ON-SITE SEWAGE DISPOSAL SYSTEMS

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Regulatory Jurisdiction of Sewage Disposal Systems in CT

CT Department of Energy & Environmental Protection

Local and State Department of Public Health

Department of Energy and Environmental Protection

- Design Flows Exceeding 5,000 GPD, and Alternative & Community Systems

- Large commercial properties, large schools & restaurants, apartments, condominiums

State and Local Health Departments

- Conventional Septic Systems with Design Flows of 5,000 Gallons Per Day (GPD) and Less

- Single-family homes, small commercial properties, small schools, churches

CONNECTICUT PUBLIC HEALTH CODE

On-site Sewage Disposal Regulations, and Technical

Standards for Subsurface Sewage Disposal Systems

PHC Section 19-13-B100a (e.g., Building Conversions, Changes in Use, Building Additions)

Effective August 3, 1998

PHC Section 19-13-B103 (Design Flows 5,000 Gallons per Day or Less)

Effective August 16, 1982

Technical Standards for Subsurface Sewage Disposal Systems

Effective August 16, 1982

Former revisions: 1986, 1989, 1992, 1994, 1997, 2000, 2004, 2007, 2009, 2011

Revised January 1, 2015

PHC Section 19-13-B104 (Design Flows Greater than 5,000 Gallons per Day)

Effective August 16, 1982

State of Connecticut
Department of Public Health
Environmental Engineering Program
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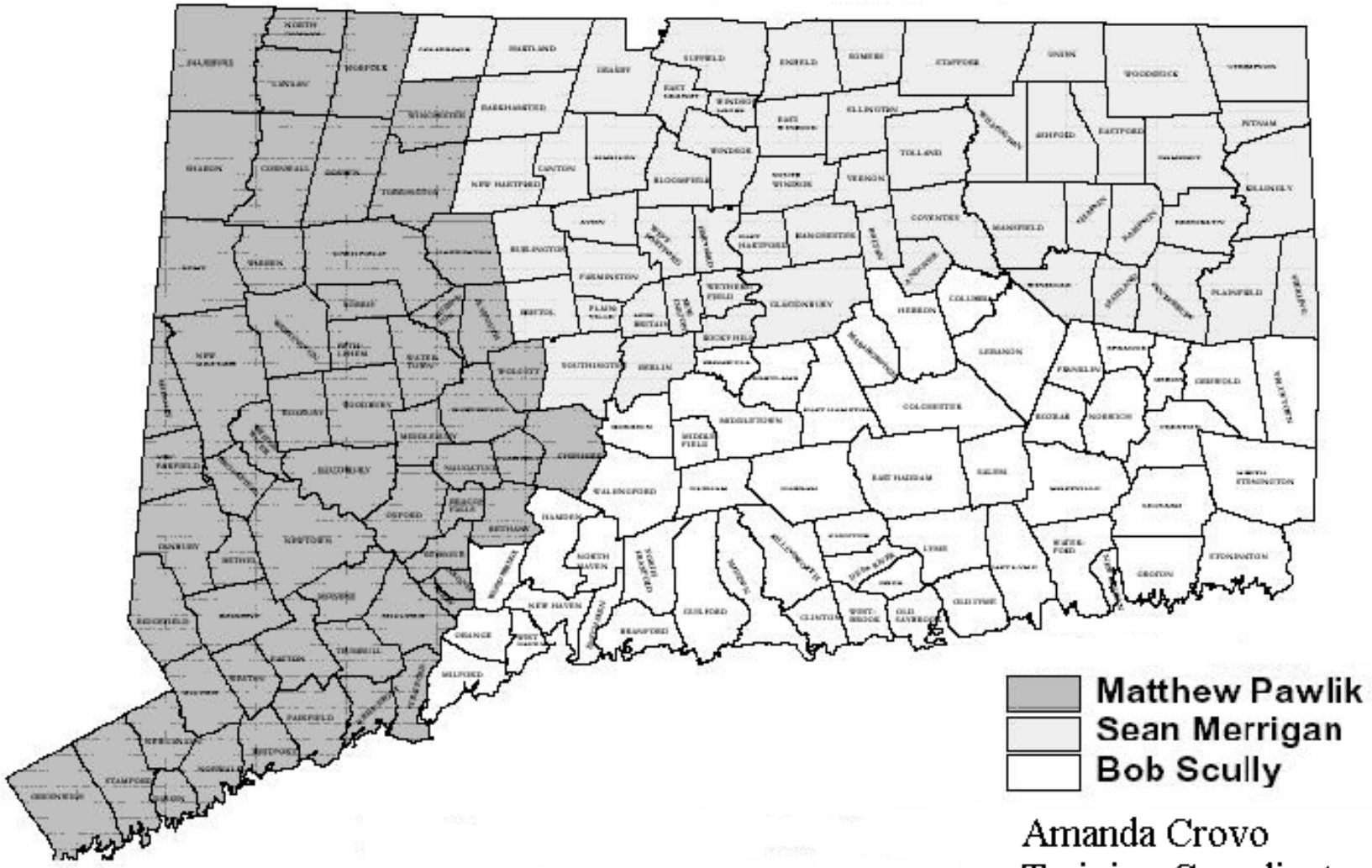
www.ct.gov/dph/subsurfacesewage

January 2015

CT Department of Public Health
Environmental Engineering Program
Regional Assignments



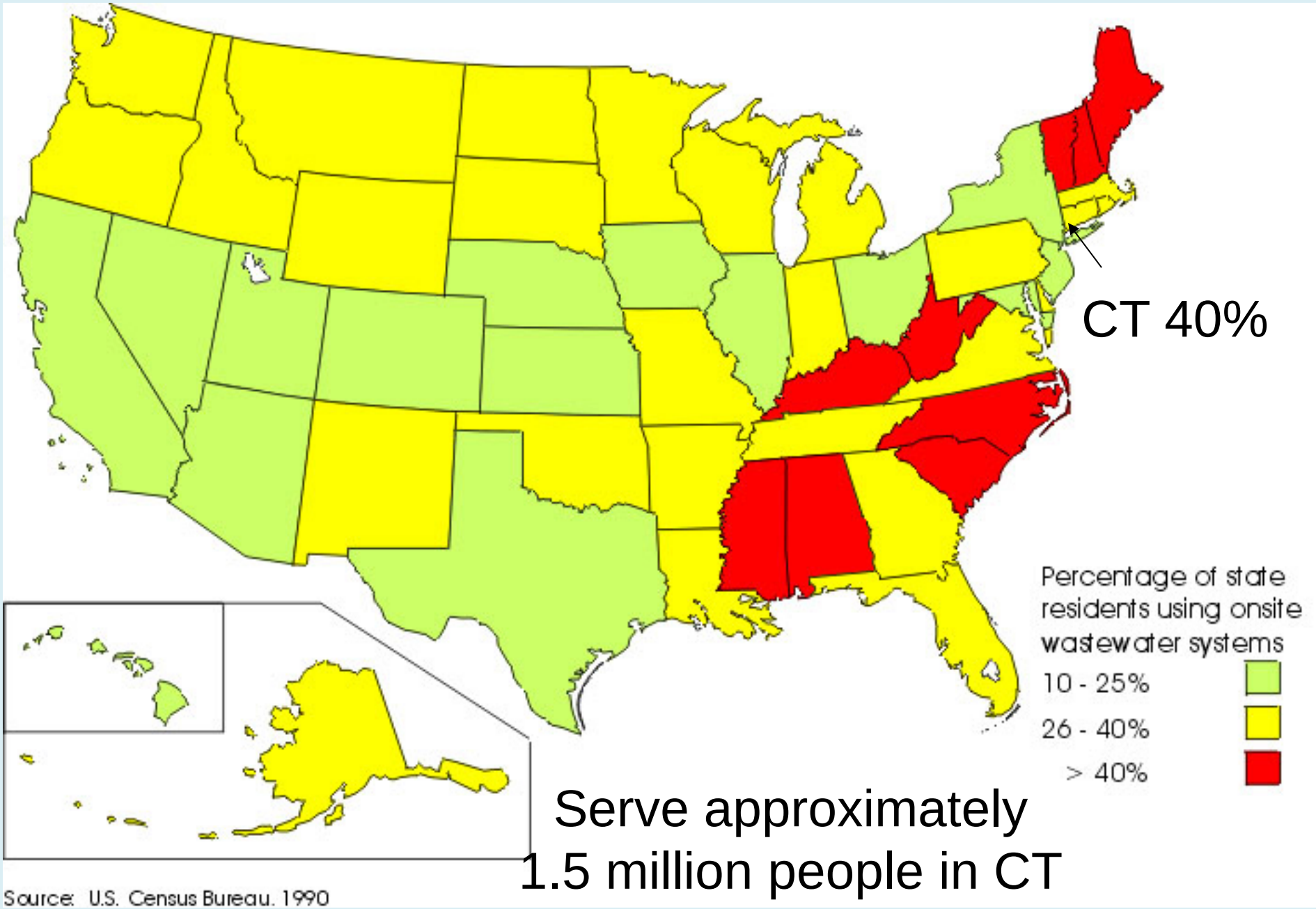
Amanda Crovo
Training Coordinator

Local Health Departments

- Perform site testing, plan reviews, inspections, issue permits for small systems.
- Investigate complaints of sewage odors and possible failures.
- LHD may issue orders if no response from property owners

