

BMP Verification Standard Operating Procedures



8/12/2022

Virginia Department of Health

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Note: Insert additional sections/page numbers including any appendices

SECTION 1: ORGANIZATION/AGENCY INFORMATION

- Organization name: Virginia Department of Health
- Organization address: 109 Governor Street Richmond VA, 23219
- Organization website: vdh.virginia.gov
- Type of organization (ex. municipality, state agency, nongovernment organization, etc): State Agency

Populate the table below with authorized contact(s) name(s)/title(s)/phone/email/etc.
Insert additional table rows, as needed.

Name	Title	E-mail	Phone
Megan Senseman	Environmental Data Coordinator	Megan.senseman@vdh.virginia.gov	804-864-7463
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SECTION 2: DESCRIPTION OF ORGANIZATION AND BMP RELATED PROGRAMS

This section should include a description of your organization and the program(s) that lead to BMPs on the ground.

- Provide a brief background and description of your organization.
- Tell us about the programs that result in BMP implementation.
 - Provide link to any program manuals, guides, documents.
- What is the source of funding for the program(s)?
 - Is the funding short-term (grants) or long-term?
- Which BMPs are implemented?
 - Ensure all BMPs reported by your organization are included.
 - Consult the BMP Warehouse Reporting Template for reportable practices and Chesapeake Bay Program's [CAST source data](#) for BMP definitions.

The Virginia Department of Health (VDH) is dedicated to protecting and promoting the health of Virginians. The VDH is made up of a statewide Central Office in Richmond and 35 local health districts. These entities work together to promote healthy lifestyle choices that can combat chronic disease, educate the public about emergency preparedness and threats to their health, and track disease outbreaks in Virginia. The mission of the Office of Environmental Health Services (OEHS), an office within VDH, is to protect public health by preventing the transmission of disease through food, milk, shellfish, water and sewage and to work in partnership with other agencies to protect the environment. OEHS includes the VDH Onsite Sewage Program.

The Alternative Onsite Sewage System Regulations ([12VAC 5-613](#), the AOSS Regulations) took effect on December 7, 2013. Section 90.D of the AOSS Regulations requires that all alternative onsite sewage systems (AOSS) located in the Chesapeake Bay watershed include a 50 percent nitrogen reduction. Section 90.D applies to AOSS for which (1) a construction permit application is submitted on or after December 7, 2013, or (2) an application for reissuance of a renewable operating permit is submitted on or after December 7, 2013. This section of the regulation does not apply to conventional onsite wastewater treatment systems.

VDH's Onsite Sewage Program is funded by state general funds at a central office level. Local health departments are funded through a combination of general funds, local funding, and fees. Funding for staff lead reporting of BMPs to DEQ is provided by a grant from DEQ. Table 1 below includes all BMPs that are reported by VDH.

Table 1: Septic BMPs reported by VDH

<i>Onsite Practices</i>	<i>BMP Long Name</i>	<i>Credit Duration</i>	<i>BMP Type</i>	<i>Verification Group</i>
Septic Connections	Septic Connection	100	Structural	Connection to Sewer
Septic Denitrification	Septic Denitrification	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	Septic Tank Advanced Treatment	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	RMF	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	IFAS	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	Proprietary Ex Situ	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	IFAS Elevated Mound	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	IFAS Shallow Pressure	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	Proprietary Ex Situ Elevated Mound	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	Proprietary Ex Situ Shallow Pressure	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	RMF Elevated Mound	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	RMF Shallow Pressure	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	Septic Effluent Elevated Mound	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	Septic Effluent Shallow Pressure	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	Constructed Wetland Septic	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	IMF	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	NSF 40	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	Constructed Wetland Elevated Mound	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	Constructed Wetland Shallow Pressure	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	IMF Elevated Mound	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	IMF Shallow Pressure	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	NSF 40 Elevated Mound	10	Structural	AOSS including all nitrogen reducing systems
Septic Denitrification	NSF 40 Shallow Pressure	10	Structural	AOSS including all nitrogen reducing systems
Septic Pumping	Septic Tank Pumpout	1	Annual	Pumpouts

SECTION 3: SITE SELECTION, PRACTICE DESIGN, AND INSTALLATION

This section should include a description of how the organization/program(s) selects, designs, installs and maintains eligible BMPs. It should include descriptions of how the required measures are collected for the practices to be reported in the BMP Warehouse.

