




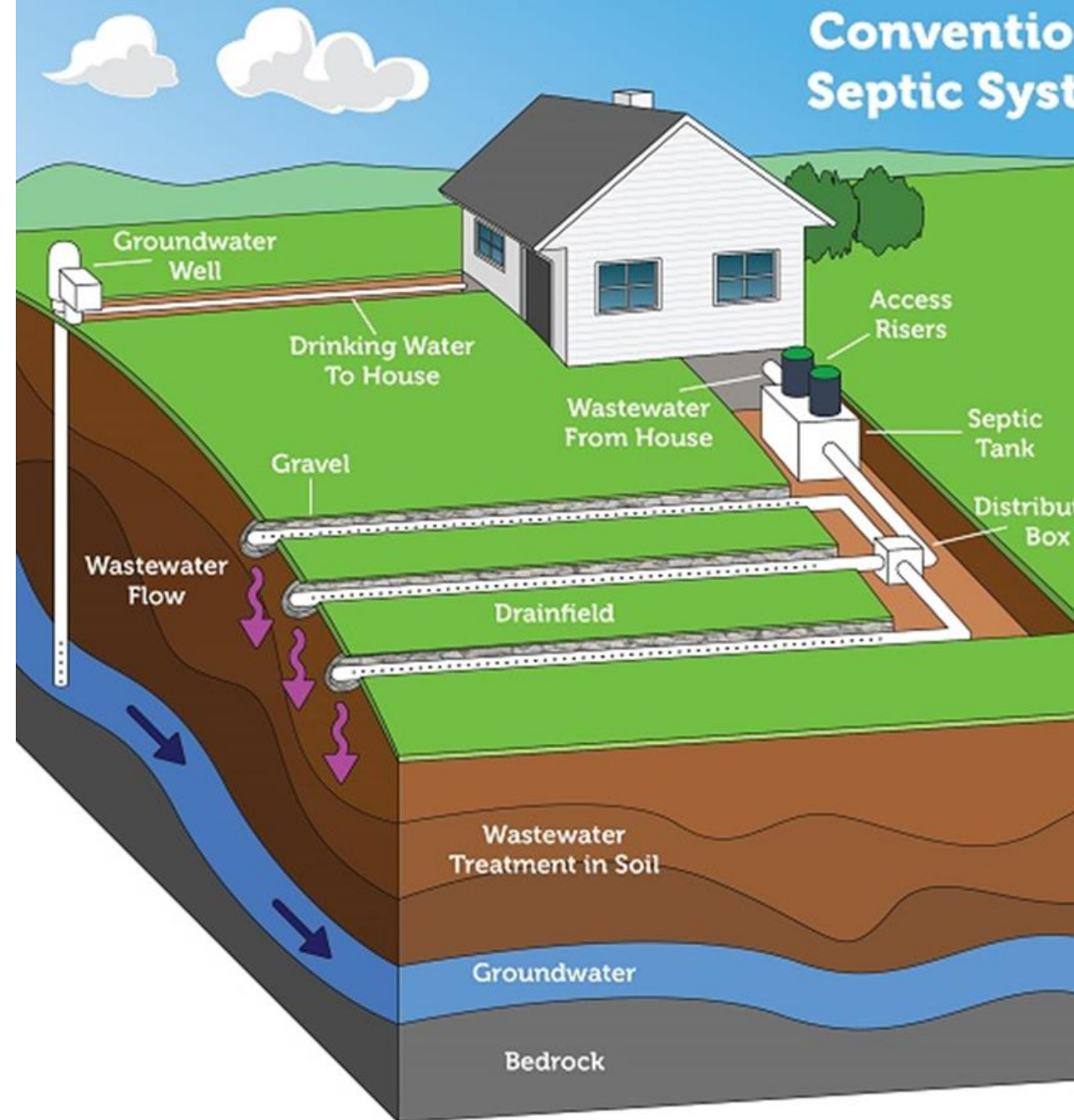
Septic Systems



Matthias Neville-Salt Lake County Bureau of Water Quality and Hazardous Waste

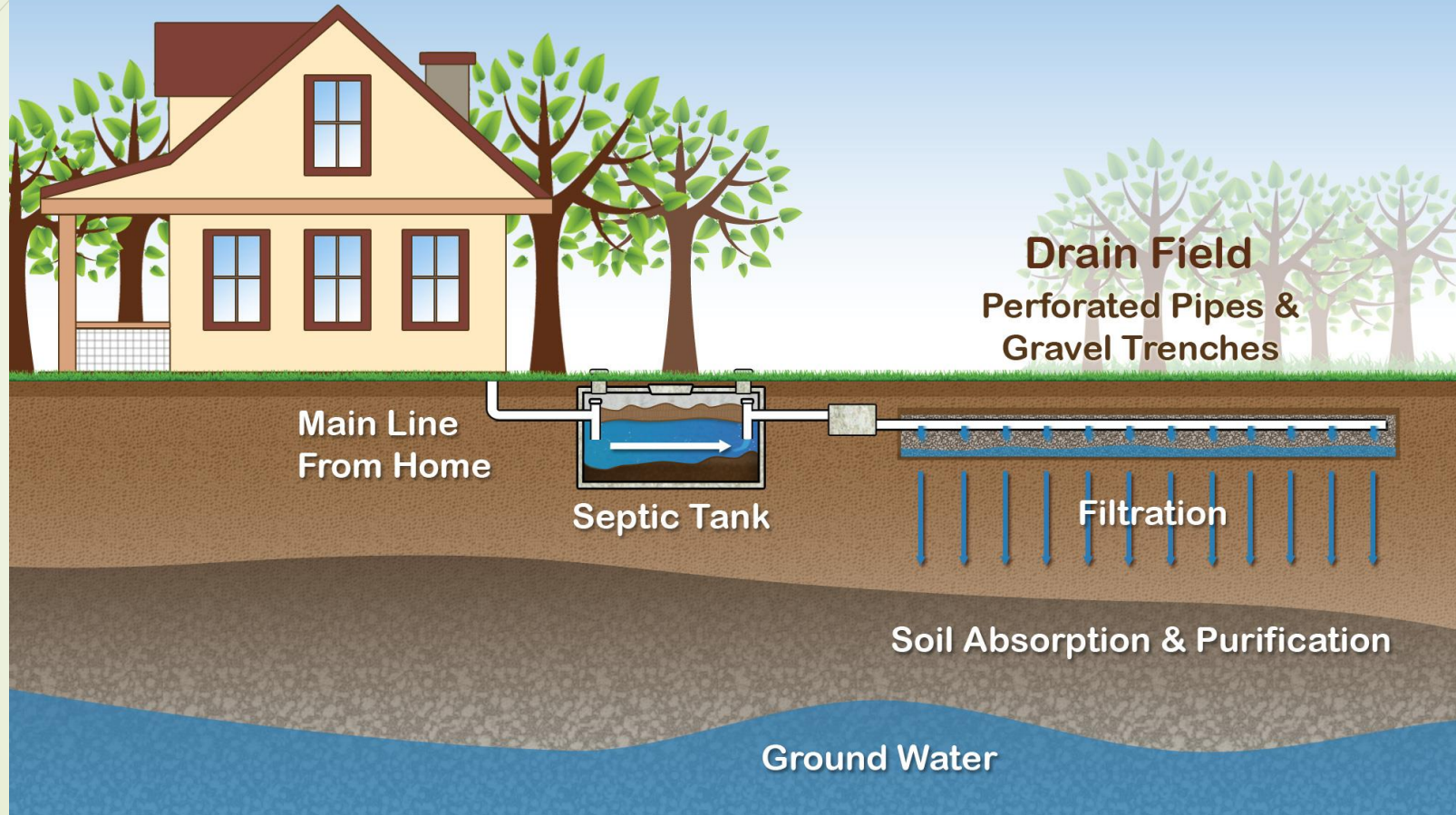
Septic System Basics-Conventional

- ▶ A system to treat and dispose of wastewater.
- ▶ Consists of a tank and a drainfield.
- ▶ Effective system but must be maintained properly.
 - ▶ Typical lifespan ~30-50 years



