

UNIVERSITY OF MINNESOTA

ONSITE
SEWAGE
TREATMENT
PROGRAM

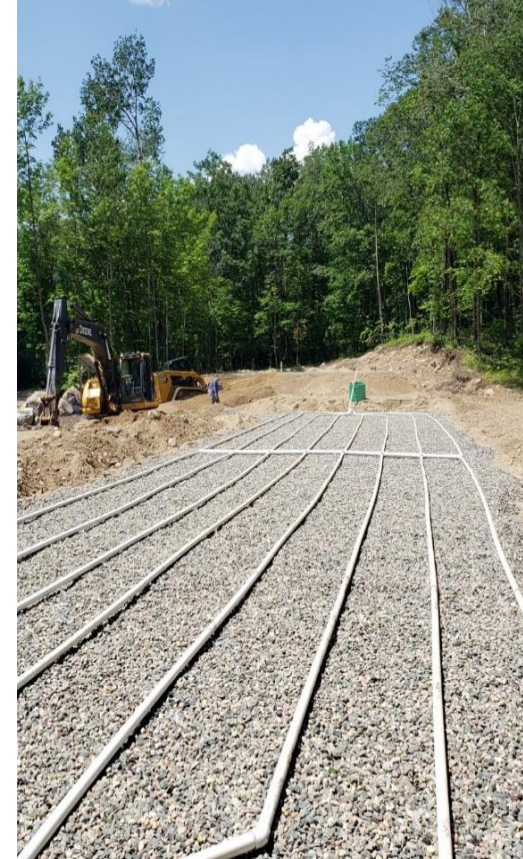


Onsite | 2024
Spokane, WA
Wastewater
Mega-Conference

Celebrating Tomorrow's Environment
Clean Water for the Future



Considerations for Septic Systems Serving Vacation Home Rentals



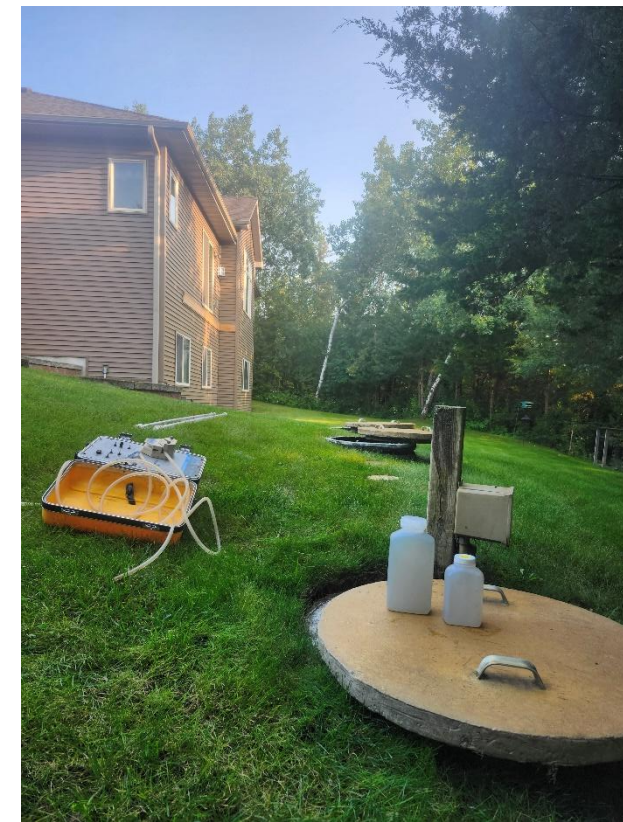
Dr. Sara Heger, sfheger@gmail.com

*The materials being presented represent my own opinions,
and do NOT reflect the opinions of NOWRA.*

Short-Term Rental (STR) Presentation Overview

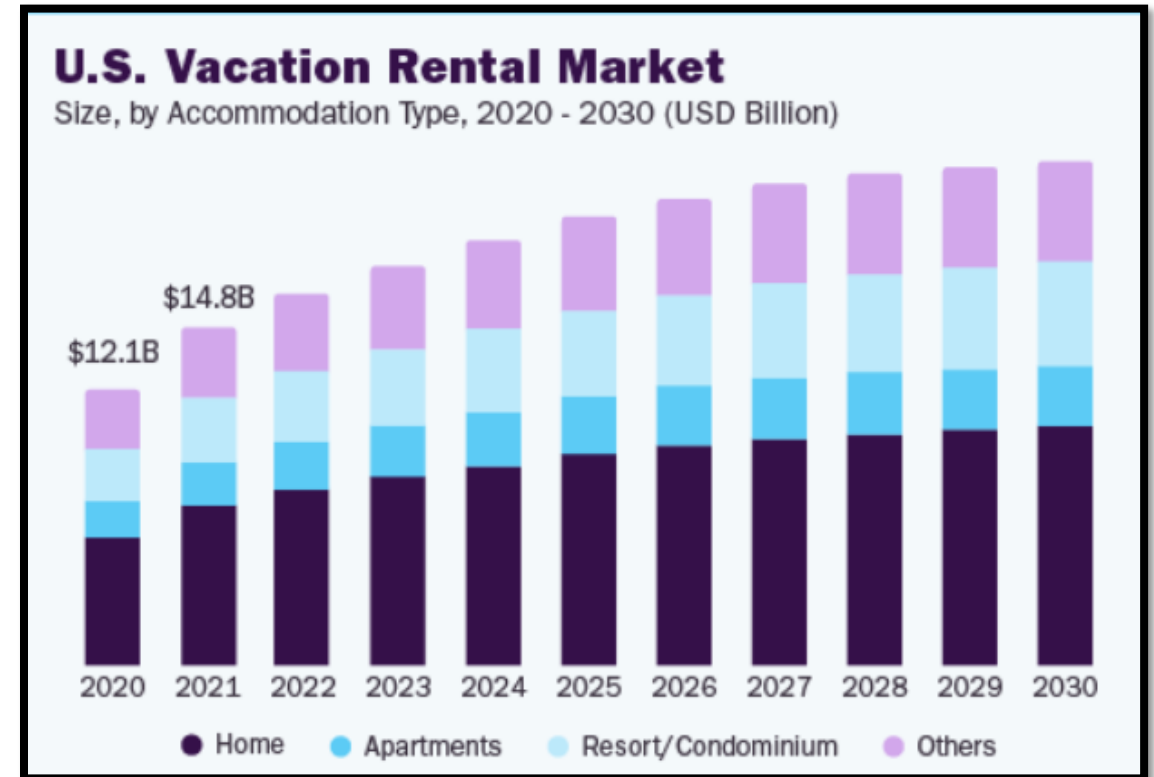
- Overview and education of owners and users
- Design considerations
- Installation considerations
- Management consideration
- Regulatory considerations

