Virginia Administrative Code Title 12. Health

Agency 5. Department of Health

Chapter 613. Regulations for Alternative Onsite Sewage Systems

# 12VAC5-613-10. Definitions.

Part I. General

The following words and terms used in this chapter shall have the following meanings. Terms not defined in this chapter shall have the meanings prescribed in Chapter 6 (§ 32.1-163 et seq.) of Title 32.1 of the Code of Virginia or in 12VAC5-610 unless the plain reading of the language requires a different meaning.

"Alternative onsite sewage system," "AOSS," 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.

"Best management practice" means a conservation or pollution control practice approved by the division, such as wastewater treatment units, shallow effluent dispersal fields, saturated or unsaturated soil zones, or vegetated buffers, that manages nutrient losses or other potential pollutant sources to minimize pollution of water resources.

"Biochemical oxygen demand, five-day" or "BOD5" means the quantitative measure of the amount of oxygen consumed by bacteria while stabilizing, digesting, or treating biodegradable organic matter under aerobic conditions over a five-day incubation period; BOD5 is expressed in milligrams per liter (mg/l).

"Board" means the State Board of Health.

"Chesapeake Bay Watershed" means the following Virginia river basins: Potomac River Basin (see 9VAC25-260-390 and 9VAC25-260-400 ), James River Basin (see 9VAC25-260-410 ,

9VAC25-260-415 , 9VAC25-260-420 , and 9VAC25-260-430 ), Rappahannock River Basin (see 9VAC25-260-440 ), Chesapeake Bay and small coastal basins (see 9VAC25-260-520 , Section 2 through Section 3g), and the York River Basin (see 9VAC25-260-530 ).

"Conventional onsite sewage system" means a treatment works consisting of one or more septic tanks with gravity, pumped, or siphoned conveyance to a gravity distributed subsurface drainfield.

"Department" means the Virginia Department of Health.

"Direct dispersal of effluent to ground water" means less than six inches of vertical separation between ground water and the point of effluent application or the bottom of an effluent- dispersal trench or other excavation. Other excavation excludes the following: minor tillage of the soil surface without soil removal; replacement of fill material with better quality fill material as determined by the department to improve the ability of the site to treat wastewater; house foundations; tank excavations; force main and header line excavations; and soil disturbances, including preexisting drainfields installed prior to July 17, 2017, that are not designed for surface or ground water drainage, and do not create a direct conduit to ground water.

"Disinfection" means a process used to destroy or inactivate pathogenic microorganisms in wastewater to render them non-infectious.

"Dissolved oxygen" or "DO" means the concentration of oxygen dissolved in effluent, expressed in mg/l or as percent saturation, where saturation is the maximum amount of oxygen that can theoretically be dissolved in water at a given altitude and temperature.

"Division" means the Division of Onsite Sewage and Water Services, Environmental Engineering, and Marina Programs within the department.

"Effluent" means sewage that has undergone treatment.

"General approval" means that a treatment unit has been evaluated in accordance with the requirements of this chapter and 12VAC5-610 and approved for TL-2 or TL-3 in accordance with this chapter.

"GPD/sf" means gallons per day per square foot.

"Ground water" means any water, except capillary moisture, beneath the land surface in the zone of saturation or beneath the bed of any stream, lake, reservoir, or other body of surface water wholly or partially within the boundaries of this Commonwealth, whatever the subsurface geologic structure in which such water stands, flows, percolates, or otherwise occurs. Ground water includes a seasonal or perched water table.

"High-level disinfection" means a disinfection method that results in a fecal coliform concentration less than or equal to 2.2 colonies/100 ml. Chlorine disinfection requires a minimum total residual chlorine (TRC) concentration at the end of a 30 minute contact time of 1.5 mg/l. Ultraviolet disinfection requires a minimum dose of 50,000 µW-sec/cm2. Influent turbidity to the disinfection unit shall be less than or equal to 2 Nephelometric turbidity units (NTU) on average.

"Ksat" means saturated hydraulic conductivity.

"Large AOSS" means an AOSS with a combined peak daily sewage flow greater than 1,000 GPD or a structure with an peak daily sewage flow in excess of 1,000 GPD.

"Limiting feature" means 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.

"Local health department" means the local health department having jurisdiction over the AOSS.

"Maintenance" means performing adjustments to equipment and controls and in-kind replacement of normal wear and tear parts such as light bulbs, fuses, filters, pumps, motors,

or other like components. Maintenance includes pumping the tanks or cleaning the building sewer on a periodic basis. Maintenance shall not include replacement of tanks, drainfield piping, and distribution boxes or work requiring a construction permit and an installer. [**DEFINITION SUBJECT TO CHANGE BASED ON 2018 GA SESSION]**

"MGD" means million gallons per day. "MPI" means minutes per inch.

"Operate" means the act of making a decision on one's own volition to (i) place into or take out of service a unit process or unit processes or (ii) make or cause adjustments in the operation of a unit process at a treatment works.

"Operation" means the biological, chemical, and mechanical processes of transforming sewage or wastewater to compounds or elements and water that no longer possess an adverse environmental or health impact.

"Operator" means any individual employed or contracted by any owner who is licensed or certified under Chapter 23 (§ 54.1-2300 et seq.) of Title 54.1 of the Code of Virginia as being qualified to operate, monitor and maintain an alternative onsite sewage system.

"Organic loading rate" means the biodegradable fraction of chemical oxygen demand (BOD, biodegradable fats, oils, and grease and volatile solids) delivered to a treatment component in a specified time interval expressed as mass per time or area; examples include pounds per day, pounds per cubic foot per day (pretreatment), or pounds per square foot per day (infiltrative surface or pretreatment). For a typical residential system, these regulations assume that biochemical loading (BOD5) equals organic loading.

"Owner" means the Commonwealth or any of its political subdivisions, including sanitary districts, sanitation district commissions and authorities, or any individual, any group of individuals acting individually or as a group, or any public or private institution, corporation, company, partnership, firm, or association that owns or proposes to own a sewerage system or treatment works.

“Permeability limiting feature” means any soil horizon, layer, feature, etc., that is less permeable than the infiltrative surfaces higher in the soil profile

"pH" means the measure of the acid or base quality of water that is the negative log of the hydrogen ion concentration.

"Pollution" means such alteration of the physical, chemical, or biological properties of any state waters as will or is likely to create a nuisance or render such waters (i) harmful or detrimental or injurious to the public health, safety, or welfare or to the health of animals, fish, or aquatic life; (ii) unsuitable with reasonable treatment for use as present or possible future sources of public water supply; or (iii) unsuitable for recreational, commercial, industrial, agricultural, or other reasonable uses. Pollution shall include any discharge of untreated sewage into state waters.

"Point source discharge" means any discernible, confined, and discrete conveyance including any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water run-off.

"Project area" means one or more recorded lots or a portion of a recorded lot owned by the owner of an AOSS or controlled by easement upon which an AOSS is located or that is contiguous to a soil treatment area and that is designated as such for purposes of compliance with the performance requirements of this chapter. In the case of an AOSS serving multiple dwellings, the project area may include multiple recorded lots as in a subdivision.