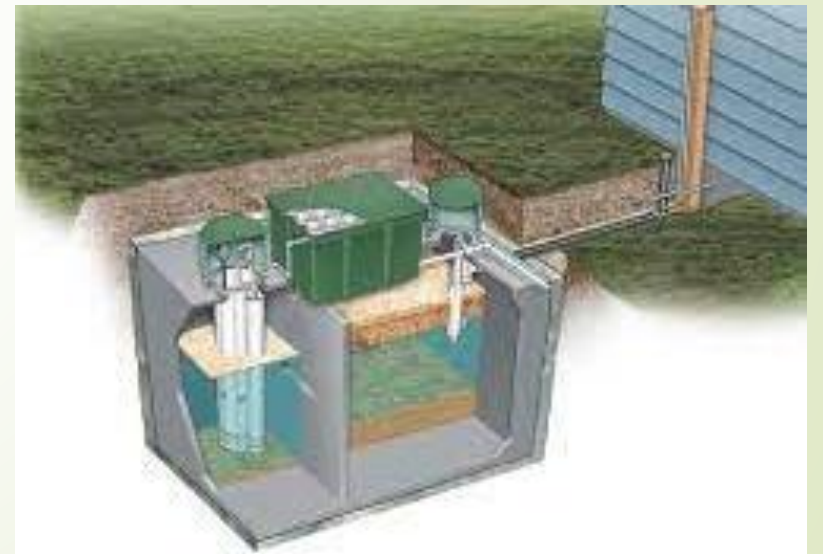
Please note: Septic systems vary. Diagram is not to scale.

Conventional Septic System



Alternative Septic Systems

- ▶ Use advanced filtration to clean the effluent before entering the soil
- ▶ Allowed in Salt Lake County Since 2013
- ▶ Packed Bed Media and Membrane Bioreactor (new)
 - ▶ Both NSF/ANSI Standard 40 and 245 Certified





NSF/ANSI Standards 40 and 245

Any residential system with a treatment capacity of 400-1500 gal/day (1514 L/day-5678 L/day).

- ▶ Standard 40: CBOD5 and TSS reduction
- ▶ Standard 245: Nitrogen reduction (plus meet Standard 40)
- ▶ Both: pH

Performance evaluation:

- ▶ No restriction for seasons
- ▶ No service or maintenance during entire six month test
- ▶ All test data reported
- ▶ No allowance for discard of any data, except if test facility fails to provide an acceptable test



Alternative Advantages

- Reduction in setback requirements
- 30% reduction in drainfield size
- Less daily flow
- Much cleaner effluent



Conformance with the minimum setback distances in Section R317-4-13 Table 2, except for the following that require a minimum of **50 feet of separation**:

- I. watercourses, lakes, ponds, reservoirs;
- II. non-culinary springs or wells;
- III. foundation drains, curtain drains; or
- IV. non-public culinary grouted wells, constructed as required by Title R309.

TABLE 2 – MINIMUM SEPARATION DISTANCES IN FEET (a)

Item Requiring Setback	From Building Sewers and Effluent Sewers	From Septic, Pump, and Others Tanks	From Absorption Area and Replacement Area
Absorption and Replacement Areas	--	5	(b)
Public Culinary Water Sources (c)	(c)	100 (c)	100 (c)
Individual or Nonpublic Culinary Water Sources (d)	25	50	100(e)
Culinary Water Supply Line	(f)	10 (f)	10 (f)
Non-culinary Well or Spring	10	25	100
Lake, Pond, Reservoir (a)	10	25	100
Watercourse (live or ephemeral stream, river, subsurface drain, canal, storm water drainage systems, etc.)	--	25	100 (g)
Building Foundation			
Without foundation drain	--	5	5 (h)
With foundation drain	--	10	100 (i)
Curtain drains	10	10	100 (i)
Dry washes, gulches, and gullies	--	25	50
Swimming pool (below ground)	3	10	25
Dry wells, catch basins.		5	25
Down slopes that exceed 35 %. (This includes all natural slopes or escarpments and any manmade cuts, retaining walls, or embankments.		10	50 (j)
Property line	5	5	5

- Chamber system is a conventional system but also get a 30% reduction in drainfield size.





