

**PERIODIC REVIEW OF THE  
REGULATIONS FOR ALTERNATIVE ONSITE SEWAGE SYSTEMS  
12VAC5-613-10 et seq.  
Meeting Minutes May 9, 2018**

The Virginia Department of Health (VDH) held a listening session (public meeting) on May 9, 2018, in the Auditorium of the Fire and Rescue Training Center at 16600 Courage Court, Leesburg, VA 20175. The purpose of the meeting was to gather comment and feedback on the Regulations for Alternative Onsite Sewage Systems (AOSS Regulations), [12VAC5-613](#).

VDH staff Karri Atwood, Marcia Degen, Douglas Canody, and Lance Gregory facilitated the meeting and/or recorded minutes. The meeting was opened at 9 AM. The sign in sheet is at the end of the minutes.

The following agenda was used for the meeting. A copy of the PowerPoint is attached to the minutes.

- I. Welcome and Overview of Alternative Onsite Sewage Systems (AOSS)  
Dr. Marcia Degen, Office of Environmental Health Services (OEHS) Technical Services
- II. The AOSS Regulations, 12 VAC 5-613-10, et.seq.  
Dr. Marcia Degen  
Karri Atwood, OEHS, Legal Affairs
- III. The Periodic Review Process  
Karri Atwood
- IV. Review of Working Draft Regulation  
Dr. Marcia Degen and Karri Atwood
- V. Open for Public Comment on Working Draft of the AOSS Regulations.

Karri Atwood opened the floor for comment after the introductory remarks.

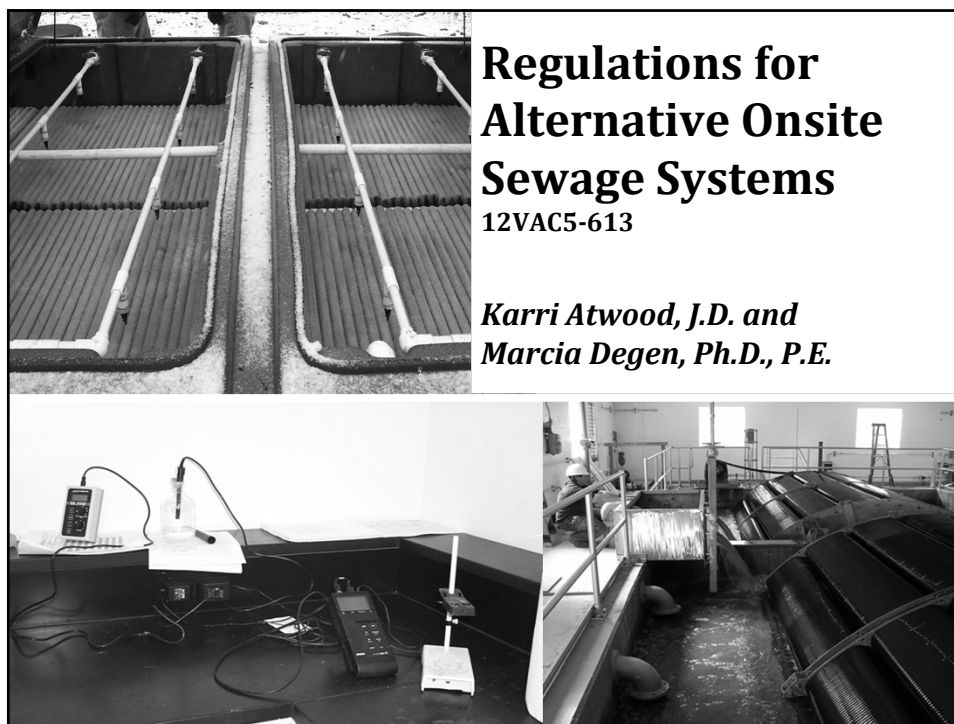
- O&M Manuals: Matt Toley questioned the need for O&M manuals. They take up a lot of room at VDH and you can find them all online anyway. Pam Pruett disagreed that the O&M manuals are to be site specific and include more than what you can find online. Jeff Sledgeski noted that owners never look at the manuals till the system fails. Owners should be required to sign something when they buy the house.
- Biogators and the like: Jim Larosa asked about Biogator and similar units that are add on treatment units but often not able to produce TL2 or TL3 effluent quality. The regulations don't address these types of systems. VDH noted that these are considered alternative treatment systems and require O&M. The design of the drainfield when using one of these can be handled as either assuming septic tank effluent quality for sizing or verifying treatment quality through either NSF 40 certification or testing under 12VAC5-613-100E.

