

Office of Regulatory Management
Economic Review Form

Agency name	Virginia Department of Health
Virginia Administrative Code (VAC) Chapter citation(s)	12 VAC 5-635
VAC Chapter title(s)	Rainwater Harvesting Regulations
Action title	New Regulations (no previous version)
Date this document prepared	03/01/2024
Regulatory Stage (including Issuance of Guidance Documents)	Final

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 & Indirect Costs & Benefits (Monetized)</p>	<p>Direct Costs: These are new regulations. With respect to the use of harvested rainwater for non-potable purposes, VDH does not anticipate changes to the direct cost for system owners, designers, equipment manufacturers, or installers who operate under existing rainwater harvesting guidance. Prior to this regulation, VDH did not encourage use of harvested rainwater for potable water supply. The regulation allows 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.</p> <p>To develop the Regulations, the stakeholders reviewed national and international rainwater harvesting standards and rainwater harvesting system (and other water reuse) regulations in other states and jurisdictions including the cities of San Francisco and Seattle. This effort allowed the stakeholders to collaborate to develop regulations that are consistent in scope and requirements with similar regulations throughout the country. Based on this effort, VDH considers the Regulations to meet an appropriate and reliable level of public health protection which is not overly burdensome to the regulated community.</p> <p>The Regulations are Virginia’s second set of regulations addressing private water supply, with the first being the Private Well Regulations (12VAC5-630). The Private Well Regulations address only the location and construction of wells (pursuant to § 32.1-176.4. of the Code of Virginia). Post well construction activities, including water quality and well maintenance, are at the discretion of the well owner. In comparison, the rainwater harvesting system regulations address water quality and system operation and maintenance. VDH attributes this distinction to (i) the known reliability of groundwater quality in the Commonwealth, and (ii) the necessity to filter and disinfect harvested rainwater in order to ensure it meets the required quality dependent its intended use. Other direct costs: (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) Training and Outreach Program (\$200,000) Staff resources at Local Health Departments (\$300 to \$1500 per permit application).</p> <p>Indirect Costs: VDH does not anticipate indirect costs for users of non-potable use rainwater harvesting systems. A potential indirect cost for users of rainwater harvesting systems for potable use is provision of a secondary water supply in</p>
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	<p>the event of drought when the secondary water supply is hauled water (generally \$110 to \$150 per 1000 gallons.)</p> <p>Direct Benefits: 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. Because these are new regulations, there is no existing baseline from which monetized value can be estimated.</p> <p>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. Because these are new regulations, there is no existing baseline from which monetized value can be estimated.</p>													
(2) Present Monetized Values	Direct & Indirect Costs	Direct & Indirect Benefits												
	<p>(a) \$302,000 for program start up (database, registry, training & outreach)</p> <p>(b) \$212,000 annually thereafter for O&M</p>	(b) Intangible benefit												
(3) Net Monetized Benefit	\$514,000													
(4) Other Costs & Benefits (Non-Monetized)	<p>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.</p>													
(5) Information Sources	<p>HS Govtech (database provider); Rainwater Management Solutions; VDH OEHS Division of Data Management and Process Improvement</p> <p>Stakeholder group assembled to draft the Regulations</p> <table border="1" data-bbox="391 1619 1333 1873"> <thead> <tr> <th data-bbox="391 1619 678 1661"><u>Name</u></th> <th data-bbox="678 1619 1333 1661"><u>Representing</u></th> </tr> </thead> <tbody> <tr> <td data-bbox="391 1661 678 1703"><u>Anthony Creech</u></td> <td data-bbox="678 1661 1333 1703"><u>VDH Office of Environmental Health Services (OEHS)</u></td> </tr> <tr> <td data-bbox="391 1703 678 1745"><u>Aaron Moses</u></td> <td data-bbox="678 1703 1333 1745"><u>VDH Office of Drinking Water (ODW)</u></td> </tr> <tr> <td data-bbox="391 1745 678 1787"><u>Angela King</u></td> <td data-bbox="678 1745 1333 1787"><u>Virginia Coastal Policy Center</u></td> </tr> <tr> <td data-bbox="391 1787 678 1829"><u>Benjamin Sojka</u></td> <td data-bbox="678 1787 1333 1829"><u>Rainwater Management Solutions (Industry)</u></td> </tr> <tr> <td data-bbox="391 1829 678 1873"><u>Evan Branosky</u></td> <td data-bbox="678 1829 1333 1873"><u>Home Builders Association of Virginia</u></td> </tr> </tbody> </table>		<u>Name</u>	<u>Representing</u>	<u>Anthony Creech</u>	<u>VDH Office of Environmental Health Services (OEHS)</u>	<u>Aaron Moses</u>	<u>VDH Office of Drinking Water (ODW)</u>	<u>Angela King</u>	<u>Virginia Coastal Policy Center</u>	<u>Benjamin Sojka</u>	<u>Rainwater Management Solutions (Industry)</u>	<u>Evan Branosky</u>	<u>Home Builders Association of Virginia</u>
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<u>David Sample</u>	<u>Virginia Tech</u>
<u>Lance Gregory</u>	<u>VDH OEHS</u>
<u>Jay Ford</u>	<u>Chesapeake Bay Foundation</u>
<u>Jay Otto</u>	<u>Otto Sales (Industry)</u>
<u>Jeffrey Brown</u>	<u>Virginia Department of Housing and Community Development (DCHD)</u>
<u>Kathy DeBusk Gee</u>	<u>Longwood University</u>
<u>Michael Redifer</u>	<u>City of Newport News Code Compliance</u>
<u>Michelle Ashworth</u>	<u>Virginia Municipal Stormwater Association</u>
<u>Nelson Daniel</u>	<u>VDH ODW</u>
<u>Robert Cooper</u>	<u>Virginia Department of Environmental Quality (DEQ)</u>
<u>Robert Edelman</u>	<u>VDH ODW</u>
<u>Seana Ankers</u>	<u>Mission H2O (Legal)</u>
<u>Skip Harper</u>	<u>DHCD</u>
<u>Trip Perrin</u>	<u>Lindl Corporation (Industry)</u>
<u>Tyrone Jarvis</u>	<u>Go Green Auto Care (Industry)</u>
<u>Valerie Rourke</u>	<u>DEQ</u>