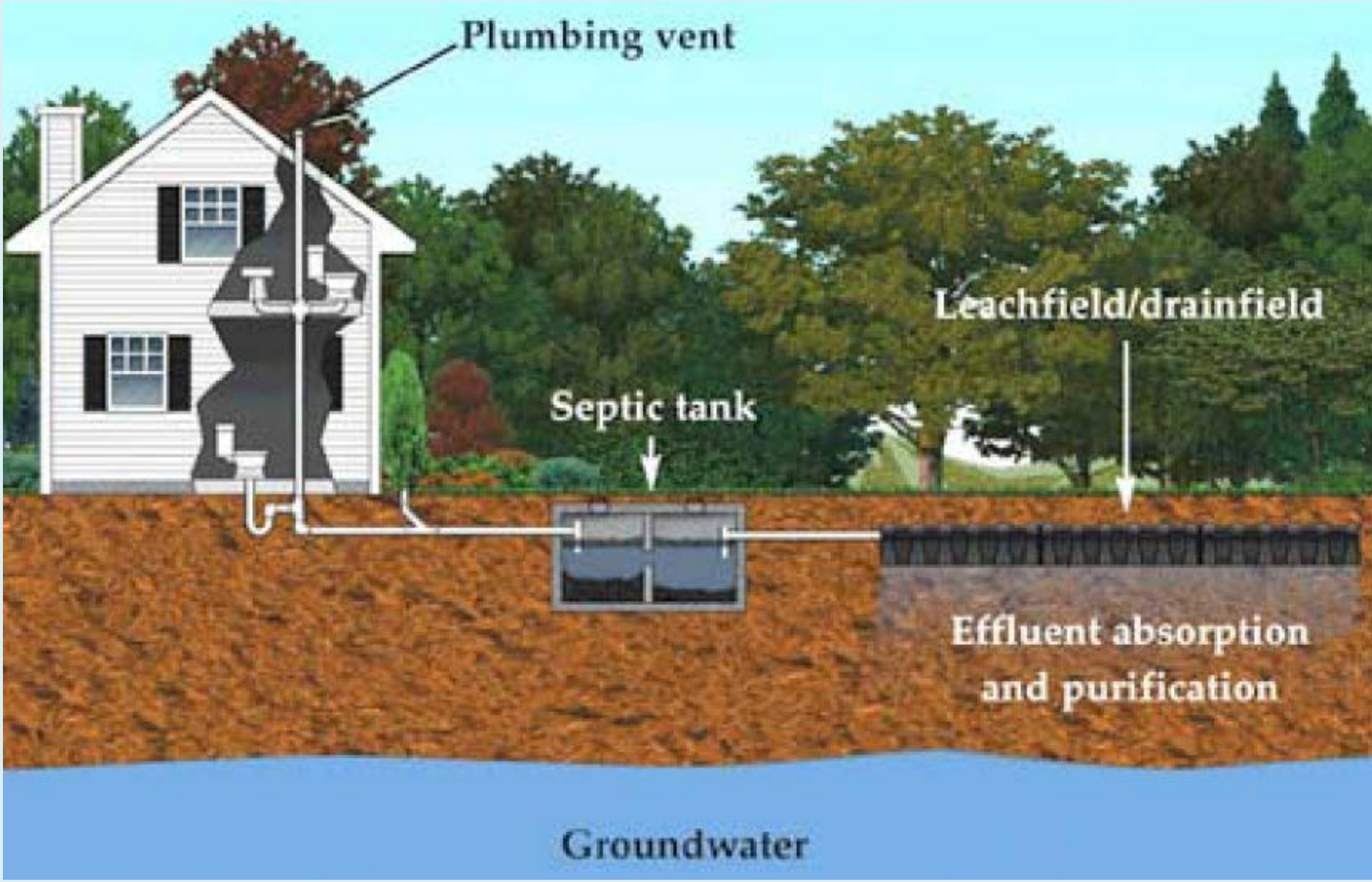
Why A Septic System?

- Low density – towns wish to remain rural
- Public sewers too costly in rural areas
- Cost effective with proper maintenance (pump septic tanks every 3-5 years)
- Typically cause less pollution



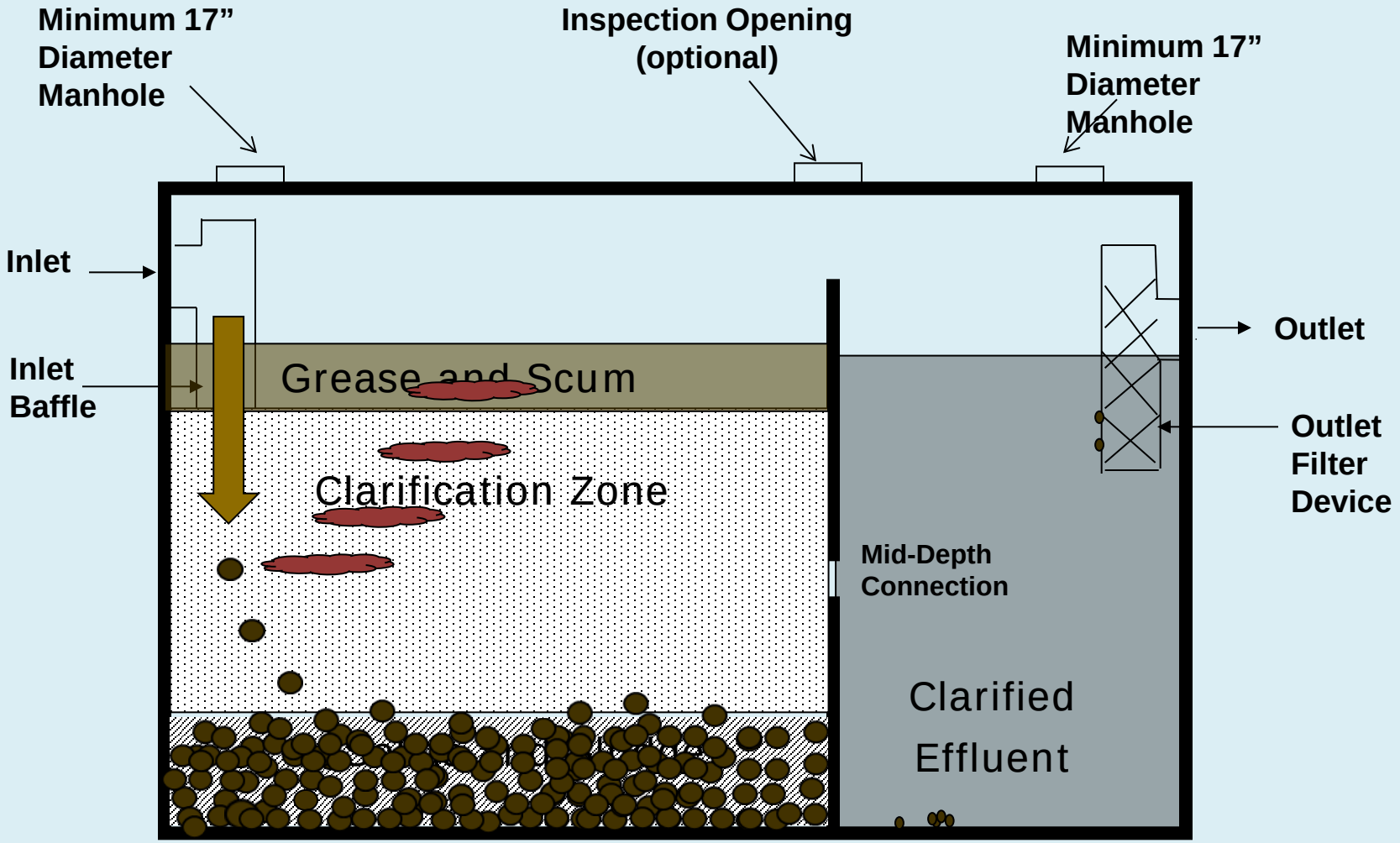
Serve approximately
1.5 million people in CT

- What is a Septic System?


Plumbing vent
Leachfield/drainfield
Septic tank
Effluent absorption
and purification
Groundwater

Septic Tank

- Provides the primary treatment: separates, settles and digests



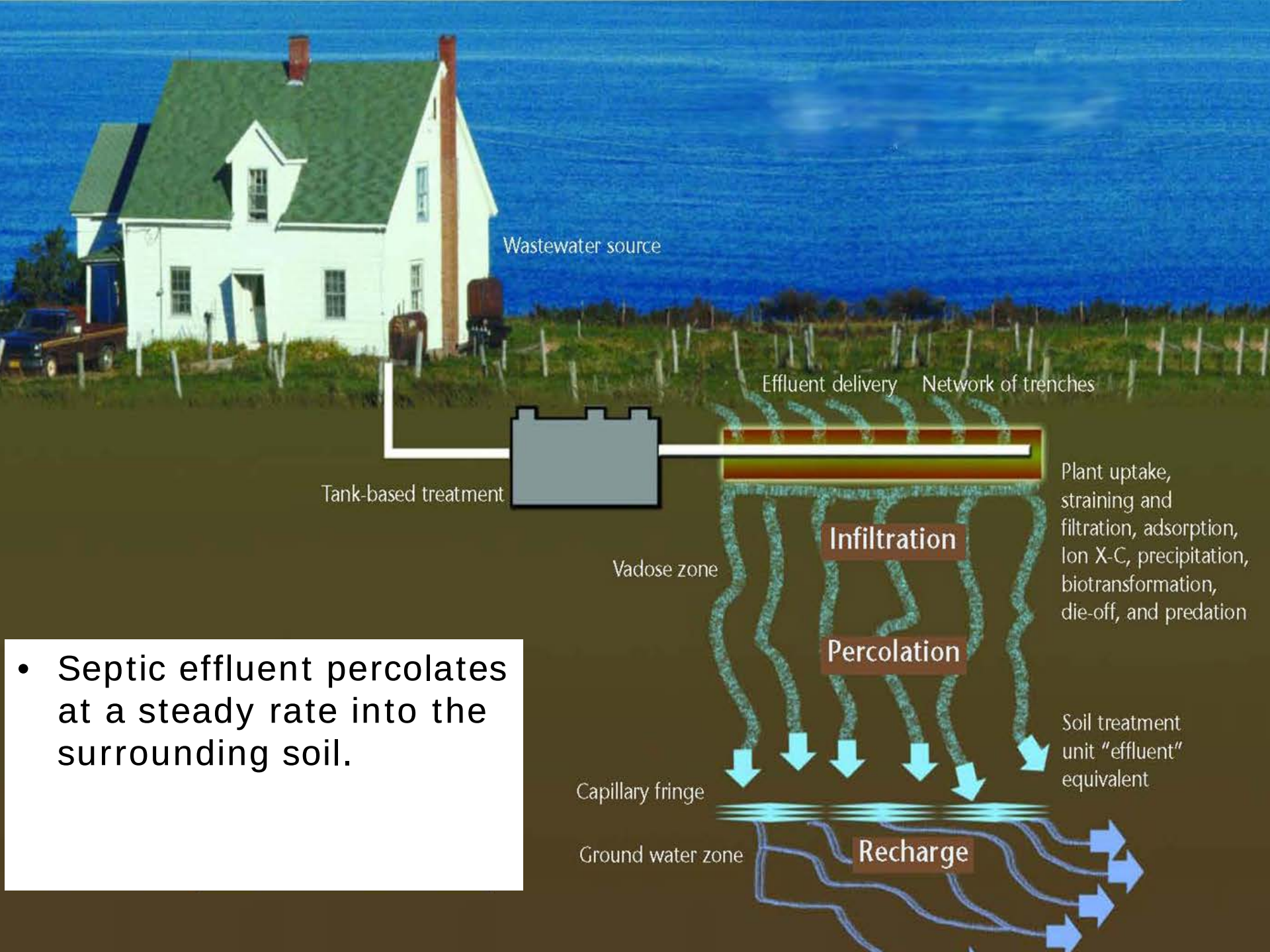
Two Compartment Septic Tank

Septic Tank with Effluent Filter

Leaching System

- Treat and disperse effluent (liquid from the septic tank) into the surrounding soils without breaking out on the ground surface or polluting the groundwater.