"Project area boundary" or "project boundary" means the physical limits of the three- dimensional length, width, and depth of the project area, whereby each dimension is identified as follows: (i) the horizontal component is the length and width of the project area; the upper vertical limit is the ground surface in and around the AOSS; and (iii) the lower vertical limit is the limiting feature.

"Renewable operating permit" means an operation permit that expires and must be revalidated at a predetermined frequency or schedule in accordance with this chapter.

"Reportable incident" means one or more of the following: an alarm event lasting more than 24 hours; an alarm event that reoccurs; any failure to achieve one or more performance requirements; removal of solids; replacement of media; or replacement of any major component of the system including electric and electronic components, pumps, blowers, and valves. The routine cleaning of effluent filters is not a reportable incident.

"Residential wastewater" means sewage (i) generated by residential or accessory uses, not containing storm water or industrial influent, and having no other toxic, or hazardous constituents not routinely found in residential wastewater flows, or (ii) as certified by a professional engineer

"Saturated hydraulic conductivity" means a quantitative measure of a saturated soil's capacity to transmit water when subjected to a hydraulic gradient.

"Settleable solids" means a measure of the volume of suspended solids that will settle out of suspension within a specified time, expressed in milliliters per liter (ml/l).

"Sewage Handling and Disposal Regulations" means 12VAC5-610 or its successor.

"Small AOSS" means an AOSS with a combined peak flow of less than or equal to 1,000 GPD, or a structure with an peak daily sewage flow of less than or equal to 1,000 GPD.

“Soil-like” [**DEFINITION NEEDED TO SPECIFY MATERIAL FOR VERTICAL SEPARATION as NOTED IN 80.14]**

"Soil treatment area" means the physical location in the naturally occurring soil medium where final treatment and dispersal of effluent occurs.

"Standard disinfection" means a disinfection process that results in a fecal coliform concentration of less than or equal to 200 colonies/100 ml. Chlorine disinfection requires a minimum TRC concentration at the end of a 30 minute contact time of 1.0 mg/l. Influent TSS to the disinfection unit shall average 30 mg/l or less.

"Standard engineering practice" means the care, diligence, competence, and judgment that a reasonably prudent and experienced professional engineer licensed in the Commonwealth of Virginia would exercise given the circumstances, including site and soil conditions, of a particular AOSS design.

"State waters" means all water, on the surface and under the ground, wholly or partially within or bordering the Commonwealth or within its jurisdiction, including wetlands.

"Subsurface drainfield" means a system installed within the soil and designed to

accommodate treated sewage from a treatment works.

"Surface waters" means: (i) all waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide; (ii) all interstate waters, including interstate wetlands; (iii) all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds and the use, degradation, or destruction of which would affect or could affect

interstate or foreign commerce including any such waters: (a) that are or could be used by interstate or foreign travelers for recreational or other purposes; (b) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (c) that are used or could be used for industrial purposes by industries in interstate commerce; (iv) all impoundments of waters otherwise defined as surface waters under this definition; (v) tributaries of waters identified in clauses (i) through (iv) of this definition; (vi) the territorial sea; and (vii) wetlands adjacent to waters (other than water that are themselves wetlands) identified in clauses (i) through (vi) of this definition.

"Total nitrogen" or "TN" means the measure of the complete nitrogen content of wastewater including all organic, inorganic, and oxidized forms expressed in mg/l as nitrogen.

"Total residual chlorine" or "TRC" means a measurement of the combined available chlorine and the free available chlorine available in a sample after a specified contact time.

"Total suspended solids" or "TSS" means a measure of the mass of all suspended solids in a sample typically measured in milligrams per liter (mg/l).

"Treatment level 2 effluent" or "TL-2 effluent" means secondary effluent as defined in 12VAC5-610-120 that has been treated to produce BOD5 and TSS concentrations equal to or less than 30 mg/l each.

"Treatment level 3 effluent" or "TL-3 effluent" means effluent that has been treated to produce BOD5 and TSS concentrations equal to or less than 10 mg/l each.

"Treatment unit" or "treatment system" means a method, technique, equipment, or process other than a septic tank or septic tanks used to treat sewage to produce effluent of a specified quality before the effluent is dispersed to a soil treatment area.

“Treatment works” means any device or system used in the storage, treatment, disposal or reclamation of sewage or combinations of sewage and industrial wastes, including but not limited to pumping, power and other equipment and appurtenances, septic tanks, and any works, including land, that are or will be (i) an integral part of the treatment process or (ii) used for ultimate disposal of residues or effluents resulting from such treatment.

"Turbidity" means a measurement of the relative clarity of effluent as a result of the presence of varying amounts of suspended organic and inorganic materials or color.

"Vertical separation" means 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.

"Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

## 12VAC5-613-20. Purpose and Authority.

1. Pursuant to the requirements of §§ 32.1-12 , 32.1-163.6 , and 32.1-164 of the Code of Virginia, the board has promulgated this chapter to:
	1. Establish a program for regulating the operation and maintenance of alternative onsite sewage systems;
	2. Establish performance requirements for alternative onsite sewage systems;
	3. Establish horizontal setbacks for alternative onsite sewage systems that are necessary to protect public health and the environment;
	4. Discharge the board's responsibility to supervise and control the safe and sanitary collection, conveyance, transportation, treatment, and disposal of sewage by onsite sewage systems and treatment works as they affect the public health and welfare;
	5. Protect the quality of surface water and ground water;
	6. Guide the commissioner in determining whether a permit or other authorization for an alternative onsite sewage system shall be issued or denied; and
	7. Inform owners, applicants, onsite soil evaluators, system designers, and other persons of the requirements for obtaining a permit or other authorization for an AOSS.
2. The division may, as it deems necessary, develop best management practices for the purposes of recognizing acceptable methods to reduce pollution from AOSSs.

# 12VAC5-613-30. Applicability and Scope.

1. As provided in this section, this chapter governs the design, construction, and operation of AOSSs.
2. Part II of this chapter, Performance Requirements, applies only to AOSSs with applications filed on or after December 7, 2011.
3. Any AOSS with an application filed prior to December 7, 2011, is subject to the performance requirements contained in the regulations in effect at the time the system was permitted or the performance requirements contained in the operation permit.
4. Small AOSSs designed, constructed, permitted, and operated in accordance with this chapter; the prescriptive design, location, and construction criteria of 12VAC5-610-20; and the policies and procedures of the department are presumed to comply with the ground water quality requirements of 12VAC5-613-90 A.
5. Part III of this chapter, Operation and Maintenance Requirements, shall apply to all AOSSs, including those with applications filed prior to December 7, 2011.
6. Requirements for renewable operation permits contained in this chapter shall apply only to AOSSs with applications filed on or after December 7, 2011.
7. The laboratory sampling requirements of this chapter apply only to AOSSs with

applications filed on or after December 7, 2011.

