

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

The Virginia Department of Health (VDH) held a listening session (public meeting) on May 10, 2018, in the Board Room at the Augusta County Government Center in Verona, Virginia. 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, and Anthony Creech facilitated the meeting and/or recorded minutes. The meeting was opened at 10 AM.

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.

- Harrison Cabbage (operator) noted there is a lack of enforcement of the operation and maintenance (O&M) requirements and no communication to the owners as to their responsibility. An owner won't do anything until the County tells them to. He notifies VDH if a homeowner cancels a maintenance contract with him, but VDH doesn't have the staff to follow up on it. VDH noted that a stronger enforcement policy is in the works and proposed changes to the regulations will help with enforcement.
- Jeff Gentry (designer) agreed that post installation upkeep and O&M is lacking. Often when a home changes hands, the new owner is not notified of their responsibilities. Owner communication is an issue. He also noted a shortage of service providers.
- Bill Moore (designer) asked if the sampling that is done is available. He would like to be able to access it to see how his designs are doing. VDH responded that the raw data are available [online](#), but the data are only as good as the input. Often operators do not input the data into the field and just attach the data report as a pdf. If it's not input into the data

field, the data are not readable by the database. This causes issues with VDH being able to track when sample data are submitted because VDH staff have to open each report, open the pdf, and check the file instead of having the database do the work. Mandatory data fields are needed.

- Jeff Gentry asked if there will be mandatory reporting of pumpouts. He feels that Loudoun seems to be the only health district enforcing pumpouts. VDH noted that the AOSS Regulations require that pumpouts for alternative systems be reported. VDH has no authority to require pumpouts to be reported for conventional systems. Mr. Gentry asked if there is any consideration to requiring O&M for conventional systems with pumps and control panels. VDH responded that a recent bill to the general assembly asking for authority to regulate O&M of conventional systems was not passed so VDH cannot require O&M for conventional systems.

VDH reviewed key points in the working draft regulation and asked for input.

- Changing ‘average’ to ‘peak’ in relation to design flow throughout the regulation.
  - VDH noted that all small AOSS designs are based on peak flow and that Table 1 also is based on a maximum loading to the drainfield and that changing the regulation to peak flow instead of average daily flow will be more in line with how designs are actually accomplished. VDH also believes it will help in consistently applying the O&M requirements for large systems as well.
  - Attendees commented that it’s confusing as to where the ‘peak’ is to be applied. If it’s a peak to the drainfield, then the regulation should clearly state that.
  - Bob Marshall noted that there is a need for a way to catch changes in use for commercial systems that affect how a system performs. VDH noted that the AOSS Regulations have renewable operating permits for large AOSS that will allow VDH to assess changes every 5 years. It was noted that there is no policy or minimum requirements for renewing operating permits and perhaps there should be more detail in the regulations.
- Adding a definition for ‘soil-like’.
  - 12VAC5-613-80.14 allows soil, sand, or soil-like material be used to increase vertical separation. Soil-like has no definition and as a result has been problematic from an implementation standpoint.
  - Comment: Add in clean sand and/or a definition for sand.
  - Comment: Add Texture Group I and Texture Group II as a modifier for the soil description.
- Removal of 12VAC5-613-40.G.
  - VDH noted that the AOSS Regulations are supplemental to the Sewage Handling and Disposal Regulations and that all procedures related to filing an application are to follow the Sewage Handling and Disposal Regulations as stated in 12VAC50613-40.B. Section 40.G. sets a different standard for submittals under 32.1-163.6 that has been problematic with regard to adequate number of soil borings, depth of soil borings, and sanitary surveys. VDH sees no need to set a different submittal standard for engineered systems.
  - Comment: If removed need to reinforce that all submittals have to follow the Sewage Handling and Disposal Regulations

- Comment: Why not add in more detail? The Alternative Discharge Regulations (12 VAC5-640) have a list of what is required in a plan submittal.
- Table 1 modifications to add in soil descriptors; remove Ksat; add in other dispersal methods, and split texture group III into 2 categories.
  - Comment: Would like to see ksat stay as he designs on ksat.
  - Comment: Revised table is more prescriptive and should try to get away from more prescription.
  - Comment: In general, commenters like the expanded table, but do not see the need for the soil descriptors.
- Table 2 modifications to change 0-12 to 6-12 for depth to limiting features other than water table and changes for clarity.
  - No comments
- Sampling and Enforcement changes to section 100.
  - VDH explained that the changes would modify the ‘1+’ enforcement strategy currently in place. Sample results 3x the limit would result in immediate enforcement. For larger system, out of compliance has been defined.
  - Comments: The penalties are too low to bring about compliance. VDH explained that civil penalties can accrue up to \$3000
- Deletion of section 210 - Waivers
  - VDH explained that the variance process would provide the same relief that section 210 does. Section 210 has also not been used much.
  - Comment: Better to keep section 210 so that more work doesn’t go up to the Commissioner’s office.

