



# Summary of Ohio's Proposed Sewage Treatment System Rules

OTCO 50<sup>th</sup> Anniversary Workshop  
Deer Creek State Park

*Residential Water and Sewage Program  
Bureau of Environmental Health  
Ohio Department of Health*

# Why new rules?

Change is *long* overdue...

- Significant research and science behind wastewater treatment
- New technologies to treat wastewater
- Knowledge of public health impact
- Ohio has a law requiring updated rules!
- A 2012 ODH survey shows that ~31% of STS are reported to be failing.



# Clean Watersheds Needs Survey

## Existing Systems and Failures by District

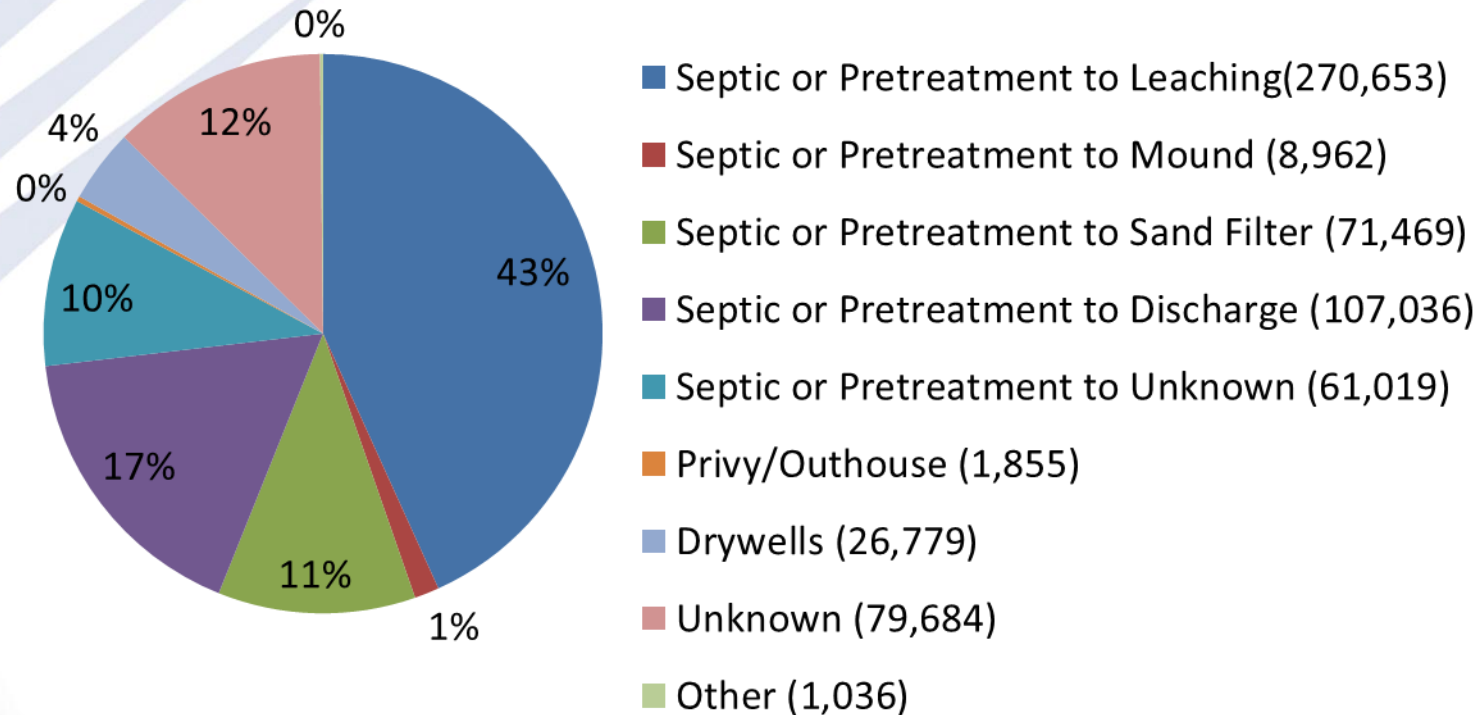
OEPA District	Central	Northeast	Northwest	Southeast	Southwest	Total
Existing Systems Reported	54,813	236,386	117,819	87,943	131,532	628,493
Failing Systems Reported	20,512	90,380	45,560	13,267	24,269	193,988
Failure Rate	37%	38%	39%	15%	18%	31%



Based on response from 88 health districts, 74 county health districts (84%).