1. Any AOSS with an application filed prior to December 7, 2011, is subject to the laboratory sampling requirements contained in the regulations in effect at the time the system was permitted or the sampling requirements contained in the operation permit.
2. AOSSs designed pursuant to § 32.1-163.6 of the Code of Virginia are subject to the following requirements:
	1. Performance requirements of this chapter unless waived pursuant to 12VAC5-613-210;
	2. Horizontal setback requirements of this chapter;
	3. Operation, maintenance, inspection, and sampling requirements of this chapter; and
	4. Standard engineering practice.
3. Dispersal of treated or untreated sewage to a wetland that is subject to permitting by the Virginia Department of Environmental Quality pursuant to the requirements of Title 62.1 of the Code of Virginia is specifically excluded from this chapter.

 **Regarding K below: Small spray irrigation systems are permitted by VDH through an agreement with DEQ. Should we incorporate the spray requirements into this regulation?**

1. Spray irrigation systems are subject to permitting by the Virginia Department of Environmental Quality and are specifically excluded from this chapter.

 **[ L through M are no longer needed]**

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# 12VAC5-613-40. Relationship to Other Regulations.

1. This chapter is supplemental to 12VAC5-610 (Sewage Handling and Disposal Regulations).

All procedures pertaining to enforcement, minimum requirements for filing applications, and processing of applications, including appeals and case decisions contained in the Sewage Handling and Disposal Regulations shall apply to the permitting of AOSSs under this chapter. For application submittal, Ksat or percolation rate are required at the proposed installation depth and at depths below the soil treatment area to demonstrate compliance with this chapter. Ksat or percolation rate may be estimated for small AOSSs. The Ksat or percolation rate must be measured using an appropriate device for large AOSSs.

1. In any case where there is a conflict between this chapter and the Sewage Handling and Disposal Regulations, this chapter shall control.
2. This chapter supersedes Table 5.4 of the Sewage Handling and Disposal Regulations for all AOSSs designed to disperse TL-2 or TL-3 effluent. Table 5.4 of the Sewage Handling and Disposal Regulations (12VAC5-610-950 ) shall govern the design of any AOSS designed to disperse septic tank effluent to the soil treatment area unless waived pursuant to 12VAC5- 613-210 . The Sewage Collection and Treatment Regulations, 9 VAC25-790, are supplemental for systems with flows over 10,000 gpd.
3. All plans and specifications for AOSSs shall be properly sealed by a professional engineer licensed in the Commonwealth pursuant to Title 54.1 of the Code of Virginia unless such plans are prepared pursuant to an exemption from the licensing requirements of Title 54.1 of the Code of Virginia. All AOSS designs prepared by a professional engineer shall be reviewed by the department pursuant to § 32.1-163.6 of the Code of Virginia unless otherwise designated in writing by the professional engineer.
4. When AOSS designs are prepared pursuant to an exemption from the licensing requirements of Title 54.1 of the Code of Virginia, the designer shall provide a certification statement on a form approved by the division identifying the specific exemption under which the plans and specifications were prepared and certifying that the designer is authorized to prepare such plans pursuant to the exemption.
5. All construction applications, operation and maintenance reports, and construction completion statements submitted to the Department must contain the licensure number of the certifying individual under Title 54.1 of the Code of Virginia.

**The intention is that the submittal requirements and site characterization requirements are the same as 610 with the exception of the Ksat and other requirements as specified. Is this section (Old F) necessary? Suggesting to delete it.**

* 1. . .

## 12VAC5-613-50. Violations and Enforcement.

1. Subject to the limitations of 12VAC5-613-30 .B, failure by any owner of an AOSS to achieve one or more performance requirements prescribed by this chapter or specified for the AOSS shall be a violation of this chapter.
2. Failure by any owner to comply with the conditions of an operation permit shall be a violation of this chapter.
3. Failure by any owner to accomplish any mandated visit, operation, maintenance, repair,

monitoring, sampling, reporting, or inspection requirement prescribed by this chapter shall be a violation of this chapter.

1. Failure by any owner to follow the approved operation and maintenance manual (O&M manual) shall be deemed a violation of this chapter when such failure results in the failure to achieve one or more performance requirements prescribed by this chapter.
2. Failure by any operator to perform any mandated activity in accordance with 12VAC5-613- 110 , 12VAC5-613-120 , 12VAC5-613-180 , or 12VAC5-613-190 shall be a violation of this chapter.
3. Nothing in this chapter shall be construed to limit the authority of the board, the commissioner, or the department to enforce this chapter or to enforce the requirements of 12VAC5-610 .
4. In accordance with the Sewage Handling and Disposal Regulations and § 32.1-25 of the Code of Virginia, the commissioner may take such samples and conduct such monitoring, including ground water samples and monitoring, that he deems necessary to enforce this chapter.
5. The board, commissioner, and department may use any lawful means to enforce this chapter including voiding a construction or operation permit, imposition of civil penalties, or criminal prosecution pursuant to § 32.1-27 of the Code of Virginia.
6. Except when there is additional evidence that an AOSS has failed to achieve one or more of the performance requirements of this chapter or when a licensed operator has filed a report indicating that an AOSS is not functioning properly and cannot be returned to normal function via routine maintenance, the department shall not rely solely on the results of an individual grab sample to establish the factual basis for a violation of this chapter.

## 12VAC5-613-60. Operation Permits and Land Records.

**Is it appropriate to clarify here if this recordation applies to large AOSSs, especially community systems?**

1. The department shall not issue an operation permit for an AOSS to serve a residential structure until the property owner has recorded an instrument that complies with § 15.2-2157 E of the Code of Virginia in the land records of the circuit court having jurisdiction over the site of the AOSS. The local health department shall receive legal documentation indicating that the instrument has been duly recorded before issuance of the operation permit.
2. When all or part of the project area is to be used in the management of nitrogen from a large AOSS, the property owner or the owner of the AOSS shall record legal documentation in the land records of the circuit court having jurisdiction over the site of the AOSS. Such documentation shall contain assurances that the land area will be protected and preserved in accordance with the management methods established by the designer. The local health department shall receive legal documentation indicating that the instrument has been duly recorded before issuance of the operation permit.
3. All large AOSSs and any AOSS permitted pursuant to 12VAC5-613-90 C shall be subject to a renewable operating permit. Such permits shall be issued for a period of five years. The owner of the AOSS shall apply for a new permit at least 180 days prior to the expiration date.

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## 12VAC5-613-70. General Approval Testing and Evaluation.

Goal: allow acceptance of out of state data in similar climate; allow CBOD5 data; create a de-listing protocol. Should specific states or other geographic reference replace hardiness zones?