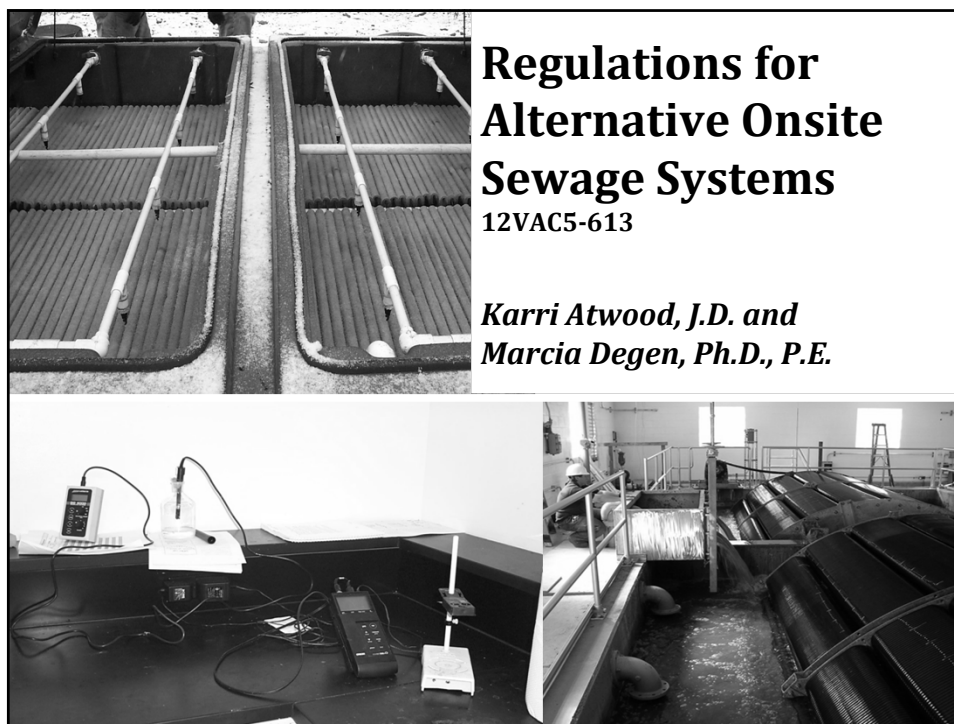
VDH asked if there were any other comments from the audience.

Bill Moore said that he is seeing more interest in community systems but that there is a reluctance for the general public to embrace them.

Bob Marshall noted that VDH needs plan review forms that would provide staff guidance and also allow the private sector to see what VDH is looking for. VDH noted that revisions to the plan review policy will include plan review sheets.

Steve Elgin noted that section 200 should be clarified to note that only engineers submitting under 32.1-163.6 can use these horizontal setbacks.

The meeting was closed at 12N.



# 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.

3

## 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

4

## Two Basic Categories of OWTS

- Conventional
- Alternative

5

## Conventional Onsite Systems

Two main characteristics (must have both):

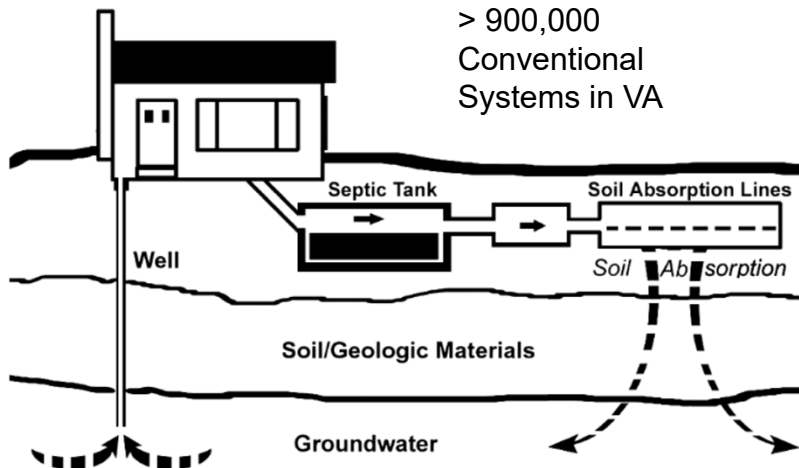
- Septic tank(s) for treatment
- Gravity distribution within a trench type drainfield