- Must be designed & installed correctly, and not over used.



- Septic effluent percolates at a steady rate into the surrounding soil.

How does a leaching system work?

- A biological layer is formed at the soil interface inside the leaching system (Biomat).

- Biomat layer reduces the rate at which sewage passes into the soil.

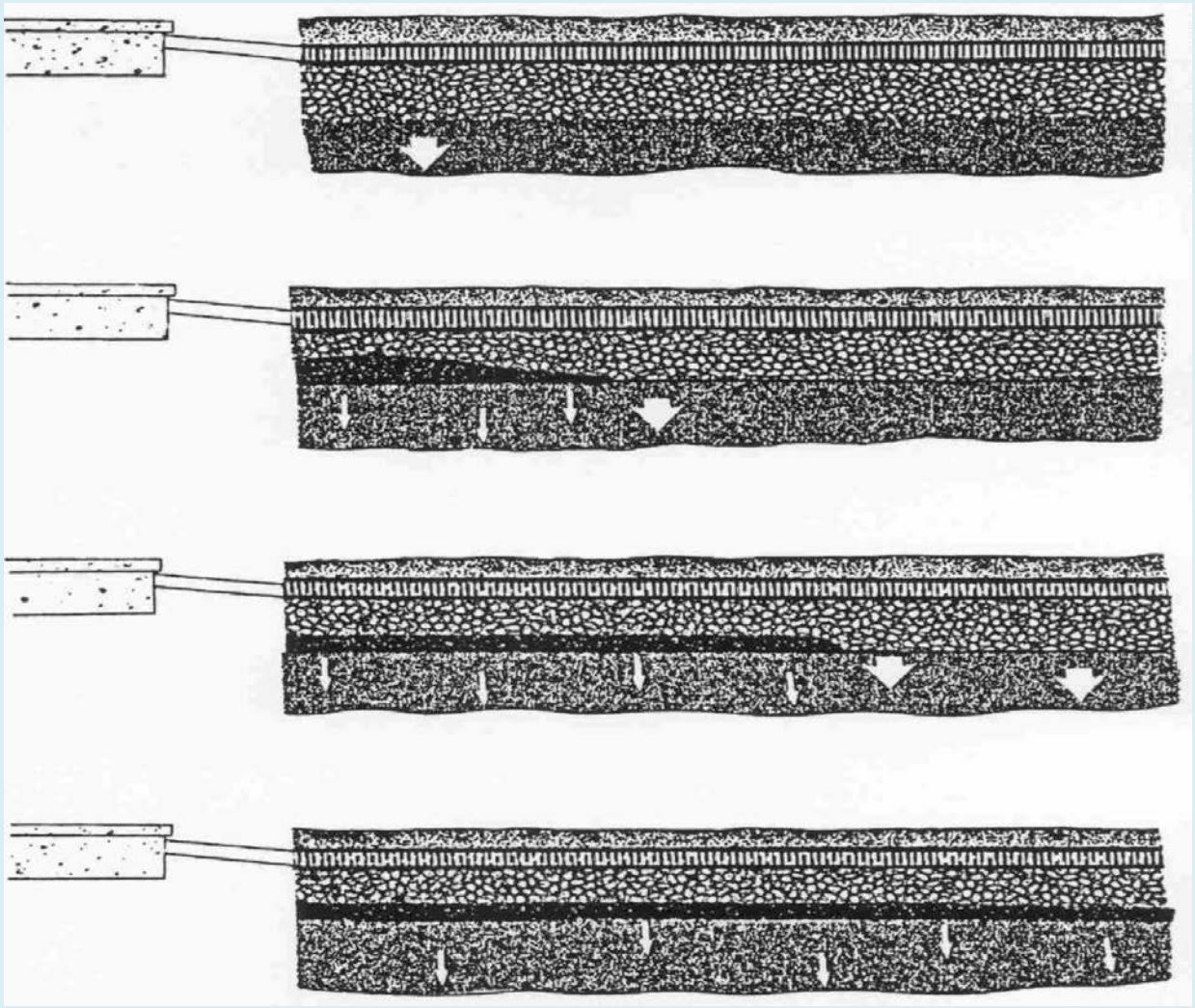
Formation of a Biomat
(Gravity Distribution)