Salt Lake County Health Regulation #13

- ▶ 4.9. Watershed. Any onsite wastewater system on property in the watershed area shall conform to the Department's Health Regulation #14, Watersheds. **All black water discharged from any property in a watershed area shall be discharged into a wastewater holding tank as outlined in Utah Administrative Rule R317-10.** Septic tanks with absorption systems shall be used for the disposal of other domestic wastewater in a watershed (from sinks, washbowls, bathtubs, washing machines, and dishwashers) in compliance with Utah Administrative Code R317-4.

How Big?

- ▶ Sized based on the number of bedrooms.
 - ▶ 1000 gallons for 3 bedrooms + 250 gallons for each additional bedroom
 - ▶ Drainfield is sized based on the number of bedrooms and how quickly water moves through the soil (perc tests)
 - ▶ Daily flow 150 gallons per bedroom per day.

"Bedroom" means any portion of a dwelling that is so designed as to furnish the minimum isolation necessary for use as a sleeping area. It may include a den, study, sewing room, or sleeping loft. Unfinished basements shall be counted as a minimum of one additional bedroom."

- Unfinished basement counts as one bedroom.



Test Pits



TABLE 5

MAXIMUM HYDRAULIC LOADING RATES FOR PERCOLATION TESTING

Percolation Rate (Minutes per Inch)	Absorption Systems Hydraulic Loading Rates (a) (gal/ft ² /day) (c)(d)(e)	Absorption Beds and Mound Systems Hydraulic Loading Rates (b) (gal/ft ² /day) (c)(d)(f)
0-10 (g)	0.90	0.45
11-20	0.70	0.35
21-30	0.60	0.3
31-40	0.55	0.27
41-50	0.50	0.25 (h)
51-60	0.45	0.22 (h)
61-90 (i)	0.40	(j)
91-120 (i)	0.35	(j)

TABLE 6

MAXIMUM HYDRAULIC LOADING RATES FOR SOIL CLASSIFICATION

Texture	Structure	Absorption Systems Hydraulic Loading Rate (gal/ft ² /day) (a)(b)(c)	Absorption Beds and Mound Systems Hydraulic Loading Rate (gal/ft ² /day) (a)(b)(d)
Coarse sand, sand, loamy coarse sand, loamy sand	Single grain	0.9 (e)	0.45 (e)
Fine sand, very fine sand, loamy fine sand, loamy very fine sand	Single grain	0.7	0.35
Coarse sandy loam, sandy loam	Massive	0.45	0.22 (f)
	Platy	0.5	0.25 (f)
	Prismatic, blocky, granular	0.65	0.32
Fine sandy loam, very fine sandy loam	Massive	0.4	(g)
	Platy	0.35	(g)
	Prismatic, blocky, granular	0.5	0.25 (f)
Loam	Massive	0.4	(g)
	Platy	(e)	(g)
	Prismatic, blocky, granular	0.5	0.25 (f)
Silt loam	Massive	(e)	(g)
	Platy	(e)	(g)
	Prismatic, blocky, granular	0.45	0.22 (f)
Sandy clay loam, clay loam, silty clay loam	Massive	(e)(h)	(g)
	Platy	(i)	(i)
	Prismatic, blocky, granular	0.4 (e)(h)	(g)
Silt, silty clay, sandy clay, clay	Massive	(i)	(i)
	Platy	(i)	(i)
	Prismatic, blocky, granular	0.35 (e)(h)	(g)

Example

- ▶ Jim wants to build a 5 bedroom home. A perc test was performed with a result of 5.7 min/inch. How big does his septic system need to be?

Equation: Daily flow/hydraulic loading rate

$750/0.9=$ **833.33 square feet** of drainfield required.