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

Relies on 'good' soils for majority of treatment

6

## Conventional System: Drainfield



7

## Conventional Onsite System



8

## 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

9

## 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

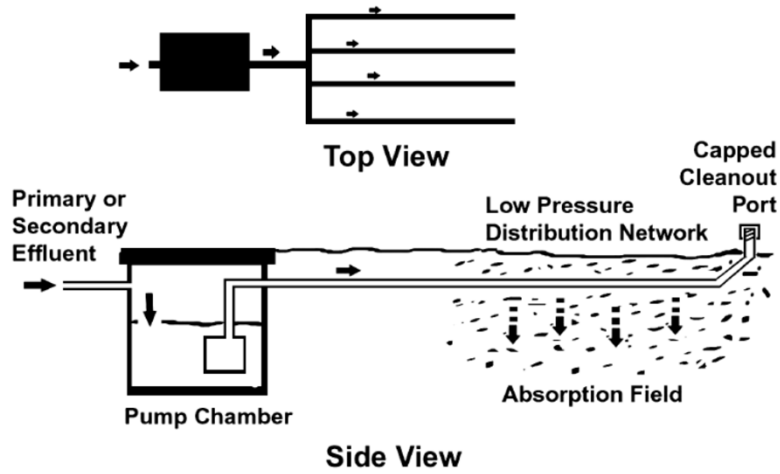
Provides additional treatment in a “box”

