

Office of Regulatory Management  
Economic Review Form

<b>Agency name</b>	Virginia Department of Health
<b>Virginia Administrative Code (VAC) Chapter citation(s)</b>	12 VAC 5-635
<b>VAC Chapter title(s)</b>	Rainwater Harvesting Regulations
<b>Action title</b>	Promulgate Rainwater Harvesting Regulations
<b>Date this document prepared</b>	August 18, 2023
<b>Regulatory Stage (including Issuance of Guidance Documents)</b>	Proposed

**Cost Benefit Analysis**

Complete Tables 1a and 1b for all regulatory actions. You do not need to complete Table 1c if the regulatory action is required by state statute or federal statute or regulation and leaves no discretion in its implementation.

Table 1a should provide analysis for the regulatory approach you are taking. Table 1b should provide analysis for the approach of leaving the current regulations intact (i.e., no further change is implemented). Table 1c should provide analysis for at least one alternative approach. You should not limit yourself to one alternative, however, and can add additional charts as needed.

Report both direct and indirect costs and benefits that can be monetized in Boxes 1 and 2. Report direct and indirect costs and benefits that cannot be monetized in Box 4. See the ORM Regulatory Economic Analysis Manual for additional guidance.

**Table 1a: Costs and Benefits of the Proposed Changes (Primary Option)**

<p>(1) Direct &amp; Indirect Costs &amp; Benefits (Monetized)</p>	<p><b>Direct Costs:</b></p> <p><u>Direct Costs Related to Potable Water Use Systems</u></p> <p>At present, Virginia does not authorize the treatment of harvested rainwater for potable use in private systems. The regulations will allow property owners the option of the use of harvested rainwater for private potable water systems. VDH anticipates that the direct cost (design, installation, permitting and regulatory fees) will be comparable to that of private wells, based on the following:</p> <p>During the drafting of the regulations, VDH obtained an estimated cost to design and install a single-family potable rainwater harvesting system from a water treatment system provider. The 2021 estimate is \$10,550. Accounting for inflation, the current cost is estimated as \$12,000 to \$15,000. For comparison, in July 2023, VDH received a variance request to allow cistern on a property located where groundwater reserves are limited, and the driller estimated a minimum cost to install a well at \$20,000 with no guarantee that water would be encountered. Currently, the installation of a private well in Virginia ranges in cost from \$10,000 up to \$30,000 or more depending on local conditions, including well depth.</p> <p>For existing cistern owners who must rely on hauled water for potable water supply, the regulations will provide opportunity to use harvested rainwater instead. VDH estimates daily water use to be 75 gallons a day per person, meaning that a family of four requires 109,500 gallons per year. Assuming a \$110/thousand gallons water delivery cost, the annual cost of water delivery is \$12,045.00. Installation costs for a cistern system for hauled water are comparable to that of a private well. Installation of a rainwater harvesting system would reduce if not eliminate the need for water delivery. Therefore, VDH anticipates that a rainwater harvesting system would pay for itself within one to two years.</p> <p>In summary, the regulations generally increase Virginian’s ability to obtain drinking water while maintaining the safety of that water. This will ultimately reduce economical and regulatory burdens associated with ensuring water quality and safety for private water systems. Other direct costs to VDH: (see TH-02 for additional detail)</p> <p>Update EHD database (\$68,000 to modify; \$54,000 annually thereafter to maintain.)          Create Online Registration (\$34,000 to create; \$24,000 annually thereafter to maintain.)          Staff resource in support of database modification and registry creation (\$134,000 annually)</p>
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Training and Outreach Program (\$200,000)  
 Staff resources at Local Health Departments (\$300 to \$1500 per permit application).

**Indirect Costs:** A potential indirect cost for users of rainwater harvesting systems is provision of a secondary water supply in the event of drought when the secondary water supply is hauled water (generally \$110 to \$150 per 1000 gallons.) In most cases, VDH anticipates secondary water supply to be either public water or a private well, so indirect cost is considered minimal.