Tank: 1000 gallons for 3 bedrooms +250+250=**1500 Gallons**



Health Department Role

1. PURPOSE & APPLICABILITY OF REGULATION

1.1. The purpose of this Regulation is to provide for the health, safety, and general welfare of the citizens of Salt Lake County and **protect the environment through the regulation of illegal discharge of wastewater and pollutants** to the maximum extent practicable as required by federal, state, and local law.

1.2. This Regulation establishes methods for controlling pollution as defined herein. The objectives of this Regulation are:

1.2.1. To mandate connections of buildings to a public sewer system when the sewer is available to property;

1.2.2. **To permit and regulate the installation and use of onsite wastewater systems**, alternative onsite wastewater systems, wastewater holding tanks and pressure distribution systems;

1.2.3. To require and regulate toilet facilities; and

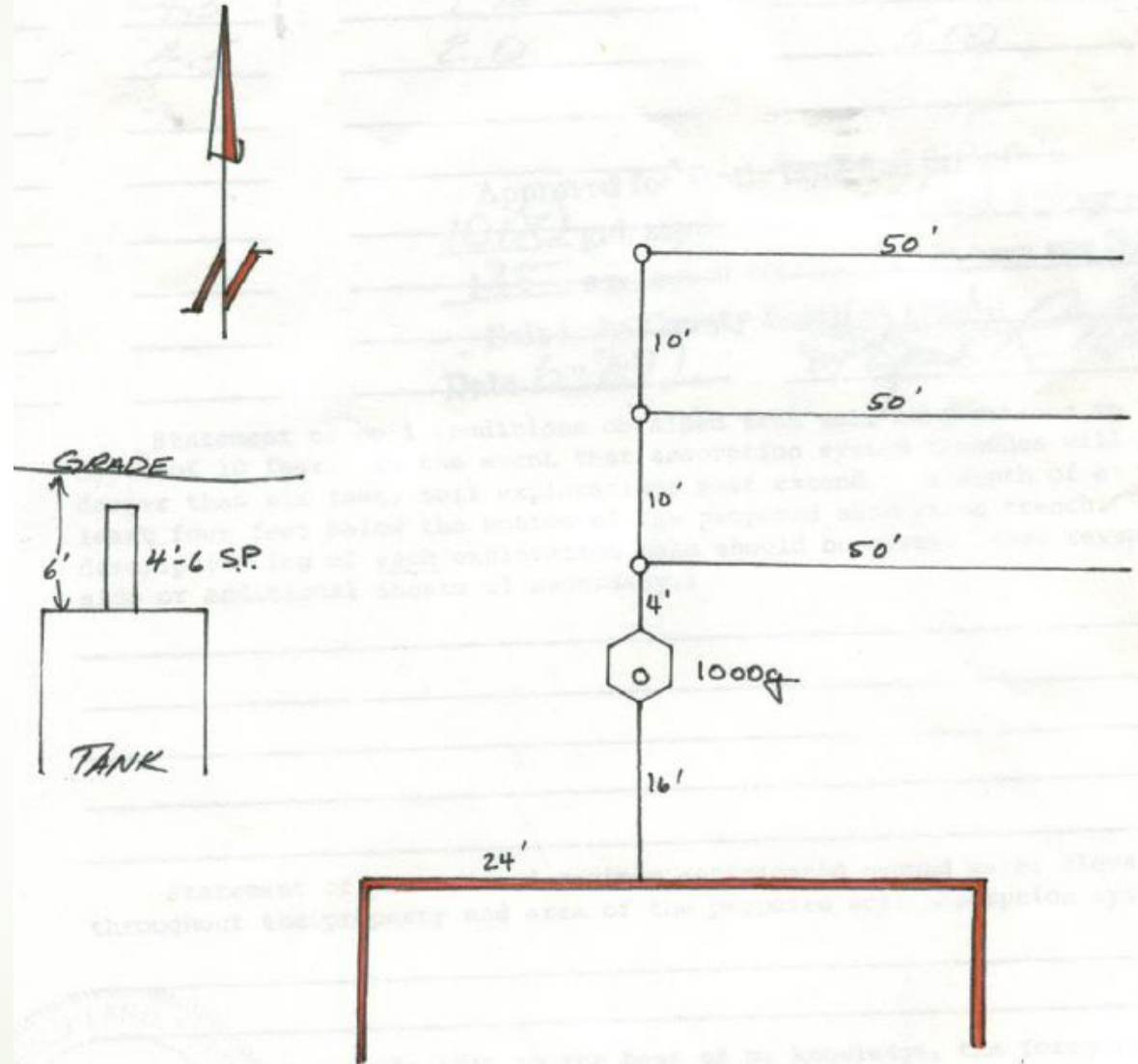
1.2.4. To prohibit the illegal discharge of wastewater.

