

Office of Regulatory Management  
Economic Review Form

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| <b>Agency name</b>   | Department of Environmental Quality     |
| <b>Virginia Administrative Code (VAC) Chapter citation(s)</b>      | 9 VAC 25-600                            |
| <b>VAC Chapter title(s)</b>  | Designated Groundwater Management Areas |
| <b>Action title</b>  | Periodic Review                         |
| <b>Date this document prepared</b>                                 | 2/14/2023                               |
| <b>Regulatory Stage (including Issuance of Guidance Documents)</b> | Periodic Review                         |

**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)**

Omitted pursuant to ORM Regulatory Economic Analysis Manual

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

Omitted pursuant to ORM Regulatory Economic Analysis Manual

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

Omitted pursuant to ORM Regulatory Economic Analysis Manual

**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**

- Agency Note:** There are no regulatory changes associated with this periodic review. The Designated Groundwater Management Areas (GWMA)s regulation declares two groundwater management areas. The Eastern Virginia Groundwater Management Area encompasses the counties of Charles City, Essex, Gloucester, Isle of Wight, James City, King George, King and Queen, King William, Lancaster, Mathews, Middlesex, New Kent, Northumberland, Prince George, Richmond, Southampton, Surry, Sussex, Westmoreland, and York; the areas of Caroline, Chesterfield, Fairfax, Hanover, Henrico, Prince William, Spotsylvania, and Stafford counties east of Interstate 95; and the cities of Chesapeake, Franklin, Hampton, Hopewell, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg. The Eastern Shore Groundwater Management Area encompasses the counties of Accomack and Northampton. Withdrawals of groundwater within the designated areas that are greater than 300,000 gallons per month are required to obtain a permit to withdraw groundwater and the permitting requirements reside in a companion regulation, the Groundwater Withdrawal Regulations (9VAC25-610).

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| <p>(1) Direct &amp; Indirect Costs &amp; Benefits (Monetized)</p> | <p>Direct Costs: There are no direct costs associated with the regulatory description of the groundwater management areas.</p> <p>Indirect Costs: Groundwater withdrawals that occur in designated GWMA)s are potentially subject to a companion regulation – Groundwater Withdrawal Regulations (9VAC25-610). Groundwater withdrawals by local partners that occur within designated groundwater management areas may be required to obtain a permit for the withdrawal and be subject to other requirements. Groundwater withdrawals of greater than 300,000 gallons per month in a GWMA are required to be permitted under 9VAC25-610. Out of approximately 370 active Groundwater Withdrawal permits issued for withdrawals occurring within the two GWMA)s, 165 of the permits were issued to municipal permittees.</p> <ul style="list-style-type: none"> <li> <p>One potential indirect cost associated with the Groundwater Withdrawal Regulations includes an application requirement (9VAC25-610-94 2 a) for the permit fee as required by the Fees for Permits and Certificates Regulations (9VAC25-20). The permit fee for a groundwater withdrawal is \$9000. The fee is paid at the time of application and is a one-time cost during the 15-year permit term.</p> </li> </ul> |
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- Another potential indirect cost associated with the Groundwater Withdrawal Regulations is the public notice of every draft permit and draft special exception which is paid for by the applicant as required by 9VAC25-610-250 A. The average cost of a public notice published in a newspaper with general circulation in the area affected by the withdrawal is \$450. This is a one-time cost during the 15-year permit term charged upon application for a new permit, expansion of an existing withdrawal, or reapplication for a current permitted withdrawal.
- 9VAC25-610-94 3 outlines additional application requirements that may be required upon application for a new withdrawal, expanded withdrawal, or reapplication. These costs could potentially be incurred once over the 15-year permit term during the application/reapplication process and could be necessary to characterize the aquifer system at the proposed withdrawal site. They are not frequently required for complete applications, but are possibilities based on site specific conditions. Each potential indirect cost listed below can vary greatly depending on site conditions and type of equipment used and are meant to be rough estimates.
  - Installation of monitoring wells – The cost of drilling and well construction by a licensed well drilling contractor is typically based on a charge per foot of depth, roughly \$75 to \$150 for depths up to 500 feet, or as much as \$250 for depths greater than 500 feet. Lower per-foot charges are often coupled with a base fee for mobilization and other tasks, roughly \$7,000 to \$15,000. Costs also depend on the geographic region within Virginia. For completion of a typical confined-aquifer well, roughly 100 to 500 feet deep, the total indirect cost could range from \$13,000 to \$75,000.
  - Geophysical logs – Geophysical logs are usually collected from an existing well or borehole, often by the same contractor that performed the drilling. The typical cost of a geophysical log is \$1,500 to \$2,500.
  - Collection and analysis of drill cuttings – The cost of collecting drill cuttings is normally included in the cost of drilling a monitoring well or a geophysical logging borehole. Additional sieve analysis is sometimes required to support selection and placement of the monitoring well screen. The sieve analysis adds a typical cost of \$750 to \$2,000.