**Direct Benefits:**  
General: These are new regulations. Currently, rainwater may be harvested for use throughout the Commonwealth for non-potable purposes under existing VDH Rainwater Harvesting Guidelines and provisions within the Uniform Statewide Building Code (USBC). VDH does not currently authorize the harvesting of rainwater for private potable use, and the regulations will make this possible.

VDH anticipates a public health benefit to the Commonwealth by means of clarity of water quality standards for all forms of harvested rainwater use; protection of water resources by means of reduction in use of existing groundwater and surface water supply; and allowance of a form of private water supply in locations where no other form of water supply is available due to geologic or anthropogenic factors.

Direct Benefits Related to Non-potable Use Systems  
 With respect to the use of harvested rainwater for non-potable purposes, industry currently contends with a patchwork of governance; no statewide water quality standards, outdated and incomplete agency guidance, manufacturer’s varying performance standards, the USCB, and third-party guidance from trade associations and similar groups. This is difficult for industry to navigate and results in unreliable compliance across jurisdictions. Of most concern is the lack of consistent water quality standards based on the intended use of harvested rainwater. VDH anticipates that the regulations will benefit the regulated community by standardizing design and installation criteria, resulting in a 10 to 20% increase in efficiency, with no anticipated increases in the cost of compliance.

**Indirect Benefits:** VDH anticipates indirect benefits to homebuilders, realtors, and manufacturers/purveyors of rainwater harvesting system components as the result of the allowance of a previously unavailable private water supply.

(2) Present Monetized Values	Direct & Indirect Costs	Direct & Indirect Benefits
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	(a) \$302,000 for program start up (database, registry, training & outreach) (b) \$212,000 annually thereafter for O&M	(b) Intangible benefit
(3) Net Monetized Benefit	\$514,000	
(4) Other Costs & Benefits (Non-Monetized)	VDH anticipates a public health benefit to the Commonwealth by means of clarity of water quality standards for all forms of harvested rainwater use; protection of water resources by means of reduction in use of existing groundwater and surface water supply; and allowance of a form of private water supply in locations where no other form of water supply is available due to geologic or anthropogenic factors.	
(5) Information Sources	HS Govtech (database provider); Rainwater Management Solutions; VDH OEHS Division of Data Management and Process Improvement; <a href="#">HomeAdvisor</a>	

**Table 1b: Costs and Benefits under the Status Quo (No change to the regulation)**

(1) Direct & Indirect Costs & Benefits (Monetized)	This will be the initial promulgation of 12VAC5-635. The regulation is mandated by § 32.1-248.2 of the Code of Virginia, as such the status quo is not a viable option and it is not feasible to assess. However, the benefits discussed in Table 1a would not be reaped if the regulatory changes described are not put in place.	
(2) Present Monetized Values	Direct & Indirect Costs	Direct & Indirect Benefits
	(a)	(b)
(3) Net Monetized Benefit		
(4) Other Costs & Benefits (Non-Monetized)		
(5) Information Sources		