reculation Test Yes No Number of Bedrooms 3 Septic Tank Size 1000
 ainfield Size 125 Square Feet Per Bedroom or 375 Total Sq. Ft.
 w Installation Yes No Existing Installation _____ Approx. Age _____
 stallation covered or uncovered at time of inspection uncovered
 ETCH: _____

Health Department Role Continued...

We want to help!

- ▶ We issue permits for new builds and major repairs (replacement of tank or drainfield)
- ▶ We can point you to septic designers and plumbers to help
- ▶ Provide as-built drawings
- ▶ Protect water quality
- ▶ We work with septic designers, installers, and plumbers to help determine best course of action
- ▶ Remodels-the size of your septic system counts



te of Final Inspection 7/19/77 Approved Rejected
 asons for rejection _____



Application Submission

Once plans are ready, submit them to HealthWater@slco.org, along with the following items:

1. Completed onsite wastewater construction permit application
2. Soil exploration/percolation test results
3. System design plans
4. House/Building plans
5. Water availability letter
6. Sewer service letter (if within the jurisdiction of a sewer utility)
7. Watershed construction letter from Salt Lake City Public Utilities (if within the watershed)

Once all necessary items are submitted and fees are paid, the application review will begin. Please allow 10 business days for review.

If the design does not meet code requirements or items are missing, we will provide comments and the applicant can respond and update the plans to meet code requirements or address deficiencies.

Approved applications will receive a permit, stamped copy of the approved plans, and an approval letter.

Permits expire one year from the date of issuance, but extensions may be granted upon request.

Systems should be installed according to the approved plans. Any changes must be reviewed and approved by Salt Lake County Health Department. Systems must be inspected by the department prior to backfilling.

Alternative systems, pressure distribution, and holding tanks require operating permits to ensure they are properly maintained. These permits must be renewed yearly. Receiving an operating permit requires owners to show they are maintaining their systems appropriately.



You are not alone

In 2022, Salt Lake County received 29 onsite wastewater applications

Operation and Maintenance

Repairs/replacements

Perc Tests/Test Pits

Big Cottonwood Canyon

Little Cottonwood Canyon

Emigration Canyon

Herriman

Random areas of the cities

What should you do?