- Clarification on using 12VAC5-610 vs 613: Unless the AOSS Regulations address an issue, the design requirements under 12VAC5-610 apply. JT Frazier asked that the AOSS Regulations address installing under a restriction with treated effluent and center to center spacing. Pam Pruett added minimum installation for AOSS trenches on slopes greater than 10%. They noted that this is not being done consistently across the state.
- Addition of definition for permeability limiting feature: Jim Larosa asked about adding minimum requirements for Ksats to avoid issues such as Ksats run in the summer on shrink swell clays. Pam Pruett asked if Appendix G in the 610 regulations could be modified or add to the AOSS Regulations some minimum requirements for Ksats such as duration, in horizon testing, pre-soak, and time of year and for both falling head and constant head tests. Tom Ashton noted that the Virginia Tech Ksat Manual is pretty good for address minimum requirements. Tom Ashton does not believe that pre-soaking is viable for some soil types.
- Changing from average flow to peak flow: Jeff Sledgeski asked that smalls be extended to 1,050 gpd so that it is an even increment of 150 gpd/bedroom or some multiple of 150.
- Table 1 modifications: Pam Pruett said that you have to consider structure with texture and suggested the Tyler chart as a reference. Bill Sledgeski agreed that you need to have texture and structure together. He suggested that there could be a requirement to run a Ksat if a designer wanted to go outside the chart maximums. Matt Toley likes the original Table 1. Bob Melby thought the proposed chart was too complicated and too intertwined to put in a regulation.
- Adding reference to Sewage Collection and Treatment Regulation: JT Frazier like the reference to the Sewage Collection and Treatment Regulations for large AOSS.
- Adding definition for soil-like fill under 12VAC5-613-80.14: JT Frazier suggested just keeping the sand and removing soil and soil-like. Pam Pruett noted that North Carolina has an areal fill definition that may be helpful and suggested talking to Randy Miles. Suggestion to add definition for sand such as ASTM C33 or the mound criteria. Jim Larosa asked how does the state ensure that anything other than sand has uniform distribution without specifications? The 610 regulations have 3 types of fill systems only.
- Local ordinances: Matt Kroll asked about if a locality can have an ordinance that is more stringent than state regulation. Karri Atwood addressed his question and offered to discuss more after the meeting as his question was outside the scope of the meeting.
- O&M: Pam Pruett described a situation where an operator identifies a problem with an AOSS but the owner will not get it fixed. The owner will jump from provider to provider in an effort to get a different answer. There needs to be better follow up by VDH when an operator reports a problem. Operators need the ability to see the O&M reports online so they can see the history of the site like they can in Loudoun County. Lance Gregory with VDH answered that one of the goals of the new VDH database is to have basic information available online such as permits, O&M. He asked what basic info do you want access to and to send specific thoughts to him. Also need to know what improvements are needed to the O&M database such as email notification back to the operator.
- 12VAC5-613.90D: JT Frazier said its confusing to look at the Total nitrogen (TN) limits for the Chesapeake Bay and not understand that these are in addition to the TN limits in 90B and the most limiting limit will rule. That should be clarified.

Pam Pruett agrees with dropping 90.D.4.

- Table 2: JT Frazier noted the change from '0 to 12' to '6 to <12' to limiting features other than water table and agrees this is a good change. He would like to see a caveat that the six inches must be naturally occurring soil.
- 12VAC5-613-90.B: Jerry Franklin would like clarification on how much increase in background TN concentration will trigger accelerated groundwater sampling as the values can vary seasonally.
- 12VAC5-613.70: Pam Pruett would like to see influent samples tested for the TL3 testing protocol. She has conducted some of those studies and knowing the influent strength is important to understanding the results.
- 12VAC5-613-100: JT Frazier agrees with modifying the timeframe for initial grab sampling for small AOSS. He noted that 100E does not have the 1.5 or 3 times the limit triggers that are found in 100D and asked if they should be there. Angela Morehead asked about automatic resampling when exceedances are found. Jim Larosa noted that there is not enough staff to catch the 1.5 and 3 time trigger and an automatic resample requirement would be helpful. Pieter Sheehan noted that manpower should be a factor in developing the regulation.
- 12VAC5-613-70  
:JT asked the effect on a homeowner if a generally approved treatment unit is de-listed. VDH noted that for delisting, a notice of alleged violation would be sent to the manufacturer. Individual owners may be subject to enforcement depending on the status of their individual system. Jim Larosa noted that it'll also have an effect on how SAP evaluations are done.
- O&M manual and enforcement: Builders are not sharing O&M manuals with the owner. Is there a way to mandate that the O&M manual is transferred to a new owner? She also asked about how to handle when a BOD comes back high, but the operator reports no deficiencies. VDH staff noted that proposed modifications to section 100 would help with the more egregious exceedances.
- Homeowner awareness: Jim Larosa noted that often an agent signs the recordation document, not the owner, so the owner never gets first hand knowledge of the recordation or the requirements of owning an AOSS. Fairfax VDH noted that they sent a letter 90 days after the operation permit is issued to notify the owner of their responsibilities.
- Section 210: Pam Pruett and JT Frazier agree that don't need section 210 and that minimum standards must be maintained. Jerry Franklin noted that local health departments don't have time or staff to follow up on the extra monitoring required by this section and the database certainly won't track it.
- O&M: Matt Toley believes that there needs to be more precise O&M on low pressure distribution systems. Specifically the distal heads need to be measured on at least one lateral at the high and low end of each valve group.
- Section 40: Adrian Joye asked that the relationship between the 610 and 613 regulations be clarified to consultants and VDH staff. JT Frazier noted that perhaps asking for a form approved by the division might help with consistency in applications.

The meeting was closed at 11 AM.



## Regulations for Alternative Onsite Sewage Systems

12VAC5-613

*Karri Atwood, J.D. and  
Marcia Degen, Ph.D., P.E.*

## Today's Agenda

- I. Welcome and Overview of Alternative Onsite Sewage Systems (AOSS)
- II. The AOSS Regulations
- III. The Periodic Review Process
- IV. Review of Working Draft Regulation
- V. Public Comment

## Onsite Wastewater Treatment Systems

Septic systems are used to treat and dispose of relatively small volumes of wastewater, usually from houses and businesses that are located relatively close together. Septic systems are also called onsite wastewater treatment systems (OWTS), decentralized wastewater treatment systems, on-lot systems, individual sewage disposal systems, cluster systems, package plants, and private sewage systems.

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## How Many Onsite Sewage Systems?