Overview and Education



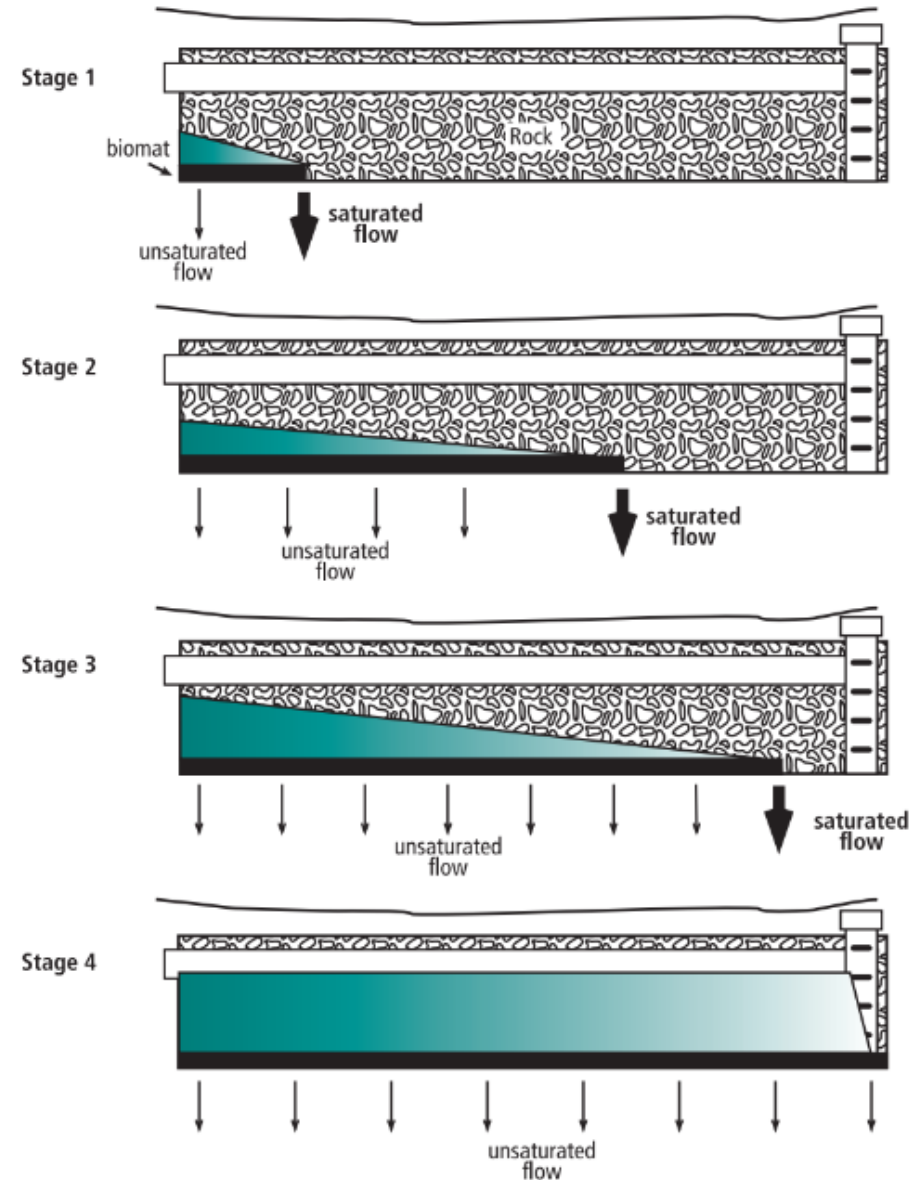
Overview

- According to the AirDNA the U.S. STR hit record highs in 2023
- More and more of your customers may be renting out their vacation homes/cabins either part time or full time
- Challenges
 - may require more frequent maintenance and management
 - property owners could irreparably damage their system if these issues are not addressed