**Table 1c: Costs and Benefits under Alternative Approach(es)**

<p>(1) Direct &amp; Indirect Costs &amp; Benefits (Monetized)</p>	<p><b>The stakeholder workgroup assembled to draft the regulations considered permitting for all rainwater harvesting systems, as opposed to permitting only for potable use rainwater harvesting systems. This option was rejected by the workgroup</b></p> <p>Direct Costs: Would likely increase the price of goods and services currently applicable to non-potable rainwater harvesting systems, which currently do not require construction permits. Further, would place significant burden on local health department personnel, who currently do not have expertise to conduct engineering review of complex non-potable rainwater harvesting system plans for large facilities such as schools and office buildings.</p> <p>Indirect Costs: Would possibly make marketplace less competitive as smaller businesses may be less able to adjust to increased VDH requirements.</p> <p>Direct Benefits: No obvious benefits. The current practice in Virginia regulating non-potable rainwater harvesting system design and construction per the Uniform Statewide Building Code has been proven successful. We note that the water quality standards in the proposed regulations will provide clarity to the regulated community, without a significant impact on design and construction cost.</p> <p>Indirect Benefits: None obvious.</p>	
<p>(2) Present Monetized Values</p>	<p>Direct &amp; Indirect Costs</p>	<p>Direct &amp; Indirect Benefits</p>
	<p>(a) Insufficient baseline to determine</p>	<p>(b) Insufficient baseline to determine</p>
<p>(3) Net Monetized Benefit</p>	<p>Insufficient baseline to determine</p>	
<p>(4) Other Costs &amp; Benefits (Non-Monetized)</p>	<p>The stakeholder group assembled to draft the proposed regulations agreed that permitting of rainwater harvesting systems for non-potable use would place an unnecessary burden on the regulated community with no advantage over the status quo.</p>	
<p>(5) Information Sources</p>		
<p>(1) Direct &amp; Indirect Costs &amp;</p>	<p><b>The stakeholder workgroup assembled to draft the regulations considered not requiring a permitting program for rainwater</b></p>	

Benefits (Monetized)	<b>harvesting systems for potable water supply. This option was rejected by the workgroup.</b>	
	Direct Costs: Would lower the cost of implementing harvested rainwater as a private potable water source.	
	Indirect Costs: The indirect cost would be an adverse public health risk for system users, for which VDH would have no mechanism of response, correction, or enforcement. The risk of adverse health outcome includes illness and death of system users.	
	Direct Benefits: No obvious benefits	
	Indirect Benefits: No obvious benefits	
(2) Present Monetized Values	Direct & Indirect Costs	Direct & Indirect Benefits
	(a) Insufficient baseline to determine	(b) Insufficient baseline to determine
(3) Net Monetized Benefit	Insufficient baseline to determine	
(4) Other Costs & Benefits (Non-Monetized)	The stakeholder group assembled to draft the proposed regulations agreed that not permitting rainwater harvesting systems for potable use would represent unnecessary risk to public health. The group concurred that potable use systems, especially those incorporating filtration and disinfection, merit a permit system so that the Commonwealth can mitigate conditions that might lead to severe illness and potential mortality.	
(5) Information Sources		

**Impact on Local Partners**

Use this chart to describe impacts on local partners. See Part 8 of the ORM Cost Impact Analysis Guidance for additional guidance.

**Table 2: Impact on Local Partners**

(1) Direct & Indirect Costs & Benefits (Monetized)	Direct Costs: There are no anticipated economic costs or savings to localities from the development of these Regulations. As rainwater harvesting becomes common, the regulated community may petition local governments to eliminate mandatory connection to public water supplies or reduce fees for public water for users who rely primarily on harvested rainwater. However, the economic impact of this potential
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	<p>action is unknown currently. There is also some potential for economic benefit to localities based on a possible increase in the ability for taxable property to be developed. However, the amount of economic benefit is difficult to predict until the regulations are in effect.</p> <p>Indirect Costs: In many localities, connection to public water supply and associated monthly fee is mandatory by ordinance. Over time, localities may face pressure to offer relief from mandatory connection – or fees – for properties served by a potable use rainwater harvesting system.</p> <p>Direct Benefits: Lowered demand on municipal water supply systems.</p> <p>Indirect Benefits: The Regulations are designed to improve public health by establishing water quality standards for all uses of harvested rainwater. This will benefit locality owned properties such as schools which incorporate rainwater harvesting systems for non-potable uses such as toilet/urinal flushing and irrigation.</p>	
(2) Present Monetized Values	Direct & Indirect Costs	Direct & Indirect Benefits
	(a) Insufficient baseline to determine	(b) Insufficient baseline to determine
(3) Other Costs & Benefits (Non-Monetized)	Insufficient baseline to determine	
(4) Assistance	VDH does not anticipate significant funding challenges to localities. However, VDH intends to provide assistance to all people in the Commonwealth via a training and outreach program to introduce the new regulations.	
(5) Information Sources	Stakeholder group analysis.	

