



Virginia Department of Planning and Budget **Economic Impact Analysis**

12 VAC 5-635 Rainwater Harvesting Systems Regulations
Virginia Department of Health
Town Hall Action/Stage: 5542 / 9620
January 19, 2023

The Department of Planning and Budget (DPB) has analyzed the economic impact of this proposed regulation in accordance with § 2.2-4007.04 of the Code of Virginia (Code) and Executive Order 19. The analysis presented below represents DPB's best estimate of these economic impacts.¹

Summary of the Proposed Amendments to Regulation

The State Board of Health (Board) proposes to adopt new regulations regarding the use of rainwater.

Background

Chapter 817 of the *2018 Virginia Acts of Assembly* amended § 32.1-248.2 of the Code of Virginia (Code) to require the Board to adopt regulations regarding the use of rainwater and gray water. The legislation mandates that the regulations regarding use of rainwater: 1) describe the conditions under which rainwater may appropriately be used and for what purposes, and 2) provide standards for the use of rainwater harvesting systems, including systems that collect rainwater for use by commercial enterprises but do not provide water for human consumption, as defined in §32.1-167. The Virginia Department of Health (VDH) states that gray water will be regulated separately, via a pending revision of the *Sewage Handling and Disposal Regulations* (12VAC5-610).

¹ Code § 2.2-4007.04 requires that such economic impact analyses determine the public benefits and costs of the proposed amendments. Further the analysis should include but not be limited to: (1) the projected number of businesses or other entities to whom the proposed regulatory action would apply, (2) the identity of any localities and types of businesses or other entities particularly affected, (3) the projected number of persons and employment positions to be affected, (4) the projected costs to affected businesses or entities to implement or comply with the regulation, and (5) the impact on the use and value of private property.

Chapter 817 further instructs VDH to promote the use of rainwater as means to reduce freshwater consumption, ease demands on public treatment works and water supply systems, and promote conservation; and to consider recognizing rainwater as an independent source of fresh water available for use by the residents of the Commonwealth.

Specifically, the proposed regulation would have the following sections: 12VAC5-635-10 *Definitions*, 12VAC5-635-20 *Applicability of regulations*, 12VAC5-635-30 *Relationship to Virginia Sewage Handling and Disposal Regulations*, 12VAC5-635-40 *Relationship to the State Water Control Board*, 12VAC5-635-50 *Relationship to the Uniform Statewide Building Code*, 12VAC5-635-60 *Right of Entry and Inspections*, 12VAC5-635-70 *End use tiers for rainwater harvesting systems*, 12VAC5-635-80 *Reserved*, 12VAC5-635-90 *Permits for rainwater harvesting systems; general*, 12VAC5-635-100 *Application procedures for a construction permit for a rainwater harvesting system for Tier 4 end use*, 12VAC5-635-110 *Issuance of a construction permit*, 12VAC5-635-120 *Denial of a construction permit*, 12VAC5-635-130 *Revision of approved plans*, 12VAC5-635-140 *Installation inspection and correction*, 12VAC5-635-150 *Requirement for an easement*, 12VAC5-635-160 *Land records*, 12VAC5-635-170 *Issuance of operation permit*, 12VAC5-635-180 *Variances*, 12VAC5-635-190 *Enforcements, notices, informal conferences, appeals*, 12VAC5-635-200 *Cross connection abatement*, 12VAC5-635-210 *Backflow prevention*, 12VAC5-635-220 *Water storage unit location*, 12VAC5-635-230 *Materials and equipment*, 12VAC5-635-240 *Design and installation*, 12VAC5-635-250 *Filtration*, 12VAC5-635-260 *Disinfection*, 12VAC5-635-270 *General certification*, 12VAC5-635-280 *Temporary removal from service*, 12VAC5-635-290 *Performance requirements; general*, 12VAC5-635-300 *Continuity of water supply*, 12VAC5-635-310 *Water quality standards*, 12VAC5-635-320 *Operator requirements; Frequency of inspection*, 12VAC5-635-330 *Operation and maintenance; operator's responsibility*, 12VAC5-635-340 *Operation and maintenance; owner's responsibilities*, 12VAC5-635-350 *Operation and maintenance manual*, 12VAC5-635-360 *Inspection requirements*, 12VAC5-635-370 *Inspection Reports*, and 12VAC5-635-9998 *FORMS*.

