

On-site Wastewater Treatment Systems (OWTS)

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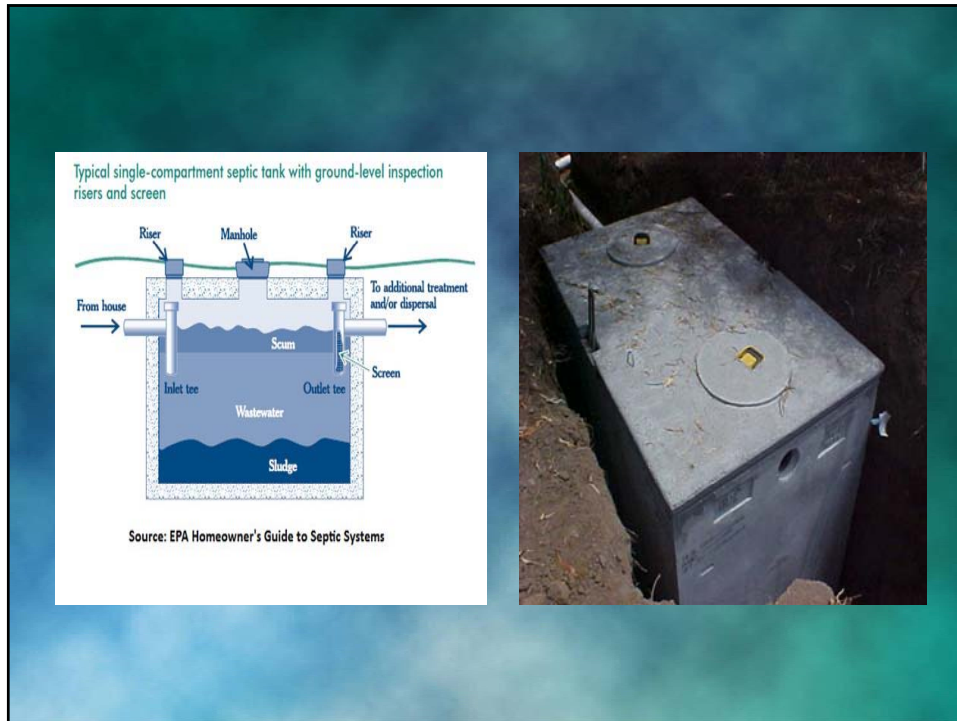
Topics

- Basic OWTS system design and function
- OWTS maintenance
- OWTS failures & repairs
- OWTS-STS (Supplemental Treatment Systems)
- Graywater Systems
- Questions

On-site Wastewater Treatment Systems (OWTS)

What is an OWTS?

- A subsurface sewage disposal system that uses a combination of a septic tank and a effluent dispersal mechanism. This is a two stage process
 - 1st stage: A two compartment septic tank separates the raw sewage into 3 phases: A scum layer made up of fats, oils, and grease (FOG) that rises to the top of the tank, a sludge layer made up of undissolvable matter that settles to the bottom of the tank, and a clarified liquid layer in middle of the tank.



- 2nd stage: Soil Absorption- the clarified water from the middle of the tank is sent out to a leach field that provides area for the bacteria in the soil to destroy pathogenic bacteria and remove nitrogen (10-50% removal). The soil can also retain some viruses and chemicals.
- Types of Soil Absorption in San Diego County:
 - Leach Lines (including graveless chambers)
 - Horizontal Seepage Pits (30mpi or better soils)
 - Vertical Seepage Pits (coastal areas only)

Soil Absorption Systems



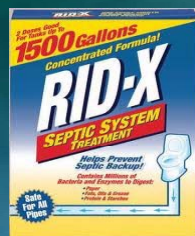
OWTS Maintenance

- Domestic waste only: never put chemicals, industrial waste, solvents, paint, pesticides, or fertilizers into your OWTS.
- BLEACH !: use in moderation, never pour large amounts down the drains.
- Limit the use of the garbage disposal
- Throw away FOG's instead of pouring down the drain.
- Don't flush non-biodegradables, paper towels, feminine hygiene products.

OWTS Maintenance

- Don't use excessive antimicrobial soaps and products.
- Don't flush unused antibiotics.
- Use less water.
- Pump septic tank every 3-5 years.
- Don't drive/park on leach lines (ok for H and V pits)
- Divert roof and surface drainage away from leach field

Septic Tank Additives



See Our Selection of Septic Additives and Care Products

DON'T USE THEM



OWTS Failures

- Average life expectancy of an OWTS is ~30 years with proper use and maintenance.
- San Diego County Code requires all new developed lots maintain a primary OWTS that meets all code requirements plus 100% reserve area.
- This reserve area is for the purpose of providing an area to repair a failing OWTS.

Signs of a Failing OWTS

- Plumbing/Flushing is slow and eventually backs up into the house.
- Plumbing breaks, broken fittings.
- “Smelly” water surfacing around the area of the septic tank and/or leach field.
- Pumping frequently to prevent any of the above.



