



Economic Impact Analysis Virginia Department of Planning and Budget

12 VAC 5-613 – Regulations for Alternative Onsite Sewage Systems
Virginia Department of Health
October 4, 2010

Summary of the Proposed Amendments to Regulation

The proposed regulations 1) establish performance and horizontal setback requirements for alternative onsite sewage systems (AOSS), 2) require owners of AOSS to have a relationship with a licensed operator for operation and maintenance of the system; establish an inspection, sampling, and reporting frequency for AOSS; and establish a \$1 fee for filing of inspection reports with the Virginia Department of Health, 3) establish nitrogen limitations for all large AOSS and reduce nutrient loads for small AOSS, 4) establish additional design and monitoring requirements for small and large AOSS that disperse effluent directly into the groundwater, and 5) provide that generally approved systems undergo a reevaluation after five years from the effective date of these regulations.

Result of Analysis

There is insufficient data to accurately compare the magnitude of the benefits versus the costs. Detailed analysis of the benefits and costs can be found in the next section.

Estimated Economic Impact

Chapter 515 of the 2008 Acts of Assembly mandated that treatment works designs from individuals licensed as professional engineers shall be accepted as long as they comply with standard engineering practices, performance requirements, and the horizontal setback requirements established by the Board of Health. The performance requirements in effect at that time were Sewage Handling and Disposal Regulations¹ (SHDR) which had two basic principles: a) no back-up into the dwelling and b) no effluent or sewage discharge onto the ground surface. After July 2008, Virginia Department of Health (VDH) started receiving applications with

designs that otherwise complied with the performance requirements of the SHDR, but for the places that had historically been denied permits such as areas shallow to water table or rock and wetlands. In response, Chapter 220 of the 2009 Acts of Assembly directed VDH to implement emergency regulations which introduced additional performance requirements beyond SHDR.

In addition to the performance requirements contained in the emergency regulations, the proposed regulations contain additional performance requirements for cases where professional engineers propose sewage systems to disperse or discharge directly into groundwater or into wetlands. Under SHDR, VDH had been denying most proposals for direct dispersal into the groundwater.

While the proposed regulations also establish horizontal setback requirements for AOSS, these are the same standards enforced under the SHDR.

In short, when the statute mandated VDH to accept engineered designs for treatment works, the performance requirements contained in the SHDR were not adequate to minimize public health and environmental risks posed by the engineered systems. The proposed regulations introduce performance requirements that take into account potential risks posed by engineered systems.

One of the main economic effects of the proposed regulations arises from the fact that the sewage system permit has a direct impact on the feasibility of a building project and therefore the value of the underlying real property. In the absence of these regulations, VDH would be required to accept engineered systems shallow to water table or rock and wetlands as long as they complied with the performance requirements of SHDR. Since the proposed regulations introduce additional criteria compared to SHDR, they have the potential to make some of the previously feasible real estate development projects infeasible if the standards to protect public health and environment have not been met. On the other hand, VDH has been denying engineered systems designed to disperse or discharge directly into groundwater or into wetlands based on the interpretation that such a design is not a standard engineering practice. Since the proposed regulations allow systems designed to discharge into the groundwater so long as the standards to protect public health and environment have been met, they have the potential to make some of the previously infeasible real estate development projects feasible.

¹ 12 VAC 5-610

Considering, of the 1,500 to 2,700 alternative systems built every year, 25 to 300 are direct dispersal systems, the proposed performance standards are expected to make more feasible projects infeasible than making infeasible projects feasible. However, the proposed performance standards provide protection against the public health and environmental risks otherwise would have been posed by a large proportion of the alternative systems.

Chapter 220 of the 2009 Acts of Assembly also mandated that the Board of Health adopt regulations for operation and maintenance of the AOSS. The proposed regulations require that all AOSS owners must have a relationship with an operator, have the operator inspect their system once a year, report their findings with VDH, collect samples for laboratory testing every five years for generally approved systems and every year for non-generally approved systems. VDH expects the cost of regular maintenance to be approximately \$300 to \$600 per year for generally approved small AOSS. The estimated maintenance cost for non-generally approved small AOSS range from \$450 to \$800 because of the increased sampling frequency. There are approximately 60,000 AOSS currently operating in Virginia and every year an additional 1,500 to 2,700 new systems come online. Approximately 60 to 80 percent of the systems are generally approved and the rest are non-generally approved. Thus, the statewide total cost of the proposed maintenance requirement for existing systems is expected to be between \$10.8 million and \$28.8 million for generally approved systems and \$5.4 million and \$19.2 million for non-generally approved systems. As more systems are installed, the statewide cost is expected to grow annually by \$270,000 to \$1.3 million for generally approved systems and by \$243,000 to \$480,000 for non-generally approved systems.