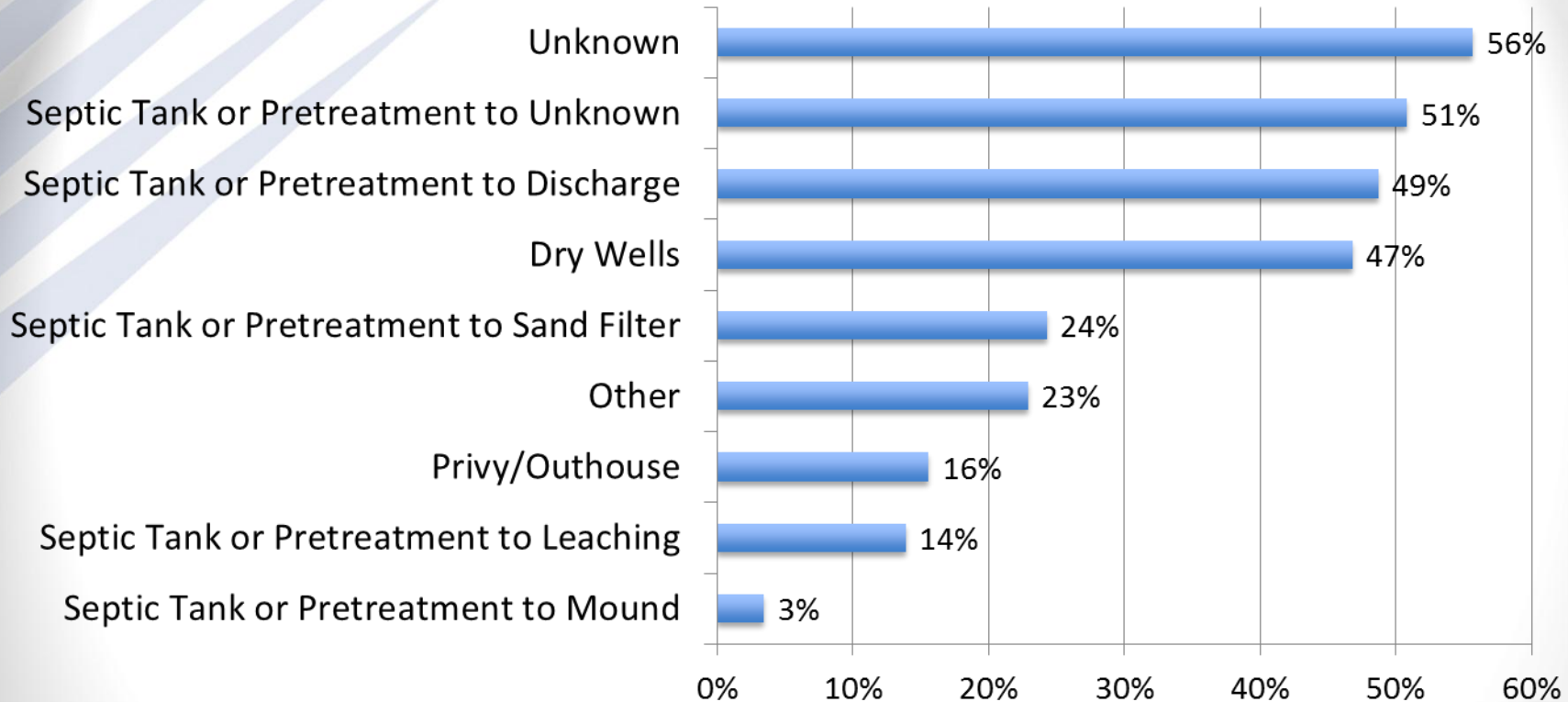
# Clean Watersheds Needs Survey

## Existing Ohio HSTS by Type



# Clean Watersheds Needs Survey

## Failure Rates by System Type



# Clean Watersheds Needs Survey

Principle Reasons for Failure	
Soil Limitations	33%
Design Issues	14%
Site Limitations	25%
Installation Issues	3%
No Leach Field	14%
Direct discharge exceeds limits	43%
System Owner Abuse	17%
Unapproved System	7%
Old System (age)	44%
Other (Specify):	1%