About 10% of all new systems are alternative

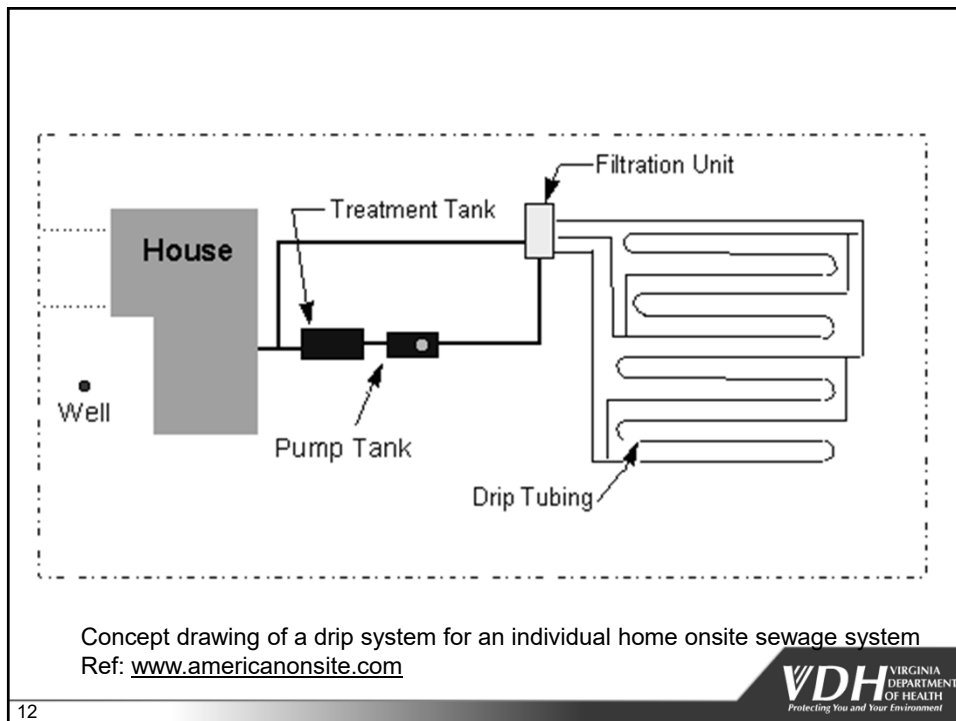
10



# Alternative Onsite System: LPD



11

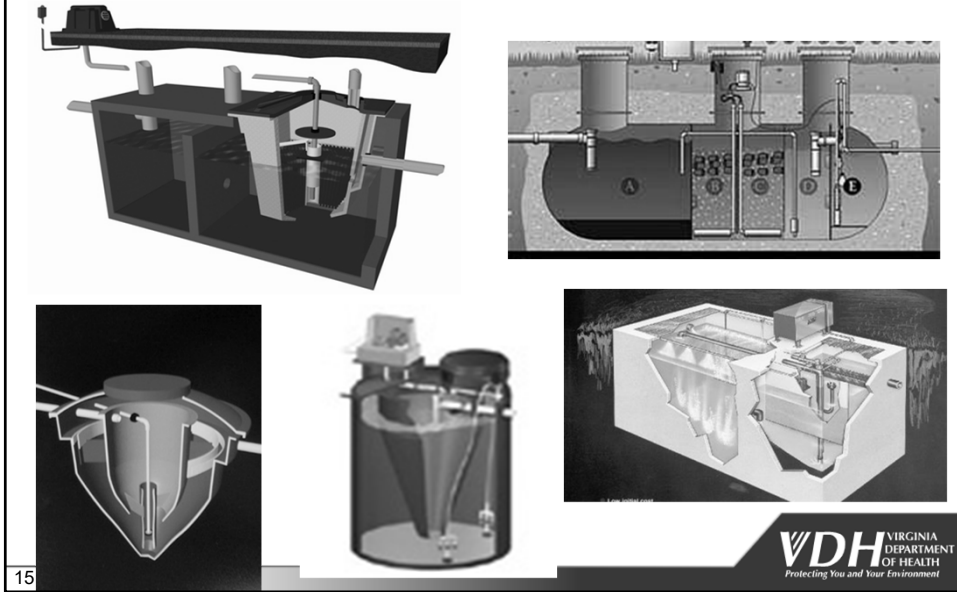


Concept drawing of a drip system for an individual home onsite sewage system  
Ref: [www.americanonsite.com](http://www.americanonsite.com)

12



### Suspended Growth Systems - "ATUs"



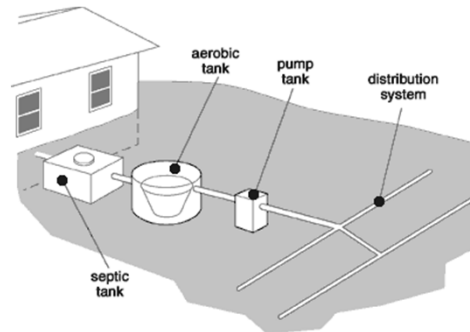
### Attached Growth Systems - "Media Filters"



## Layout

Positioned after primary tank (septic tank)