1. The division shall develop a protocol to verify the expected performance of treatment units of small AOSSs that meet TL-2 or TL-3 effluent quality. The protocol to evaluate and test field performance of TL-3 treatment units shall include the following minimum requirements:
	1. The manufacturer shall evaluate at least 20 treatment units installed for single family residences occupied full-time, year-round throughout the testing and evaluation period. The test population may be composed of units from one or more of the following categories:
2. Treatment units installed and tested in the Commonwealth of Virginia in accordance with Agency policy;
3. Treatment units undergoing NSF/ANSI Standard 360 certification testing. Only data collected from test units located within USDA Plant Hardiness Zones 1a through 7b will be accepted; and
4. Test units installed and tested in other states meeting all of the following requirements:
5. The test units are located in USDA Plant Hardiness Zone 1a through 7b;
6. The test units meet the residential use and occupancy and design capacity requirements of agency policy; and
7. The sample collection, transport, and analysis methods use to collect the data are d comparable to those provided in agency policy.
	1. The manufacturer shall provide the division with quarterly results of effluent samples measuring, at a minimum, BOD and TSS for each installed treatment unit. Influent samples may be required to justify the removal of a test unit from the testing population. CBOD5 (5 day carbonaceous biochemical oxygen demand) may be substituted for BOD5, but the Division shall apply a 1.2 correction factor to the result.
	2. Operation and maintenance shall be performed on each treatment unit during the evaluation period in accordance with the provisions of this chapter; and
	3. An independent, disinterested third party shall oversee and administer the testing and evaluation protocol. Examples of an independent third party include faculty members in an appropriate program of an accredited college or university, a licensed professional engineer experienced in the field of environmental engineering, or a testing firm that is acceptable to the division.

B. The division will maintain a publicly available list of generally approved treatment units.

C. The division will analyze samples collected pursuant to 12 VAC5-613-100 (D) every five years. Treatment units that fail to meet the applicable performance standards of the Regulations may be subject to general approval revocation

12VAC5-613-75. Treatment Unit General Approval Revocation.

A. The division will notify through certified mail the manufacturer when any previously generally approved treatment unit may fail to meet applicable general approval standards following analysis of samples collected pursuant to 12VAC5-613-100 (D).

B. Following such notification, the manufacturer may request within 60 days of receipt an informal fact finding proceeding pursuant to Code of Virginia section 2.2-4019 and 12VAC5-610-200 (B).

C. The division may revoke general approval of a treatment unit following an informal fact finding proceeding when factual data, argument, or proof demonstrates samples collected pursuant to 12VAC5-613-100 (D) fail to meet applicable general approval standards or the manufacturer fails to request an informal fact finding proceeding as contemplated by B. of this section.

D. A manufacturer may appeal an adverse case decision revoking general approval within 30 days of receipt pursuant to Code of Virginia section 2.2-4020.

# 12VAC5-613-80. Performance Requirements; General.

Part II. Performance Requirements

All AOSS designed, constructed, and operated pursuant to this chapter shall comply with the following performance requirements unless waived pursuant to 12VAC5-613-210 :

1. The presence of raw or partially treated sewage on the ground's surface or in adjacent ditches or waterways is prohibited;
2. The exposure of insects, animals, or humans to raw or partially treated sewage is prohibited;
3. The backup of sewage into plumbing fixtures is prohibited;
4. The direct dispersal of effluent into ground water shall comply with 12VAC5-613-90 C;
5. All treatment works shall be designed for the anticipated receiving wastewater characteristics and peak flow;
6. Dosing of the treatment works shall accommodate the design peak flow within each component’s rated capacity;
7. The AOSS shall be designed so that all components are of sufficient structural integrity to minimize the potential of physical harm to humans and animals;
8. The conveyance system for any AOSS shall be designed and installed with sufficient structural integrity to resist flotation,inflow and infiltration and to maintain forward flow;
9. The AOSS shall be designed to minimize noise, odor, or other nuisances at the property

boundary;

1. Maximum hydraulic loading rates for systems using TL-2 and TL-3 effluent are found in Table 1 and the following applies:
	1. Loading rates shall be reduced according to the features and properties of the soils in the soil treatment area.
	2. The proposed design of the system shall be adequate to achieve all performance requirements of this chapter. Adherence to the maximum hydraulic loading rate criteria herein does not assure or guarantee that other performance requirements of this chapter, including effluent dispersal or ground water quality, will be met. ;
	3. Loading rates for systems shall not exceed the values in Table 1;
	4. Hydraulic loading rates shall be incrementally reduced from the TL-2 values in Table 1 when a treatment unit or system is not designed to achieve TL-2 or TL-3. In such cases, the designer shall, for monitoring purposes, specify the effluent quality of the treatment unit. If the specified BOD5 exceeds 60 mg/l, the designer shall use loading rates for septic tank effluent as found in 12VAC5-610 et seq.;
	5. and

**First stakeholder group, met on 5/24 requested soil descriptors, second stakeholder group met on 9/20 did not like the soil descriptors. Do the additional columns and loading rates bring clarity or add to confusion?**

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Table 1
~~Maximum Pressure-Dosed Trench Bottom~~Maximum Hydraulic Loading Rate

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| --- | --- | --- | --- | --- |
| Percolation Rate(MPI) | Soil Texture Group | Texture | TL-2 Effluent(gpd/ft2) | TL-3 Effluent(gpd/ft2) |
|  |  |  | GravityTrencha | Pressure Dosed Trenchb | Dripc | Pad/Moundd | Gravity Trencha | Pressure Dosed Trenchb | Dripc | Pad/Moundd |
| ≤15 | ISands | Sand,Loamy Sand | 1.8 | 1.8 | 0.6 | 1.2 | 3.0 | 3.0 | 1.0 | 1.66 |
| 15 to 25 | IIAStructureless | Sandy Loam | 1.4 | 1.4 | 0.47 | 0.93 | 2.0 | 2.0 | 0.67 | 1.66 |
| >25 to 45 | IIBCoarse Loams | Sandy Loam, Loam,Sandy Clay Loam | 1.13 | 1.2 | 0.4 | 0.8 | 1.41 | 1.5 | 0.5 | 1.11 |
| >45 to 70 | IIIAFine Loams | Silt Loam,Sandy Clay Loam | 0.62 | 0.8 | 0.27 | 0.53 | 0.77 | 1.0 | 0.33 | 0.67 |
| >70 to 90 | IIIBFine Loams | Clay Loam,Silty Clay Loam | 0.36 | 0.58 | 0.19 | 0.38 | 0.46 | 0.72 | 0.24 | 0.44 |
| >90 | IV Clays | Sandy Clay, Silty Clay, Clay | 0.2 | 0.4 | 0.13 | 0.27 | 0.25 | 0.5 | 0.17 | 0.35 |

**a. Gravity Trench: Trench bottom loading rate derived from pressure trench rates using gravity/LPD ratio from Table 5.4 of the SHDR**

**b. Pressure Dosed: Trench bottom loading rates; Intra-range rates interpolated/extrapolated from regulatory rates**

**c. Drip: Area loading rate derived from pressure trench rates per 12VAC5-610-955.C (1/3 of pressure trench loading rate)**