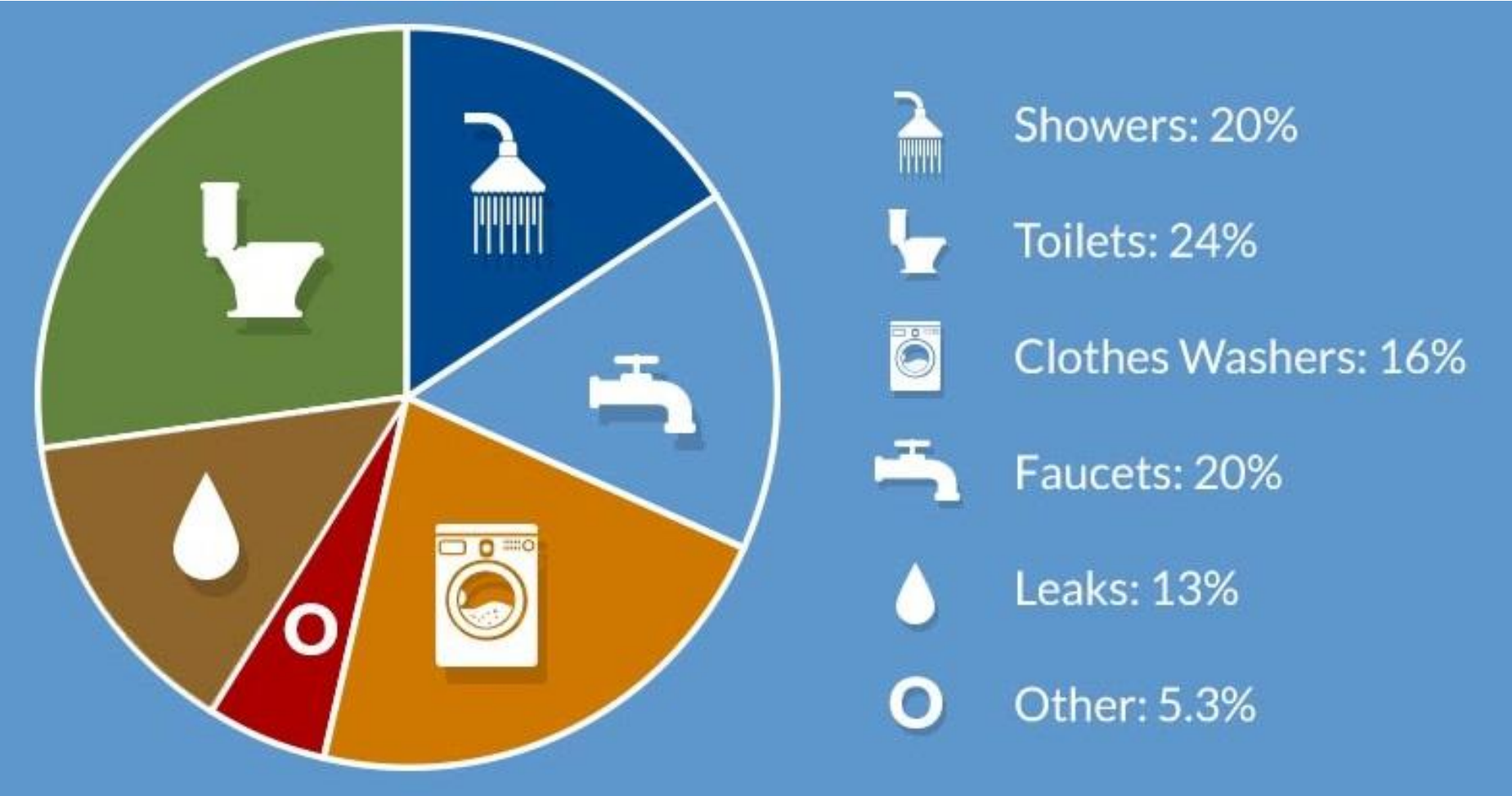


Education

- Owner
 - During new system design need to account for additional usage – real or potential
 - During bidding of the installation, discussion about optional protections to add to the design
 - Conventional systems may need more management
 - Understanding of increased usage and its impact on system longevity



Discuss Water Using Device Upgrades



Bathroom Recommendations

- Toilet is #1 water user in a homes
- Replace old 5+ gallon flush toilets with low or dual flush toilets to use 1.6 gallons per flush or less
- Look for WaterSense Label
- Fix leaking problems
 - Typically, a simple gasket that if not replaced can add 100s of gallons of water per day
- Low flow showerhead and faucets can help too

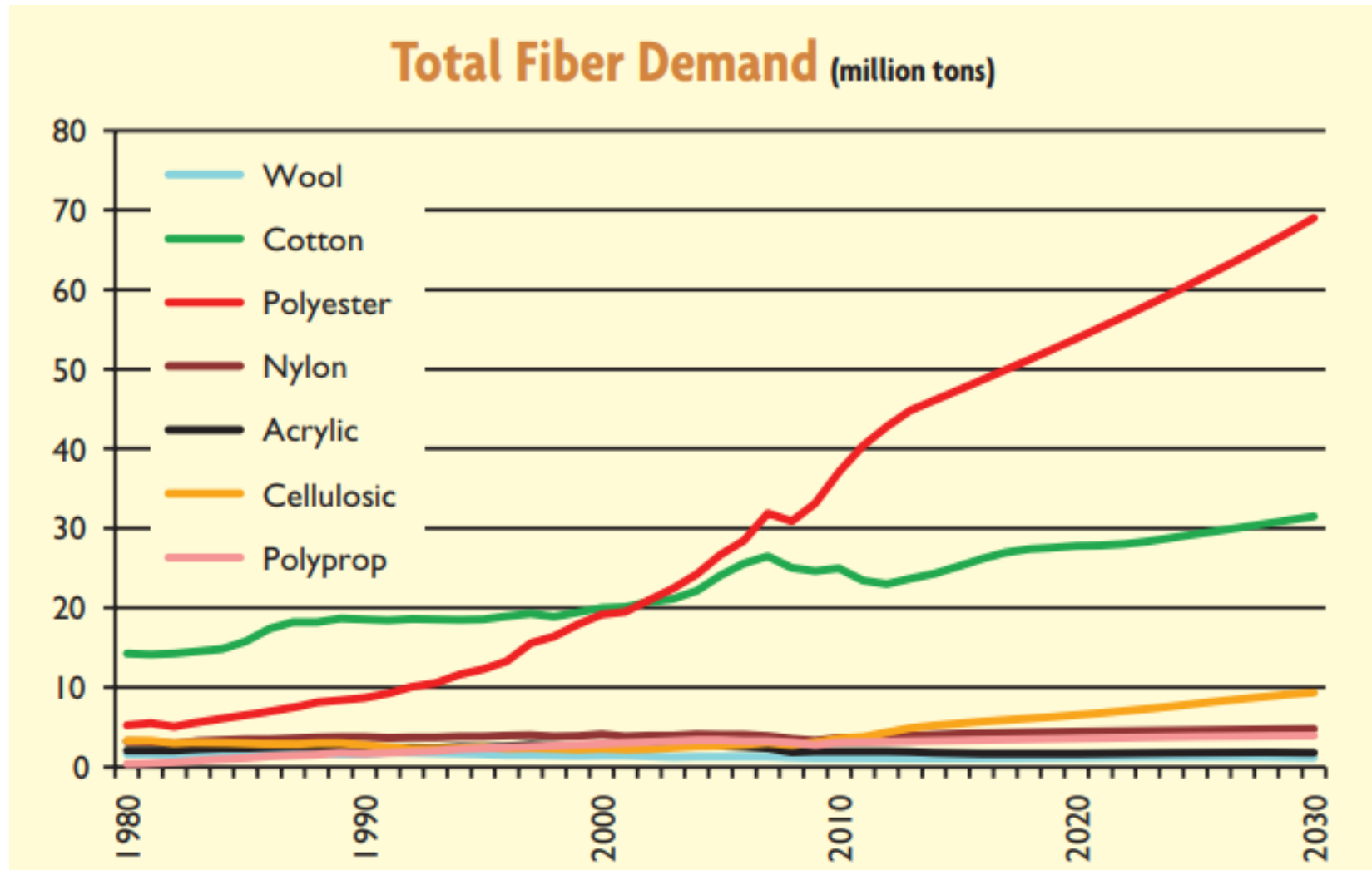


Laundry Recommendations

- Install front loading or efficient top loading machines
 - 65% less water
 - 12 – 20 gallons
 - Less electricity to dry clothes
 - Energy star label
- Do not do all the sheets and towels at the home when rental turns over – have an extra set



Increase in Synthetic Fibers



Laundry Cont'd

- Chose a non-agitating washing machine (less lint)
- Add a washing machine lint filters:
 - Washing clothing releases a lot of lint, much of which is inorganic
 - Install an after-market lint filter
- Equip the septic tank with an effluent filter and alarm