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



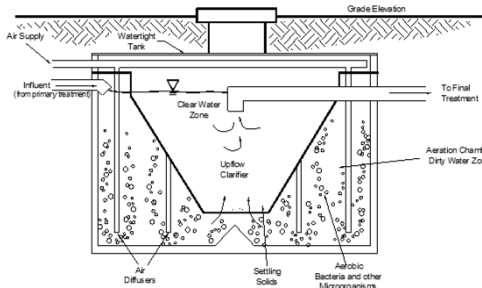
17



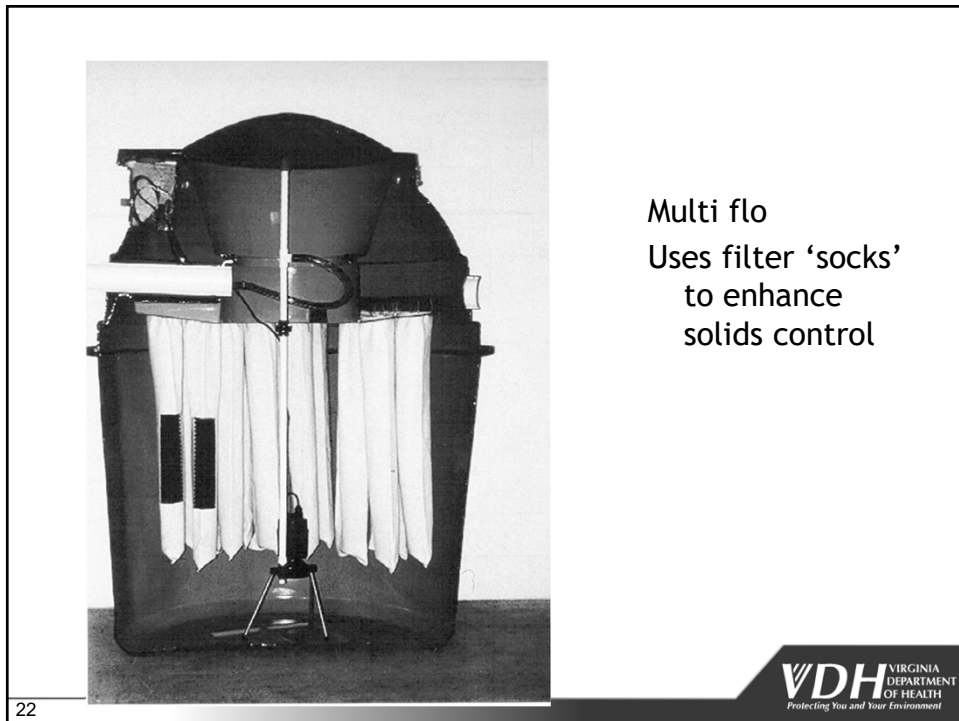
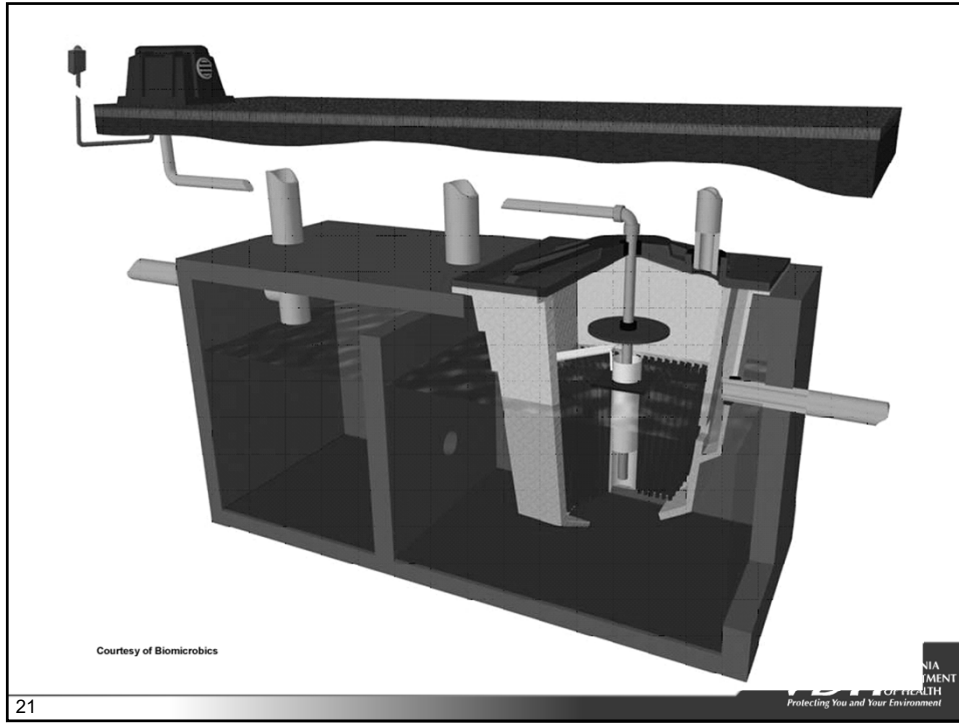
## ATUs are Biological Reactors