The proposed regulation defines “rainwater harvesting system” as “a water system for collecting, storing, potentially treating, and distributing rainwater for an end use.” Rainwater harvesting systems are divided into four tiers, based upon the intended end use of the rainwater collected. Tier 4 is for water intended for human consumption (potable).

Tier 4: Potable Water

A construction permit, issued by VDH, would be required for a rainwater harvesting system for Tier 4 end use. VDH would issue the construction permit if it determines that: 1) the rainwater harvesting system is adequate to produce potable water, 2) the system complies with all requirements of the regulation and 3) the installation and operation of the system would not create an actual or potential health hazard or nuisance. There is no proposed fee for the permit.

Upon completion of the installation, alteration, or rehabilitation of a rainwater harvesting system intended for Tier 4 end use:

1. The owner or agent shall submit to the local health department a statement signed by the installer certifying that the rainwater harvesting system was installed, altered or rehabilitated in accordance with the construction permit and that the rainwater harvesting system complies with applicable state and local regulations, ordinances and laws;
2. The designer shall thoroughly inspect the system installation to determine whether the installation was completed substantially in accordance with the approved evaluation and design, including any revisions made ...; and
3. The designer shall submit to the local health department a signed inspection report stating that the installation was completed substantially in accordance with the approved evaluation and design revised only in accordance with [delineated] provisions

There are further requirements if the designer observes deficiencies during the inspection.

Further, the proposed regulation states that no rainwater harvesting system intended for Tier 4 end use may be operated, except for the purposes of testing the system, until VDH has issued an operation permit to the owner. For an operation permit to be issued, all of the requirements mentioned in the above paragraph must have been completed, and the owner must:

1. Record an instrument describing applicable annual water quality testing and maintenance requirements for each component of the rainwater harvesting system in the land records of the circuit court having jurisdiction over the site of the rainwater harvesting system; and
2. Submit to the local health department legal documentation indicating that the instrument has been duly recorded in the land records.

The instrument recorded pursuant to this section shall be transferred with the title to the property upon the sale or other transfer of the property in which the rainwater harvesting system is located. There is no proposed fee for the operation permit.

Tiers 1, 2, and 3: Non-potable Water

An owner may install and operate a rainwater harvesting system without a permit where the water is not intended for human consumption (i.e., Tier 1, 2 or 3).

- Tier 1 is low exposure non-potable water end use where humans will rarely come into contact with the treated rainwater due to the nature of the installation that limits direct or indirect contact under normal operation. Examples include trap primers, restricted access spray irrigation, surface and subsurface irrigation, and ice rinks. In this context, restricted access spray irrigation means spray irrigation in fenced or remote locations where human visitation is controlled or prevented.
- Tier 2 is medium exposure non-potable water end use where human contact with treated rainwater is indirect or limited. Examples include toilet and urinal flushing, clothes washing, HVAC evaporative cooling, and rooftop thermal cooling.
- Tier 3 is high exposure non-potable water end use where human contact with treated rainwater is direct. Examples include hose bibs, pressure washing, firefighting or protection and fire suppression, decorative fountains, vehicle washing, and non-restricted spray irrigation.

The owner of a Tier 1, 2, or 3 end use rainwater harvesting system shall file a registration form with the department within 30 days of the following: 1) installing a rainwater harvesting system, 2) change of ownership of a rainwater harvesting system, or 3) permanently closing a rainwater harvesting system. There is no proposed fee for the registration.

Other Requirements²

According to VDH, water quality treatment is inconsistent from locality to locality because of the current absence of statewide water quality standards. The proposed regulation includes specific minimum water quality standards that differ by tier level. Tiers 2, 3, and 4 all have standards of removal of bacteria and protozoa (higher the tier, higher the standard), while

² Not all requirements are specifically discussed in this report.