Laundry Filters

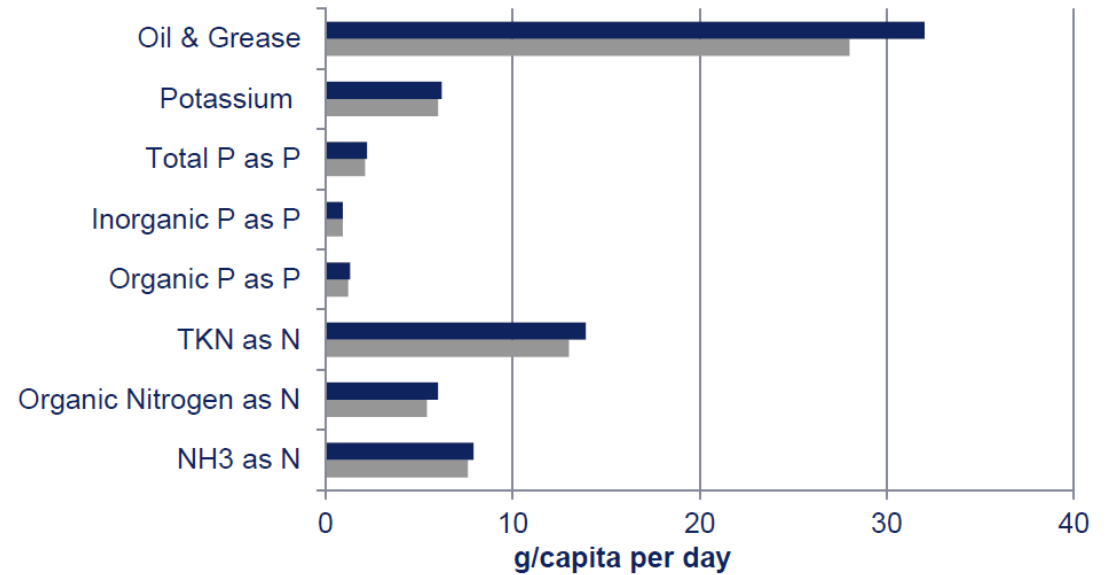
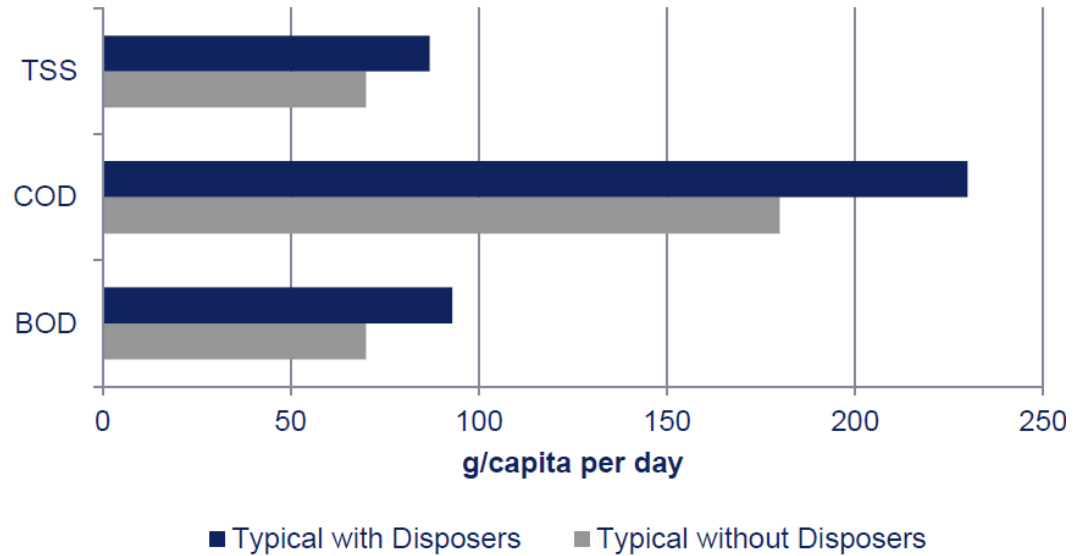
- Data collected in MN shows the average family produces 2 pounds of lint per year
- Equivalent to 90 plastic water bottles

Kitchen Recommendations

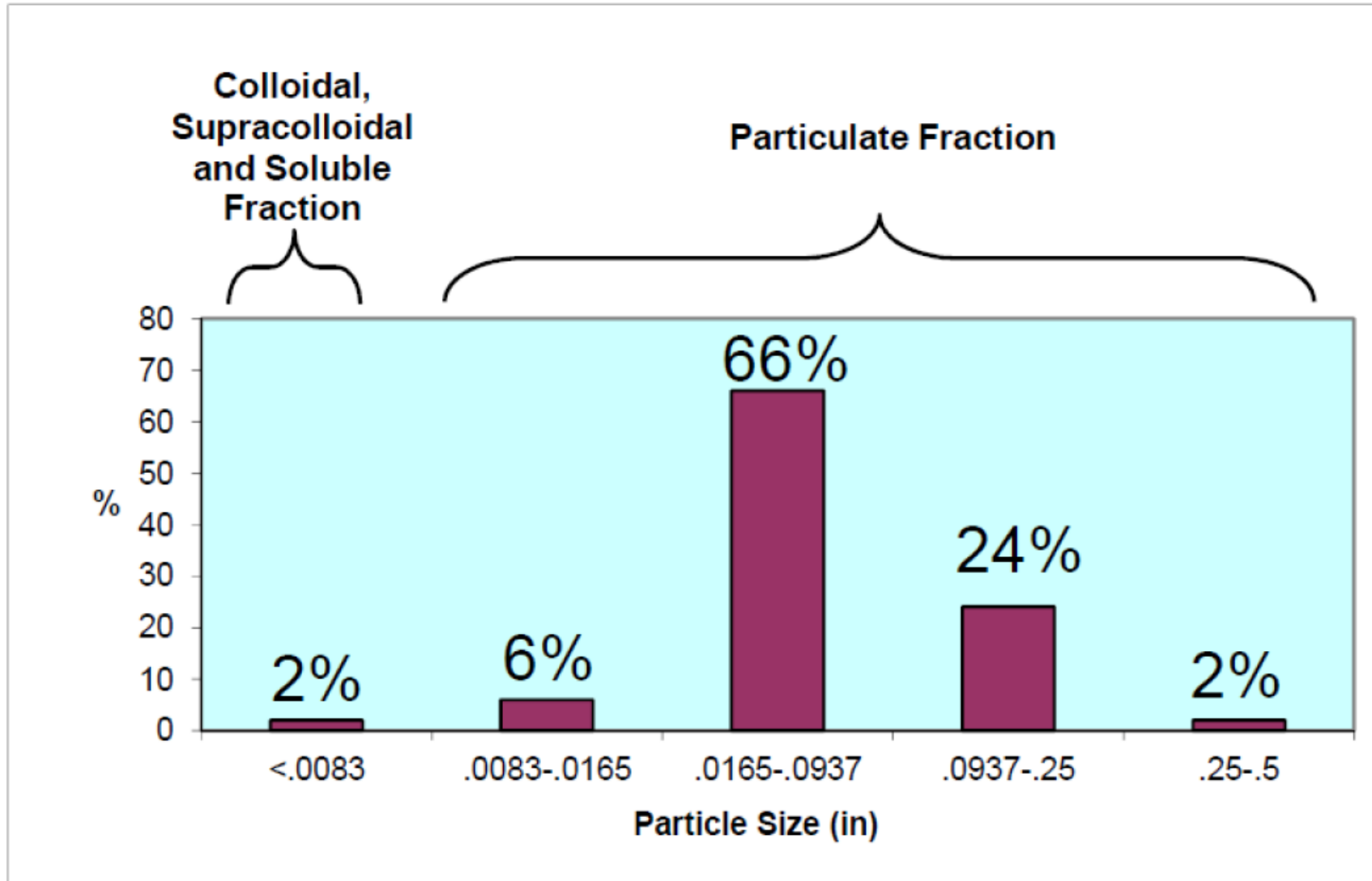
- Better to not have a garbage disposal
- Good strainers to catch food waste
- Provide natural-based cleaners and soaps
- Do not use pods (contain plastics)