**d. Pad/Mound: From GMP 147, based on sand/soil interface area for mounds or bottom excavated area of pad**

1. Septic tank effluent may only be discharged to a soil treatment area when the vertical separation to a limiting feature consists of at least 18 inches of naturally-occurring, in-situ soil. AOSSs designed to disperse septic tank effluent require at least 12 inches of soil cover over the soil treatment area;
2. Whenever the depth to a permeability limiting feature on the naturally occurring site is less than 18 inches as measured from the ground surface, whenever the treatment works does not provide at least 18 inches of vertical separation to a permeability limiting feature, or whenever the design is for a large AOSS, then the following shall apply:
	1. The designer shall demonstrate through appropriate calculations, topographical maps, or other means that (i) the site is not flooded during the wet season or intermittently,

and

* 1. water mounding will not adversely affect the functioning of the soil treatment area or create ponding on the surface;
	2. For large AOSSs, the department may require the owner to monitor the degree of saturation beneath the soil treatment area to verify that water mounding is not affecting the vertical separation; and
	3. For any system in which artificial drainage is proposed as a method to meet the requirements of this chapter, the designer shall provide calculations or other documentation sufficient to demonstrate the effectiveness of the proposed drainage.
1. The following minimum effluent quality shall be met for the described vertical separation to limiting feature as measured from the point of effluent application or the bottom of the trench or other excavation:

**Edits for clarity to Table 2 as proposed by stakeholder group and VDH.**

Table 2

Minimum Effluent Requirements for Vertical Separation to Limiting Features

|  |  |
| --- | --- |
| Vertical Separation | Minimum Effluent Quality |
| >18" (requires naturally occurring, undisturbed soils) | Septic |
| <18" to 12" (requires minimum 6" of naturally occurring, undisturbed soils) | TL-2 |
| 6” to <12” | TL-3 and standard disinfection |
| <6” to seasonal or permanent water table | See 12VAC5-613-90.C.. |
|  |  |

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1. The designer shall specify methods and materials that will achieve the performance requirements of this chapter whenever sand, soil, or soil-like material is used to increase te vertical separation to comply with Table 2.

**Below # 15 noted as vague. Stakeholders split on dropping completely vs revision.**

15. . The designer shall demonstrate the soil treatment area shall be protected from solids carryover and bulking from upstream processes.

## 12VAC5-613-90. Performance Requirements; Ground Water Protection.

1. The AOSS shall not pose a greater risk of ground water pollution than systems otherwise permitted pursuant to 12VAC5-610 . After wastewater has passed through a treatment unit or septic tank and through the soil in the soil treatment area, the concentration of fecal coliform organisms shall not exceed 2.2 cfu/100 ml at the lower vertical limit of the project area boundary.

**Goal for 90 B: Provide more direction on when groundwater monitoring wells will be installed and what a minimum monitoring plan looks like.**

1. Each large AOSS shall comply with TN limit of 5 mg/l at the project area boundary. Prior to the issuance of a construction permit, the designer shall demonstrate compliance with this requirement through modeling or other calculations. Such demonstration may incorporate multiple nitrogen removal methods such as pretreatment, vegetative uptake (only for AOSSs with shallow soil treatment areas), denitrification, and other viable nitrogen management methods. Ground water and other monitoring is required for all systems with peak design flows over 5,000 gpd and may be required for systems greater than 1,000 gpd up to 5,000 gpd. When required, groundwater monitoring shall be conducted in accordance with the following minimum standards.

1. A minimum of one upgradient and two downgradient wells shall be installed per dispersal area.

2. Groundwater monitoring wells shall be installed to measure the impact of the effluent applied to the soil treatment area on the first permanent water table.

3. Background conditions are to be established by sampling the groundwater monitoring wells prior to the addition of any effluent to the soil.

4. Groundwater wells shall be sampled annually for TN. If TN shows an increase over the background value as determined by the agency, groundwater wells will be sampled quarterly.

5. Groundwater wells shall be sampled semi-annually for pH, chlorides, and conductivity.

1. AOSSs with direct dispersal of effluent to ground water are subject to the following requirements:
	1. If the concentration of any constituent in ground water is less than the limits set forth at 9VAC25-280 , the natural quality for the constituent shall be maintained; natural quality shall also be maintained for all constituents not set forth in 9VAC25-280 . If the concentration of any constituent in ground water exceeds the limit in the standard for that constituent, no addition of that constituent to the naturally occurring concentration shall be made. The commissioner shall consult with the Department of Environmental Quality prior to granting any variance from this subsection.
	2. Ground water and laboratory sampling in accordance with 12VAC5-613-100 G.
	3. The treatment unit or system shall comply with the following at a minimum:
		1. The effluent quality from the treatment unit or system shall be measured prior to the point of effluent application to the soil treatment area and shall be as follows: BOD5 and TSS concentrations each equal to or less than 5 mg/l; fecal coliform concentrations less than or equal to 2.2 col/100 ml as a geometric mean with no sample exceeding 14 col/100 ml; and TN concentration of less than 5 mg/l;
		2. High level disinfection is required; and
		3. Treatment systems shall incorporate filtration capable of compliance with an average turbidity of less than or equal to 2 NTU prior to disinfection.
	4. Gravity dispersal to the soil treatment area is prohibited.

5. Table 1 of 12 VAC5-613-80 applies to the soil treatment area.

* 1. A renewable operating permit shall be obtained and maintained in accordance with

12VAC5-613-60 C.

**For 7 below, the term ‘hydrogeologic analysis’ is nebulous. Minimum components should be defined. Suggestions include surface morphometry, mounding analysis, slug tests, etc.**

**Sea level rise is a concern to stakeholders. How do we incorporate it?**

* 1. The designer shall provide sufficient hydrogeologic analysis to demonstrate that a proposed AOSS will function as designed for the life of the structure served without degradation of the soil treatment area. This shall include a determination of ground water flow direction and rate.

**Goals for 90D: Clarify N requirements; eliminate options that can’t be documented; provide relief for smaller large AOSS**

1. The following additional nutrient requirements apply to all AOSSs in the Chesapeake Bay Watershed:
	1. All small AOSSs shall provide a 50% reduction of TN as compared to a conventional single family home gravity drainfield system.-; Compliance with this subdivision may be demonstrated through the following:
2. For residential wastewater systems, compliance with one or more best management practices recognized by the division; or
3. For non-residential wastewater systems, relevant and necessary calculation provided to demonstrate effluent TN concentration of 24 mg/l measured prior to application to the soil treatment area and monitoring of effluent for TN at the frequency described in 12VAC5-613-100E. If the soil treatment area is designed in accordance with a division recognized best management practice for nitrogen reduction, the effluent TN concentration can be increased accordingly as long as the combination of the effluent quality and the best management practice predict a TN concentration within 24 vertical inches below the soil treatment area but above any limiting features of 24 mg/l or less.
	1. All large AOSSs up to and including peak design flows of 40,000 gallons per day shall comply with the following TN requirements
		1. A demonstrated effluent quality of less than or equal to 20 mg/l TN measured prior to application to the soil treatment area; or

 If the soil treatment area is designed in accordance with a division recognized best management practice for nitrogen reduction, the effluent TN concentration may be increased accordingly provided the combination of the effluent quality and the best management practice predict a TN concentration within 24 vertical inches below the soil treatment area but above any limiting features of less than or equal to 15 mg/l

The AOSS operation permit shall be conditioned upon compliance with the constituent concentrations approved pursuant to this subdivision.