Tier 1 does not. Tier 4 has a required pH range, while the other tiers do not. The proposed regulation also states that “It is unlikely that human infectious viruses are present in harvested rainwater. However, if underground water storage tanks are used where there is a potential for sewage contamination or surface water infiltration, a [specified] reduction for viruses shall be required.”

The owner of a rainwater harvesting system would be required to ensure that the rainwater harvesting system is inspected and tested for water quality by an operator at the times described in the following table below. An operator is defined as a person employed or contracted by an owner to operate and maintain a rainwater harvesting system and holding certification as a designer, installer, or inspector. Owners may be certified to become operators.

<u>End Use Tier</u>	<u>Initial Inspection</u>	<u>Regular Inspection Schedule</u>
1	Prior to the system entering service	As needed
2, 3	Prior to the system entering service	Every 12 months while structure is occupied. If system only provides water for outdoor use, then as needed
4 (single service connection)	Condition of issuance of Operation Permit	Every 180 days while structure is occupied. *
4 (multiple service connections)	Condition of issuance of Operation Permit	Every 90 days while any connection serves an occupied structure. *

* If a structure is vacant longer than the regular inspection cycle in Table 5, an operator shall inspect the rainwater harvesting system prior to the structure becoming reoccupied.

During an inspection, the operator must review and evaluate the operation of the rainwater harvesting system, 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. If a rainwater harvesting system permitted for Tier 4 end use 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 must report immediately to the owner the remediation efforts necessary to return the rainwater

harvesting system to normal operation, including recommendation for temporary or emergency alternate water supply if the system does not provide water acceptable for human consumption.

The operator would also be required to maintain a written log for each rainwater harvesting system for which the operator is responsible that contains, at minimum, the following items: 1) results of testing and sampling, 2) information regarding reportable incidents, including the corrective action required and taken, 3) maintenance, corrective actions, and repair activities that are performed for purposes other than a reportable incident, and 4) recommendations for repair and replacement of system components. Additionally, the owner and operator must maintain and operate the rainwater harvesting system in accordance with an approved operation and maintenance manual.

The proposed regulation states that a person providing design, installation, or inspection of rainwater harvesting systems shall be certified by the American Society of Sanitary Engineering (ASSE) as follows:

1. Rainwater Harvesting System Designers shall maintain ASSE 21120 Rainwater Catchment Systems Designer certification.
2. Rainwater Harvesting System Installers shall maintain ASSE 21110 Rainwater Catchment Systems Installer certification.
3. Rainwater Harvesting System Inspectors shall maintain ASSE 21130 Rainwater and Stormwater Catchment Systems Inspector certification.

Other proposed requirements for the regulation are consistent with the Virginia Uniform Statewide Building Code, which applies to rainwater harvesting systems,³ and thus would not have impact.

The Virginia Plumbing Code⁴ requires that VDH approve individual water supplies as potable prior to connection to the plumbing system.⁵ Currently there is no mechanism for VDH to approve rainwater harvesting systems for potable uses. The proposed regulation would

³ Source: VDH

⁴ The Virginia Uniform Statewide Building Code (13VAC5-63) incorporates the "International Plumbing Code - 2018 Edition" by reference. See <https://law.lis.virginia.gov/admincode/title13/agency5/chapter63/section9999/>

⁵ Section 602.3.3 of the 2018 edition of the Plumbing Code states that "Water from an individual water supply shall be approved as potable by the authority having jurisdiction [VDH] prior to connection to the plumbing system." See <https://codes.iccsafe.org/content/VPC2018P1/chapter-6-water-supply-and-distribution>

provide such a mechanism. Rainwater harvesting systems for non-potable end use have no such requirement and are currently operating in the Commonwealth.⁶