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|  | <ul style="list-style-type: none"> <li>○ Continuous cores – The cost of continuous coring depends on the coring method, the total hole depth, and the corresponding number of workdays. For a typical hole, roughly 100 to 500 feet deep, the total cost could range from \$15,000 to \$57,000.</li> <li>○ Water quality samples – For collection and analysis of water quality samples from a single well, the typical cost is approximately \$3,000 to \$6,000.</li> <li>○ Pump tests – For a single-well test, the total cost could range from \$3,000 to \$12,000 depending on the test duration and the available options for water disposal.</li> <li>○ Aquifer tests – For an aquifer test with one pumping well and one observation well, the total cost could range from \$3,000 to \$25,000 depending on the test duration and the available options for water disposal.</li> </ul> <p>Direct Benefits: The direct benefits associated with a locality being included in a designated groundwater management area include managing groundwater resources to protect the public welfare, safety, and health. Management of this water supply provides certainty that the groundwater supply will continue to be available at expected volumes and at a quality able to be used with minimal cost. This certainty provides a necessary foundation for sustained future economic growth and development and this benefit is not able to be monetized.</p> <p>Indirect Benefits: The monitoring and permitting of groundwater withdrawals in a GWMA protects the aquifer from being overdrawn and allows for the safe withdrawal of groundwater that is able to sustain future economic growth and development. This benefit is not able to be monetized.</p> |
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| (2) Present Monetized Values | Direct & Indirect Costs   | Direct & Indirect Benefits  |
|                              | (a) Direct – none<br>Indirect - \$9,450 (certain)<br>Indirect – cost amounts are uncertain because they are site specific and in some cases will not occur; potential ranges of costs are provided in Box 1 of the table above) | (b) Direct – benefits unable to be monetized<br>Indirect –benefits unable to be monetized |

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| (3) Other Costs & Benefits (Non-Monetized) | Direct Benefits: The direct benefits associated with a locality being included in a designated groundwater management area include managing groundwater resources to protect the public welfare, safety, |
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|                         | <p>and health. Management of this water supply provides certainty that the groundwater supply will continue to be available at expected volumes and at a quality able to be used with minimal cost. This certainty provides a necessary foundation for sustained future economic growth and development.</p> <p>Indirect Benefits: Groundwater withdrawals of greater than 300,000 gallons per month in a GWMA are required to be permitted under 9VAC25-610. Groundwater aquifers are a valuable resource that need to be protected from being overdrawn. If withdrawals of groundwater are not regulated and monitored, aquifers may be overdrawn, causing other users including local partners to not be able to withdraw groundwater or reducing the aquifer’s ability to store water. Monitoring and permitting groundwater withdrawals in a GWMA protects the aquifer from being overdrawn and allows for the safe withdrawal of groundwater that is able to sustain future economic growth and development.</p> |
| (4) Assistance          | <p>Groundwater withdrawals over 300,000 gallons per month in a GWMA are subject to the Groundwater Withdrawal Regulations (9VAC25-610). 9VAC25-610-85 requires a pre-application meeting for the applicant and owner/operator applying for a new or expanded groundwater withdrawal. The purpose of the meeting is to have a mutual exchange of information on the proposed application and regulatory requirements. DEQ staff provide assistance to applicants during this meeting so that they are aware of regulatory requirements and information required to submit a complete application.</p>   |
| (5) Information Sources | <p>Permit Fee – 9VAC25-20<br/> Public Notice Fee – Average of fees charged by newspapers with circulation in both GWMA<br/> Well drilling/analysis costs – Drilling contractors, consultants, and agency staff</p>   |

**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**

- Agency Note:** There are no regulatory changes associated with this period review. The current regulatory requirement declaring designated groundwater management areas does not have a direct impact on families. This regulation does indirectly benefit families since groundwater withdrawals above 300,000 gallons per month within the management areas are regulated to protect groundwater supplies for all users.