### Miniature Wastewater Treatment Plants

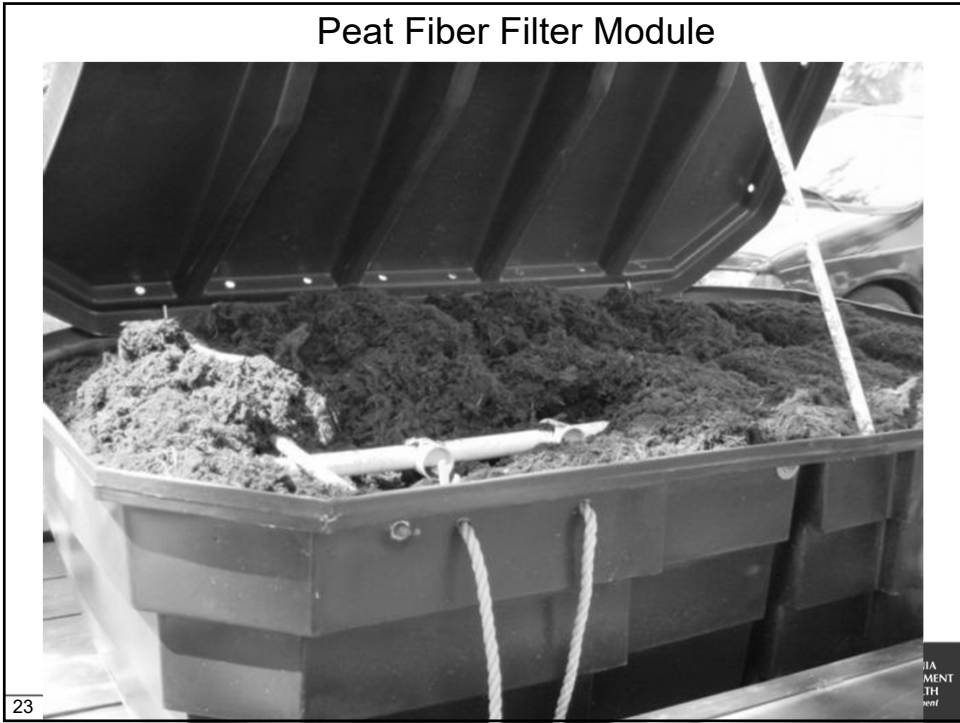
- the biological processes are well-understood
- the overall design objective is effective mixing of microbes, wastewater, and dissolved oxygen



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

27

## Regulations for alternative onsite sewage systems

28

## Regulatory Background

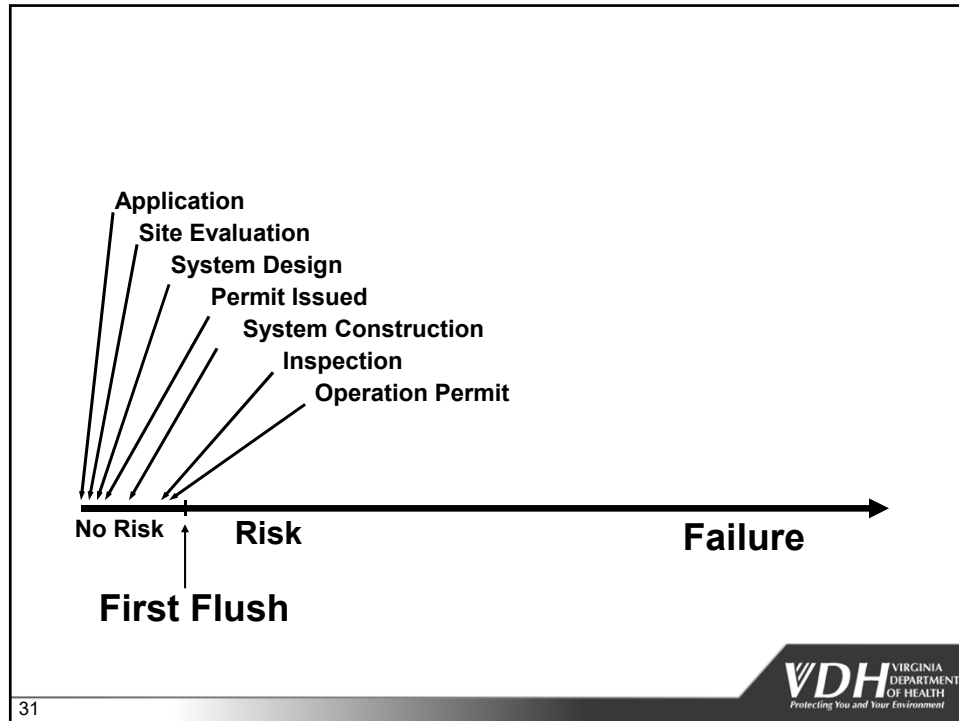
- Originally onsite systems only regulated through the Sewage Handling and Disposal Regulations  
12 VAC 5-610
- Administrative practices
- Soil and site evaluation techniques
- Conventional designs
- Designs for a few alternatives (LPD and mounds)
- Focus on small systems

29

## 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

30



## 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

## 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

33

33

## 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)

34

34

## 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

35

35

### 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                         |                                    |   |