Estimated Benefits and Costs

Benefits

Since there is currently no mechanism for VDH to approve rainwater harvesting systems for potable uses, local building officials cannot grant building permits for new construction with rainwater harvesting systems to be used for potable water.⁷ By providing such a mechanism, the proposed regulation would enable the construction of buildings that use rainwater harvesting systems for potable uses. To the extent that this new option is utilized, it may ease demands on public treatment works and water supply systems. It can also be beneficial for people who do not have access to a public water supply, where the water table is such that a well is not practical, or the local water is contaminated and not easily treated. According to the agency, there are currently an estimated several hundred homeowners relying on cisterns throughout Virginia who regularly pay for hauled water to maintain their water supply (costs range from \$110 to \$150 per 1,000 gallons). The proposed regulation may allow these individuals to reduce or discontinue reliance on that service. To the extent that the proposed new mechanism for VDH to approve rainwater harvesting systems for potable uses is utilized, firms that supply such systems and firms that supply design, installation, or inspection services for these systems would benefit from additional business.

Contaminated drinking water can transmit diseases such as diarrhea, cholera, dysentery, hepatitis A, typhoid, and polio.⁸ Thus, ensuring that the rainwater harvesting systems that are to be used for drinking water truly produce potable water is highly beneficial. Additionally, the various requirements that may help reduce the level of contamination in water from systems that produce water not intended for consumption, but where people are expected to have contact with treated rainwater, may also potentially reduce disease transmission.

The proposed requirement that all individuals who provide design, installation, or inspection of rainwater harvesting systems be certified by ASSE may help ensure that the design,

⁶ Source: VDH

⁷ Ibid

⁸ Source: World Health Organization. See <https://www.who.int/news-room/fact-sheets/detail/drinking-water>

installation, and inspection of the systems is done competently. This may reduce the likelihood of failures of the systems.

Costs

As indicated above, persons providing design, installation, or inspection of rainwater harvesting systems are not currently required to be certified. To the extent that persons providing these services do not already have such certification, the proposed requirement for ASSE certification would produce new costs for these individuals and/or the firms that employ them. There are several ASSE-approved training providers, and the cost for training and certification would cost approximately \$400 to \$600 for online training. The training is expected to take one to two days. Participants must also pass an examination to earn certification.⁹

The proposed requirements that operators and owners produce and keep logs and manuals would require additional time be spent to the extent that these items are not already being produced. To the extent that the proposed water quality standards and inspection schedules are more stringent than what localities are already requiring, there may be associated additional costs to meet these requirements as well.

VDH does not believe that the legislation provided the authority to charge fees for costs associated with the rainwater harvesting system program. Thus, the agency estimates general fund dollars would be required for the following costs:

- 1) an estimated one-time cost of \$68,000 for VDH's database vendor to modify the internal Environmental Health Database to incorporate a permitting program for Rainwater Harvesting Systems for Potable Use to track program permits, operation, and maintenance. There would also be an annual ongoing cost of \$54,000 to VDH's database vendor to maintain this system.
- 2) a one-time cost of \$34,000 to VDH's database vendor to develop an online tool for registering rainwater harvesting systems with VDH. There would also be an on-going annual cost of \$24,000 to VDH's database vendor to maintain this tool.
- 3) an estimated staff resource cost of \$134,000 to provide development, support, and review of the operation and maintenance of both systems described in 1 and 2 above. VDH anticipates that the development costs would decrease over time as the operation and maintenance effort increases.

⁹ Source: VDH

- 4) personnel costs for developing training and outreach programs and materials to familiarize VDH staff and the regulated community with the regulations. There would be an ongoing cost associated with the engineering review of permit applications, and there will be an ongoing cost for enforcement of the regulations. VDH estimates an annual staff resource cost of \$200,000 to provide the training, outreach, engineering review, and enforcement processes. VDH anticipates that the training and outreach costs would decrease over time as the engineering review and enforcement costs increase.
- 5) a staff resource cost at local health departments to process applications for potable rainwater harvesting system permits. VDH anticipates the cost to process each application would vary based on the size and complexity of the systems with a range of \$300 to \$1500 in staff resources per application.