- Approximately 1,015,000 total in VA
- 665,750 installed prior to 1990
- About 30,000 alternative systems in VA
- About 10% of new systems are alternative systems

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## Two Basic Categories of OWTS

- Conventional
- Alternative

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## Conventional Onsite Systems

Two main characteristics (must have both):

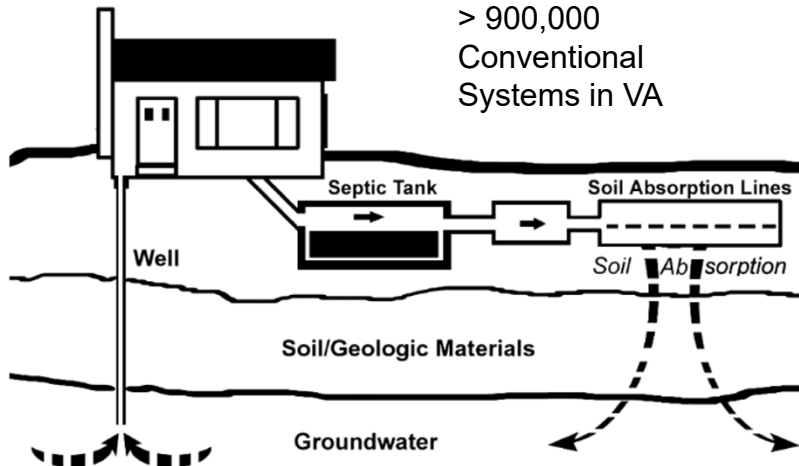
- Septic tank(s) for treatment
- Gravity distribution within a trench type drainfield

May use a pump when the drainfield is at a higher elevation

Relies on 'good' soils for majority of treatment

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## Conventional System: Drainfield



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## Conventional Onsite System



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## Alternative Onsite Sewage System

"Alternative onsite sewage system" or "alternative onsite system" means a treatment works that is not a conventional onsite sewage system and does not result in a point source discharge.

*Code of Virginia* § 32.1-163

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## Alternative Onsite Sewage System

Main characteristics:

- Treatment other than a septic tank, and/or
- Uses a method of distribution other than gravity, typically pressurized
- Does not result in a point source discharge

Designed to improve treatment of septic effluent in the soil, or

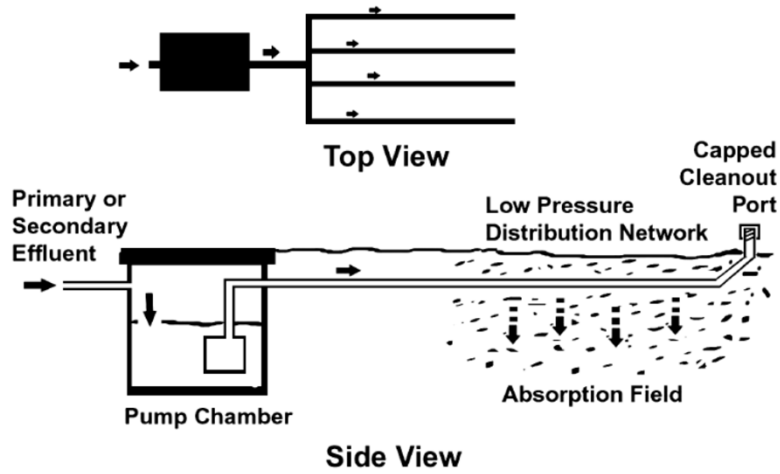
Provides additional treatment in a "box"

About 10% of all new systems are alternative

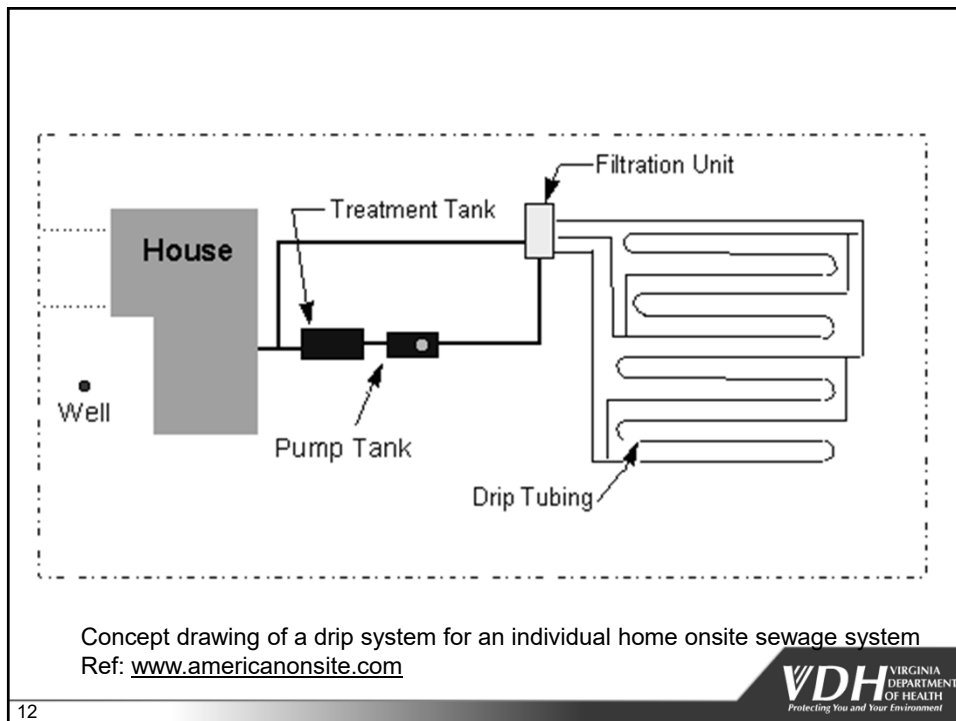
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## Alternative Onsite System: LPD



