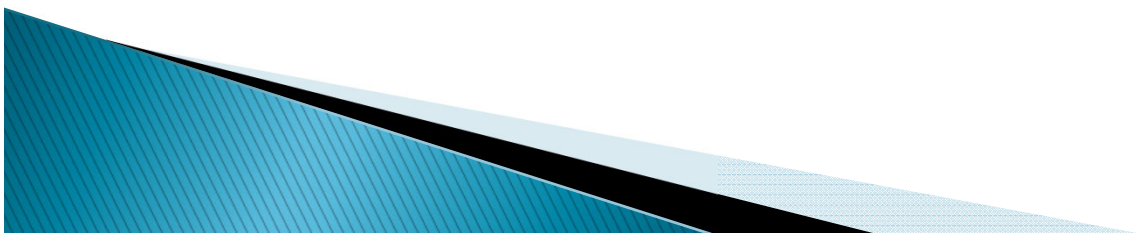
- Don’t need additives
- Sludge and scum measured
- Cleaned when greater than 25% of capacity is sludge + scum
- Licensed and bonded Maintainer
- Cleaned from manholes. Never from inspection pipes

Tank Pumping (Cont.)

- Remove all scum sludge and liquid from the tank
- Flushing and back flushing
- Check baffles
- Homeowner information from maintainer

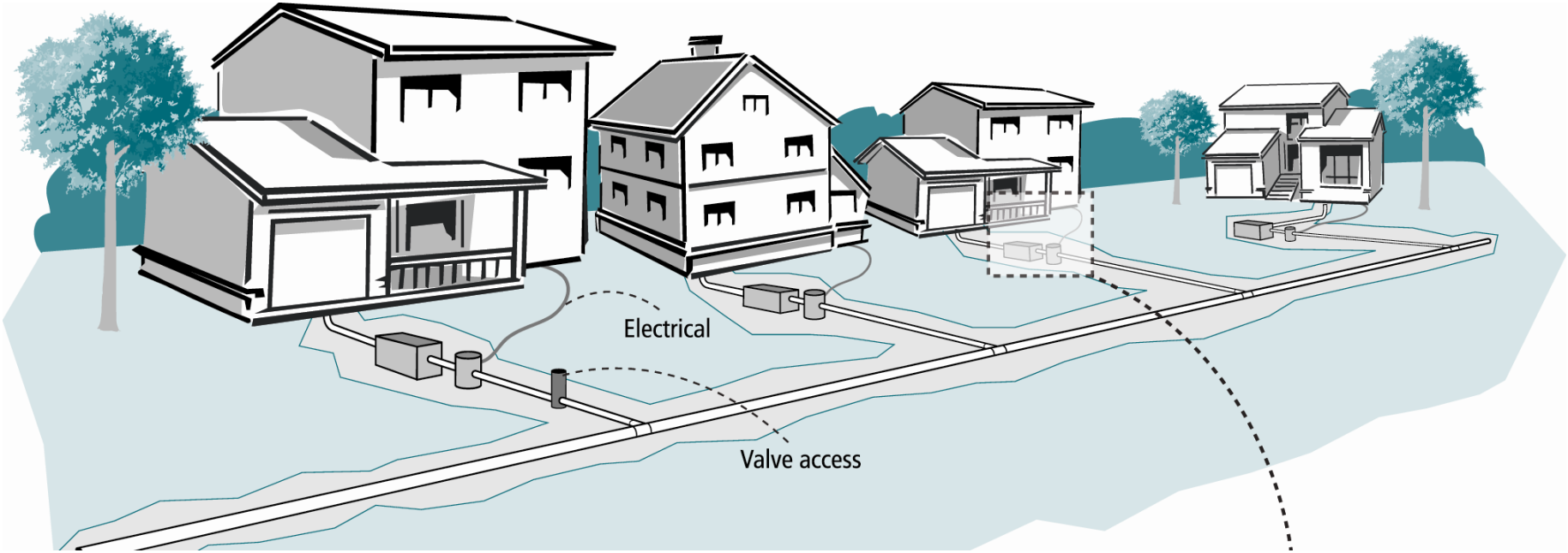
How to Hire a Service Provider/Maintainer

- List of licensed Maintainers on MPCA Website
- Word of mouth
- Response to interview questions over the phone
  - Opening access?
  - Complete removal?
  - Additives recommended?
  - Are all drivers certified?
  - Septage treatment?
  - Cost?



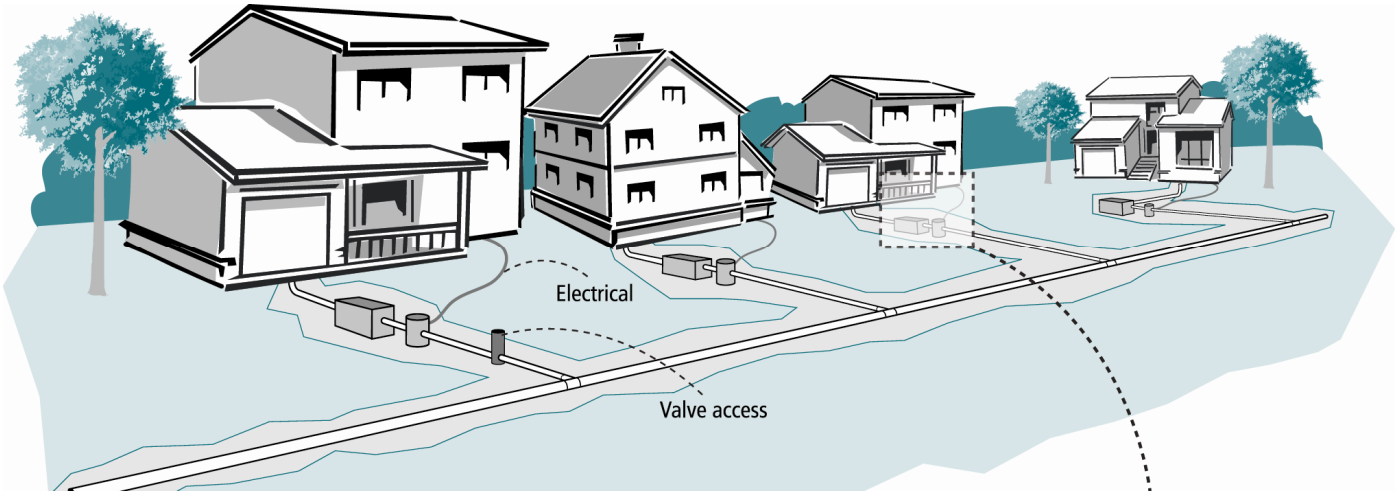
Homeowner Tips

What YOU can do to extend the life of your septic



- Conserve water
- Time water usage to spread out over day and week
- Be mindful of the products you use and limit cleaners
- Do not use system as a garbage can
- Call your Service Provider if alarm signals

Homeowner Tips



- Utility locate – any and all digging!
- Keep off the soil treatment area!
- Don’t use chemical drain cleaners – buy a plumber’s snake or cable auger for drain cleaning

Contacts

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More Information

U of M:
http://septic.umn.edu

MPCA:
https://www.pca.state.mn.us/water/ssts-practitioner-and-homeowner-information

EPA:
https://www.epa.gov/septic/septicsmart-homeowners

Video:
https://www.youtube.com/watch?v=fVSHhZmU12E&index=5&list=PLYu06XHEBZESW4Hky6T57_6QsiEaV2Lib

Questions?