# History

- State minimum rules for sewage treatment system construction and operation were adopted in 1977.
- Local health districts were authorized to adopt more stringent rule – many did so.
- Chapter 3718 establishing authority for state law and rules was adopted in 2005.
- Portions of the state law were suspended in 2007.
- Sub. S.B. 110 (128<sup>th</sup> General Assembly effective 9-17-2010) changed ORC Chapter 3718 governing sewage treatment systems including both household and small flow (<1,000 gpd) systems.
  - ODH required to adopt new rules after January 1, 2012.



# Rule Development Process

- ODH convened a rule advisory committee in October, 2010 with 43 members representing stakeholder organizations including local health districts, product manufacturers, system installers, service providers, septage haulers, local and state government, homebuilders, realtors, etc.
- The committee met monthly from December 2010 through October 2012 with discussions on related rule topics at each meeting.





# Rule Advisory Committee

Ohio Environmental Protection Agency  
Ohio Department of Natural Resources  
Assoc. of Ohio Health Commissioners  
Association of Ohio Pedologists  
County Commissioners' Assoc. of Ohio  
County Engineers Association of Ohio  
Ohio Association of Realtors  
Ohio Environmental Council  
Ohio Environmental Health Assoc.  
Ohio Home Builders Association  
Ohio Manufactured Home Association  
Ohio On-site Wastewater Association

Ohio Precast Concrete Association  
Ohio Public Health Association  
Ohio State University Extension  
Ohio Township Association  
Ohio Waste Haulers Association  
Ohio Farm Bureau Federation  
Local Health Districts – At Large  
St. Bd. of Registration for PE & Surveyors  
Academic  
Manufacturers  
Ohio Association of Boards of Health  
Ohio Association of Sanitary Engineers



# Rule Development Process

- Rule advisory committee meetings were open, streamed over the internet, and most were audio recorded. Resource materials, notes of committee decisions, and comments were captured and posted on a department website.
- Rule drafts were prepared based on committee discussions. Groups of draft rules were posted on the ODH website in February, 2012; August, 2012, October, 2012 and early December, 2012 allowing an extended review period for most proposed rules.



# Rule Development Process

1. First full draft distributed for initial comment period
  - December 20, 2012 through March 1, 2013
  - ODH scheduled and held **11 regional meetings** in January 2013 around the state to discuss rules and obtain comments.
2. ODH received **2100+** comments.
  - All comments were logged and reviewed/discussed.
3. ODH reconvened the RAC to discuss key comments and revise the 1<sup>st</sup> draft (June, 2013)
  - Consult with legal counsel, ODNR, etc.



# Rule Development Process

5. November 2013 – Released **2<sup>nd</sup> draft** and begin Ohio Public Health Advisory Board 60 day review process and also Common Sense Initiative review
  - Public comments accepted in the first 30 days
    - Approximately **700** public comments received
  - ODH conducted **6 regional meetings** to review changes
  - Days 30-60 – OPHAB review of public comments and provide recommendations/comments to the Director
6. Review public comments and recommendations from OPHAB
  - Make changes and prepare rules for final filing with JCARR.