- How are BMP sites chosen?
- How are BMPs designed?
 - Provide link to any design guidelines or standards.
- Who installs/builds the BMPs?
 - What are their qualifications/certifications?
- How is the BMP determined to be complete?
- How are the appropriate metrics collected?

The septic systems that qualify as BMPs are installed at properties as needed. Sites of septic system installations are chosen based on criteria listed in [12VAC5-610-590](#). Licensed professionals determine the location on a property site that will fit this criteria the best. When the designer determines that the site and soil criteria require an AOSS, then a BMP must be installed when located in the Chesapeake Bay watershed. Design requirements for onsite BMPs are found in the AOSS Regulations and agency policy ([GMP 2013-01](#)).

The [Virginia Onsite Sewage and Water Services program](#), through regulations, requires that onsite septic systems be installed and inspected by licensed installers and designers according to [Virginia's Sewage Handling and Disposal Regulations \(12VAC5-610\)](#). The Virginia Department of Professional and Occupational Regulation (DPOR) oversees certification and licensure for professionals in the onsite sewage sector. Designations include Alternative and Conventional Onsite Sewage System Installers, Operators, and Soil Evaluator ([18VAC160-40](#)). DPOR also provides oversight of [Professional Engineers \(18VAC10-20\)](#), which must design and approve most alternative onsite sewage systems (AOSS) ([Regulations for Alternative Onsite Sewage Systems, 12VAC5-613-40](#)).

The [Virginia Onsite Sewage and Water Services program](#), through regulations, requires that onsite septic systems be inspected by the licensed onsite soil evaluator or professional engineer that designed the system. The inspection report and associated documents are then reviewed by local health department staff prior to issuance of an operation permit for the system. A BMP is considered complete when the installation is completed and has begun operation. BMP data are collected by VDH staff in the local health districts and maintained in a statewide environmental health database.

SECTION 4: PRACTICE VERIFICATION

This section should describe practice re-inspection procedures to ensure continued operation as intended, and associated data collection.

- Describe inspection/maintenance protocols for each BMP or group of practices.
 - Provide sample checklists, if available.
- Who is responsible for maintenance the practice(s)?
 - What are their qualifications/certifications?
- Who is responsible for inspections?
 - What are their qualifications/certifications?
- How are inspections scheduled?
 - How frequent are the re-inspections?
- If deficiencies are identified in the inspection, how are they resolved?
- What data is captured during the inspection?

For the verification groups in the onsite septic sector, the annual practice of septic tank pump-out does not require any follow-up checks for the purpose of verification. Initial on-site inspections performed by licensed onsite sewage service providers are standard for the remaining two approved practices – connection to sewer and AOSS including all nitrogen reducing systems. Inspection of AOSS are covered in the AOSS Regulations. [Section 100](#) of the AOSS Regulations outlines the ongoing sampling requirements for AOSS. [Section 120](#) of the AOSS Regulations outlines the responsibilities for operators when performing a site evaluation. [Section 150](#) and [160](#) establish the requirements for operator frequency for AOSS. [Section 180](#) of the AOSS Regulations details the inspection requirements.

Pursuant to section [140](#) of AOSS Regulations, homeowners are responsible for ensuring the maintenance of their AOSS by an alternative onsite sewage system operators licensed by the Department of Professional and Occupational Regulation (DPOR). The qualifications for a master alternative onsite sewage system operator are contain in DPOR’s regulations, [18VAC160-40-220](#). Maintenance inspections are performed by alternative onsite sewage system operators licensed by the Department of Professional and Occupational Regulation (DPOR). The qualifications for a master alternative onsite sewage system operator are contain in DPOR’s regulations, [18VAC160-40-220](#).

The requirements for inspection frequency is determined by the average daily flow to an AOSS pursuant to section [150](#) of the AOSS Regulation. The frequency is shown in Table 2 below. AOSSs with average daily 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](#)).

Table 2: Minimum Operator Visit Frequency for AOSSs up to 40,000 GPD

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

Any deficiencies or issues with the septic system that are identified during the maintenance inspection are resolved during that maintenance visit or at a later date. In the maintenance report, the operator will identify the maintenance needed and what maintenance, if any, is provided. They will also certify if the AOSS is functioning as designed. Where a system is reported as not functioning as designed, the local health department will follow up and take enforcement actions as appropriate.

When performing a maintenance inspection, general data is collected on the contractor performing the inspection, the location of the septic system, the owner of the septic system, and the maintenance needed and performed. There is also information collected on the septic system, including data on the tank and treatment, field and laboratory tests performed, and the pumpout, if performed.