Septic Repairs

- A typical repair will consist of 200-300 ft of additional leach line added to the existing leach field. If the existing leach field is not usable a repair close to the size of the original system is recommended.
- County Code requires a failing system be repaired within 30 days. If a Notice of Violation was issued, a repair permit must be obtained within 5 days.
- Immediately pump the septic tank and as often as necessary to confine sewage subsurface.

Septic Repairs

- In areas with known high groundwater that does not allow a repair to meet the required 5ft to groundwater separation, a Supplemental Treatment System (STS) also commonly referred to as an advanced treatment system or ATU, may be required.

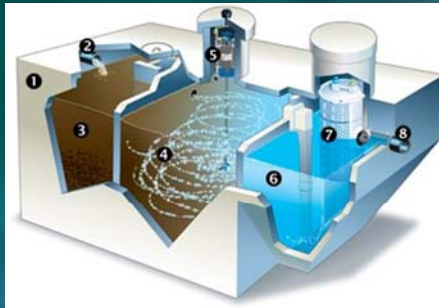
On-site Wastewater Treatment Systems - Supplemental Treatment Systems (OWTS-STs)

OWTS-STs

- On July 24th 2015, the Board of Supervisors voted to adopt the Local Area Management Plan (LAMP). County Code was amended to reflect the requirements in the LAMP and went into effect on August 24th 2015.
- The LAMP allowed the county to allow the use of advanced treatment systems as an approved system for new construction. Previously, such systems were only allowed as experimental repairs.
- The LAMP also allowed for a reduction to groundwater and soil depth requirements when an OWTS-STs was used.

Types of OWTS-STS's

- Advanced Treatment Tanks – stand alone aerobic treatment tanks. Examples: Jet J750, Singular Green 960, & Pekasys
- Recirculating Treatment Systems- take septic tank effluent and recirculate over a treatment surface. Examples: Anua Bio Peat & AdvanTex.
- Others: All OWTS-STS's must have NSF40 standard approval.



Why use an OWTS-STS?

- High groundwater is the most common use.
- Lack of soil depth.
- Small lots size, lack of available area for a standard leach field.
- Very poor percolating soils (heavy clay soils)
- Proximity to impaired water bodies and areas that require for a greater reduction of nitrogen and pathogens.

OWTS-STS Pollutant Reductions

<u>WQ Parameter</u>	<u>Removal in Septic Tank</u>	<u>With Aerobic Treatment</u>
BOD	15 – 50%	75 – 90%
TSS	25 – 45%	75 – 90%
Nitrogen	<10%	40 – 90%
Enteric Bacteria	10 – 40%	High but variable
Enteroviruses	No significant reductions	High but variable

OWTS-STS Effluent Disposal

- Similar to a conventional system, the treated effluent must be disposed of by way of a soil dispersal system.
- Drip dispersal lines allow the disposal to be done over an area, slowly throughout the day, rather than in peak flows as in septic systems.
- Drip dispersal lines are installed at a much shallower (6"-12") depth than leach lines (3'-5')



Disadvantages of OWTS-STS's

- Cost: an OWTS-STS will typically cost 2-4x as much as a conventional system.
- Complexity and Maintenance
 - Engineer designed
 - Annual Operating Permit
 - Requires a service contract with a qualified provider,
 - Replacement parts costs over time.
 - Cost of electricity for pumps.
 - Drip dispersal lines susceptible to damage over time from plant roots and homeowner planting/digging.

Graywater Systems

Common Uses/Reasons

- The most common reason people on an OWTS use a graywater system is to “help” a failing or near failing OWTS.
- Irrigate my yard/trees/plants.
- I want to save the environment and do my part with water savings.

Common Misconceptions With Graywater Systems

- I’m allowed to use all my graywater without permits.
 - The state Graywater Rules allow for a “Clothes Washer system” to be used without a permit.
- I can use my graywater to water my trees/irrigate my yard.
 - You can do both of these as long as its subsurface.
- I can collect all my graywater in the “container” and then pump out of it.

Graywater vs. Blackwater

Analysis	Graywater	Blackwater	Graywater %	Blackwater %
BOD5 g/p.d	25	20	56%	44%
Total Phos. g/p.d	2.2	1.6	58%	42%
TKN g/p.d	1.1	11	9%	91%
Plate count 35°	83 x 10e9	62 x 10e9	57%	43%
Fecal Coli. 44°	1.7 x 10e9	3.8 x 10e9	31%	69%
TSS mg/L	148	363	29%	71%

g/p.d = grams/person per day
BOD5= 5 day Biological Oxygen Demand
TKN= Total Kjeldahl Nitrogen- sum of all organic nitrogen, ammonia (NH₃) & ammonium (NH₄⁺)

Clothes Washer Systems

- A Clothes Washer system is allowed by law to be used without review requirements or permit to install.
- The Clothes Washer systems is specifically defined as discharge from a laundry machine ONLY.
- Does not require plumbing installation.
- Does not use a pump.
- The graywater must be discharged into a gravel or mulch basin with a minimum of 3 inches or rock or mulch cover over the discharge point.
- The discharge is not allowed to surface or run off the property.



Costs for Graywater Systems (non clothes washer system)

- Graywater System Design Field Review
 - \$447.00
- Graywater System Installation Permit
 - \$388.00
- Graywater System Permit-Reinspection
 - \$173.00