However, there have been several known localities² that were already requiring some type of maintenance or inspection. A survey conducted by the Weldon Cooper Center for Public Service³ indicates 39 percent of the respondents said that homeowners in their counties or localities were legally required to have their systems inspected, 35 percent said this was not the case, and the remaining 26 percent were not sure. Additionally, 39 percent of the AOSS owners surveyed had maintenance contracts in place and 77 percent said that they had had a routine maintenance performed on their system in the last five years. Furthermore, 84 percent of

² Known localities that used to require maintenance of AOSS include Loudoun County, Augusta County, and Gloucester County.

³ Survey of Alternative Onsite System Issues in Virginia, 2009, Weldon Cooper Center for Public Service.

respondents with AOSS had their system inspected in the last year. Thus, a non-negligible portion of the AOSS owners had already been incurring maintenance and inspection costs for their systems prior to the proposed regulations and the additional costs on these owners will be smaller.

On the other hand, routine inspection and maintenance is expected to extend the operational life of the system indefinitely, reduce operational and equipment deficiencies, allow the operator to find out and respond more quickly to problems, and consequently reduce malfunction costs and the chances of total system failure and the need for system replacement. Additionally, routine inspection and maintenance is expected to reduce public health and environmental risks associated with a system failure.

The proposed regulations are also expected to have a significant effect on the operators. Since a relationship with an operator is required, an increase in demand for AOSS technical services is expected. However, as mentioned before some of the AOSS owners already have maintenance or inspection performed on their systems voluntarily or as required by their local government. Thus, the potential increase in their business revenues will be somewhat offset.

The proposed regulations are likely to introduce some administrative costs on VDH. Under the proposed regulations, VDH will develop an inventory of AOSS in Virginia, build an Internet based report filing system for the annual inspection reports required, compare reports with the inventory, conduct random site inspections, and follow up with those who do not get their systems inspected annually. According to VDH approximately 10 to 24 full time positions will be devoted to ensure compliance with the new regulations, but the administrative resources will be shifted from other functions to meet this need.

Also, pursuant to Chapter 892 of the 2007 Acts of Assembly, the proposed regulations establish a \$1 fee for filing of annual inspection reports. Since there are approximately 60,000 systems operating in Virginia, up to \$60,000 in fees is expected to be collected annually from the licensed operators. These funds will help VDH offset some of its administrative costs discussed above.

Furthermore, the proposed regulations establish nitrogen limitations for small AOSS and reduce nutrient loads for large AOSS. All small AOSS in the Chesapeake Bay Watershed are required reduce total nitrogen by 50 percent. To achieve the required reduction, VDH estimates

that small AOSS installation costs will increase by \$2 to \$10 per gallon of capacity depending on the site conditions due to the required changes in the design. For example, an AOSS designed for a three bedroom home at 450 gallon per day capacity is expected to incur an additional one-time \$900 to \$4,500 in installation and new equipment costs. Approximately 1,000 to 2,000 small AOSS are estimated to be installed in the Chesapeake Bay Watershed every year. Thus, statewide total cost to comply with new nitrogen limits for small AOSS owners may range from \$900,000 to \$9 million annually.

Large AOSS are required to reduce their nitrogen concentration from 5 mg/l to 3 mg/l. The estimated cost of the required design change to achieve the new standard is estimated to be between 10 cents to 75 cents per gallon of capacity depending on the type of technology chosen and site conditions. For example, a system designed to discharge 10,000 gallons per day may incur an additional \$1,000 to \$7,500 in one-time installation and new equipment costs to reduce nitrogen load. Approximately 20 large AOSS with an average capacity of 10,000 gallons per day are estimated to be installed in the Chesapeake Bay Watershed annually. Thus, statewide total cost to comply with new nitrogen limits for large AOSS owners may range from \$20,000 to \$150,000 annually.