Garbage disposal - Effluent Quality




TSS 33% and BOD 24% an increase



Particle Size Distribution of Ground Food Waste Based on Fineness Testing.

Cleaning Challenges

- How will they use their rental
- Booking types
 - Weekly
 - Weekends
 - Daily
- Each time one group leaves the entire unit/home is cleaned



Overview Amenities Policies Location

Condo

Brand New Duplex Across the road from Devils Lake w/lake access

★ 5.0/5 Exceptional

[See all 5 reviews >](#)

3 bedrooms 2 bathrooms Sleeps 10

\$300 per night

Cleaning Challenges Cont'd

- Is done on-site or off-site
- Loads when the unit turns over
- Extra sheets and towels available
- Type of cleaning products used
 - More sanitizers are being used
 - No quats – “**ammonium chloride**”



Education

- User
- For owners of rental properties outreach materials must be used to help educate rental guests that
 1. Home is on a septic system, and
 2. Tips on what to put (or not put) down the sink and/or drain

Welcome! Did you know this property is served by a septic system?

Please help us be SepticSmart by taking steps to ensure that our septic system continues to operate as expected – helping protect the environment and ensuring a good stay. Whatever goes down our toilet, sink, or shower pipes ends up in our septic system and affects how well it works.

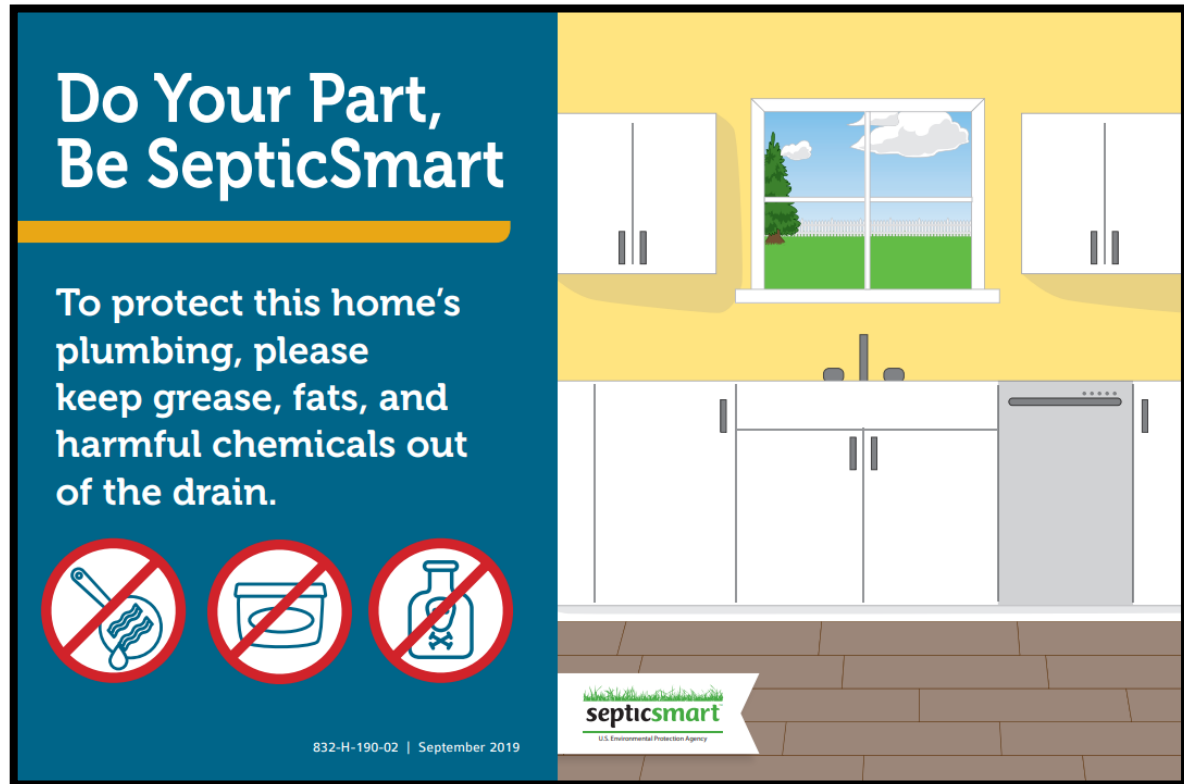
Please do your part to be SepticSmart by taking these simple steps:

- ✓ **Think at the Sink!** Please keep grease, fats, harmful chemicals, and hair out of the drain. They can clog or damage our system and can cause an expensive plumbing mess.
- ✓ **Don't Overload the Commode!** Please do not flush non-degradable items such as dental floss, diapers, wipes, hygiene products, or hair.
- ✓ **Be WaterWise!** Stagger use of water-based appliances among house guests. All of the water in this home's pipes ends up in the septic system. Efficient water use improves the operation of a septic system and reduces the risk of failure.
- ✓ **Be Mindful of Guests!** If there are more people staying in our home than our septic system was designed to support, your guests may overload the system and mess up your stay. This is one reason why we cannot accept more than the maximum number of guests.
- ✓ **When in Doubt, Follow an Easy Rule of Thumb:** Do not flush anything besides human waste and toilet paper. If you perceive an issue with our plumbing, please call _____. In the rare instance that sewage should back up into our home, avoid contact with it.