* 1. All large AOSSs with peak design flows over 40,000 gallons per day shall comply with the following TN requirements:
		1. A demonstrated effluent quality of less than or equal to 8 mg/l TN measured prior to application to the soil treatment area; or
		2. If the soil treatment area is designed in accordance with a division recognized best management practice for nitrogen reduction, the effluent TN concentration may be increased accordingly provided the combination of the effluent quality and the best management practice predict a TN concentration within 24 vertical inches below the soil treatment area but above any limiting features of less than or equal to 5 mg/l.

The AOSS operation permit shall be conditioned upon compliance with the constituent concentrations approved pursuant to this subdivision.

**VDH previously pursued removal of 90 D 4 based on the following:**

**3 mg/l TN and the 3 mg/l TP are not appropriate limits for onsite systems for the following reasons.**

* **there is no standard for P in the *Groundwater Standards***
* **As discussed previously, 5 mg/l TN is protective of drinking water based on VA regulations**
* **EPA has set the maximum recommended limit for onsite systems at 10 mg/l TN (A Model Program for Onsite Management in the Chesapeake Bay Watershed June 2013)**
* **The existing TN limit of 5 mg/l would be maintained statewide for direct dispersal systems, but no additional reduction in that limit is proposed for the Chesapeake Bay**.
1. When an application is filed to repair or voluntarily upgrade an existing sewage system with a peak design flow of 1,000 gallons per day or less, and the existing sewage system already disperses effluent to ground water as defined in 12VAC5-613-10 and the repair or upgrade must also be direct dispersal due to site conditions, then the repair or upgrade shall not be subject to the requirements of subsection C or subdivision D 4 of this section and 12VAC5-613-100 G. The repair or upgrade shall be subject to the following requirements:
	1. A minimum 50% reduction of TN as compared to a conventional gravity drainfield system.
	2. Provide TL-3 effluent and standard disinfection in accordance with Table 2 of subdivision 13 of 12VAC5-613-80 for systems with less than 12 inches but 6 inches or more vertical separation to ground water.
	3. Monitoring pursuant to 12VAC5-613-100 D or E as appropriate.
2. Subsection E of this section does not apply to any application for repair or voluntary upgrade when the existing sewage system was installed on or after December 7, 2013, and the existing system was designed to meet the performance requirements for direct dispersal of effluent to ground water as set forth in subsection C or subdivision D 4 of this section and 12VAC5-613-100 G.

## 12VAC5-613-100. Performance Requirements; Laboratory Sampling and Monitoring.

**Goal of modifications to 100: clarify purpose of sampling for small systems and sample point; add in enforcement triggers; modify sampling frequency for large AOSS**

1. Laboratory sampling is not required for any small AOSS with an installed soil treatment area that is sized for septic tank effluent and complies with the requirements of 12VAC5-610 for septic tank effluent.
2. For large AOSS, all effluent samples must be taken at the end of all treatment, prior to the point where the effluent is discharged to the soil treatment area unless changed pursuant to 12VAC5-613-90 or 12VAC5-613-210 . The designer shall identify the sampling points. When required, the sampling point for chlorine disinfection shall be at the end of the chlorine contact tank if TRC is to be used to measure compliance.
3. All sampling and monitoring shall be conducted according to procedures approved under 40 CFR Part 136 or alternative methods approved by the U.S. Environmental Protection Agency unless other procedures have been specified in this chapter.

Goals for this section:

1. Clarify that small system sampling is to assess a given treatment unit, not the overall system.
2. Delay initial sample for 45 days to allow for system to acclimate.
3. Provide triggers for enforcement.

Comments rec’d: how about seasonal facilities? How about moving sampling to one year for smalls?

1. The owner of each small AOSS must ensure that an initial grab sample of the effluent from the treatment unit is collected within 45 to 180 days of system operation. The sample must be analyzed in accordance with 40 CFR Part 136 or alternative methods approved by the U.S. Environmental Protection Agency for wastewater . Thereafter, if the treatment unit has received general approval, a grab sample is required once every five years. Samples shall be analyzed for BOD5 and, if disinfection is required, fecal coliform must be sampled after the disinfection unit. Treatment units utilizing chlorine disinfection may alternatively sample for TRC at the end of the chlorine contact tank When a single sample is evaluated, compliance is defined as a result no greater than 1.5 times the applicable standard for BOD5. For TRC and fecal coliform, the single sample compliance is defined as a result that complies with the standard. Any noncompliance will follow the procedures outlined in 12 VAC 5-613-50 (I), unless the sample is 3 times greater than the applicable standard then the provisions of 12 VAC5-610-170 and the Code of Virginia 32.1-27 shall apply

Sample results shall be submitted to the local health department by the 15th of the month following the month in which the sample was taken.

1. For small AOSSs that utilize a treatment unit that has not received general approval, in addition to the initial sample required by subsection D of this section, four additional grab samples of the effluent from the treatment unit shall be collected, analyzed, and submitted to the department within the first two years of operation and annually thereafter. The interval for collecting the samples shall not be less than quarterly or more than semiannually. Samples shall be analyzed for BOD5 and, if disinfection is required, fecal coliform shall be sampled at the end of the disinfection unit. Treatment units utilizing chlorine disinfection may alternatively sample for TRC at the end of the chlorine contact tank . After two years of sampling in accordance with this subsection, the owner may submit a request to the department to reduce the sampling frequency to once every five years. The department shall grant such requests if the mean of five or more consecutive samples complies with the applicable performance requirements of this chapter.

When the mean of the five sample results do not comply with the applicable performance standards (the sample result is greater than the applicable standard), the operator shall initiate corrective action and continue sampling at the current frequency until the mean of the last 5 samples comply with the applicable standard

1. Sampling and monitoring requirements for AOSS treatment systems with peak design flows greater than 1,000 GPD are contained in Table 3:

Table 3

Sampling and Monitoring for Large AOSSs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| PLANT SIZE | >2.0 MGD | >1.0 - to 2.0 MGD | >100,000GPD to 1.0 MGD | >40,000 GPDto 100,000 GPD | >5,000 GPDto 40,000 GPD | >1,000 GPDto 5,000 GPD |
| Flow | Totalizing, Indicating,& Recording | Totalizing, Indicating,& Recording | Totalizing, Indicating,& Recording | Totalizing, Indicating,& Recording | Measured | Measured or Estimate |
| BOD5, TSS | 24-HC\*1/day | 24-HC 5days/wk | 8-HC 3days/wk | 4-HC 1day/wk | Grab quarterly | Grab 1/yr |
| Total Nitrogen | 24-HCweekly | 24-HCweekly | 8-HCmonthly | 4-HCquarterly | Grab quarterly | Grab 1/yr |
| TRC, End of Contact Tank\*\* | Grab daily | Grab daily | Grab weekly | Grab weekly | Grab weekly | Grab 1/yr |
| Fecal Coliform\*\*\* | Grab weekly | Grab weekly | Grab monthly | Grab monthly | Grab quarterly | Grab 1/yr |

\*HC – hourly, flow weighted composite samples

\*\*if disinfection required and chlorine used

\*\*\*if disinfection required and a disinfectant other than chlorine used

For systems required to sample annually, the system will be considered in compliance if the BOD5, TSS, and TN are less than 1.5 times the applicable standard. Any noncompliance will follow the procedures outlined in 12 VAC 5-613-50 (I), unless the sample is 3 times greater than the applicable standard then the provisions of 12 VAC5-610-170 and the Code of Virginia 32.1-27 shall apply.