One Day

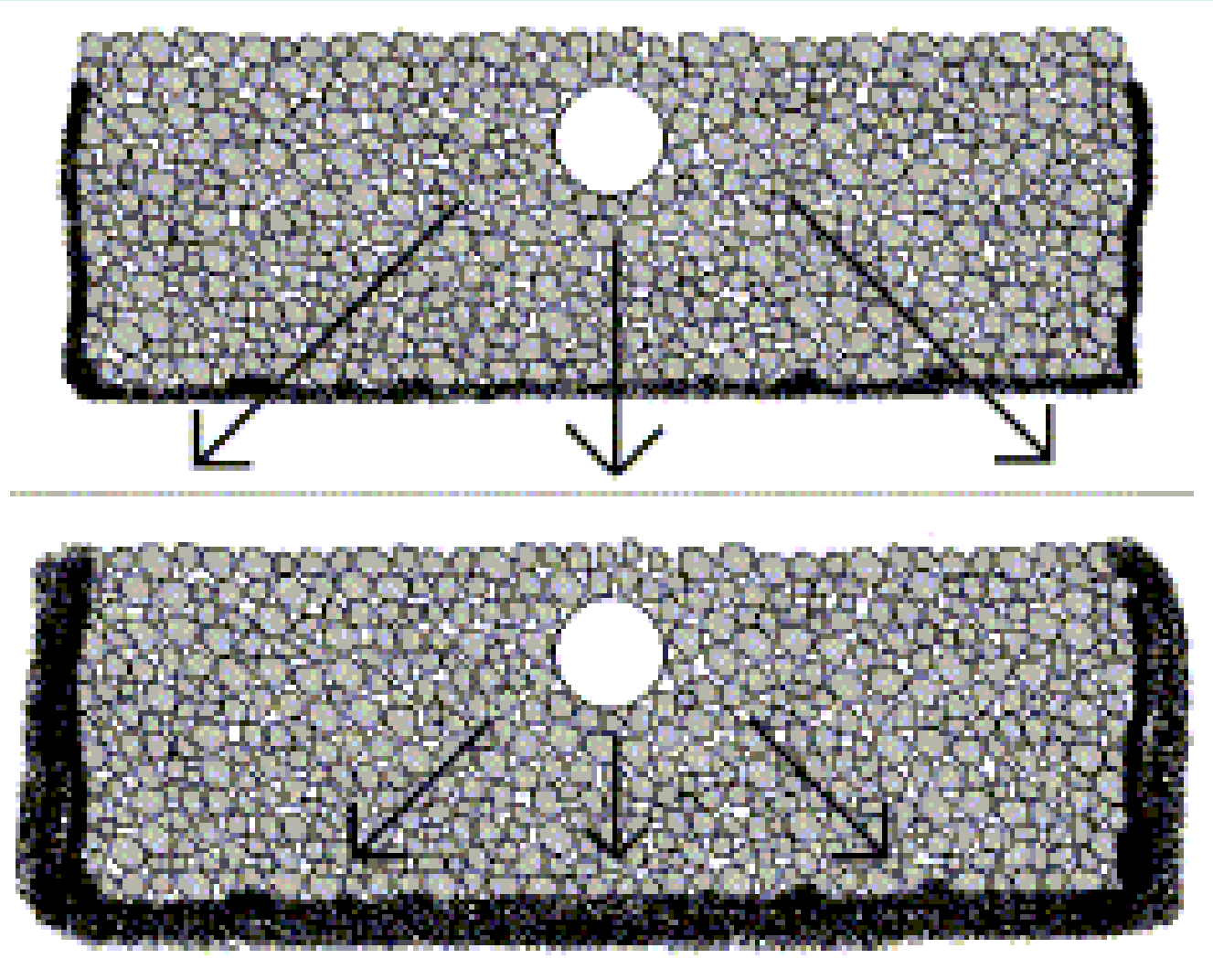
1-3 Month

3-6 Months

6 Months-1 Year



Biomat Growth



Distribution Piping

Distribution Box Installed

Perforated Piping

Level Distribution System

Serial Distribution System

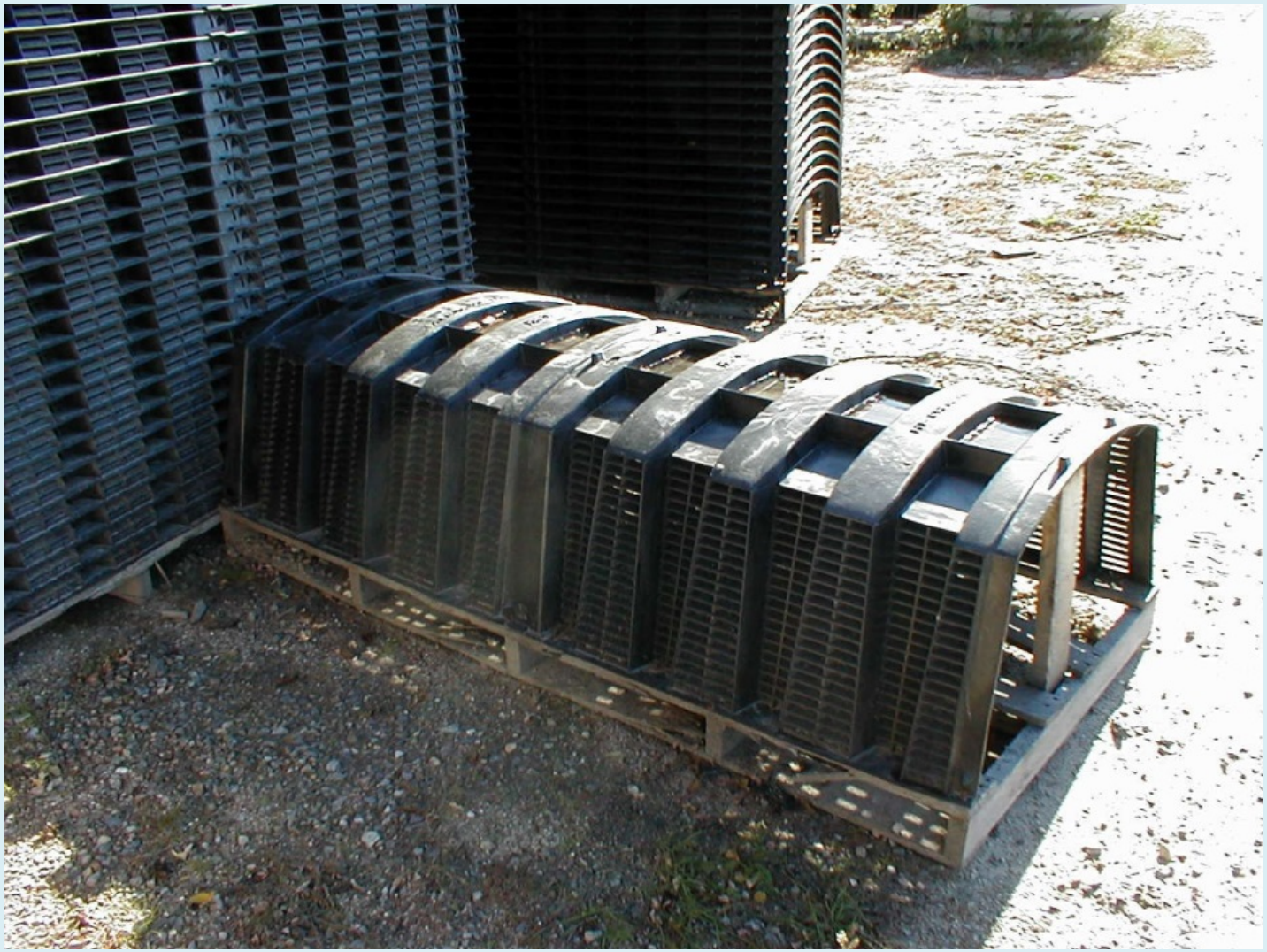
Stone Trenches

Leaching Pit or Dry Well

Galleries – 12-inch high

Galleries – 4’ x 4’

Plastic Leaching Chambers



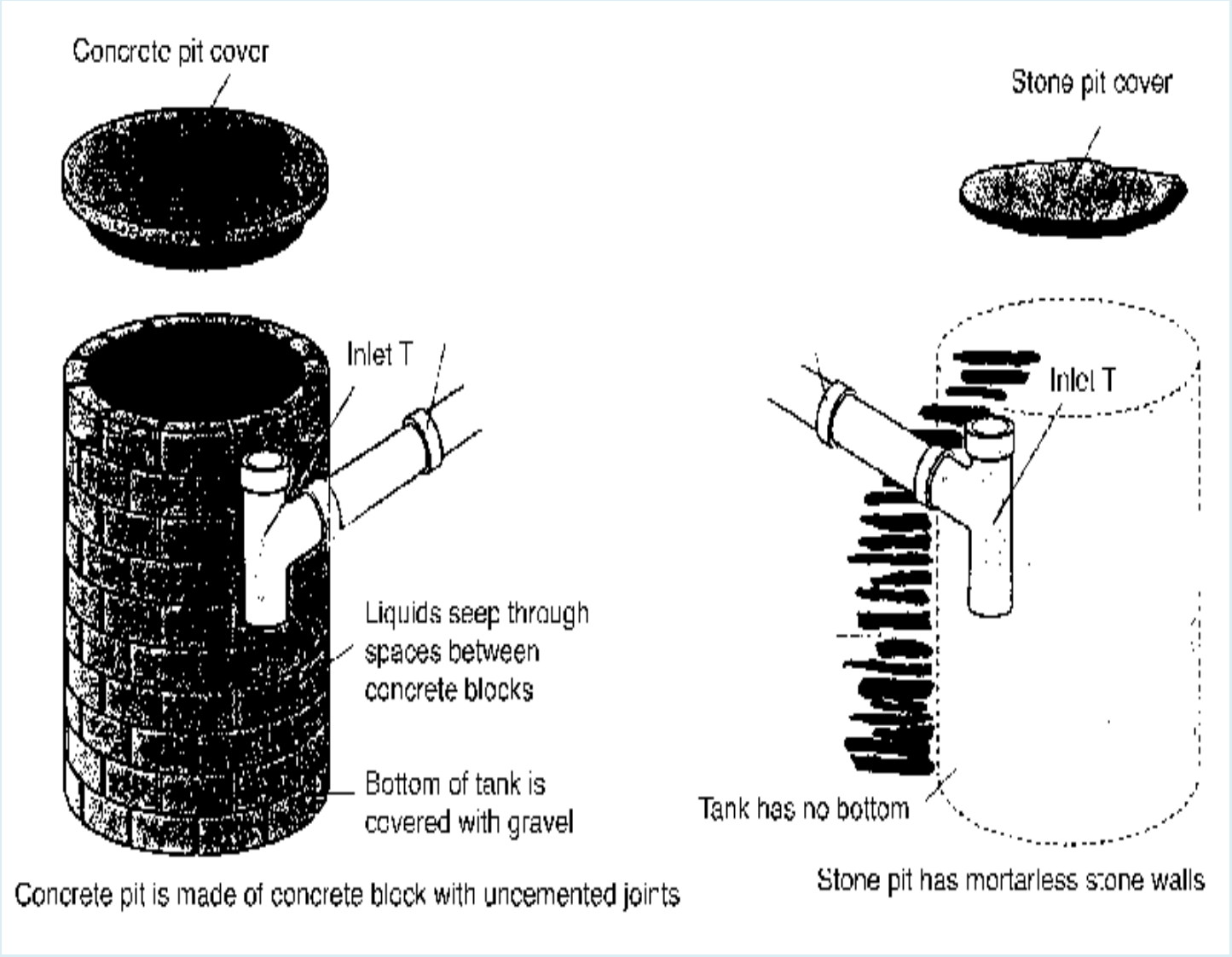
Proprietary Systems

Proprietary Systems

Proprietary Systems

Proprietary Systems

Cesspools – Not Allowed



Cesspools

- Antiquated systems without a septic tank.
- Cesspool abandonment is encouraged and typically occurs at the time of a real estate transaction.
- The Federal Underground Injection Control program required large capacity cesspools that serve multi-family residential building(s), or non-residential buildings serving 20 or more persons per day to be abandoned by April 5, 2005.

Domestic Sewage?

Domestic Sewage

- Water from residential uses
  - Toilets
  - Bathing/showers
  - Cooking and cleaning
  - Laundry
- Wastewater from restaurants and commercial buildings

Domestic Sewage Concerns

- Kitchen wastes – extremely high in fats, oils, and grease
- Wastes from garbage disposal systems contain large amounts of solids
- Laundry wastes high in phosphates, clothing fibers, oils and bacteria shed from the body.

Pollutants in Domestic Sewage

- Coliform Bacteria
- Suspended Solids
- Biologiocal Oxygen Demand (BOD)
- Nitrogen
- Phosphates

Biological Oxygen Demand

- measure of the amount of bio-degradable organic material in the wastewater
- High BOD = strong waste (restaurant)
- Low BOD = weak waste (office)

Biological Oxygen Demand

- Properly functioning septic tank will reduce effluent BOD by about 25 to 30 percent

- Further reduction occurs when the effluent comes in contact with bacterial growth in the leaching system (biomat)

Nitrogen

- Hazardous to infant children (blue baby disease)

- Septic systems only remove approximately 30% of total nitrogen with the remaining 70% being discharged to the groundwater.

Phosphates

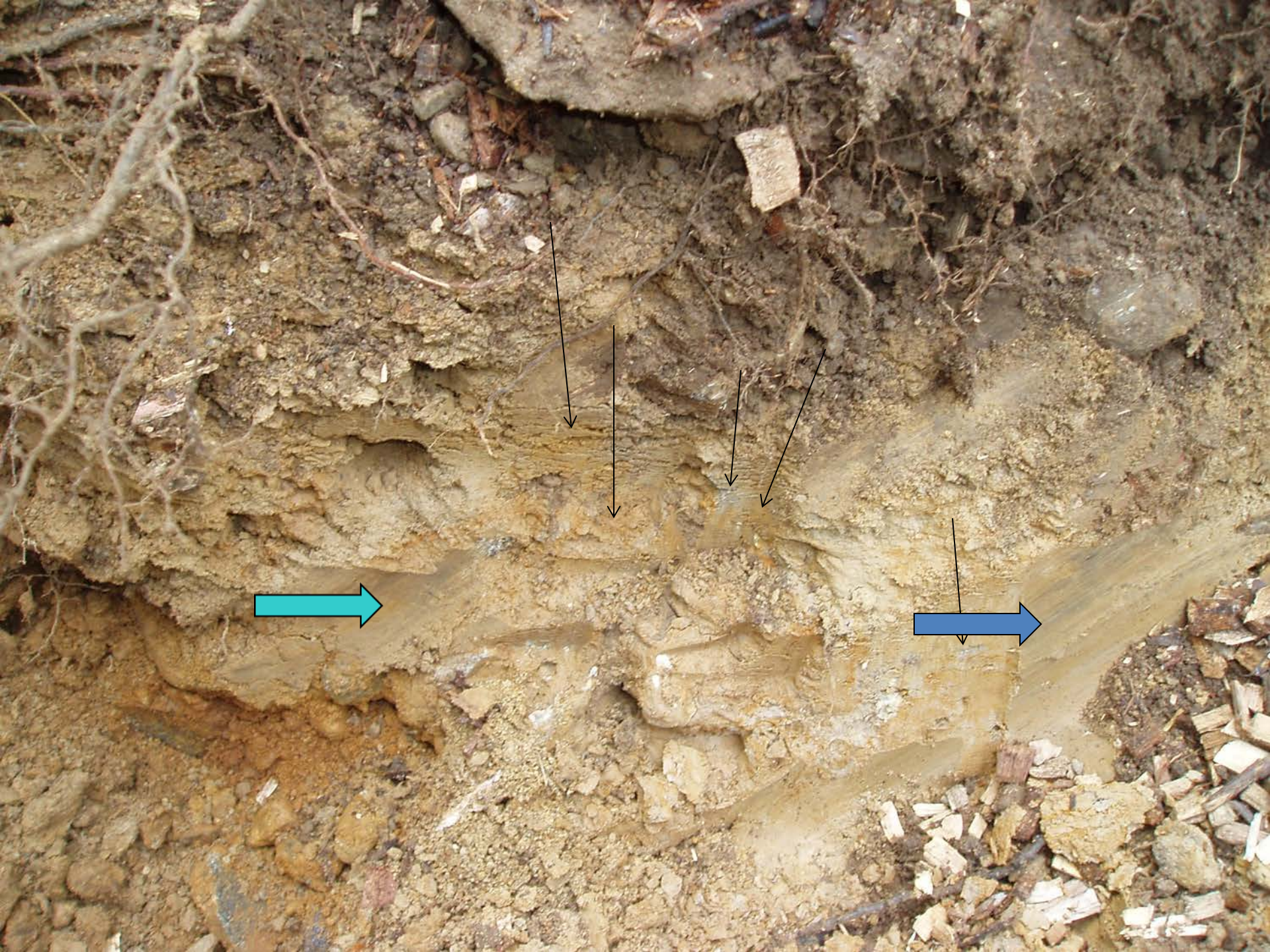
- Stimulates plant growth (lush green grass or algae growth in surface water)
- Readily removed by filtration through only a foot or two of most soil types