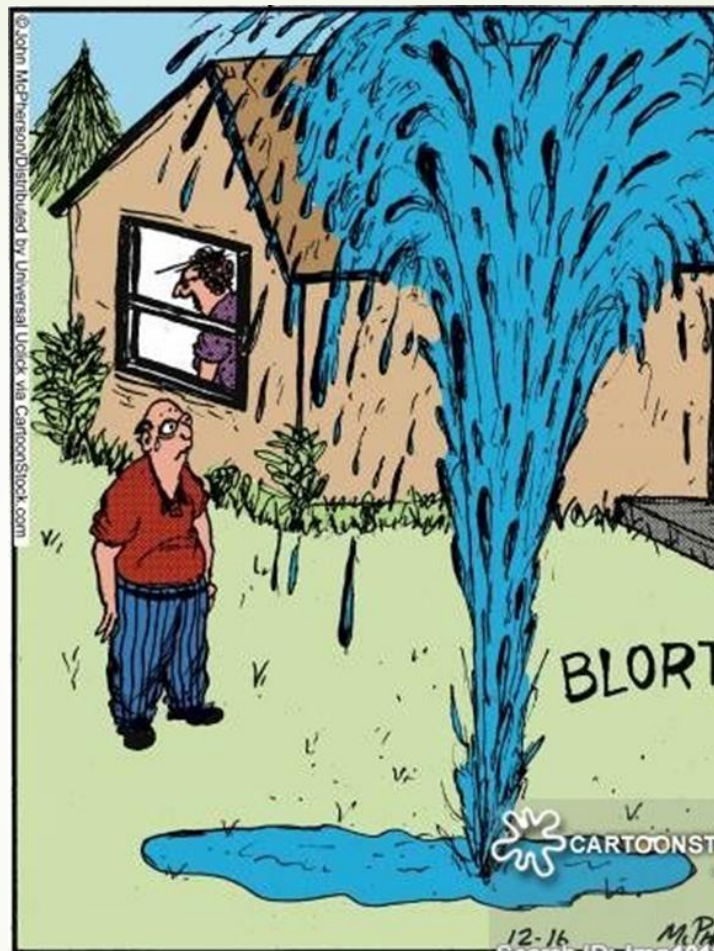
- ▶ Septic systems require maintenance
- ▶ Learn about them
- ▶ Do you know where your tank is? Drainfield?
- ▶ Know who to call

- ✓ Have your system inspected every three years by a qualified professional or according to your state/local health department's recommendations
- ✓ Have your septic tank pumped, when necessary, generally every three to five years
- ✓ Avoid pouring harsh products (e.g., oils, grease, chemicals, paint, medications) down the drain
- ✓ Discard non-degradable products in the trash (e.g., floss, disposable wipes, cat litter) instead of flushing them
- ✓ Keep cars and heavy vehicles parked away from the drainfield and tank
- ✓ Follow the system manufacturer's directions when using septic tank cleaners and additives
- ✓ Repair leaks and use water efficient fixtures to avoid overloading the system
- ✓ Maintain plants and vegetation near the system to ensure roots do not block drains
- ✓ Use soaps and detergents that are low-suds, biodegradable, and low- or phosphate-free
- ✓ Prevent system freezing during cold weather by inspecting and insulating vulnerable system parts (e.g., the inspection pipe and soil treatment area)



Signs Of Trouble

- Plumbing not working or backing up into the house
- Plumbing is really slow
- Wet spots in your yard
- Foul smells




“Rick, I think something is wrong with the septic system. The toilet is flushing kind of slowly.”





Challenges

- ▶ Slopes-Cannot exceed 35% for drainfield
- ▶ High ground water
- ▶ Proximity to streams or wells
- ▶ Old system
- ▶ No room for a new drainfield

- 
- 3.11. Repair of a Malfunctioning or Unapproved System.
 - Upon determination by the regulatory authority that a malfunctioning or unapproved onsite wastewater system creates or contributes to any dangerous or unsanitary condition that may involve a public health hazard, or noncompliance with this rule, the regulatory authority shall order the owner to take the necessary action to cause the condition to be corrected, eliminated or otherwise come into compliance.
 - A. For malfunctioning systems, the local health department shall require and order:
 - 1. all necessary steps, such as maintenance, servicing, repairs, and replacement of system components to correct the malfunctioning system, **to meet all rule requirements to the extent possible and may not create any new risk to the environment or public health;**
 - 2. effluent quality testing as required by Subsection R317-4-11.4;
 - 3. evaluation of the system design including non-approved changes to the system, the wastewater flow, and biological and chemical loading to the system;
 - 4. additional tests or samples to troubleshoot the system malfunction.
 - B. The regulatory authority may require fees for additional inspections, reviews, and testing.



Takeaways

- ▶ We want to help you. We want to work with you.
- ▶ Know your system. If you don't know where it is, find it.
- ▶ Recognize the signs of a struggling septic system and take action when they come up.

Questions?

► Contact Information

- Matthias Neville
mrneville@slco.org
(385)-468-3862

<https://slco.org/health/waste/septic>