For systems sampled more frequently than annual, when the 12 month average of the sample results is equal to or less than the applicable standard, then the system is considered in compliance and any enforcement will follow the procedures of 12 VAC5-613-50(I).

1. Systems with direct dispersal to ground water as described in 12VAC5-613-90 C shall comply with the following:
	1. Small AOSS treatment systems:
		1. Shall incorporate a method to remotely monitor the operation of treatment units and processes, including the status of the disinfection unit, and automatically notify the operator and local health department if an alarm condition occurs;
		2. Shall be sampled quarterly in accordance with 12VAC5-613-90 C and as defined in the renewable operating permit; and
		3. No treatment units or systems shall be deemed generally approved.
	2. Large AOSSs must be continuously monitored for the proper operation of all treatment units. If the wastewater treatment works is not manned 24 hours a day, telemetry shall be provided that monitors all critical systems, including turbidity into the disinfection unit and the functionality of the disinfection unit, and notifies the operator and local health department if an alarm condition occurs.
		1. Treatment works with a peak design flow of less than 40,000 GPD shall be sampled at least monthly in accordance with 12VAC5-613-90 C and as defined in the renewable operating permit.
		2. Treatment works with a peak design flow of 40,000 GPD or greater shall be sampled at the frequency specified in Table 3 of this section. Total phosphorus and other limited parameters not listed in Table 3 of this section shall be conducted at a frequency defined in the renewable operating permit. The treatment works must comply with the continuous operability requirements of a Reliability Class I rating as described in 9VAC25-790 . Appropriate backup power sources, equipment redundancy, and failsafe modes must be in place.
	3. Ground water monitoring is required for all large AOSSs with direct dispersal of effluent to the ground water and such monitoring shall be conducted in accordance with the renewable operating permit 12VAC5-613-90B.

# 12VAC5-613-110. Performance Requirements; Field Measurements, Sampling, and Observations.

1. For treatment units or treatment systems with peak design flows less than or equal to 40,000 GPD, the following parameters shall be evaluated or tested when applicable: flow, pH, TRC, DO, odor, turbidity (visual), and settleable solids.
2. For treatment systems with peak design flows greater than 40,000 GPD, the operator shall follow the operational and control testing requirements of the O&M manual.

# 12VAC5-613-120. Operator Responsibilities.

Part III

Operation and Maintenance Requirements

**VDH has received reports that some operators read this section and a ‘visit’ is all that’s required. However, the expectation is that the operator is ‘operating’ the system and that at each visit, all operational tests, modifications, etc. are done. Language added in attempt to clarify**

1. . An operator is charged with operating, maintaining, and monitoring the treatment works
2. Whenever an operator performs a visit that is required by this chapter or observes a reportable incident, he shall document the results of that visit in accordance with 12VAC5- 613-190 or as otherwise specified in the operation permit.
3. Whenever an operator performs a visit that is required by this chapter, he shall do so in such a manner as to accomplish the various responsibilities and assessments required by this chapter through visual or other observations and through laboratory and field tests that are required by this chapter or that he deems appropriate.
4. Each operator shall keep an electronic or hard copy log for each AOSS for which he is responsible. The operator shall provide a copy of the log to the owner. In addition, the operator shall make the log available to the department upon request. At a minimum, the operator shall record the following items in the log:
	1. Results of all testing and sampling;
	2. Reportable incidents;
	3. Maintenance, corrective actions, and repair activities that are performed other than for reportable incidents;
	4. Recommendations for repair and replacement of system components;
	5. Sludge or solids removal; and
	6. The date reports were providedto the owner.
5. When performing activities pursuant to a visit that is required by this chapter, the operator is responsible for the entire AOSS, including treatment components and soil treatment area components and the operator shall follow the approved O&M manual.

## 12VAC5-613-130. Sludge and Solids Removal.

Any person who pumps or otherwise removes sludge or solids from any septic tank or treatment unit of an AOSS shall file a report with the appropriate local health department on a form approved by the division.

## 12VAC5-613-140. Owner Responsibilities.

It is the owner's responsibility to do the following:

* 1. Have the AOSS operated and maintained by an operator;
	2. Have an operator visit the AOSS at the frequency required by this chapter;
	3. Have an operator collect any samples required by this chapter;
	4. Keep a copy of the log provided by the operator on the property where the AOSS is located in electronic or hard copy form, make the log available to the department upon

request, and make a reasonable effort to transfer the log to any future owner;

* 1. Follow the O&M manual and keep a copy of the O&M manual in electronic or hard copy form for the AOSS on the property where the AOSS is located, make the O&M manual available to the department upon request, and make a reasonable effort to transfer the O&M manual to any future owner; and
	2. Comply with the onsite sewage system requirements contained in local ordinances adopted pursuant to the Chesapeake Bay Preservation Act (§ 10.1-2100 et seq. of the Code of Virginia) and the Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC10-20 ) when an AOSS is located within a Chesapeake Bay Preservation Area.

12VAC5-613-150. Operator Requirements for Aoss with Peak Design Flows Up to 40,000 Gpd, Minimum Frequency of Visits.

The owner of each AOSS shall have that AOSS visited by an operator in accordance with Table 4.

Table 4

Minimum Operator Visit Frequency for AOSSs up to 40,000 GPD

|  |  |  |
| --- | --- | --- |
|  Peak Design Daily Flow | Initial Visit | Regular visits following initial visit |
| ≤1,000 GPD | 45- 180 calendar days of the issuance of the operation permit | Every 12 months |
| >1,000 GPD to 5,000 GPD | First week of actual operation | Quarterly |
| >5,000 GPD to 40,000 GPD | First week of actual operation | Monthly |

# 12VAC5-613-160. Operator Requirements for Systems with Peak Design Flows Greater Than 40,000 Gpd.

1. AOSSs with peak design flows greater than 40,000 GPD shall be attended by a licensed operator and manned in accordance with the recommendations specified in the Sewage Collection and Treatment Regulations for sewage treatment works (9VAC25-790 ).
2. When the operating staff cannot be physically present at the treatment works site during the designated manning hours, then the operating staff shall have a method in place for an operator to respond to the operation and maintenance needs of the treatment works within the timeframe provided by the O&M manual or as otherwise directed by the department.
3. Attendance by the operator pursuant to this section shall not be waived.
4. The department may reduce operator or staffing requirements when automatic

monitoring, telemetry, or other electronic monitoring or process controls are employed. All reductions must be approved by the division director.