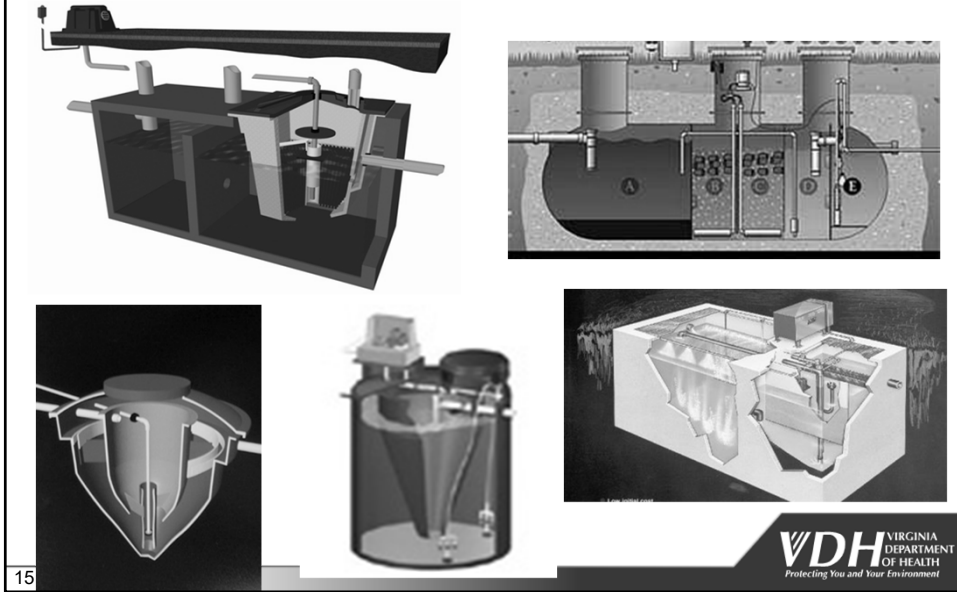
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### Suspended Growth Systems - "ATUs"



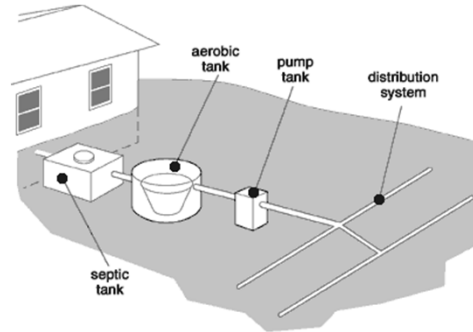
### Attached Growth Systems - "Media Filters"



# Layout

Positioned after primary tank (septic tank)

- minimizes the solids that enter an ATU
- provides some flow equalization



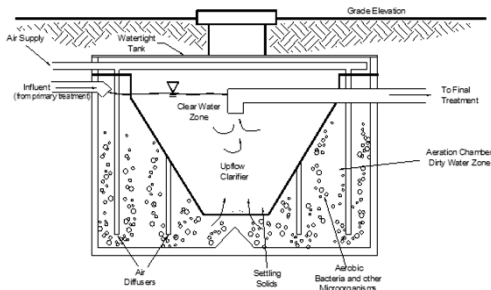
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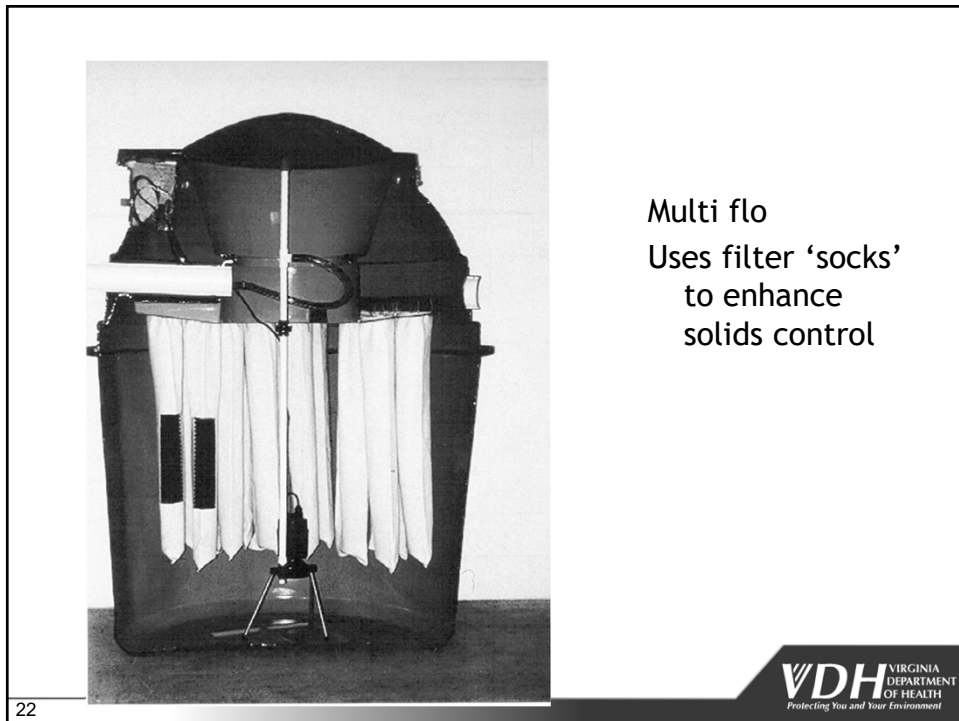
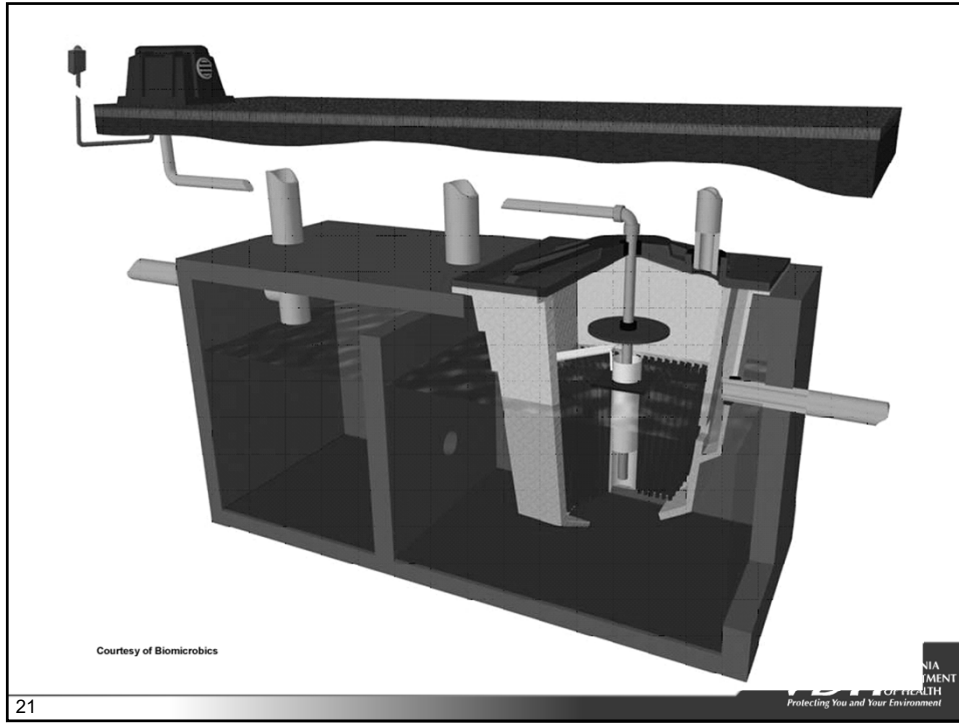
## ATUs are Biological Reactors