The proposed regulations establish additional design and monitoring requirements for small and large AOSS that disperse effluent directly into the groundwater. The one-time additional costs to change the small AOSS design is estimated to be between \$5,000 and \$10,000 depending on the capacity of the system, technology chosen, and the site conditions. The costs associated with the additional monitoring of small AOSS are estimated to be between \$800 and \$2,500 per year. VDH estimates that there are 25 to 300 small AOSS coming online each year that disperse effluent directly into the groundwater. Thus, statewide one-time total annual design costs are expected to range from \$125,000 to \$3,000,000. The statewide costs for the additional monitoring costs may range from \$20,000 to \$750,000 in the first year and continually increase by about the same amount for each additional year as more systems built over time.

Similarly, the proposed regulations require additional monitoring and treatment including enhanced disinfection and nutrient reduction for large AOSS that disperse effluent directly into the groundwater. The one-time additional design costs to comply with the proposed changes are estimated to be \$2 to \$10 per gallon of capacity. VDH estimates there are approximately 10 large

AOSS are built per year. If the average capacity of new systems is 10,000 gallons per day, then the statewide costs may range from \$200,000 to \$1 million every year. In addition, additional ongoing monitoring costs are expected, but VDH does not have good estimates for this type of costs. Statewide additional monitoring costs will accumulate over time as more systems are built.

The statewide costs for the additional monitoring costs may range from \$20,000 to \$750,000 in the first year and continually increase by about the same amount for each additional year as more systems are built over time.

The proposed regulations also provide that generally approved systems undergo a reevaluation after five years from the effective date of these regulations. Currently, there are seven manufacturers with a generally approved system. A reevaluation would require analysis of 80 observations per system at a cost of \$300 to \$400 per observation. Thus, the total cost to all seven manufacturers is estimated to be \$168,000 to \$224,000 or \$24,000 to \$32,000 per manufacturer five years later. VDH is likely to incur some administrative costs in order to conduct the proposed reevaluations. On the other hand, the proposed reevaluation will help make sure that the generally approved systems continue to meet performance standards.

The main benefit of the proposed regulations is to protect public health and environment. Improperly sited and designed systems may cause untreated sewage to move hundreds of feet away from a home contaminating the underground and surface waters threatening the public health. Organic matter, suspended solids, and nutrients may threaten streams, rivers, and lakes. Pollutants such as bacteria, viruses, and nitrate may threaten the public health. In the absence of the proposed performance standards and maintenance requirements, alternative sewage systems would pose health and environmental risks.

Businesses and Entities Affected

Currently, there are 60,000 AOSS systems, 545 licensed AOSS operators, and seven manufacturers with a generally approved system in Virginia.

Localities Particularly Affected

Some of the proposed regulations establish nitrogen limitations for AOSS located in the Chesapeake Watershed which includes all or parts of following localities: Frederick, Clarke, Loudoun, Shenandoah, Warren, Fauquier, Prince William, Fairfax, Rockingham, Page,

Rappahannock, Culpeper, Stafford, Augusta, Greene, Madison, Orange, Albemarle, Spotsylvania, Louisa, Caroline, King George, Westmoreland, Essex, Richmond, Northumberland, Highland, Bath, Alleghany, Rockbridge, Nelson, Buckingham, Fluvanna, Goochland, Hanover, Henrico, King William, King and Queen, New Kent, Middlesex, Lancaster, Craig, Botetourt, Roanoke, Montgomery, Bedford, Amherst, Campbell, Appomattox, Cumberland, Prince Edward, Powhatan, Amelia, Nottoway, Chesterfield, Dinwiddie, Prince George, Charles City, James City, Surry, Gloucester, Matthews, York, Isle of Wight, Suffolk, Chesapeake, Accomack, and Northampton.

Rest of the proposed regulations applies throughout the Commonwealth. However, the survey conducted by the Weldon Cooper Center for Public Service⁴ reveals that 31.3 percent of the alternative systems surveyed are located in Northwest Virginia, 26.3 percent are located in Northern Virginia, 22.4 percent are located in Eastern Virginia, 18.5 percent are located in Central Virginia, and 4.6 percent are located in Southwest Virginia.