Following these easy steps will not only avoid septic system issues but will also help ensure an enjoyable stay.




Kitchen and Bathroom Signs Design to Hung or Placed on the Counter



**Do Your Part,
Be SepticSmart**

To protect this home's plumbing, please keep grease, fats, and harmful chemicals out of the drain.



832-H-190-02 | September 2019

septicSMART
U.S. Environmental Protection Agency

The sign features a kitchen illustration with white cabinets, a window, and a sink. The background is dark blue with a yellow banner at the top.



Do Your Part, Be SepticSmart

This home has a septic system. To prevent plumbing problems, keep hygiene products, hair, wipes, medicine, trash, and other products out of the toilet and drain.

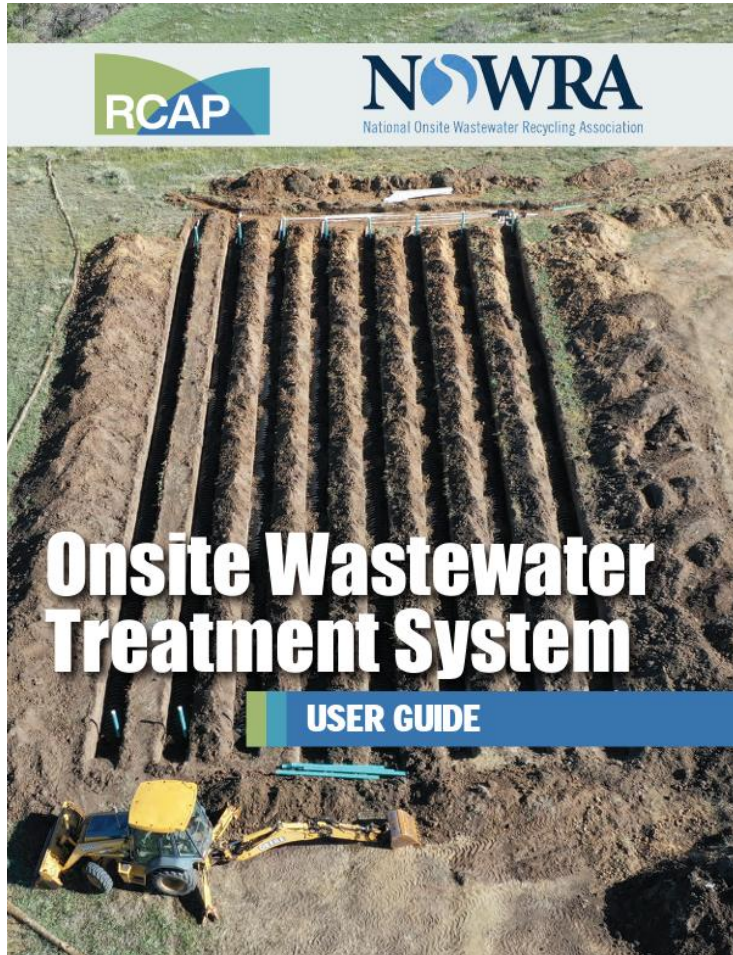


832-F-190-15 | September 2019

septicSMART
U.S. Environmental Protection Agency

The sign features a light blue background with a yellow banner at the top. The bottom section has a grey tiled floor pattern.

Other Education Options



- Management plan/Operating manual
- Onsite Wastewater Treatment System User Guide
- <https://online.flippingbook.com/view/162468359/>
- <https://www.nowra.org/library/homeowner-training-materials/users-guide/>

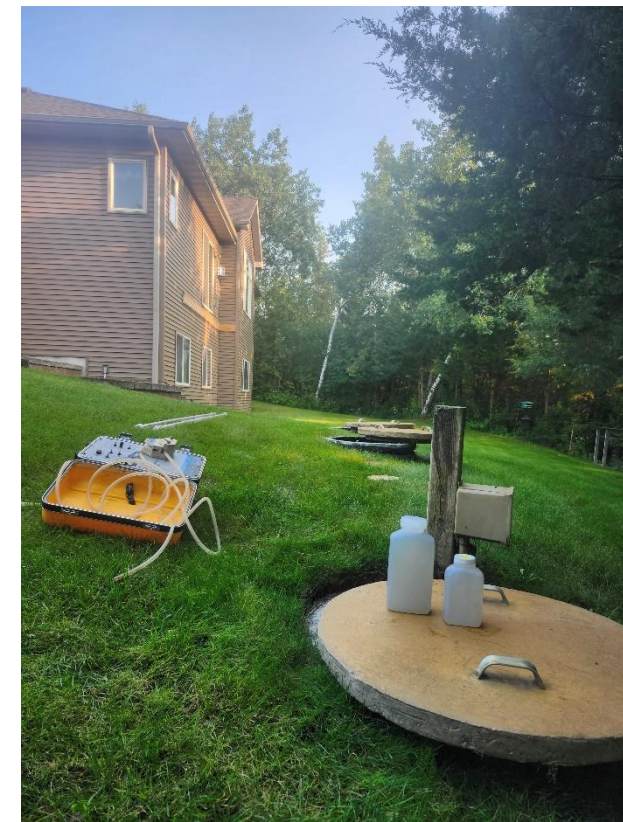
Online Free Self Paced Module
<https://www.pathlms.com/nowra/>

Onsite Wastewater Treatment System Homeowner Education

RESUME COURSE



Design Considerations



Flow Determination

01

Number of
bedrooms

02

Number of
beds

- Air mattresses,
pull out beds

03

True
maximum
occupancy
(listing #)