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

(1) Direct & Indirect Costs & Benefits (Monetized)	This will be the first version of 12VAC5-635 – there is no existing version for comparison. It is not feasible to consider the costs and benefits under the status quo of no regulation, because this regulation is mandated by the Code of Virginia.	
(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)

(1) Direct & Indirect Costs & Benefits (Monetized)	Alternative Approach-Requiring VDH Permit for Non-potable use rainwater harvesting systems. The stakeholder workgroup assembled to draft the regulations considered permitting for all rainwater harvesting systems, as opposed to permitting only for
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	<p>potable use rainwater harvesting systems. This option was rejected by the workgroup.</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: Could 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>
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(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 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.	
(5) Information Sources	Stakeholder group analysis	

(1) Direct & Indirect Costs & Benefits (Monetized)	<p>The stakeholder workgroup assembled to draft the regulations considered not requiring a permitting program for rainwater harvesting systems for potable water supply. This option was rejected by the workgroup.</p>
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	<p>Direct Costs: Would lower the cost of implementing harvested rainwater as a private potable water source.</p> <p>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.</p> <p>Direct Benefits: No obvious benefits</p> <p>Indirect Benefits: No obvious benefits</p>	
(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)	<p>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.</p>	
(5) Information Sources	Stakeholder group analysis	

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)	<p>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 action is unknown currently. There is also some potential for economic benefit to localities based on a possible increase in the ability for taxable</p>
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	<p>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)	<p>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.</p> <p>Indirect Costs: There may be occasional need to haul water to replenish cisterns during drought conditions.</p>
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	<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