### Miniature Wastewater Treatment Plants

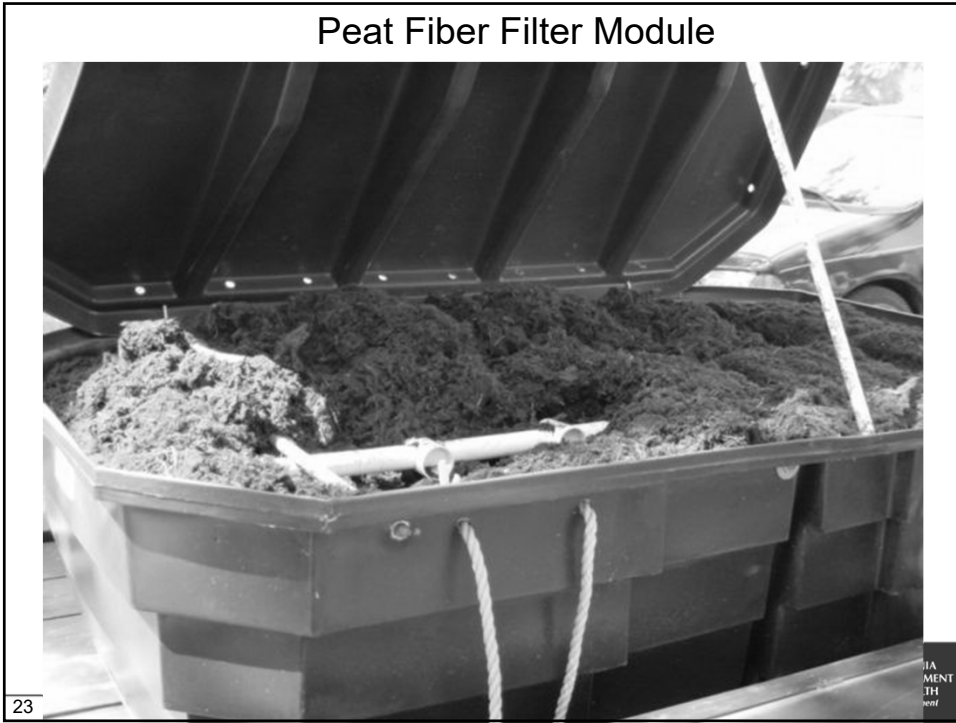
- the biological processes are well-understood
- the overall design objective is effective mixing of microbes, wastewater, and dissolved oxygen



Parameter	Septic Tank	TL-2	TL-3
BOD <sub>5</sub> , mg/l	200	30	10
TSS, mg/l	150	30	10
Nitrogen, mg/l	60	48	48
With N reduction	NA	30	30



Peat Fiber Filter Module



AdvanTex™ Textile Based Filter





Network of Small Textile Filter Units at a School





## Alternative Onsite Sewage Systems

### Difficult sites

- Slowly permeable soils
- Shallow depth to a restriction
- Limited areas

Repairs/Housing improvements to renovate a failed drainfield

Upgrade existing system for better treatment/longer life

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## Regulations for alternative onsite sewage systems

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## Regulatory Background

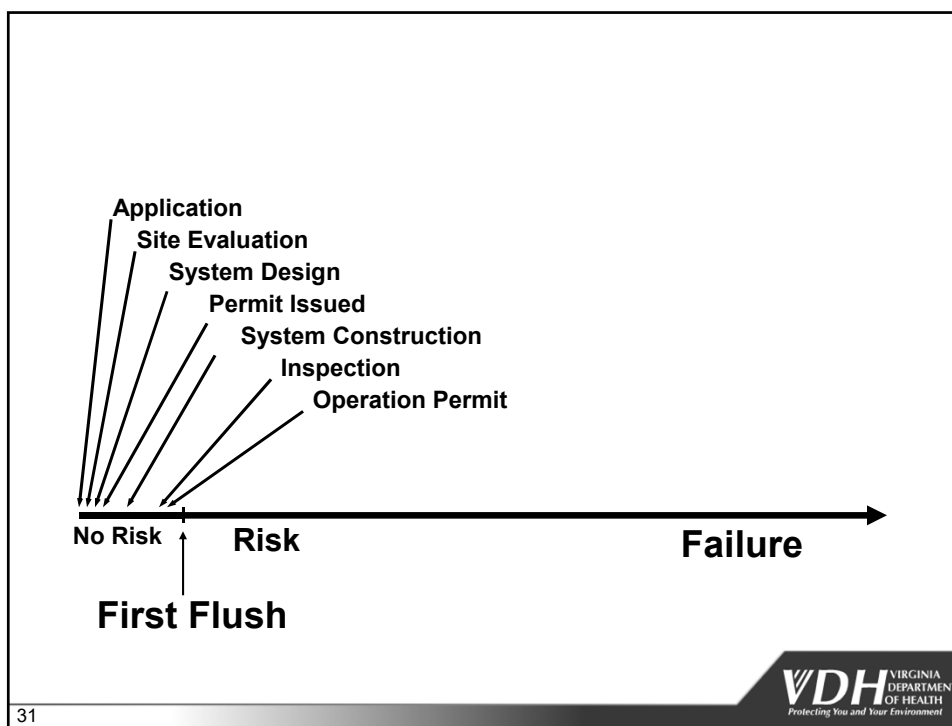
- Originally onsite systems only regulated through the Sewage Handling and Disposal Regulations  
12 VAC 5-610
- Administrative practices
- Soil and site evaluation techniques
- Conventional designs
- Designs for a few alternatives (LPD and mounds)
- Focus on small systems