36

36

## Part I - Definitions of Note

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

37

37

## Part I - Definitions of Note

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

38

38

## 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

39

39

## Part I - Definitions of Note

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

40

40

## 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

41

41

## Part I - Definitions of Note

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

42

42



## 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

43

43

## Part I - Definitions of Note

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

44

44

## 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.

45

45

High Shrink  
swell Clay



46



47

## Part I - Definitions of Note

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

48

48

## 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.

49

49

## 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

50

## Part II - Performance Requirements

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

51

51

## Part II - Design Requirements

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

52

52

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

53

53

### 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.

54

**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 +

55

55

## Nitrogen

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

56

56

## 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

57

57

## 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

58

58



## 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

## Part III - Operation and Maintenance

### Items of Importance

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

## 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

61

61

## 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

62

62

## 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

63

## 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.

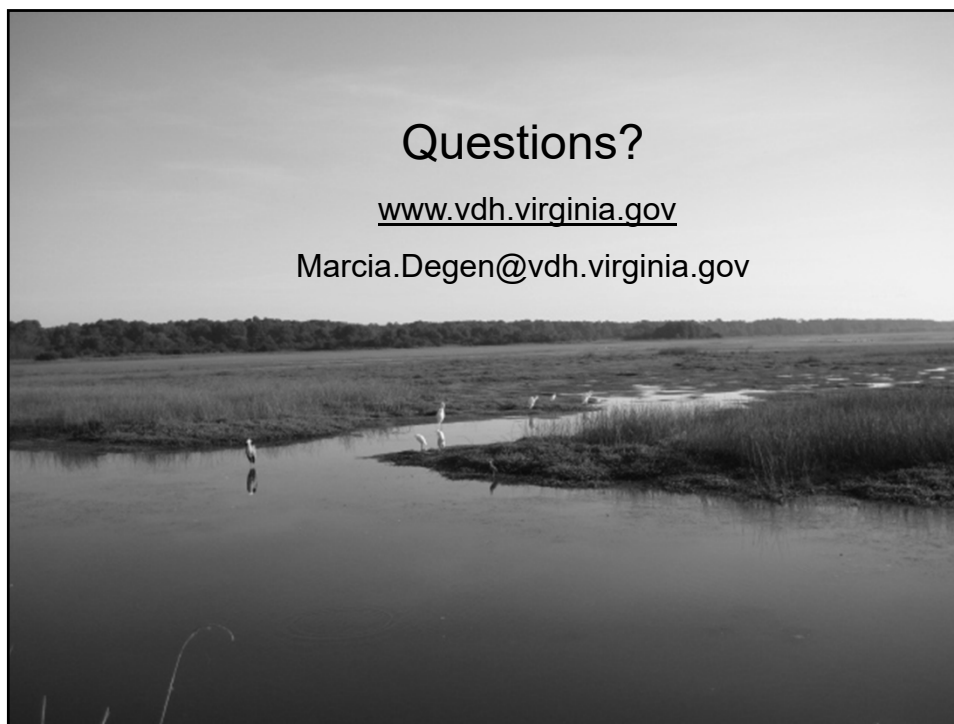
Requires justification

Requires sampling/monitoring to verify

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

64

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



## So What's A Periodic Review?



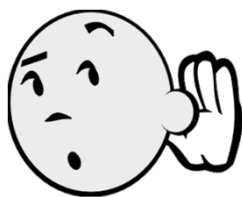
## What is a Periodic Review?

§ 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

67

## 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

68

## 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

69

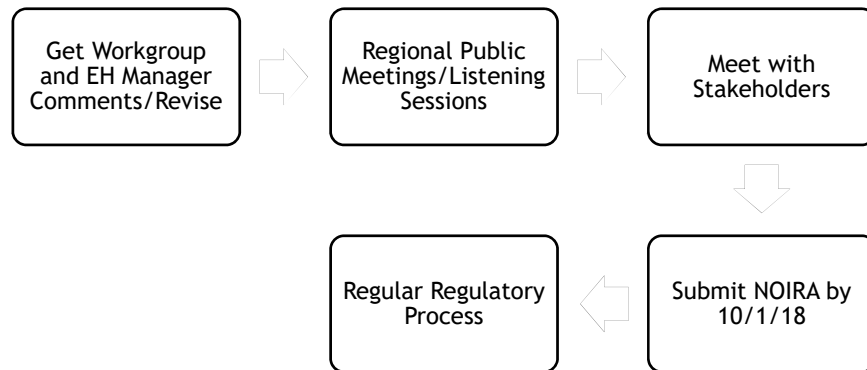
## Workgroup Meetings



- 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.

70

## Plan for AOSS Periodic Review



71

## 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

72

## 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

73

## 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?

74



## 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!