Chemical Pollutants in Sewage

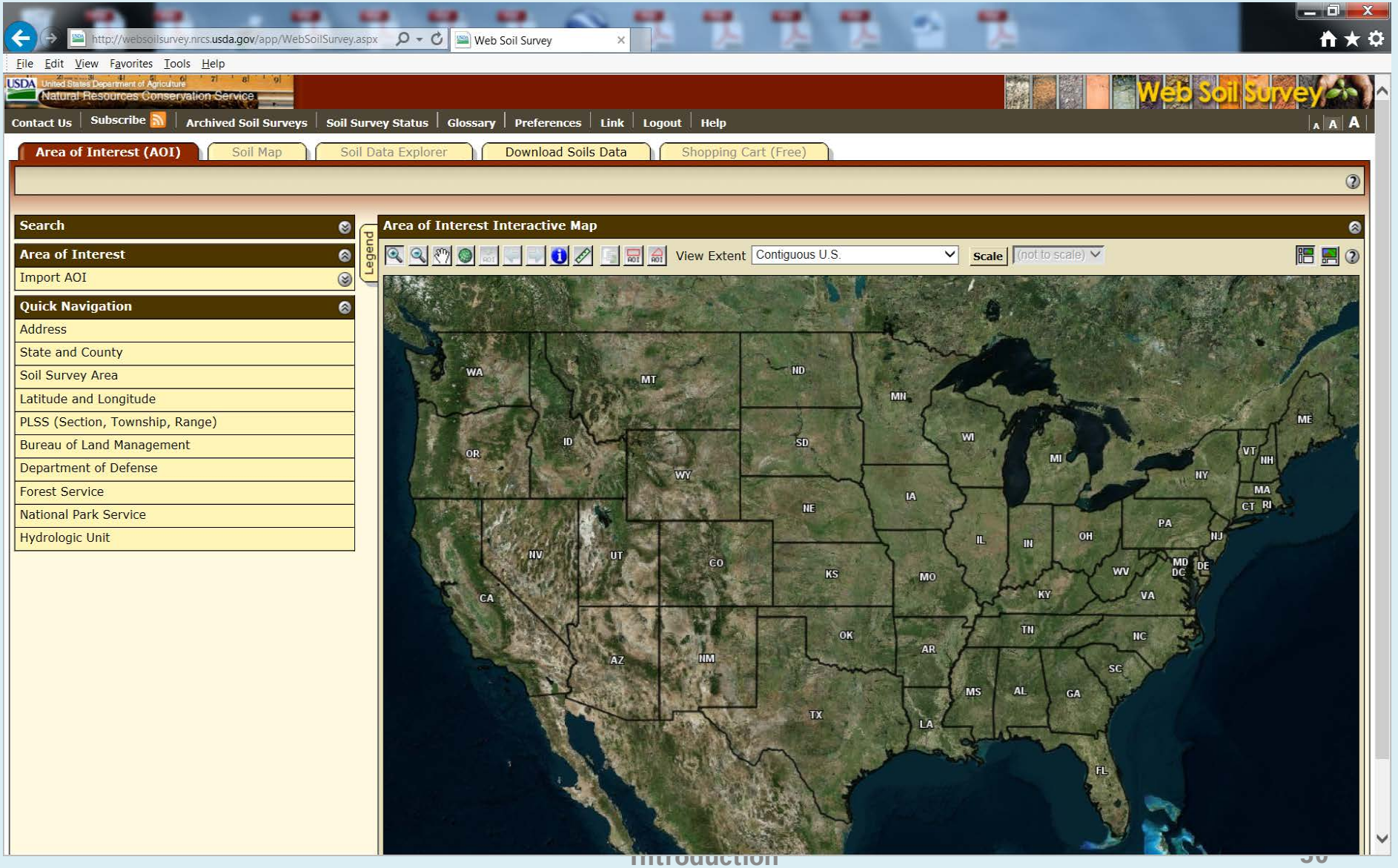
- Paints, solvents, cleaning chemicals…
- Considered to be hazardous chemicals since they can readily pass thru a septic system and enter the groundwater
- Amount of these chemicals in domestic sewage should be extremely small, if any