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## Sewage Handling and Disposal Regulations 12 VAC 5-610

- Prescriptive site and soil conditions
- Prescriptive designs
- Prescriptive loading rates
- No area reduction for higher effluent quality
- No operation and maintenance
- No follow up

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## Goals for a new regulation

- Recognize higher levels of wastewater treatment
- Reduce vertical separation to limiting features by increasing the quality of the wastewater applied
- Provide increased loading rates to soil dispersal systems for treated wastewater
- Require operation and maintenance for AOSS
- Formally require control of nitrogen
- Add in special conditions for designs by professional engineers

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## Regulations for Alternative Onsite Sewage Systems (AOSS Regs)

- 12 VAC 5-613
- Effective December 7, 2011
- Chesapeake Bay Total Nitrogen (TN) limits effective December 7, 2013

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## Regulations for Alternative Onsite Sewage Systems

- Part I: General (and Administrative) (10-70)
- Part II: Performance Requirements (80-110)
- Part III: Operation and Maintenance (120-190)
- Part IV: Horizontal Setback Requirements (200)
- Part V: Waivers from Certain Performance Requirements (210)

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## Part I - General & Administrative

### Key parts

- Upholds 12VAC5-610 where not superceeded here
- Violations and Enforcement
- Requirements for operations permits
  - Recordation of O&M
  - N dilution area
  - Renewable permit for large systems

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### PART I - DEFINITIONS

- |                                     |                                    |   |
|-------------------------------------|------------------------------------|---|
| • AOSS                              | • Operator                         | • Total Nitrogen                                |
| • BOD                               | • Owner                            | • Total Residual Chlorine                       |
| • Conventional Onsite Sewage System | • Organic loading rate             | • Total Suspended Solids (TSS)                  |
| • Disinfection                      | • pH                               | • Treatment Level 2 Effluent or "TL-2 Effluent" |
| • Dissolved Oxygen                  | • Project Area                     | • Treatment Level 3 Effluent or "TL-3 Effluent" |
| • Effluent                          | • Reportable Incident              | • Treatment Unit                                |
| • Large AOSS                        | • Saturated Hydraulic Conductivity | • Turbidity                                     |
| • Limiting Feature                  | • Settable Solids                  | • Vertical Separation                           |
| • MGD                               | • Small AOSS                       |   |
| • Maintenance                       | • Soil Treatment Area              |   |
| • Operate                           | • Subsurface Drainfield            |   |
| • Operation                         |                                    |   |

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## Part I - Definitions of Note

- AOSS vs Conventional
- TL2 and TL3
- Small vs large AOSS
- Limiting Feature
- Vertical Separation

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## Part I - Definitions of Note

- AOSS vs Conventional
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- Vertical Separation

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## Part I - Definitions of Note

### AOSS vs Conventional

Conventional consists of “one or more septic tanks with gravity, pumped or siphoned conveyance to a gravity distributed drainfield”

If it doesn't fit this definition and its not a point source discharge, it's an AOSS

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## Part I - Definitions of Note

- AOSS vs Conventional
- TL2 and TL3
- Small vs large AOSS
- Limiting Feature
- Vertical Separation

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## Part I - Definitions of Note

### TL2 and TL3 (Treatment Level)

- TL 2: 30 mg/l BOD5 and 30 mg/l TSS
- TL 3: 10 mg/l BOD5 and 10 mg/l TSS

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## Part I - Definitions of Note

- AOSS vs Conventional
- TL2 and TL3
- Small vs large AOSS
- Limiting Feature
- Vertical Separation

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## Part I - Definitions of Note

### Small vs Large AOSS

- Small AOSS : less than or equal to 1000 gpd
- Large AOSS: greater than 1000 gpd
  
- NOTE: AOSS's with flows over 10,000 gpd require an operator with BOTH an AOSS license and a wastewater works operator license

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## Part I - Definitions of Note

- AOSS vs Conventional
- TL2 and TL3
- Small vs large AOSS
- Limiting Feature
- Vertical Separation

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## Part I - Definitions of Note

### Limiting Feature

- A feature of the soil that limits or intercepts the vertical movement of water, including seasonal, perched or permanent water table, pans, soil restrictions, and pervious or impervious bedrock.

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High Shrink  
swell Clay



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## Part I - Definitions of Note

- AOSS vs Conventional
- TL2 and TL3
- Small vs large AOSS
- Limiting Feature
- Vertical Separation

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## Part I - Definitions of Note

### Vertical Separation

- The vertical distance between the point of effluent application to the soil or the bottom of a trench or other excavation and a limiting feature of the soil treatment area such as seasonal high ground water, bedrock, or other restriction.