04

Peak usage

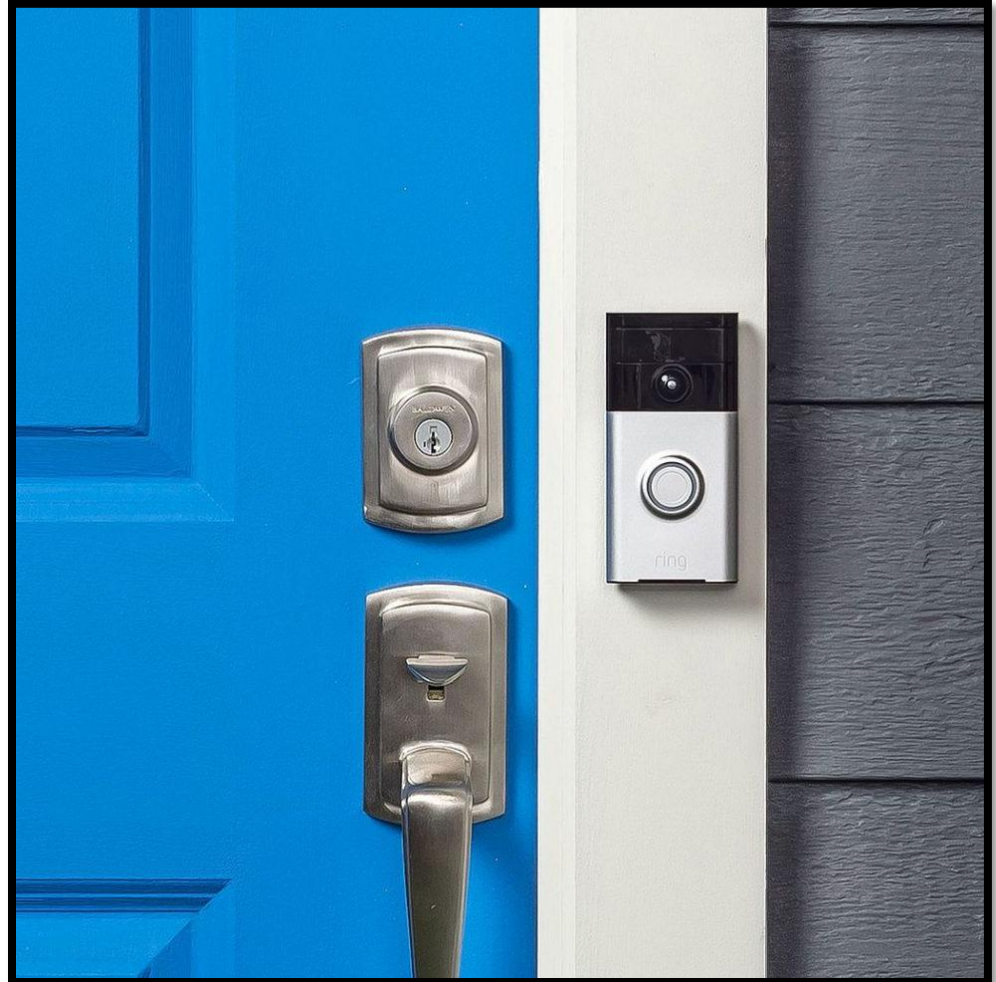
Check with the regulatory authority to determine if there are special local requirements

Flow Considerations

- Remind client – septic regulations assume two people maximum per bedroom
- If more than 2/bedroom needed to size based on people (75 gallons per person recommended)
- If you are upgrading due to a problem, be careful with flow measurement

Home Monitoring

- Alert your clients to expect renters to try to stretch the rules, especially concerning the number of guests they bring
- Meeting renters or having a camera (such as Ring) can help minimize the issue



Bed and Breakfast

- Not typically viewed as a short-term rental
- Occasionally, owners may offer breakfast to renters
- May increase the amount of food waste and waste strength
- Need to discuss plans with the owner
- Regulatory sizing may change

RV Dumping or a RV Pad

- Property owners may want to dispose of their own waste in their septic system
- Getting more common to build a pad for guest to park their RV and hook-up
- Some regulations may limit RVs
- Concerns:
 - Deodorizers such as formaldehyde
 - Rate of discharge
 - Strength



UMN RV Chemicals Evaluation

- From Amazon and picked the top 4 star selling products
 - Happy Campers Organic RV Holding Tank Treatment
 - monohydrate blend of minerals and micronutrients
 - Thetford Aqua-KEM Original Deodorizer
 - formaldehyde and methyl alcohol
 - Walex Porta-Pak Holding Tank Deodorizer
 - 2-Bromo-2-nitropropane-1,3-diol (Bronopol)
 - Walex Natural Holding Tank Deodorizer
 - enzymes, >50% of composition is not provided
- Added the recommended chemical to simulate a full 40-gallon load



Results

	Happy Campers	Aqua-Kem	Walex-Porta-Pak	Walex Bio Pal
BOD	<1	1209	55	23
COD	6	2728	121	46
TSS	6	1	3	6
Phosphorus	<1	<1	5	58
TKN	<1	<1	1	<1
pH	5.2	5.7	6.3	6.1



Recommendations

Formaldehyde should be avoided

Education/signage directing people not use

Flow data along with more wastewater samples from RV dump stations should be collected

Design Options to Consider Pretreatment

- Cleanout outside the home
- Larger septic tank capacity
- Large effluent screens and alarms
- Pump tank → Flow equalization with larger tank and time dosing
 - Time dosing must be design and setup to deal with the true peaks
- Provide space for a future advanced treatment unit and additional soil dispersal capacity

Soil Treatment Considerations

- Consider pressure distribution to minimize biomat formation if not required
- If pressure distribution is used, use larger perforations and greater distal head to help keep holes open

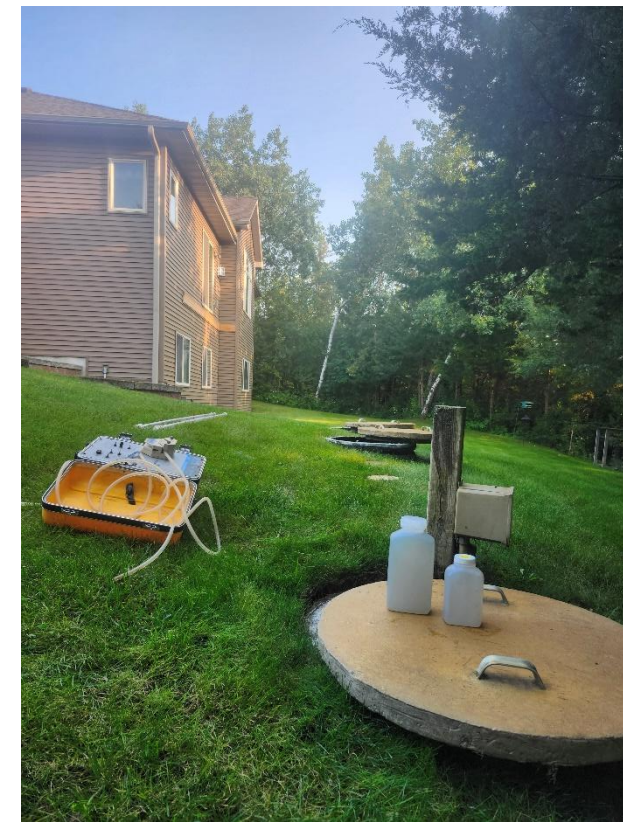


Flow Measurement

- All rental properties should have a method to track flow
 - Public water – typically only get averaged monthly use
 - Water meter – automated options exist that provide daily/hourly data
 - Water softener – hard to access
 - Panel options
 - Automated vs cycle counters and running time clocks