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| (1) Direct & Indirect Costs & Benefits (Monetized) | Direct Costs: None<br>Indirect Costs: None<br>Direct Benefits: None<br>Indirect Benefits: There is an indirect benefit to families since the Groundwater Withdrawal Regulations protect groundwater supplies for all users. Indirect benefits are unable to be monetized.   |                            |
| (2) Present Monetized Values                       | Direct & Indirect Costs   | Direct & Indirect Benefits |
|  | (a) N/A   | (b) N/A                    |
| (3) Other Costs & Benefits (Non-Monetized)         | Indirect Benefits: Individual single-family groundwater withdrawals are not regulated within the groundwater management area since they generally do not withdraw more than 300,000 gallons per month. However, since withdrawals of more than 300,000 gallons per month in a GWMA are regulated under 9VAC25-610, there is an indirect benefit to families since the Groundwater Withdrawal Regulations protect groundwater supplies for all users. Regulating withdrawals that are greater than 300,000 gallons per month protects both the quality and quantity of the groundwater resource, as well as the future availability of the groundwater resource for future withdrawals from individual family wells and groundwater withdrawals by municipalities that distribute water to families. |                            |
| (4) Information Sources                            | 9VAC25-610  |                            |

**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**

- Agency Note:** There are no regulatory changes associated with this periodic review. This regulation does not directly impact small businesses. Small businesses operating within designated groundwater management areas that withdraw more than 300,000 gallons per month of groundwater may be indirectly impacted because they are subject to permitting requirements under the Groundwater Withdrawal Regulations (9VAC25-610). Out of approximately 370 active Groundwater Withdrawal Permits, there are 72 agricultural, 68 commercial, 24 industrial, 33 irrigation, 3 manufacturing, 1 nuclear power, and 4 fossil

fuel permittees. The majority of these permittees likely are not small businesses as defined in § 2.2-4007.1 of the Code of Virginia.

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| <p>(1) Direct &amp; Indirect Costs &amp; Benefits (Monetized)</p> | <p>Direct Costs: There are no direct costs associated with the regulatory description of the groundwater management areas.</p> <p>Indirect Costs: Groundwater withdrawals that occur in designated GWMA's are subject to a companion regulation – Groundwater Withdrawal Regulations (9VAC25-610). Groundwater withdrawals of greater than 300,000 gallons per month by small businesses that occur within designated groundwater management areas may be required to obtain a permit for the withdrawal and be subject to other requirements.</p> <ul style="list-style-type: none"> <li>• One potential indirect cost associated with the Groundwater Withdrawal Regulations includes an application requirement (9VAC25-610-94 2 a) for the permit fee as required by the Fees for Permits and Certificates Regulations (9VAC25-20). The permit fee for a groundwater withdrawal is \$9000. The fee is paid at the time of application and is a one-time cost during the 15-year permit term.</li> <li>• Another potential indirect cost associated with the Groundwater Withdrawal Regulations is the public notice of every draft permit and draft special exception which is paid for by the applicant as required by 9VAC25-610-250 A. The average cost of a public notice published in a newspaper with general circulation in the area affected by the withdrawal is \$450. This is a one-time cost during the 15-year permit term charged upon application for a new permit, expansion of an existing withdrawal, or reapplication for a current permitted withdrawal.</li> <li>• 9VAC25-610-94 3 outlines additional application requirements that may be required upon application for a new withdrawal, expanded withdrawal, or reapplication. These costs could potentially be incurred once over the 15-year permit term during the application/reapplication process and could be necessary to characterize the aquifer system at the proposed withdrawal site. They are not frequently required for complete applications, but are possibilities based on site specific conditions.             <ul style="list-style-type: none"> <li>○ Installation of monitoring wells – The cost of drilling and well construction by a licensed well drilling contractor is typically based on a charge per foot of depth, roughly \$75 to \$150 for depths up to 500 feet, or as much as \$250 for depths greater than 500 feet. Lower per-foot charges are often coupled with a base fee for mobilization and other</li> </ul> </li> </ul> |
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tasks, roughly \$7,000 to \$15,000. Costs also depend on the geographic region within Virginia. For completion of a typical confined-aquifer well, roughly 100 to 500 feet deep, the total indirect cost could range from \$13,000 to \$75,000.