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## General Approval Testing and Evaluation: section 70

Gives authority to develop policy to verify performance of treatment units for TL2 and TL3

TL3 protocol to include:

- 20 units installed at single family homes
- Test BOD and TSS quarterly for one year
- Allows for O&M
- Oversight by 3<sup>rd</sup> party

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## Part II - Performance Requirements

- 80-90 Design Requirements
- 100 -110 Sampling Requirements

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## Part II - Design Requirements

- Loading Rates
- Effluent Quality based on vertical separation to a limiting feature
- Total Nitrogen (TN) requirements

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Table 1  
Maximum Pressure-Dosed Trench Bottom  
Hydraulic Rates

Percolation Rate (MPI)	Saturated hydraulic conductivity (cm/day)	TL-2 Effluent (gpd/sf)	TL-3 Effluent (gpd/sf)
≤15	> 17	1.8	3.0
15 to 25	15 to 17	1.4	2.0
>25 to 45	10 to < 15	1.2	1.5
>45 to 90	4 to < 10	0.8	1.0
>90	< 4	0.4	0.5

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### Things to Remember About Table 1 from 80.10

- Table 1 is for pressure dosed, trench bottom loading rates only.
- The designer is responsible for reducing loading rates according to the features and properties of the soils in the soil treatment area as well as for reducing loading rates for other types of dispersal.

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**Table 2**  
**Minimum Effluent Requirements for Vertical Separation to Limiting Features**

Vertical Separation To A Limiting Feature	Minimum Effluent Quality
≥18" (requires naturally occurring, undisturbed soils)	Septic
<18" to 12" (requires minimum 6" of naturally occurring, undisturbed soils)	TL-2
0-12 inches	TL-3 and standard disinfection
<6 inches to groundwater	Direct dispersal - 5/5/5 +

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## Nitrogen

- Large AOSS must control N leaching to groundwater for drinking water protection
- All AOSS in the Chesapeake Bay watershed have to control N

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## Part II - Sampling

- Field testing to check system
  - pH, flow, TRC, DO, odor, turbidity (visual), settleable solids
- Laboratory sampling for compliance
  - Defined intervals
  - BOD5 and disinfection for small AOSS (1/5 yr)
  - BOD5, TSS, TN, pH, and disinfection for large AOSS

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## Laboratory Samples vs Field Measurements, Sampling, Observations

Laboratory samples are potential compliance samples - for small AOSS 1/5 yr BOD5

Field tests are process control, or operational tests

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## Compliance Monitoring

Parameter	Plant Size	
	>10,000 gpd to 40,000 gpd	>1,000 gpd to 10,000 gpd
Flow	Measured	Measured or Estimated
BOD5, TSS	Grab Quarterly	Grab 1/yr
TN	Grab Quarterly	Grab 1/yr
TRC, end of contact tank	Grab Weekly	Grab 1/yr
Fecal Coliform	Grab Quarterly	Grab 1/yr

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## Part III - Operation and Maintenance

### Items of Importance

- Licensed operator
- O&M Manual
- O&M Visits (frequency, requirements)
- Reporting

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## O&M Involves

- Visit the system at least at the minimum frequency required by the regulations
- Perform operational adjustments, testing, and maintenance as needed to maintain system and in accordance with the O&M Manual
- Maintain log
- Provide reports to owner and VDH by 15<sup>th</sup> of month following activity

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## OPERATOR VISITS ≤ 0.04 MGD

Avg. Daily Flow	Initial Visit	Regular visits following initial visit
≤ 1,000 gpd	Within 180 calendar days of the issuance of the operation permit	Every 12 Months
>1,000 gpd to 10,000 gpd	First week of actual operation	Quarterly
>10,000 gpd to 40,000 gpd	First week of actual operation	Monthly

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## Horizontal Setbacks: Section 200

For designs by professional engineers only

- Upholds setbacks to drinking water sources/supplies, shellfish waters, sinkholes in 12VAC5-610
- Adds separation to wetlands
- Reduces separation to ditches with in 6 inches of groundwater for treated effluent and treated effluent with disinfection

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## Waivers from Certain Performance Requirements: 12VAC5-613-210

Allows a professional engineer to deviate from the soil loading rates (Table 1); the vertical separations (Table 2); and the vertical separation and soil cover requirements for septic tank effluent.