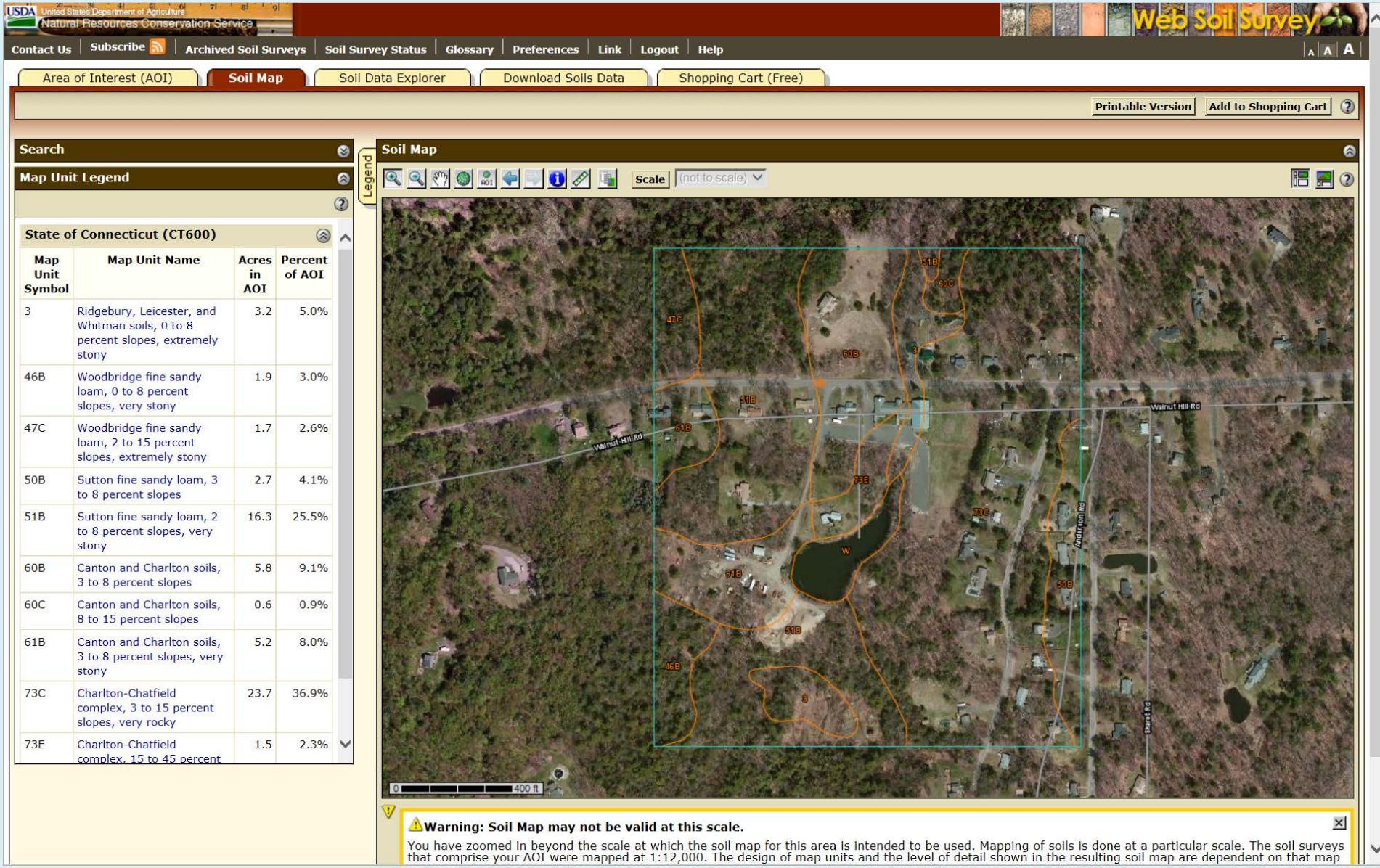
SITING AND DESIGNING SEPTIC SYSTEMS

Deep Hole Test Pits

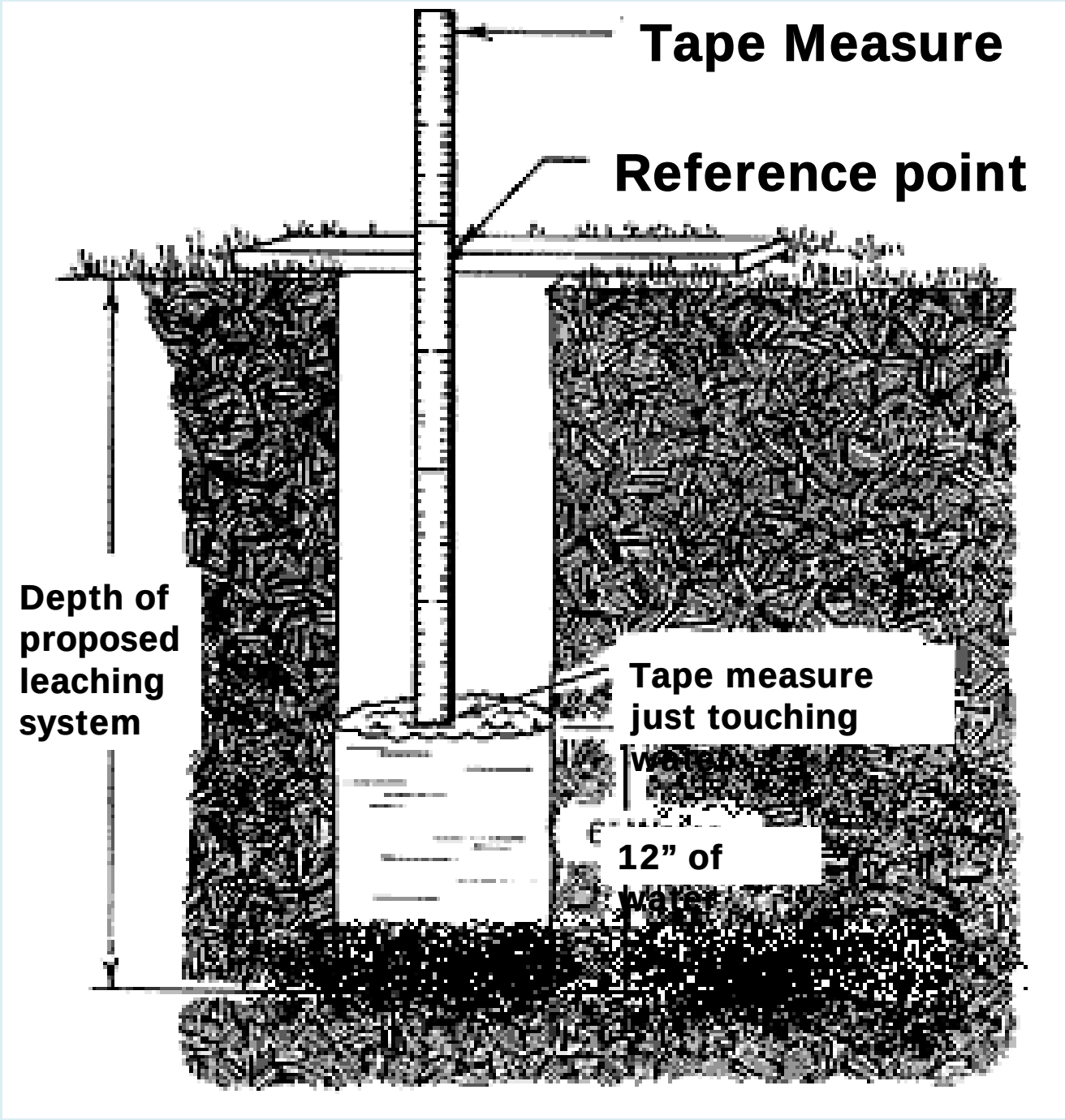


http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey




USDA United States Department of Agriculture
Natural Resources Conservation Service
Web Soil Survey
Contact Us | Subscribe | Archived Soil Surveys | Soil Survey Status | Glossary | Preferences | Link | Logout | Help
Area of Interest (AOI) | Soil Map | Soil Data Explorer | Download Soils Data | Shopping Cart (Free)
Printable Version | Add to Shopping Cart
Search
Map Unit Legend
State of Connecticut (CT600)
Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI
3 | Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony | 3.2 | 5.0%
46B | Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony | 1.9 | 3.0%
47C | Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony | 1.7 | 2.6%
50B | Sutton fine sandy loam, 3 to 8 percent slopes | 2.7 | 4.1%
51B | Sutton fine sandy loam, 2 to 8 percent slopes, very stony | 16.3 | 25.5%
60B | Canton and Charlton soils, 3 to 8 percent slopes | 5.8 | 9.1%
60C | Canton and Charlton soils, 8 to 15 percent slopes | 0.6 | 0.9%
61B | Canton and Charlton soils, 3 to 8 percent slopes, very stony | 5.2 | 8.0%
73C | Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky | 23.7 | 36.9%
73E | Charlton-Chatfield complex, 15 to 45 percent
Legend
Soil Map
Scale (not to scale)
Walnut Hill Rd
Anderson Rd
Bartlett Rd
0 400 ft
Warning: Soil Map may not be valid at this scale.
You have zoomed in beyond the scale at which the soil map for this area is intended to be used. Mapping of soils is done at a particular scale. The soil surveys that comprise your AOI were mapped at 1:12,000. The design of map units and the level of detail shown in the resulting soil map are dependent on that map

Percolation Test


Tape Measure
Reference point
Depth of proposed leaching system
Tape measure just touching water
12” of water

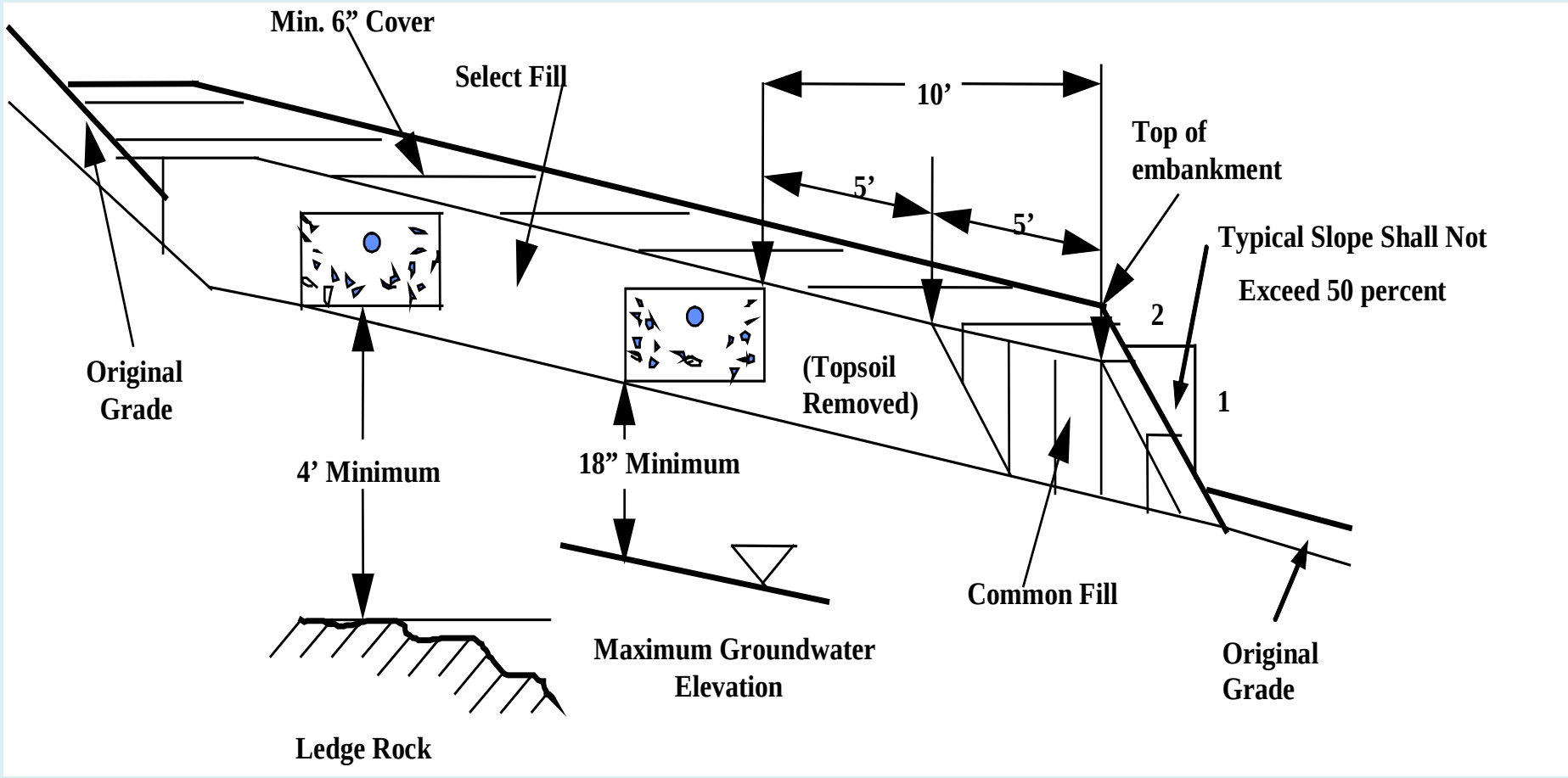
Vertical Separation Distances in CT

- Bottom of a leaching system must be a minimum:

