HB 1045

Department of Legislative Services

Maryland General Assembly
2017 Session

FISCAL AND POLICY NOTE
Enrolled - Revised

House Bill 1045 (Delegate Cassilly)
Environment and Transportation Education, Health, and Environmental Affairs

On-Site Sewage Disposal Systems - Membrane Bioreactor (MBR) Technology - Regulations

This bill requires the Maryland Department of the Environment (MDE), by January 1, 2019, to propose regulations that encourage the use of permeable micro- or ultra-filtration membrane bioreactor (MBR) or other treatment technologies in on-site sewage disposal systems (OSDS) for nonresidential uses that (1) meet MDE's guidelines for use of class IV reclaimed water and (2) are more effective than the best available technology (BAT) for removal of nitrogen approved by MDE. The regulations must (1) update the evaluation criteria used in reviewing the design of an OSDS for a nonresidential use and in determining the adequate size of a sewage disposal area and (2) increase the maximum hydraulic loading rate that may be considered to 2.5 gallons per day per square foot (gpd/ft^2) for a nonresidential system using MBR technology and adjusted based on site-specific factors, including nutrient reduction requirements, percolation rates, and other site conditions and constraints.

The bill takes effect July 1, 2017.

Fiscal Summary

State Effect: General fund expenditures for MDE increase by $82,200 in FY 2018 to hire one sanitarian to develop and implement the required regulations. Future year estimates reflect ongoing costs. Revenues are not affected.

(in dollars)	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Revenues	$0	$0	$0	$0	$0
GF Expenditure	82,200	78,200	81,700	85,300	89,200
Net Effect	($82,200)	($78,200)	($81,700)	($85,300)	($89,200)

Note:() = decrease; GF = general funds; FF = federal funds; SF = special funds; - = indeterminate increase; (-) = indeterminate decrease

Local Effect: Local government expenditures may increase to (1) update regulations, as necessary, to reflect changes to State regulations related to MBR for nonresidential uses and (2) conduct training for employees related to the use of MBR. However, it is assumed that MDE assists with training. Revenues are not affected.

Small Business Effect: Potential meaningful.

Analysis

Current Law: MDE's Onsite Systems Division provides technical assistance and direction to county health departments and local approving authorities for the implementation of delegated programs for OSDS and individual wells. Pursuant to current regulations, a person may not construct or attempt to construct an OSDS without first obtaining a permit from the appropriate approving authority. A person also may not alter an OSDS or cause it to receive any increase in flow or change in the character of wastewater unless permitted. A person must obtain an appropriate OSDS permit, well construction permit, public or private water supply system permit, or public or private sewerage permit before constructing or altering any structure, residence, floating home, or commercial establishment that is served or planned to be served by an OSDS or a private water supply system.

MDE's Onsite Systems Division has numerous guidance documents regarding OSDS and individual wells, including guidelines for large OSDS with maximum accumulative flows greater than or equal to 5,000 gpd as well as guidelines for Use of Class IV Reclaimed Water.

For OSDS with a maximum (design) daily flow that equals or exceeds 5,000 gpd for the total project or property, whether utilizing one or more than one treatment unit or disposal field, plans must be jointly approved by MDE's Water Management Administration and the local approving authority. The size of the sewage disposal area is generally determined in accordance with regulations. Generally, nonresidential OSDS are large systems that have more concentrated, higher strength waste than waste from a residential site. The loading rate for a system is determined based on available site and soil information. Under specified conditions, a maximum loading rate of 1.2 gpd/ft^2 may be considered. The lower the loading rate, the larger the footprint for the OSDS.

Class IV reclaimed water describes a treatment level for water. Reclaimed water is wastewater from a municipal sewage treatment facility that has been treated to be suitable for beneficial use. Reclaimed water is categorized into four water quality classes (I through IV), which govern their potential uses based on the level of treatment or quality attained.

Pursuant to current law, MDE is required to encourage the use of reclaimed water as an alternative to discharging treated sewage effluent to surface waters of the State.