Projected Impact on Employment

The proposed standards for direct dispersal systems appear to be less stringent than SHDR standards. Thus, they are expected to make some building projects that were infeasible under SHDR feasible. On the other hand, the proposed standards for the remaining AOSS and the nitrogen standards for the systems located in the Chesapeake Bay watershed appear to be more stringent than SHDR standards. Since AOSS systems that are not direct dispersal systems and the systems located in the Chesapeake Bay watershed has a wider applicability than the direct dispersal systems, the proposed regulations may reduce the number of feasible building projects and consequently the demand for labor.

On the other hand, the proposed regulations are expected to minimize public health and environmental risks posed by AOSS. Reduced public health and environmental risks are likely to promote tourism and commerce in the Commonwealth and increase demand for labor. Additionally, the demand for technical services of AOSS operators will add to the demand for labor.

⁴ Survey of Alternative Onsite System Issues in Virginia, 2009, Weldon Cooper Center for Public Service.

Finally, the proposed regulations are expected to increase the need for additional staff at VDH to administer the program, but the increased demand will be offset by reductions in other functional areas within the VDH.

Effects on the Use and Value of Private Property

The proposed standards for direct dispersal systems appear to be less stringent than SHDR standards. Thus, they are expected to make some building projects that were infeasible under SHDR feasible. The values of such private properties are expected to increase as a result of the proposed regulations.

On the other hand, the proposed standards for the remaining AOSS and the nitrogen standards for the systems located in the Chesapeake Bay watershed appear to be more stringent than SHDR standards. The values of such private properties are expected to decrease as a result of the proposed regulations.

Additional operating and maintenance costs on AOSS owners may negatively affect demand for their houses which in turn may have a negative effect on the price of their houses. However, ensuring proper maintenance and operation is expected to extend the life of the system and may add to the value of the house.

In addition, the asset values of AOSS operator businesses are expected to increase due to the additional demand created for their services.

Finally, the proposed sunset provisions for the systems that are generally approved is expected to introduce costs associated with testing and consequently has a negative impact on the asset values of the affected manufacturers.

Small Businesses: Costs and Other Effects

The proposed regulations will introduce the same costs and affects discussed above to small businesses if they own an AOSS. The number of small businesses that own an AOSS is not known.

In addition, most of the AOSS operators are expected to be small businesses. The proposed regulations will have a positive impact on their revenues.

Small Businesses: Alternative Method that Minimizes Adverse Impact

There is no known alternative method that would minimize the adverse impact on small businesses that own an AOSS and achieve the same goals.

Real Estate Development Costs

The proposed standards for direct dispersal systems appear to be less stringent than SHDR standards. Thus, they are expected to make some development projects that were infeasible under SHDR feasible. The proposed regulations are expected to reduce the real estate development costs in these cases.

On the other hand, the proposed standards for the remaining AOSS and the nitrogen standards for the systems located in the Chesapeake Bay watershed appear to be more stringent than SHDR standards. The proposed regulations are expected to increase the real estate development costs in these cases.

Legal Mandate

The Department of Planning and Budget (DPB) has analyzed the economic impact of this proposed regulation in accordance with Section 2.2-4007.H of the Administrative Process Act and Executive Order Number 107 (09). Section 2.2-4007.H requires that such economic impact analyses include, but need not be limited to, the projected number of businesses or other entities to whom the regulation would apply, the identity of any localities and types of businesses or other entities particularly affected, the projected number of persons and employment positions to be affected, the projected costs to affected businesses or entities to implement or comply with the regulation, and the impact on the use and value of private property. Further, if the proposed regulation has adverse effect on small businesses, Section 2.2-4007.H requires that such economic impact analyses include (i) an identification and estimate of the number of small businesses subject to the regulation; (ii) the projected reporting, recordkeeping, and other administrative costs required for small businesses to comply with the regulation, including the type of professional skills necessary for preparing required reports and other documents; (iii) a statement of the probable effect of the regulation on affected small businesses; and (iv) a description of any less intrusive or less costly alternative methods of achieving the purpose of the regulation. The analysis presented above represents DPB's best estimate of these economic impacts.