VAC Section(s) Involved*	Authority of Change	Initial Count	Additions	Subtractions	Total Net Change in Requirements
635-10	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	0		0
635-20	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	0		0
635-30	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	0		0
635-40	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	0		0
635-50	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	2		+2
635-60	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	1		+1
	(D/R):	0	0		0
635-70	(M/A):	0	0		0
	(D/A):	0	0		0

	(M/R):	0	0		0
	(D/R):	0	0		0
635-90	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	8		+8
635-100	(M/A):	0	0		0
	(D/A):	0	1		+1
	(M/R):	0	0		0
	(D/R):	0	8		+8
635-110	(M/A):	0	0		0
	(D/A):	0	1		+1
	(M/R):	0	0		0
	(D/R):	0	1		+1
635-120	(M/A):	0	0		0
	(D/A):	0	4		+4
	(M/R):	0	0		0
	(D/R):	0	0		0
635-130	(M/A):	0	0		0
	(D/A):	0	1		+1
	(M/R):	0	0		0
	(D/R):	0	4		+4
635-140	(M/A):	0	0		0
	(D/A):	0	1		+1
	(M/R):	0	0		0
	(D/R):	0	14		+14
635-150	(M/A):	0	0		0
	(D/A):	0	1		+1
	(M/R):	0	0		0
	(D/R):	0	1		+1
635-160	(M/A):	0	0		0
	(D/A):	0	0		0

	(M/R):	0	0		0
	(D/R):	0	2		+2
635-170	(M/A):	0	0		0
	(D/A):	0	1		+1
	(M/R):	0	0		0
	(D/R):	0	2		+2
635-180	(M/A):	0	0		0
	(D/A):	0	12		+12
	(M/R):	0	0		0
	(D/R):	0	7		+7
635-190	(M/A):	0	0		0
	(D/A):	0	6		+6
	(M/R):	0	0		0
	(D/R):	0	18		+18
635-200	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	1		+1
	(D/R):	0	1		+1
635-210	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	1		+1
	(D/R):	0	3		+3
635-220	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	3		+3
	(D/R):	0	26		+26
635-230	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	2		+2
	(D/R):	0	31		+31
635-240	(M/A):	0	0		0
	(D/A):	0	0		0

	(M/R):	0	6		+6
	(D/R):	0	41		+41
635-250	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	7		+7
635-260	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	1		+1
	(D/R):	0	4		+4
635-270	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	8		+8
635-280	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	4		+4
635-290	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	1		+1
	(D/R):	0	8		+8
635-300	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	10		+10
635-310	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	2		+2
	(D/R):	0	23		+23
635-320	(M/A):	0	0		0
	(D/A):	0	0		0

	(M/R):	0	0		0
	(D/R):	0	11		+11
635-330	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	10		+10
635-340	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	10		+10
635-350	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	33		+33
635-360	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	5		+5
635-370	(M/A):	0	0		0
	(D/A):	0	0		0
	(M/R):	0	0		0
	(D/R):	0	6		+6
				Grand Total of Changes in Requirements:	(M/A): 0
					(D/A): +6
					(M/R): +18
					(D/R): +308

Key:

Please use the following coding if change is mandatory or discretionary and whether it affects externally regulated parties or only the agency itself:

(M/A): Mandatory requirements mandated by federal and/or state statute affecting the agency itself

(D/A): Discretionary requirements affecting agency itself

(M/R): Mandatory requirements mandated by federal and/or state statute affecting external parties, including other agencies

(D/R): Discretionary requirements affecting external parties, including other agencies

Other Decreases or Increases in Regulatory Stringency (if applicable)

VAC Section(s) Involved	Description of Regulatory Change	Overview of How It Reduces or Increases Regulatory Burden
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.	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

		<p>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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