Installation Considerations



New Installations

- If the design was done at state minimums, offer upgrades to facilitate longevity
- All manholes to grade
 - If upgrading an existing system add risers as needed to facilitate maintenance
- Address system landscaping to avoid water run-on
- Finished soil system inspection pipes above grade and protected from damage

Access Lids – Suggest Secondary Protection

- Avoidable tragedies
- Secondary tank lids
- Safety screens or similar devices
- Riser safety locks
- Tamper resistant riser cover screws

Two Harbors toddler who fell into septic tank dies

BMTN STAFF • UPDATED: MAR 8, 2018 • ORIGINAL: JUL 19, 2016



The toddler critically injured after [falling into a septic tank](#) in northeastern Minnesota has died.



Protect the Soil Treatment Area (STA) from Traffic

- Let visitors know they cannot drive over, park cars/boats on, or set up their RV over it
 - This includes winter as compaction of snow can cause freezing issues
- The STA must be off-limits to renters with no exceptions
- Curbs, shrubs, fencing when needed

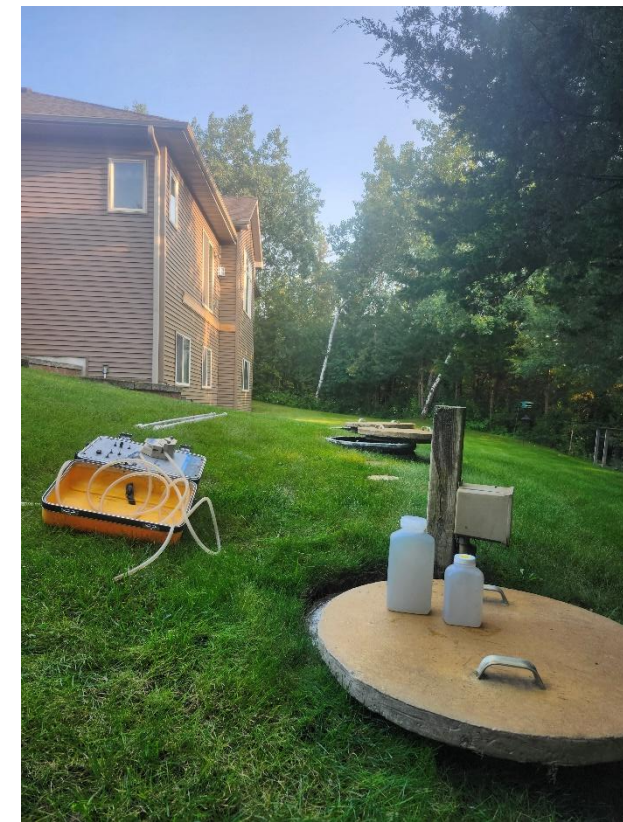


Pump Alarms and Control Panels

- Remote monitoring a bonus to troubleshooting use issues
- Wi-Fi-enabled panels are becoming more common
- Have a lock on the panel to prevent tampering with pump/alarm notification



Management Considerations



More Frequent Visits

- Checking flows
- Checking organic loading - sampling
- Measure the solids levels in the tank more frequently
 - Be sure to check pump tank for solids too
- Measured ponding in the soil system
- Clean and flush pressurized laterals when the system is being serviced

Ponding Water in Gravity STA

- Gravity systems are designed to have standing water
- With distribution boxes the amount of ponding should be uniform
- With drop boxes it needs to progressively be less
- Biomat should not exist above the system or area should not be soggy



Even vs uneven Stripes Over Gravity STA



Ponding Water in Pressure Dosed STA

- After a dose, the effluent should soak away within ~10 minutes
- With elevated systems boring sideways into media may show dry media/soil beneath systems indicating a biomat failure



Advanced Pretreatment

- Certified and licensed as a service provider
- Trained on the unit
- Check the management plan for unit
- Signs of problems
 - Wet spots
 - Effluent not clean/clear
 - Sampling results



Regulatory Considerations



Regulatory Considerations

- Permit based on max occupancy
 - How many gallons per person? 50, 75, 100?
 - Advertising limitation
- Licensing of rental
 - Compliant system before licensing of home
- Prohibit holding tanks
 - Volume of pumping may be high and difficult to regulate
- New system
 - Oversize system components
 - Control flow with time dosing before advanced treatment or soil treatment

Regulatory Considerations Cont'd

- Recommend that the system be operated under an operating permit
 - Report:
 - Flow data from water meters, event counters, cycle counters
 - Use/occupancy
 - Sampling for waste strength
- Work with other regulatory permitting departments for continuity of use

Questions & Discussion

- Got an idea for an article send an email to:
sfheger@gmail.com



A screenshot of a web page from ONSITE installer. The page features a blue header with the site name and navigation links for Systems/ATUs, Septic Tanks, Pumps, Alarms/Controls, Drainfield Media, and Distribution. Below the header is a secondary navigation bar with links for Magazine, Manufacturers, Storefronts, Classifieds, Videos/Webinars, Directories, and More. The main content area includes a banner for "ADVANCED ENVIRO SEPTIC" with a green and black logo, a "CLICK HERE TO LEARN MORE ABOUT OUR LINE OF EFFLUENT PUMPS" button, and an "Ashland PUMP" logo. The article title is "Yikes! My Vacation Renters Are Abusing the Septic System" and the author is Sara Heger. The article text begins with "Follow these consumer education and maintenance tips to prevent untimely and costly onsite system breakdowns at overused properties." Below the text are social media sharing icons for Facebook, Twitter, LinkedIn, and a share icon. A button for "Order Digital Reprints" is also visible. The article image shows a wooden cabin with a "BATHROOM" sign.