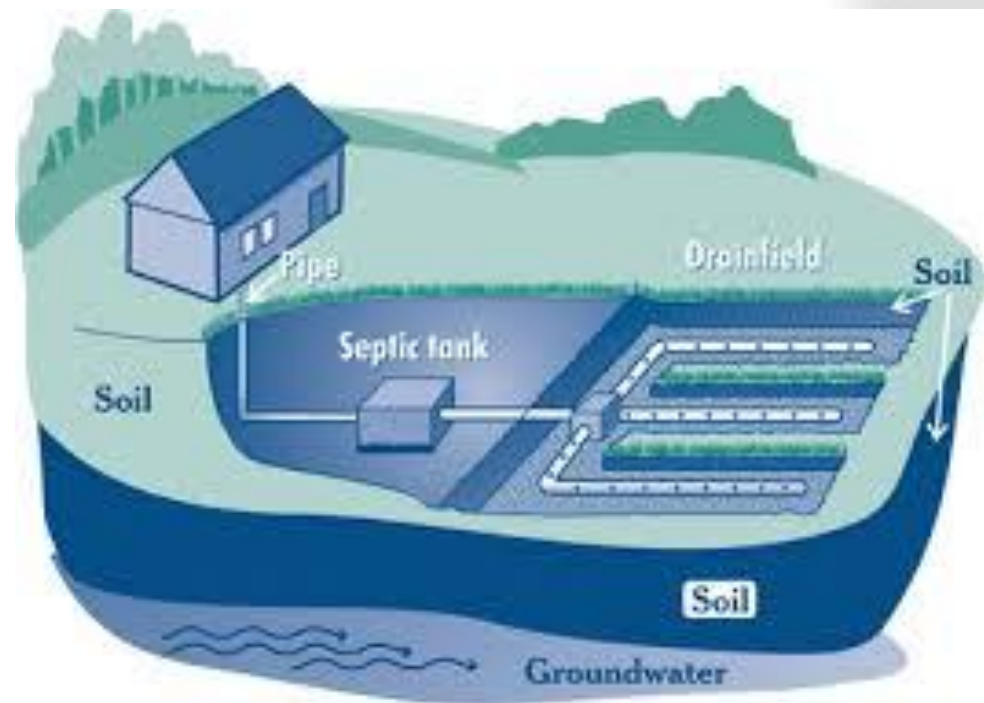
# Rule Development Process

7. Filed with Joint Committee on Agency Rule Review in July 2014
  - Up to 65 day review
  - Public hearing scheduled September 3, 2014
  - JCARR meeting scheduled September 22, 2014
  - Projected effective date of January 1, 2015



# Sewage Treatment System Rules

The rules establish new modern standards for system construction, alteration and maintenance when a system fails or breaks and must be altered or replaced, or a when a new system is installed.



# Sewage Treatment System Rules

- Standard rule format
- Use of appendices:
  - Leaching trenches – traditional, shallow, pressure distributed
  - Mound systems
  - Drip Distribution
  - Sand filters (gravity and time dosed)
  - Engineered drainage design options
- Gray water systems are separate or different than STS in the statute – added in many areas of the rules to ensure the same standards are applied
- Spray Irrigation – work with TAC to prepare a special device approval due to limited usage to date in the state



# Key Facts

- A wide range of modern design choices and technologies for new or replacement sewage systems are available that provide safe and sustainable treatment in the diverse soils and geology of the state. This promotes healthy communities and safe development in suburban and rural areas not served by public sewers.
- Lower cost, low maintenance systems such as septic tanks to leaching trenches that use the natural soils for treatment are *the preferred design* and will continue to be the primary system installed in Ohio. New technologies are available for use where the soils present greater challenges for sewage treatment.





# Many Options

- Over 40 approved pretreatment products
- Basic to complex systems designs available that can be mixed and matched to meet the site conditions, homeowner preferences and water usage, and operation/maintenance requirements



# Key Facts

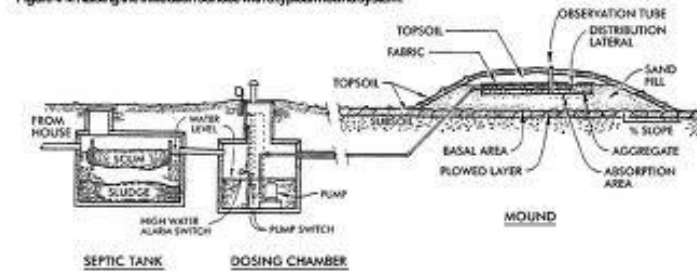
- The draft rules carefully balance the protection of public health and safety from sewage related diseases with system cost and reduce the discharge of nutrients to the environment protecting lakes and streams, and reducing growth of algae.
- Good design options for systems help protect the financial investment of the homeowner in their system. Proper system maintenance ensures systems are sustainable for many years.