**Impacts on Families**

Use this chart to describe impacts on families. See Part 8 of the ORM Cost Impact Analysis Guidance for additional guidance.

**Table 3: Impact on Families**

(1) Direct & Indirect Costs & Benefits (Monetized)	Direct Costs: The regulations provide an avenue for a private potable water source, especially in situations where no other private source, or public water supply, is available. The cost for system installation is comparable to that of a private well and other private water sources.
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	<p>Indirect Costs: There may be occasional need to haul water to replenish cisterns during drought conditions.</p> <p>Direct Benefits: May increase the market value of property where no other water source is available.</p> <p>Indirect Benefits: Rainwater harvesting represents a “green” process.</p>	
(2) Present Monetized Values	Direct & Indirect Costs	Direct & Indirect Benefits
	(a) Insufficient baseline to determine	(b) Insufficient baseline to determine
(3) Other Costs & Benefits (Non-Monetized)	Insufficient baseline to determine	
(4) Information Sources	Stakeholder group analysis	

**Impacts on Small Businesses**

Use this chart to describe impacts on small businesses. See Part 8 of the ORM Cost Impact Analysis Guidance for additional guidance.

**Table 4: Impact on Small Businesses**

(1) Direct & Indirect Costs & Benefits (Monetized)	<p>Direct Costs: Design professionals, installers, and inspectors must undertake training for certification under ASSE Rainwater Catchment System Standards. (Can be done online).</p> <p>Indirect Costs: VDH anticipates the regulations can provide a distinct avenue for water supply for both non-potable and potable use to individuals and businesses. The regulations are based on current industry standards and are not anticipated to increase construction costs beyond those applicable today. The regulations will provide a new market sector for small businesses including builders, tradespersons (e.g., plumbers, electricians), and realtors.</p> <p>Direct Benefits: New business sector</p> <p>Indirect Benefits: No obvious benefits</p>	
(2) Present Monetized Values	Direct & Indirect Costs	Direct & Indirect Benefits



	(a) Stakeholder group analysis	(b) Stakeholder group analysis
(3) Other Costs & Benefits (Non-Monetized)	The Regulations will provide an additional source of water supply to the people of Virginia. Further, the Regulations are designed to improve public health by establishing water quality standards for all uses of harvested rainwater.	
(4) Alternatives	Section 32.1-248.2 of the Code requires the Board to adopt regulations regarding the use of rainwater and 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. As an alternative, the stakeholder group assembly by VDH considered the adaptation of VDH’s Virginia Rainwater Harvesting & Use Guidelines from guidance to Regulations. The group concluded that although a straightforward adaptation of the existing guidelines would comply with § 32.1-248.2 of the Code, it would not fully address the goals implied in the statute. In addition, it would not represent an avenue to address the demand for potable water supply where no other water source is feasible. Further, it would not be consistent with mandates elsewhere in the Code relative to resource protection and management (for example, groundwater management areas). This proposed action includes potential benefits for small businesses, primarily, but not limited to, manufacturers and sellers of rainwater harvesting systems and system components, plumbers, electricians, and water quality laboratories, as it will clarify requirements for system design, installation, operation and maintenance and water quality standards.	
(5) Information Sources	Stakeholder group analysis.	

**Changes to Number of Regulatory Requirements**

**Table 5: Regulatory Reduction**

For each individual action, please fill out the appropriate chart to reflect any change in regulatory requirements, costs, regulatory stringency, or the overall length of any guidance documents.