Background: MDE advises that MBR technology is used for secondary wastewater treatment. A 2007 U.S. Environmental Protection Agency (EPA) wastewater management fact sheet on MBR states that the more conventional technologies that perform secondary treatment of municipal wastewater rely on microorganisms suspended in the wastewater to treat it. MBR is a newer technology that is increasing in use and overcomes many limitations of conventional systems. EPA advises that these systems have the advantage of combining a suspended growth biological reactor with solids removal via filtration. The membranes can be designed for and operated in small spaces with high removal efficiency of contaminants such as nitrogen, phosphorus, bacteria, biochemical oxygen demand, and total suspended solids. The membrane filtration system can essentially replace the secondary clarifier and sand filters in a typical activated sludge treatment system. Membrane filtration allows a higher biomass concentration to be maintained, thereby allowing smaller bioreactors to be used.

EPA further advises that the advantages of MBR systems over conventional biological systems include better effluent quality, smaller space requirements, and ease of automation. Specifically, MBRs operate at higher volumetric loading rates which result in lower hydraulic retention times. The low retention times mean that less space is required compared to a conventional system. Further, as noted above, the effluent from MBRs contains low concentrations of bacteria, total suspended solids, biochemical oxygen demand, and phosphorus. The primary disadvantage of MBR systems is the typically higher capital and operating costs than conventional systems for the same throughput. Operation and maintenance costs include membrane cleaning and fouling control as well as eventual membrane replacement. Energy costs are also higher because of the need for air scouring to control bacterial growth on the membranes. In addition, the waste sludge from such a system might have a low settling rate, resulting in the need for chemicals to produce biosolids acceptable for disposal.

State Expenditures: MDE's general fund expenditures increase by $82,188 in fiscal 2018, which accounts for a 90-day start-up delay. This estimate reflects the cost of hiring one sanitarian to develop and implement the required MBR regulations. It includes a salary, fringe benefits, one-time start-up costs (including the purchase of a vehicle), and ongoing operating expenses. The information and assumptions used in calculating the estimate are stated below:

- developing the regulations is an involved process that requires MDE to approve MBR manufacturers and vendors, develop operation and maintenance requirements, and establish and enforce the various components of the program, similar to the current process related to using BAT for OSDS;

- the sanitarian needs to be hired in fiscal 2018, despite the fact that the deadline for proposing the required regulations is January 1, 2019;
- increasing the maximum hydraulic loading rate, as required under the bill, requires the development of advanced soil morphological descriptions and long-term verification and commitment to require the use of MBR technology; and
- MDE must provide training to local approving authorities in order to adequately implement the proper hydraulic loading rates.

Position	1
Salary and Fringe Benefits	$58,848
One-time Vehicle Purchase	20,000
Equipment/Operating Expenses	7,340
Total FY 2018 State Expenditures	**$82,188**

Future year expenditures reflect a full salary with annual increases and employee turnover and ongoing operating expenses.

Local Expenditures: The bill results in a significant change to the overall regulation of OSDS and sewage disposal areas for nonresidential uses. As a result, local governments need to increase field staff training and expertise in soil evaluations in order to properly understand the correlation between soil characteristics, landscape positions, and permeability testing as it relates to hydraulic loading rates and design limitations. Additionally, some local governments may need to update their local codes and regulations to align with the State regulations developed under the bill. Accordingly, local government expenditures may increase, although it is assumed that MDE assists with training.

Small Business Effect: To the extent that incorporating MBR changes the hydraulic loading rate, OSDS for nonresidential uses may have smaller overall footprints, which could potentially reduce development and construction costs. Small businesses that manufacture, sell, install, or provide service for MBR systems may benefit from an increase in the demand for their products and services. Conversely, small businesses that manufacture, sell, install, or provide service for BAT and conventional systems, may be negatively affected.

Additional Information

Prior Introductions: None.

Cross File: None.

Information Source(s): Charles County; Maryland Department of the Environment; Department of Health and Mental Hygiene; U.S. Environmental Protection Agency; Department of Legislative Services

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