# System Design

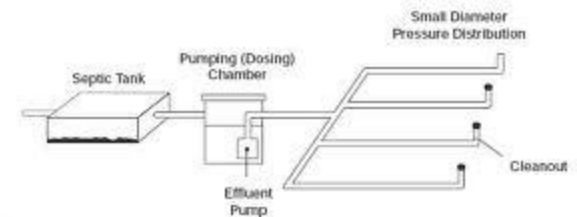
- The rules implement a scientific approach to characterizing the site and soils to determine the best site design.
- Multiple design options are usually available for most sites.

Figure 4-4. Raising the infiltration surface with a typical mound system.

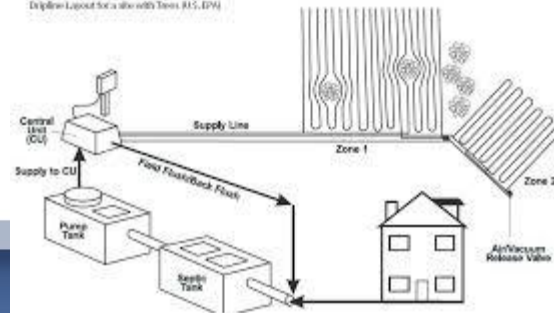


Source: ASAE, Converse and Jick 1988b.

Rigid pipe pressure distribution networks with flushing cleanouts



Drip Irrigation for a site with Trees (R.S., EPW)



Source: Adjecton/American Manufacturing, 2001.

# Soil Infiltration Loading Rates

- Soil infiltration loading rates determined by Ohio Table
  - Effluent quality: septic tank vs pretreated (BOD<sub>5</sub>/TSS) effluent
  - Soil structure, texture, and consistence of the most limiting in situ soil layer within six inches of the infiltrative/basal surface is used to determine a soil loading rate, unless the soil layers below the upper six inches are significantly less permeable.
- Selected soil loading rate for the site is used to determine the total square feet of infiltrative surface area required for the soil absorption component.
  - Daily design flow divided by the soil loading rate = minimum square feet of infiltrative surface area required for soil absorption.



# Vertical Separation & In Situ Soil

Paragraph	Limiting Condition	Minimum VSD (inches)	Minimum unsaturated in situ soil within infiltrative distance (inches)
(D)	Limiting condition not specified in this table	18	8
(E)(1)	Fractured and/or Karst bedrock	36	12
(E) (2)	Ground water or aquifer	36	12
(E) (3)	Other limiting conditions identified in soil evaluation or by the board of health as having high risk or not meeting 3701-29-15 (A)	36	12
(F)	Highly weathered soils with weak structure or low to very low permeability developed on the low lime till plains are present	24	8
(G)	Perched seasonal water if not established by board of health	12	8
(G)	Perched seasonal water as established by a board of health	6-18	6-18



# General Soil Absorption

- The VSD may be reduced using soil depth credits or through the use of an engineered drainage system to uniformly lower the level of the seasonal water table
  - minimum depth of suitable in-situ soil still required
  - soil depth must be adequate to accept and treat all effluent from the system.
- Soil depth credits
  - 1 to 1 equivalency for elevating the infiltrative surface using sand – mound
  - Pathogen reduction, as approved by Director
  - 12 inches for drip distribution (timed micro-dosing @ 0.25gal/ft<sup>2</sup>/dose)
  - 6 inches for time dosed, uniform distribution of effluent (low pressure distribution in trenches)



# Key Facts

- The draft rules combine state standards with options for local flexibility. For example, local health districts can establish a local vertical separation distance between 6 and 18 inches to the seasonal water table, representing the most common limiting condition for soils in the state. This approach will help lower system costs where local conditions can allow more basic system designs.