*Change in Regulatory Requirements*

<b>12VAC5-635 Section(s) Involved</b>	<b>Initial Count</b>	<b>Additions</b>	<b>Subtractions</b>	<b>Net Change</b>
10	0			
20	0			
30	0			
40	0			
50	0	2 (R/D)		+2 (R/D)
60	0	1 (R/S)		+1 (R/S)
70	0			
90	0	8 (R/D)		+8 (R/D)
100	0	1 (G/D) 8 (R/D)		+1 (G/D) +8 (R/D)
110	0	1 (G/D) 1 (R/D)		+1 (G/D) +1 (R/D)
120	0	4 (G/D)		+4 (G/D)
130	0	1 (G/D) 4 (R/D)		+1 (G/D) +4 (R/D)
140	0	1 (G/D) 14 (R/D)		+1 (G/D) +14 (R/D)
150	0	1 (R/S) 1 (R/D)		+1 (R/S) +1 (R/D)
160	0	2 (R/D)		+2 (R/D)
170	0	1 (G/D) 2 (R/D)		+1 (G/D) +2 (R/D)
180	0	12 (G/D) 7 (R/D)		+12 (G/D) +7 (R/D)
190	0	6 (G/D) 18 (R/D)		+6 (G/D) +18 (R/D)
200	0	1 (R/S) 1 (R/D)		+1 (R/S) +1 (R/D)
210	0	1 (R/S) 3 (R/D)		+1 (R/S) +3 (R/D)
220	0	3 (R/S) 26 (R/D)		+3 (R/S) +26 (R/D)
230	0	2 (R/S) 31 (R/D)		+2 (R/S) +31 (R/D)
240	0	6 (R/S)		+6 (R/S)

		41 (R/D)		+41 (R/D)
250	0	7 (R/D)		+7 (R/D)
260	0	1 (R/S) 4 (R/D)		+1 (R/S) +4 (R/D)
270	0	8 (R/D)		+8 (R/D)
280	0	4 (R/D)		+4 (R/D)
290	0	1 (R/S) 8 (R/D)		+1 (R/S) +8 (R/D)
300	0	2 (R/S) 3 (R/D)		+2 (R/S) +3 (R/D)
310	0	2 (R/S) 23 (R/D)		+2 (R/S) +23 (R/D)
320	0	11 (R/D)		+11 (R/D)
330	0	10 (R/D)		+10 (R/D)
340	0	10 (R/D)		+10 (R/D)
350	0	33 (R/D)		+33 (R/D)
360	0	5 (R/D)		+5 (R/D)
370	0	6 (R/D)		+6 (R/D)

*Other Decreases or Increases in Regulatory Stringency (if applicable)*

<b>VAC Section(s) Involved</b>	<b>Description of Regulatory Change</b>	<b>Overview of How It Reduces or Increases Regulatory Burden</b>
Entire chapter	New regulatory program – allowance of potable use of harvested rainwater.	<p>The initial costs of a private well are \$10k-\$30k, depending on conditions and location. For a cistern with hauled water, initial costs are similar to private well, plus \$10k-\$15k annually for water. For a new rainwater harvesting system, initial costs are approximately \$15k.</p> <p>We are currently unable to estimate how many individuals across the Commonwealth will install a rainwater harvesting system for potable use, and how many of those individuals have already installed a separate water system.</p> <p>For a family choosing between a new well or cistern vs a new rainwater system, initial costs could be similar, but potentially up to \$10k-\$15k cheaper. Relative to the ongoing water costs of a cistern, a rainwater system would pay for itself in under two years.</p>

Entire chapter	New regulatory oversight of non-potable harvested rainwater, including registration requirements.	<p>The industry currently contends with a patchwork of governance; no statewide water quality standards, outdated and incomplete agency guidance, manufacturer’s varying performance standards, the USCB, and third-party guidance from trade associations and similar groups. This is difficult for industry to navigate and results in unreliable compliance across jurisdictions. Of most concern is the lack of consistent water quality standards based on the intended use of harvested rainwater.</p> <p>VDH anticipates that the regulations will benefit the regulated community by standardizing design and installation criteria, resulting in a 10 to 20% increase in efficiency, with no anticipated increases in the cost of compliance.</p>
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