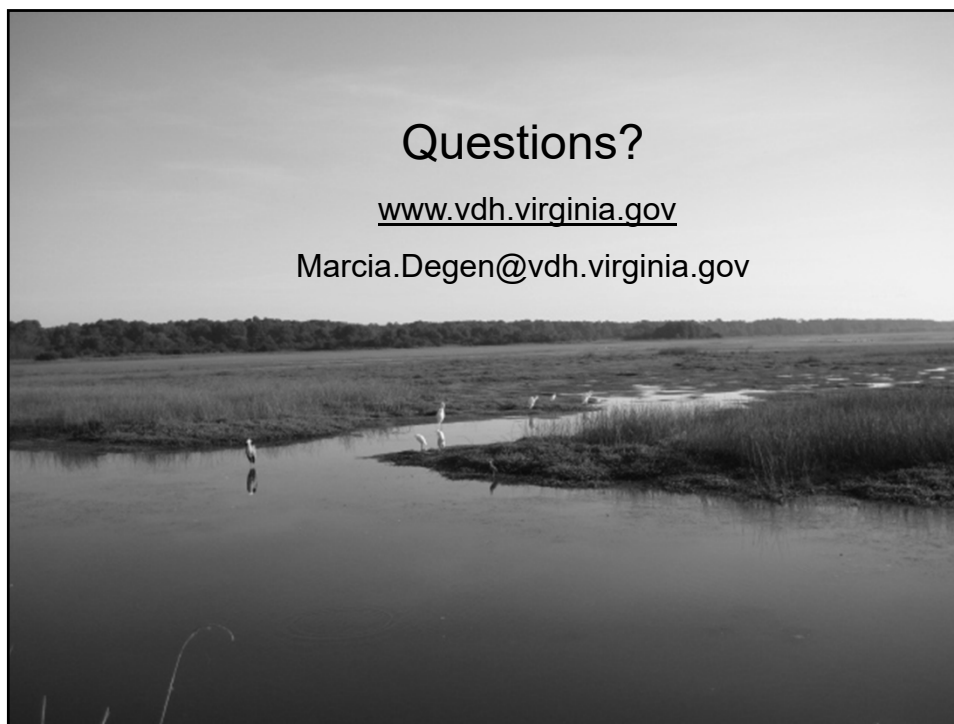
Requires justification

Requires sampling/monitoring to verify

Sets in soil standard of  $\leq 5$  mg/l BOD5 and fecal coliforms  $\leq 2.2$  col/100 ml

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Questions?  
[www.vdh.virginia.gov](http://www.vdh.virginia.gov)  
Marcia.Degen@vdh.virginia.gov



## So What's A Periodic Review?



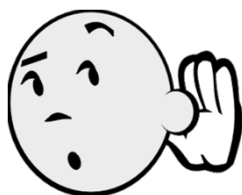
## What is a Periodic Review?

§ 2.2-4017. Periodic review of regulations. Requires agencies periodically review their regulations. Exact time period determined by Executive Order. Executive Order 17 (2014). Every existing state regulation shall be reviewed at least once every four years by the promulgating agency.

A periodic review shall include notice to the public, public comment period (minimum of 21 days), and a result announced (no later than 60 days)  
 Each periodic review shall include an examination by the OAG  
 The comment period for this Periodic Review began on January 25, 2016, and ended on February 25, 2016. 34 comments were received

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## Public Comments Received



34 comments received. Three main provisions most comments focused on:

- 12 VAC5 613-70, General Approval Process, TL3 Standard
- 12 VAC5-613-80 & 90, Loading Rate Charts, Groundwater protection
- 12 VAC5-613-100, Sampling frequency, access to sampling data
- General comments focusing on lack of clarity and enforcement of O&M

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## Workgroups Formed

Primarily from SHADAC and others who expressed interest

- Formed 3 workgroups initially to brainstorm ideas based on 12 VAC5-613-70; 12 VAC5-613-80 & 90; and 12 VAC5-613-100 amendments
- Each group tasked with coming up with ideas for amendment for respective provision

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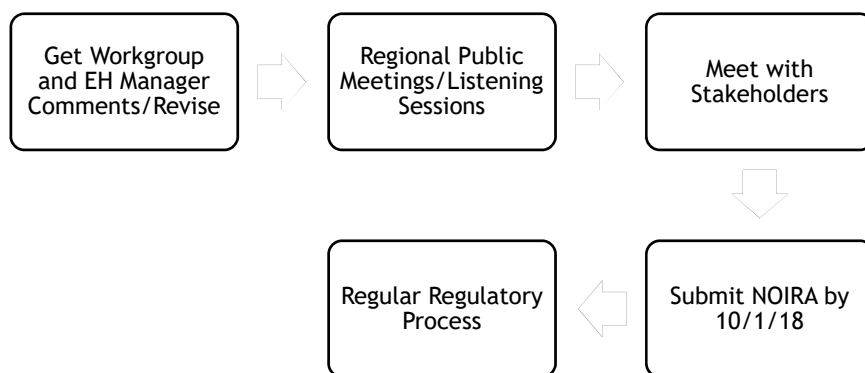
## Workgroup Meetings



- So far, we have held meetings on 5/17/17, 5/24/17, 9/20/17, and 11/1/17.
- Minutes Posted on Townhall.
- After each round of meetings, VDH staff worked on drafting proposed amendments based on brainstorming ideas in workgroups.
- The latest working draft is posted online.

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## Plan for AOSS Periodic Review



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## Areas of Amendment in Working Draft

Definitions (10)- residential wastewater, soil-like, permeability limiting feature

Applicability & Scope (30)-(K) Small spray irrigation systems are permitted by VDH through an agreement with DEQ. Should we incorporate the spray requirements into this regulation? (L)-(M) no longer needed

Relationship to Other Regulations (40)- (F) DPOR  
Licensure number

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## Amendments Continued

General Approval & Testing (70) & (75)- Goal of these amendments was to allow acceptance of out of state data in similar climate; allow CBOD5 data; create a de-listing protocol.

Performance Requirements (80)- A lot of clarity amendments and also amendments to the Tables

Performance Requirements (90)-Groundwater Monitoring Procedure added. (D) Clarifying the Nitrogen requirements and eliminating sections that VDH has found through experience is impossible to document

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## Amendments Continued

Sampling (100)-clarify purpose of sampling for small systems and sample point; add in enforcement triggers; modify sampling frequency for large AOSS

Operator Responsibilities (120)-Clarify that the requirement is that the operator is 'operating' the system and that at each visit, all operational tests, modifications, etc. are done.

Reports (190)- Requests the Operator's contact info so that VDH can follow-up.

Waivers (210)- Does VDH need this section where it has never been utilized and a variance accomplishes the same thing?

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## Comments, Concerns, Feedback

If you would like to speak, please come up to the podium, provide your name, city or county or residence, and the section of the Regulation you are addressing.

If you would rather submit written comments, you may do so either here on provided index cards or send via email to [Marcia.Degen@vdh.Virginia.gov](mailto:Marcia.Degen@vdh.Virginia.gov) or [Karri.Atwood@vdh.Virginia.gov](mailto:Karri.Atwood@vdh.Virginia.gov).

A link to the working draft of the AOSS Regulations can be found on VDH's website, <http://www.vdh.virginia.gov/environmental-health/onsite-sewage-water-services-updated/news-of-interest/>

Thank you for your participation!