Businesses and Other Entities Affected

The proposed regulations would particularly affect owners of homes and other buildings or property where potable water is hard to obtain, builders and property developers, firms that supply rainwater harvesting systems and firms that supply design, installation, or inspection services for these systems.¹⁰

The Code of Virginia requires DPB to assess whether an adverse impact may result from the proposed regulation.¹¹ An adverse impact is indicated if there is any increase in net cost or reduction in net revenue for any entity, even if the benefits exceed the costs for all entities combined. Since new costs are introduced for rainwater harvesting systems for non-potable uses, an adverse impact is indicated.

¹⁰ VDH does not have estimates for the numbers of these affected entities.

¹¹ Pursuant to Code § 2.2-4007.04(D): In the event this economic impact analysis reveals that the proposed regulation would have an adverse economic impact on businesses or would impose a significant adverse economic impact on a locality, business, or entity particularly affected, the Department of Planning and Budget shall advise the Joint Commission on Administrative Rules, the House Committee on Appropriations, and the Senate Committee on Finance. Statute does not define “adverse impact,” state whether only Virginia entities should be considered, nor indicate whether an adverse impact results from regulatory requirements mandated by legislation.

Small Businesses¹² Affected:¹³

Types and Estimated Number of Small Businesses Affected

The proposed regulation would particularly affect small firms that that supply rainwater harvesting systems, that supply design, installation, or inspection services for these systems, or have difficulty obtaining potable water.¹⁴

Costs and Other Effects

To the extent that small firms that that supply design, installation, or inspection services for rainwater harvesting systems do not already ensure that their applicable employees are ASSE certified, the proposed certification requirement would increase costs.

Alternative Method that Minimizes Adverse Impact

There are no clear alternative methods that both reduce adverse impact and meet the intended policy goals.

Localities¹⁵ Affected¹⁶

The proposed regulation may particularly affect those localities that have higher percentages of their land where the water table is such that a well is not practical, or the local water is contaminated and not easily treated. The proposal does not introduce costs for local governments.

Projected Impact on Employment

The proposed creation of the new mechanism for VDH to approve rainwater harvesting systems for potable uses may increase businesses for firms that supply such systems and firms

¹² Pursuant to § 2.2-4007.04 of the Code of Virginia, small business is defined as “a business entity, including its affiliates, that (i) is independently owned and operated and (ii) employs fewer than 500 full-time employees or has gross annual sales of less than \$6 million.”

¹³ If the proposed regulatory action may have an adverse effect on small businesses, Code § 2.2-4007.04 requires that such economic impact analyses include: (1) an identification and estimate of the number of small businesses subject to the proposed regulation, (2) the projected reporting, recordkeeping, and other administrative costs required for small businesses to comply with the proposed regulation, including the type of professional skills necessary for preparing required reports and other documents, (3) a statement of the probable effect of the proposed regulation on affected small businesses, and (4) a description of any less intrusive or less costly alternative methods of achieving the purpose of the proposed regulation. Additionally, pursuant to Code § 2.2-4007.1, if there is a finding that a proposed regulation may have an adverse impact on small business, the Joint Commission on Administrative Rules shall be notified.

¹⁴ VDH does not have estimates for the numbers of these small firms.

¹⁵ “Locality” can refer to either local governments or the locations in the Commonwealth where the activities relevant to the regulatory change are most likely to occur.

¹⁶ § 2.2-4007.04 defines “particularly affected” as bearing disproportionate material impact.

that supply design, installation, or inspection services for these systems. With increases demand, these firms may hire additional employees.

Effects on the Use and Value of Private Property

The proposed creation of the new mechanism for VDH to approve rainwater harvesting systems for potable uses may increase businesses for firms that supply such systems and firms that supply design, installation, or inspection services for these systems. Associated increased revenues could increase the value of such firms. To the extent that firms that supply design, installation, or inspection services for rainwater harvesting systems do not already ensure that their applicable employees are ASSE certified, the proposed certification requirement may moderately affect these firms' value in the opposite direction.

The proposed creation of the new mechanism for VDH to approve rainwater harvesting systems for potable uses may also reduce real estate development costs in areas where there is no public water supply, the water table is such that a well is not practical, and/or the local water is contaminated and not easily treated