Section 5: BMP Data Management, Quality Assurance and Reporting

This section should describe how the collected data associated with the practices are stored and backed up by your organization. The section also describes the procedures in place to ensure the data is complete and accurate and how it is reported to DEQ.

- How is the BMP implementation, inspection and maintenance data stored?
- Describe any QA/QC procedures in place to ensure data quality.
- Describe the electronic records retention and back up procedures in place for the data.
- Describe how the data is prepared for reporting to DEQ.
- Who is responsible for reporting to DEQ?
- When is data reported to the BMP Warehouse?
 - How frequently is data reported? (DEQ data reporting deadline is October 1 for BMP activity in the preceding July 1 and June 30.)

VDH has an internal cloud-based database called the Environmental Health Database (EHD) where Environmental Health Specialists (EHS) enter in permitting and inspection information related to septic systems. Maintenance is reported by licensed onsite professionals through VDH's Operation and Maintenance Portal. Maintenance reports submitted through the portal are reviewed by EHS, who join the maintenance reports to existing septic system records in EHD so that all information related to a given septic system is combined together.

There are several steps to ensure data quality when preparing the BMP reporting data. First, since the records located in EHD are permit records, not all records are for septic systems that were installed. Some records are permits that were denied, withdrawn, or approved but no system was installed. VDH selects permits that had either an "installed" status or an operation issue date entered to ensure only installed septic system BMPs are reported. Additionally, VDH uses a unique ID associated with the address of a septic system in EHD to prevent duplicate BMPs from being reported.

Next, VDH uses a tiered process so that a given septic system is assigned to the BMP that best matches the characteristics of that septic system. If a septic system qualifies for multiple BMPs, the BMP with the highest nitrogen reduction is applied. Finally, all BMP addresses are geocoded in ArcGIS Pro to match them to geographic coordinates associated with those addresses. Then, VDH identifies the BMPs that are located within the Chesapeake Bay Watershed using a shapefile of the watershed and selecting only BMP points within that shapefile boundary. This ensures only BMPs within the watershed are reported to DEQ. All BMP data is stored in EHD, which is a cloud-based database. When completing BMP reporting each year, VDH retains a backup of records on a shared department hard drive.

There are several steps to prepare the data for reporting to DEQ. First, the data stored in EHD is septic system permitting information and not necessarily BMP data. VDH first has to identify which of these permits are BMPs and which BMPs they are. There are several data fields used to identify BMPs, including: component type, installation depth, treatment method, and constructed wetlands. To identify which denitrification model units are applicable, if any, to a given alternative septic system, VDH reviews the GMP 2013-01 treatment unit [list](#), and compares them to the treatment model descriptions in the alternative septic system permit records in EHD.

When joining maintenance reports to the alternative onsite septic systems, VDH ensures that the most recent maintenance date is selected and included in the BMP record. Because conventional septic system pumpouts are not required to be reported to VDH, VDH uses repair permits as a proxy to estimate the number of conventional septic system pumpouts. Connections to sewer are also not required to be reported to VDH, but are reported as BMPS when these records are available.

Additional information is joined to the BMP records to meet all DEQ data requirements. In ArcGIS Pro, VDH geocodes all septic system addresses in order to get geographic coordinates for each address. Additionally, in ArcGIS Pro, VDH identifies the watershed and locality in which a BMP is located using a spatial join to a VA national boundary watershed shapefile and a map of locality boundaries. Finally, data has to be formatted to match the preset formatting of the BMP warehouse, including adding BMP names, changing date formats, including all necessary rows, etc. VDH has a dedicated personnel for reporting all BMPs to DEQ funded by a grant provided by DEQ. As of June 2022, Megan Senseman is in this position.

Data is reported to the BMP warehouse once a year by the DEQ data reporting deadline of October 1 for BMP activity in the preceding fiscal year. DEQ requires that BMP implementation and verification data is submitted through [DEQ's BMP Warehouse application](#). This application is used to upload Nonpoint Source BMP data into the BMP Warehouse using pre-determined Excel files or templates. VDH will use the BMP Warehouse to meet DEQ's BMP data reporting requirements. Once BMP data is uploaded into the system all data is stored in a centralized database. Data stored in the BMP Warehouse will be used for state and federal reporting purposes. VDH will keep up to date on any changes to the BMP Warehouse through annual BMP Warehouse training sessions offered by DEQ.