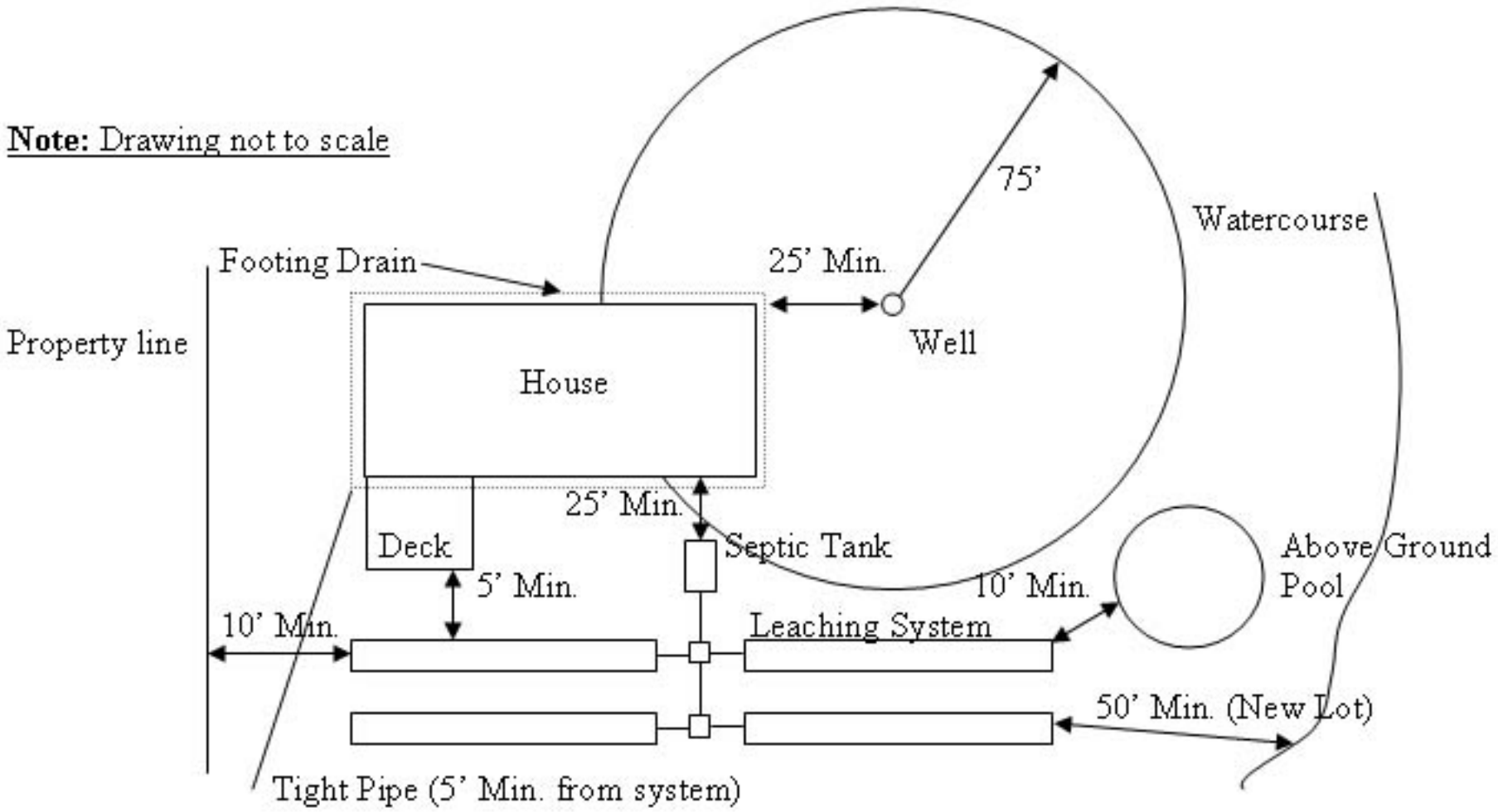
  1. 18 inches above the groundwater table (24 inches if a >2000 gpd)

  2. 48 inches above ledge rock

Cross-section of a leaching system

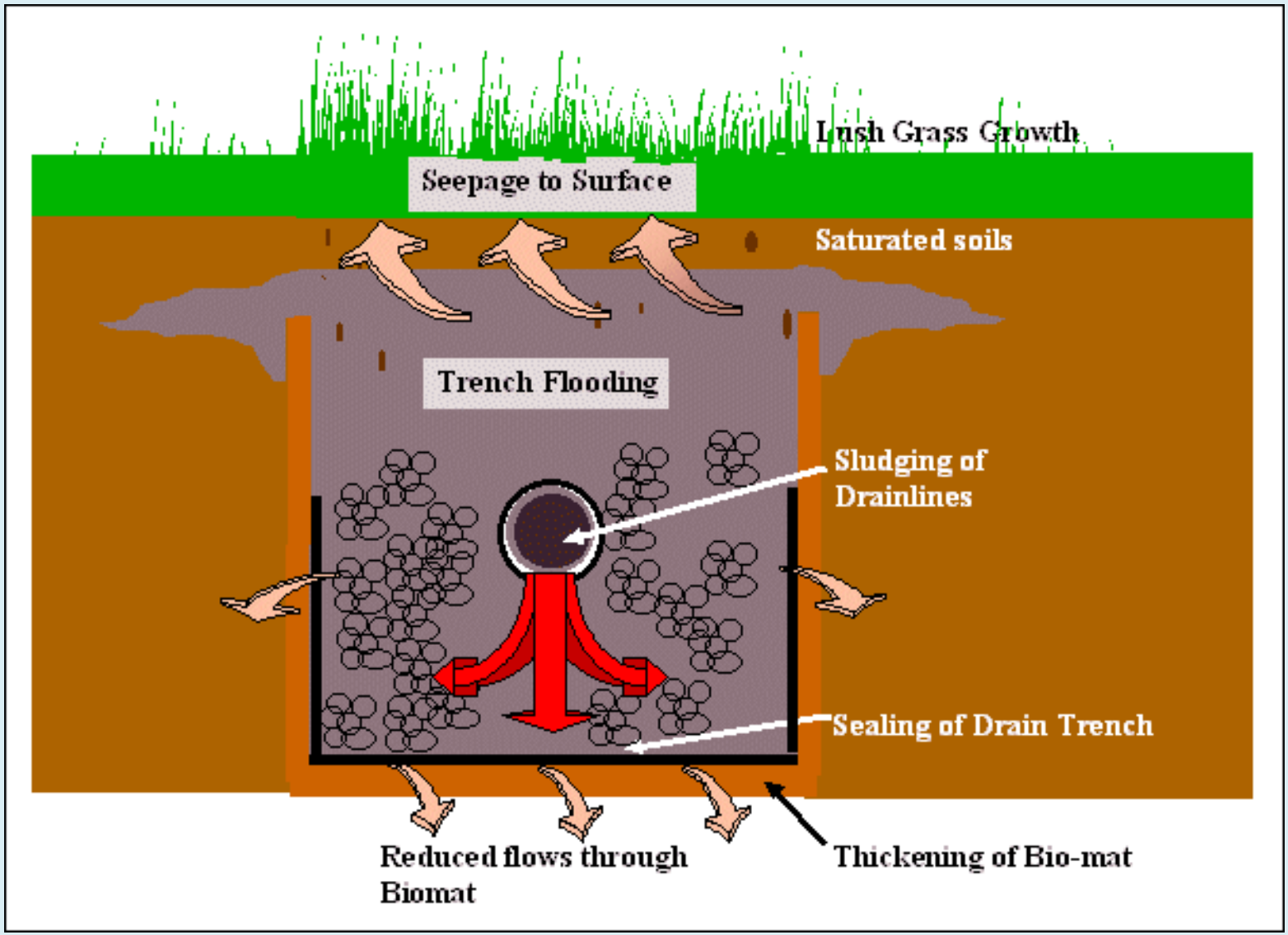


Horizontal Separation Distances



Why do Septic Systems fail?

Age of system



User habits

User habits

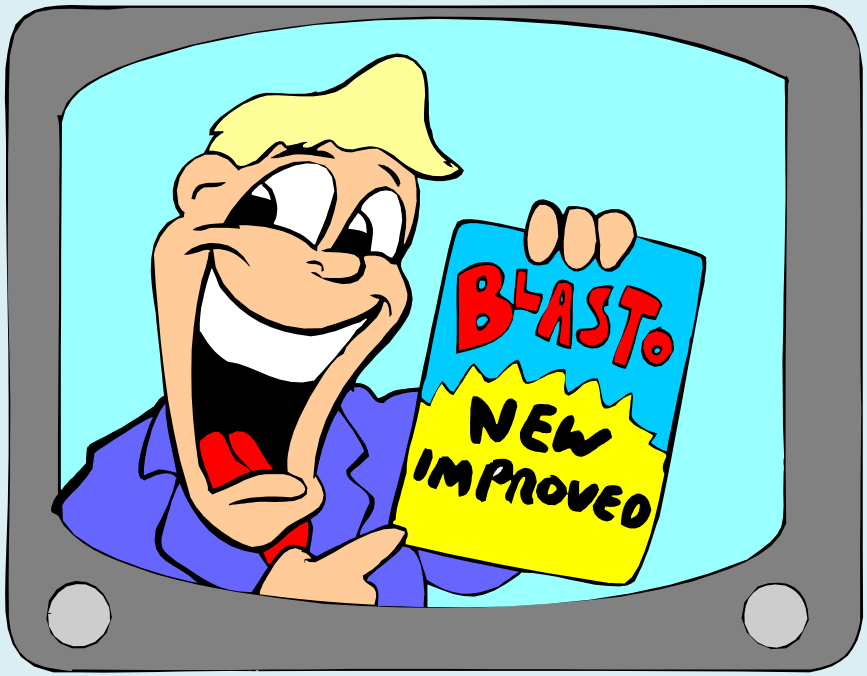
Improper maintenance

Improper maintenance

Homeowner Abuse

Use of chemical additives promoted to keep a septic system “healthy,” “free-flowing,” or “nourished”

Avoid costly septic problems! BLASTO Septic System Additive uses natural enzyme action to dissolve organic waste throughout your septic system, helping to keep waste lines clear and your septic tank “trouble-free”



Improper site evaluation

Improper installation

Improper installation

Illegal connections

How to identify a failing septic system?

SIGNS OF SEPTIC PROBLEMS

- Breakouts to surface
- Back-ups into building
- Sewage odors
- Lush green grass
- High bacteria counts

Failing or Malfunctioning?

- Failing: breaking out onto the surface, discharging to watercourse, or causing health hazards
- Malfunctioning: high levels in the septic tank, backing up into building – further assessment