## 12VAC5-613-170. Operation and Maintenance Manual.

1. This chapter outlines the minimum requirements for operation, maintenance, sampling, and inspection of AOSSs. Operation, maintenance, sampling, and inspection schedules for some AOSSs may exceed these minimum requirements, in which case the designer is responsible for determining such additional requirements based upon the proposed use, design flow, project area, loading rates, nitrogen removal, treatment level, and other factors.
2. Prior to the issuance of an operation permit, the owner shall submit an O&M manual to the local health department that complies with the minimum requirements below.
3. The O&M manual shall be easily understood by any potential owner and shall include the following minimum items:
	1. Basic information on the AOSS design including treatment unit capacity, installation depth, pump operating conditions, a list of the components comprising the AOSS, a dimensioned site layout, sampling locations, and contact information for replacement parts for each unit process;
	2. A list of any control functions and how to use them;
	3. All operation, maintenance, sampling, and inspection schedules for the AOSS, including any requirements that exceed the minimum requirements of this chapter;
	4. The performance (laboratory) data sampling and reporting schedule;
	5. The limits of the AOSS design and how to operate the system within those design limits;
	6. For systems with peak design flows greater than 40,000 GPD, the O&M manual shall include operational and control testing recommendations that shall be based upon 9VAC25-790- 970; and
	7. Other information deemed necessary or appropriate by the designer.

## 12VAC5-613-180. Mandatory Visits; Inspection Requirements.

When an operator is required to make a visit to an AOSS the operator shall, complete the following:

1. Inspect all components of the AOSS and conduct field measurements, sampling, and other observations required by this chapter, the O&M manual, or deemed necessary by the operator to assess the performance of the AOSS and its components.
2. Review and evaluate the operation of the AOSS, perform routine maintenance, make adjustments, and replace worn or dysfunctional components with functionally equivalent parts such that the system can reasonably be expected to return to normal operation.
3. If the AOSS is not functioning as designed or in accordance with the performance

requirements of this chapter, and, in the operator's professional judgment, cannot be reasonably expected to return to normal operation through routine operation and maintenance, the operator shall report immediately to the owner the remediation efforts necessary to return the AOSS to normal operation. The operator shall report to the department when the remediation efforts are complete and the system has returned to normal operation.

## 12VAC5-613-190. Reports.

When required to file a report, the operator shall complete the report in a form approved by the division. In accordance with § 32.1-164 H of the Code of Virginia, the operator shall file each report using a web-based system and pay the required fee. The operator may, solely at his own discretion, file reports in addition to those required by this chapter. Each report shall be filed by the 15th of the month following the month in which the visit occurred and shall include the following minimum elements:

1. The name, e-mail address or phone number, and license number of the operator;
2. The date and time of the report;
3. The purpose of the visit, such as required visit, follow-up, or reportable incident;
4. A summary statement stating whether:
	1. The AOSS is functioning as designed and in accordance with the performance requirements of this chapter;
	2. After providing routine operation and maintenance, the operator believes the AOSS will return to normal operation; or
	3. The system is not functioning as designed or in accordance with the performance requirements of this chapter and additional actions are required by the owner to return the AOSS to normal operation;
5. All maintenance performed or adjustments made, including parts replaced;
6. The sample location and results of field measurements, laboratory sampling, and observations;
7. The name of the laboratory that analyzed samples, if appropriate; and
8. A statement certifying the date the operator provided a copy of the report in electronic or hard copy form to the owner.

## 12VAC5-613-200. Horizontal Setback Requirements.

Part IV. Horizontal Setback Requirements

AOSSs designed pursuant to § 32.1-163.6 of the Code of Virginia are subject to the following horizontal setbacks that are necessary to protect public health and the environment:

1. The horizontal setback distances as found in 12VAC5-610 that apply to public and private drinking water sources of all types, including wells, springs, reservoirs, and other surface water sources, except that in cases where an existing sewage system is closer to a private drinking water sourceon the same property, the AOSS shall be no closer to the drinking water source than the existing sewage system;
2. The horizontal setback distances that apply to shellfish waters as found in 12VAC5-610;
3. The horizontal setback distances that apply to sink holes as found in 12VAC5-610 ;
4. A five foot horizontal separation from the soil dispersal field to a wetland that is subject to permitting by the Virginia Department of Environmental Quality pursuant to the requirements of Title 62.1 of the Code of Virginia; and
5. Unless the AOSS complies with the ground water protection requirements of 12VAC5- 613-90 .C, a horizontal separation between the soil treatment area and any drainage trench or excavation that comes within six inches vertically of ground water shall be as follows:
	1. AOSSs utilizing septic tank effluent shall be subject to a horizontal separation contained in 12VAC5-610 ;
	2. AOSSs utilizing TL-2 or TL-3 (without disinfection) shall be subject to a horizontal separation of 20 feet; and
	3. AOSSs utilizing TL-3 with disinfection shall be subject to a horizontal separation of 10 feet.

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

This section in not being used to substantiate designs. A variance could also be considered to do the same thing. Is this section needed?

Part V

Waivers from Certain Performance Requirements

1. A professional engineer designing a treatment works pursuant to § 32.1-163.6 of the Code of Virginia may deviate from the design criteria in subdivisions 10, 11, and 13 of 12VAC5- 613-80 and from the laboratory sampling location specified in 12VAC5-613-100 B through F in accordance with this part.
2. Designs pursuant to this part shall at a minimum be substantiated by:
	1. Documentation from applicable engineering standards, texts, or other publications;
	2. Relevant peer-reviewed research; or
	3. Regulations or technical guidance from other states or the U.S. Environmental Protection Agency.
3. The soil treatment area shall be adequately sized to accommodate the hydraulic and organic capacity of the underlying soil to be used;
4. Sampling and monitoring pursuant to 12VAC5-613-100 B through F may be accomplished either in situ, immediately beneath the soil treatment area and within 24 inches of the point of effluent application, or within the treatment system at a point identified by the design engineer.
	1. The professional engineer shall provide a sampling and monitoring plan to demonstrate that the design complies with the water quality standards in 12VAC5-613-90 .
	2. For in situ monitoring, the design engineer shall specify locations within the soil treatment area's zone of influence (i.e., mounding) where samples representative of the effluent quality being achieved by the treatment works can be collected.. Monitoring may be conducted using sampling wells, lysimeters, or other methods approved by the department. Suction lysimeters may not be used for fecal coliform monitoring
	3. The design engineer shall identify an intermediate compliance point (or points) within the treatment system along with corresponding constituent concentrations (e.g., BOD5, fecal coliforms) for use if in situ monitoring is not desired or if an in situ sample cannot be obtained for any reason. The intermediate compliance point and the corresponding constituent concentrations shall be approved by the department. The AOSS operation permit shall be conditioned upon compliance with the constituent concentrations approved pursuant to this subdivision.
5. The following additional performance requirements shall apply to in situ monitoring:
	1. BOD5 less than or equal to 5 mg/l.
	2. Fecal coliforms less than or equal to 2.2 col/100 ml.
6. The frequency of sampling shall be in accordance with 12VAC5-613-100 .

## Forms (12VAC5-613)

Alternative Onsite Sewage System Inspection Report (eff. 10/10).

# Documents Incorporated by Reference (12VAC5-613)

Field Book for Describing and Sampling Soils, Version 3.0, September 2012, National Soil Survey Center, Natural Resources Conservation Service, U.S. Department of Agriculture