- Geophysical logs – Geophysical logs are usually collected from an existing well or borehole, often by the same contractor that performed the drilling. The typical cost of a geophysical log is \$1,500 to \$2,500.
- Collection and analysis of drill cuttings – The cost of collecting drill cuttings is normally included in the cost of drilling a monitoring well or a geophysical logging borehole. Additional sieve analysis is sometimes required to support selection and placement of the monitoring well screen. The sieve analysis adds a typical cost of \$750 to \$2,000.
- Continuous cores – The cost of continuous coring depends on the coring method, the total hole depth, and the corresponding number of workdays. For a typical hole, roughly 100 to 500 feet deep, the total cost could range from \$15,000 to \$57,000.
- Water quality samples – For collection and analysis of water quality samples from a single well, the typical cost is approximately \$3,000 to \$6,000.
- Pump tests – For a single-well test, the total cost could range from \$3,000 to \$12,000 depending on the test duration and the available options for water disposal.
- Aquifer tests – For an aquifer test with one pumping well and one observation well, the total cost could range from \$3,000 to \$25,000 depending on the test duration and the available options for water disposal.

**Direct Benefits:** The direct benefits associated with a small business being included in a designated groundwater management area include managing groundwater resources to protect the public welfare, safety, and health. Management of this water supply removes uncertainty that the groundwater supply will continue to be available at expected volumes and at a quality able to be used with minimal cost. This certainty provides a necessary foundation for sustained future economic growth and development.

**Indirect Benefits:** There is an indirect benefit to small businesses since the Groundwater Withdrawal Regulations protect groundwater supplies for all users. Indirect benefits are unable to be monetized.



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| (2) Present Monetized Values               | Direct & Indirect Costs   | Direct & Indirect Benefits   |
|  | (a) Direct – NA<br>Indirect - \$9,450 (certain)<br>Indirect – cost amounts are uncertain because they are site specific and in some cases will not occur; potential ranges of costs are provided in Box 1 of the table above)   | (b) Direct – benefits unable to be monetized<br>Indirect - benefits unable to be monetized |
| (3) Other Costs & Benefits (Non-Monetized) | Indirect Benefits: The Groundwater Withdrawal Regulations protect groundwater supplies for all users, including those that may be considered small businesses as defined in § 2.2-4007.1 of the Code of Virginia. Regulating withdrawals that are greater than 300,000 gallons per month protects both the quality and quantity of the groundwater resource, as well as the future availability of the groundwater resource for future withdrawals.   |  |
| (4) Alternatives                           | Groundwater withdrawals over 300,000 gallons per month in a GWMA are subject to the Groundwater Withdrawal Regulations (9VAC25-610). 9VAC25-610-85 requires a pre-application meeting for the applicant and owner/operator applying for a new or expanded groundwater withdrawal. The purpose of the meeting is to have a mutual exchange of information on the proposed application and regulatory requirements. DEQ staff provide assistance to applicants during this meeting so that they are aware of regulatory requirements and information required to submit a complete application. |  |
| (5) Information Sources                    | Permit Fee – 9VAC25-20<br>Public Notice Fee – Average of fees charged by newspapers with circulation in both GWMA<br>Well drilling/analysis costs – Drilling contractors, consultants, and agency staff   |  |

### **Changes to Number of Regulatory Requirements**

*For each individual VAC Chapter amended, repealed, or promulgated by this regulatory action, list (a) the initial requirement count, (b) the count of requirements that this regulatory package is adding, (c) the count of requirements that this regulatory package is reducing, (d) the net change in the number of requirements. This count should be based upon the text as written when this stage was presented for executive branch review. Five rows have been provided, add or delete rows as needed. In the last row, indicate the total number for each column.*

**Table 5: Total Number of Requirements**

- **Agency Note:** All requirements in the regulation are on the agency and not the regulated community. This is a periodic review, and no changes to the regulation are being proposed.

|                       | <b>Number of Requirements</b> |                  |                     |                   |
|-----------------------|-------------------------------|------------------|---------------------|-------------------|
| <b>Chapter number</b> | <b>Initial Count</b>          | <b>Additions</b> | <b>Subtractions</b> | <b>Net Change</b> |
| 9VAC25-600            | 3                             | 0                | 0                   | 0                 |
| <b>TOTAL</b>          | 3                             | 0                | 0                   | 0                 |