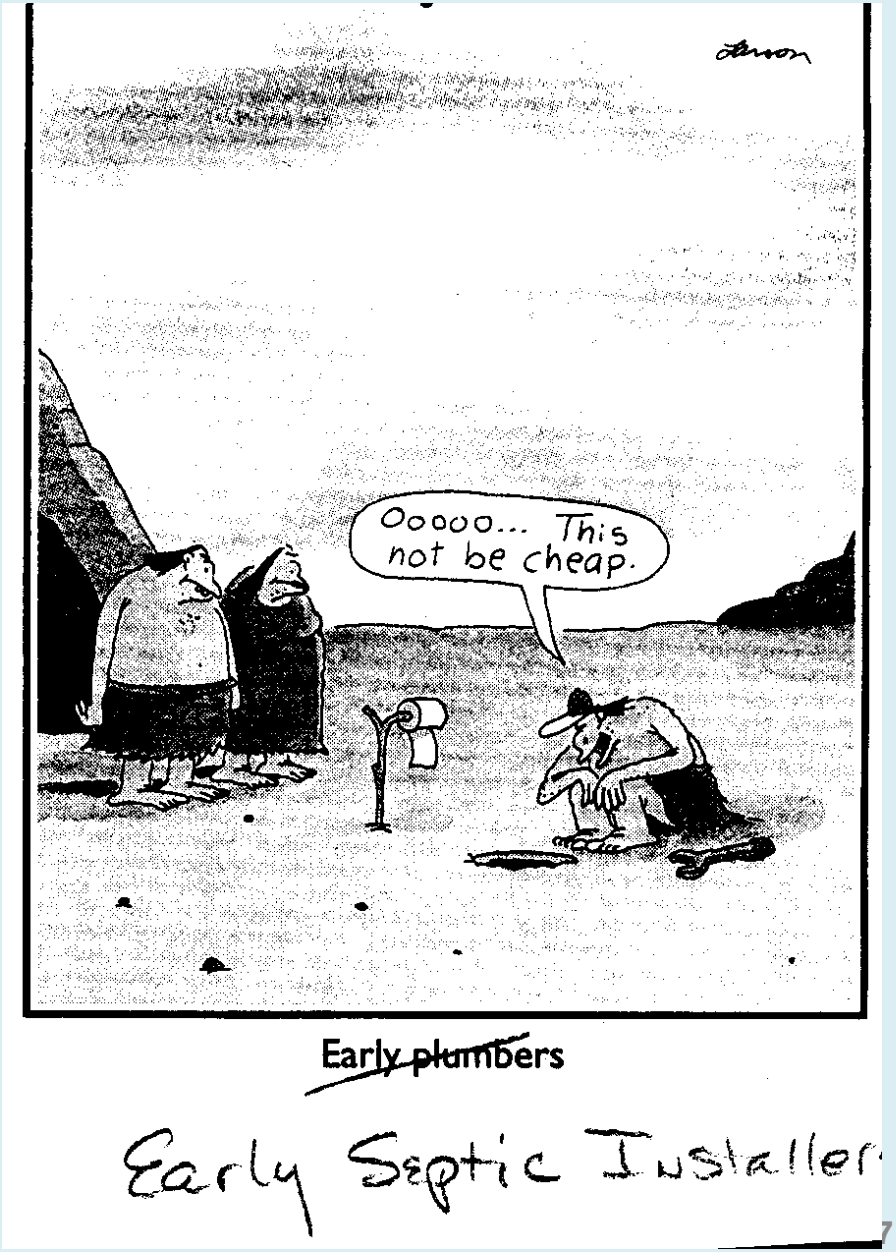
Problems Associated With Failing Systems

- Overflowing septic systems release bacteria and nutrients into the water cycle
- Contaminate nearby lakes, streams, estuaries, and ground water


(C) 2007-1991 Daniel Friedman


(C) 2006-1991 Daniel Friedman

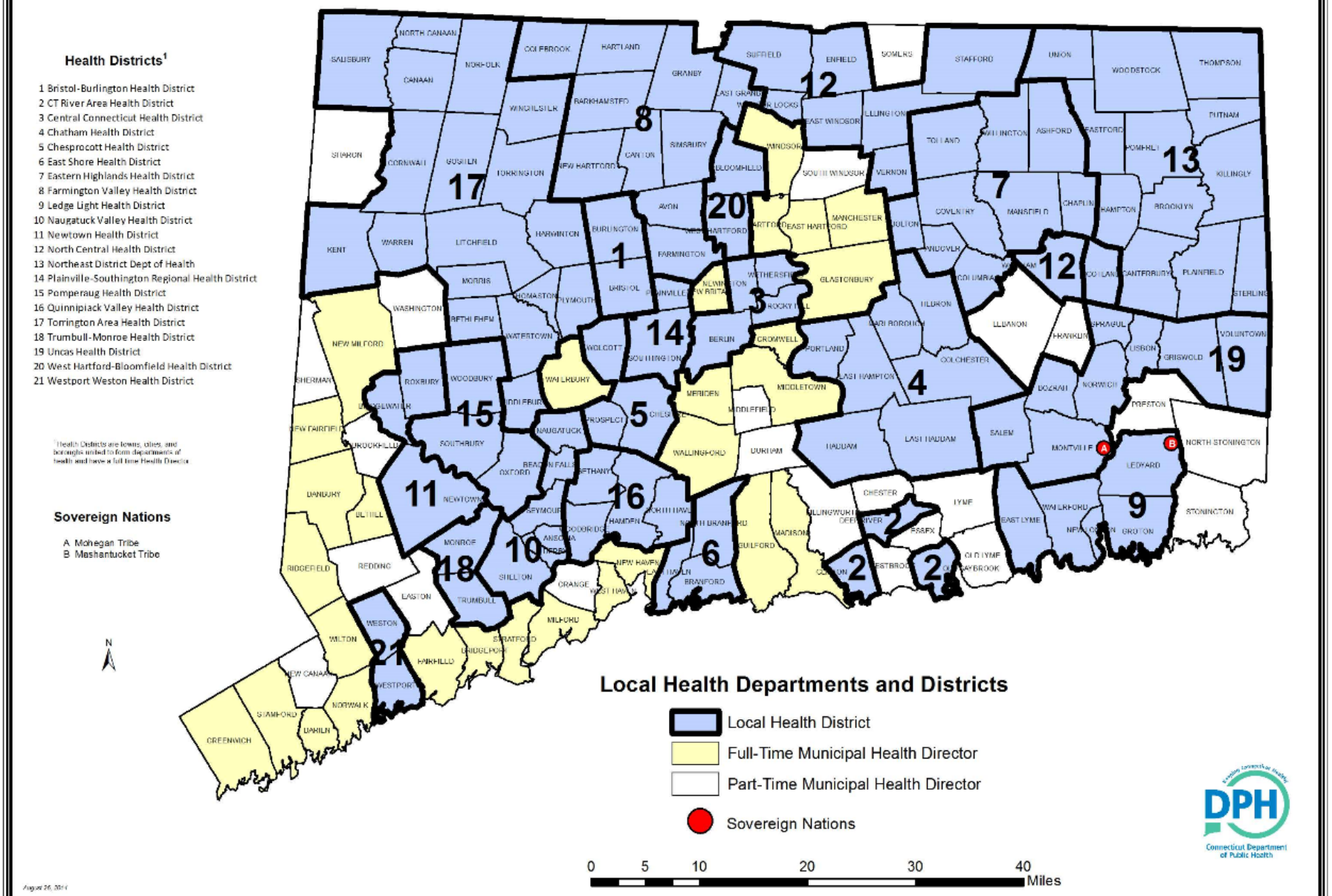
Why do people avoid fixing their system?



Who to contact?

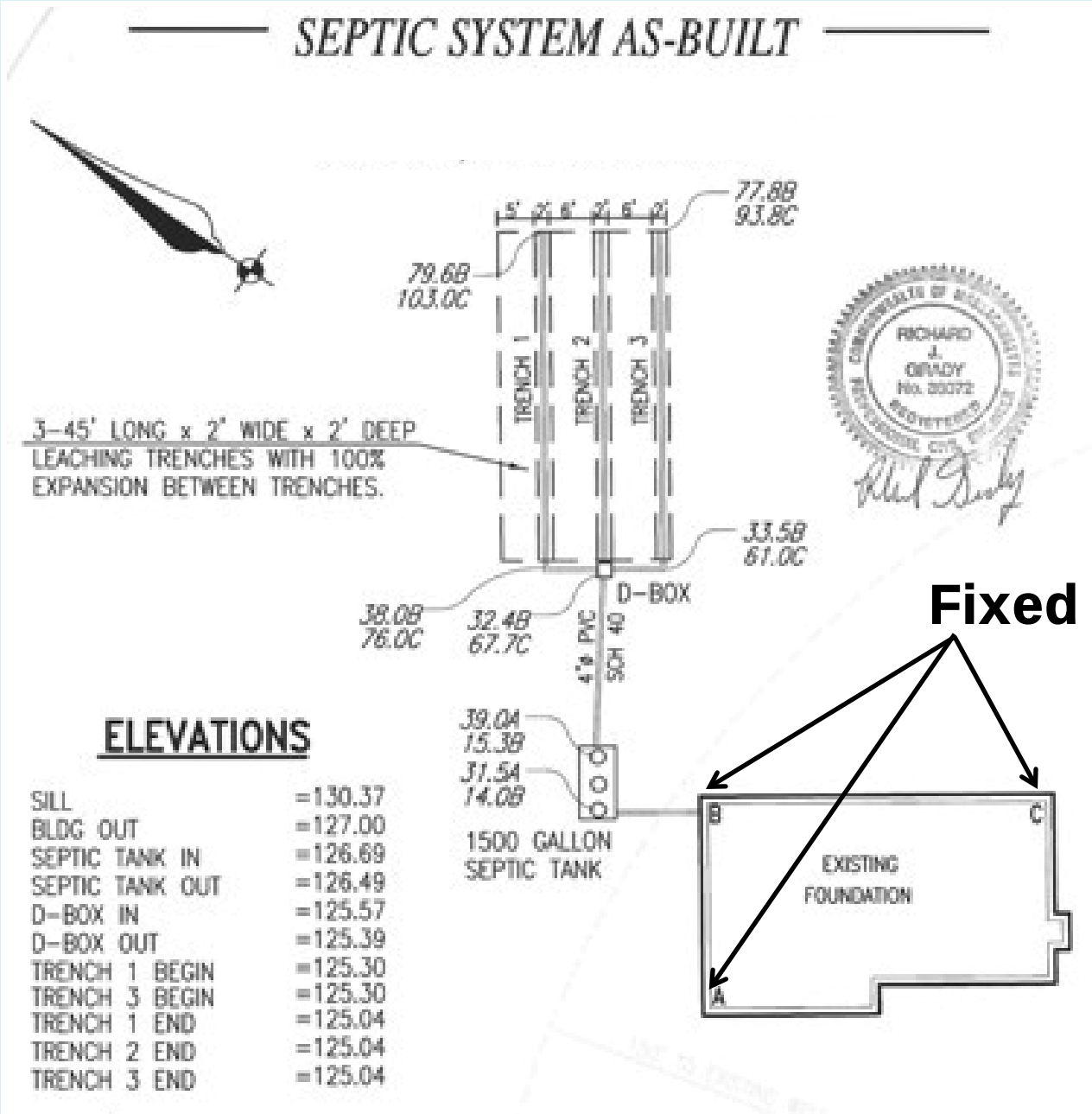
- Property owner
- Local Health Department (can issue orders)
- DEEP if large system (>5000gpd)

State of Connecticut
Local Health Departments and Districts
July 2014



Distances:
AC = 42’
BC = 20’
AD = 48’
BD = 25’

Tie Plan



Fixed points

Dye Testing

Dye Testing

Collecting Samples

- Testing for total coliform or Ecoli may not be conclusive due to other sources (birds, dogs, wildlife, natural processes)

- May want to sample for other parameters (ammonia, detergents)

Questions?

www.ct.gov/dph/subsurfacesewage