# Hydraulic Linear Loading

The HLLR shall be used to determine the minimum required length of the soil absorption component or basal area parallel to surface contours and shall be based on soil characteristics, land slope, site conditions, infiltrative distance, and the nature and depth to limiting conditions.

- (a) The HLLR shall be determined based on the soil evaluation information with reference to table 4 to determine the rate based on the soil conditions, slope and infiltrative distance.
- (b) The minimum length of the soil absorption component shall be determined by dividing the daily design flow by the hydraulic linear loading rate selected from table 4 of this rule





Table 3: Hydraulic Linear Loading Rate Table

Soil Characteristics			Hydraulic Linear Loading Rate (gpd/ft)								
			Slope 0-4%			Slope 5-9%			Slope >10%		
Texture	Structure		Infiltrative Distance (inches)			Infiltrative Distance (inches)			Infiltrative Distance (inches)		
	Shape	Grade	8-12	12-24	24-48	8-12	12-24	24-48	8-12	12-24	24-48
COS, S, LCOS, LS	--	OSG	4.0	5.0	6.0	5.0	6.0	7.0	6.0	7.0	8.0
FS, VFS, LFS, LVFS	--	OSG	3.5	4.5	5.5	4.0	5.0	6.0	5.0	6.0	7.0
CSL, SL	--	OM	3.0	3.5	4.0	3.6	4.1	4.6	5.0	6.0	7.0
	PL	1	3.0	3.5	4.0	3.6	4.1	4.6	4.0	5.0	6.0
		2, 3									
	PR/BK/GR	1	3.5	4.5	5.5	4.0	5.0	6.0	5.0	6.0	7.0
2, 3		3.5	4.5	5.5	4.0	5.0	6.0	5.0	6.0	7.0	
FSL, VFSL	--	OM	2.0	2.3	2.6	2.4	2.7	3.0	2.7	3.2	3.7
	PL	1, 2, 3									
	PR/BK/GR	1	3.0	3.5	4.0	3.3	3.8	4.3	3.6	4.1	4.6
		2, 3	3.3	3.8	4.3	3.6	4.1	4.6	3.9	4.4	4.9
L	--	OM	2.0	2.3	2.6	2.4	2.7	3.0	2.7	3.2	3.7
	PL	1, 2, 3									
	DD/BK/CD	1	3.0	3.5	4.0	3.3	3.8	4.3	3.6	4.1	4.6



# Low pressure distribution of effluent

Most systems use gravity, but there are exceptions:

- Required when applying effluent to the sand fill infiltrative surface of an elevated soil absorption component
- May be required by the product approval.
- May be required by LHD when the site and soil conditions at the location of the proposed soil absorption component present a significant risk for the surfacing of effluent, or where effluent may reach ground water or an aquifer before adequate treatment is achieved.
  - Examples: the presence of highly permeable materials directly connected to ground water or an aquifer, shallow limiting conditions, and soils with slow to very slow permeability.



# Key Facts

- The rules do **not** require that all systems be automatically upgraded. Nearly all existing systems are deemed approved under state law until they fail and cannot be repaired.
- System owners can request a timeline for the incremental repair and/or replacement of a failing system.
  - Spreads system replacement costs out over time
  - Allows the owner to try common sense solutions like installing water saving fixtures, reducing water usage or fixing leaks to reduce flow to the system



# Engineered Drainage

- STS design must identify the depth to the seasonal water table with no drainage and the depth the seasonal water table will be lowered to with drainage to demonstrate that the required VSD is met.
  - Design must demonstrate that drain spacing and depth can lower the seasonal water table to the desired depth to achieve a thickness of unsaturated soil to meet the vertical separation distance required at least three hundred and thirty days each year, with no more than thirty days of continuous saturation above the desired depth, at a recurrence frequency of 30%



# Gray Water Systems

- **“Gray water”** means wastewater discharged from lavatories, bathtubs, showers, clothes washers, and laundry sinks that does not contain food wastes or urine or fecal matter.
- **“Gray water recycling systems”** means systems that treat and reuse wastewater discharged from lavatories, bathtubs, showers, clothes washers, and laundry sinks that does not contain food wastes or bodily wastes. For the purposes of this chapter, bodily waste is considered to be human urine or fecal matter.



# Gray Water Recycling

- Nuisance standard (ORC 3718.011) applies to all gray water recycling systems
- All horizontal isolation distances must be met
- Minimum 12 inch VSD to limiting conditions
- Permit exemption for gray water systems installed for campgrounds under chapter 3729 of the revised code.



# 17 Gray Water Recycling

## Type 1

- Subsurface irrigation
- Seasonal use
- **maximum 60 gallons**

## Type 3

- Subsurface irrigation
- **Year-round use**
- Pretreated effluent credit
- May receive **hand-carried** gray water into a disposal sump

## Type 2

- Subsurface irrigation
- Seasonal use
- Between 60 and 1000 gallons per day

## Type 4

- Seasonal/**Surface Use**
- Pretreatment (NSF 350) required
- Between 60 and 1000 gallons per day



# Gray Water Recycling Systems

- If a Type 1, 2 or 4 gray water recycling system fails or is suspected of failing, gray water must be diverted to the approved public sewer system or STS
- Owner must maintain complete records and ensure proper operation and maintenance
- Except for Type 3 gray water recycling systems, no reduction in the design and sizing of the STS
- All other sewage from a dwelling must be discharged to an approved STS or sanitary sewer.





# Operation & Maintenance

- O&M management and system owner education is required for all systems installed or altered after the effective date of this chapter.
- Local health districts are provided flexibility to phase in maintenance tracking for existing systems.



## **Key Fact – Homeowners are responsible for maintaining their sewage systems**

- Just like any other part of a home, sewage systems require maintenance. This is recognized in state law, which says a homeowner is responsible for maintaining their sewage system.
- State law also says that local health districts are responsible for developing a program to ensure proper maintenance of a sewage system.
- Operation permits have been required since 1977 and are a tool to help local health districts ensure that a homeowner is doing the necessary maintenance.



# Key Fact – An operation permit will not require an inspection if proof of maintenance is provided.

- State law protects the homeowner from unwarranted inspections by allowing a homeowner to provide proof of maintenance in lieu of an inspection.
  - An inspection is only authorized under specific conditions listed in state law – nuisance, imminent threat or danger to public health, etc.
- Operation permit fee costs will be set by the local health district and no portion of this fee is returned to ODH.
  - These permit fees are to cover the costs for the local health district to track maintenance and provide reminders or education on system maintenance.



# Key Fact – Operation & maintenance will not begin immediately for all homes

- The rules provide flexibility to local health districts to implement the maintenance monitoring programs.
- Some counties already have extensive operation permit programs in place, some have programs for only mechanical systems and some have no programs at all.
- The rules require local health districts to work with their community to develop a plan to phase in the program. No time period is specified and the implementation is locally determined.



# Key Fact – The rules do not propose new types of permit fees

- Under the proposed rules there are three possible fees: installation, alteration and operational – these fees have been in place since 1977.
- Every county in Ohio already has a fee schedule established for new system installation/replacement or alteration.
- The proposed rules will allow counties that have never charged an operational fee to phase it in slowly with the least impact possible.
- The goal is to ensure systems are being correctly maintained. A sewage treatment system that is not maintained could cost a significant investment down the road- you may have a system that could last for 30 years but fails after only 10 if it is not being maintained.
- Installation and alteration fees support both the local health district program and the state sewage program which will help ensure that local health jurisdictions are doing honest and accurate inspections.



# Summary

This rule package is expected to provide:

- More options to address the diverse site and soil conditions across Ohio
- More consistency in the design, installation, and operation of sewage systems across Ohio
- More sustainable systems to protect public health and the homeowner's investment



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