



Economic Impact Analysis Virginia Department of Planning and Budget

9 VAC 25-600 – Eastern Virginia Groundwater Management Area
State Water Control Board
August 3, 2010

Summary of the Proposed Amendments to Regulation

The State Water Control Board proposes to expand the Eastern Virginia Groundwater Management Area to include the counties of Essex, Gloucester, King George, King and Queen, Lancaster, Mathews, Middlesex, Northumberland, Richmond, and Westmoreland, and the areas of Arlington, Caroline, Fairfax, Prince William, Spotsylvania, and Stafford counties east of Interstate 95.

Result of Analysis

There is insufficient data to accurately compare the magnitude of the benefits versus the costs. Detailed analysis of the benefits and costs can be found in the next section.

Estimated Economic Impact

The State Water Control Board proposes to expand the Eastern Virginia Groundwater Management Area to include the counties of Essex, Gloucester, King George, King and Queen, Lancaster, Mathews, Middlesex, Northumberland, Richmond, and Westmoreland, and the areas of Arlington, Caroline, Fairfax, Prince William, Spotsylvania, and Stafford counties east of Interstate 95. The proposed expansion is quite large which is about the size of the current management area.¹

Groundwater is a valuable economic resource due to its many beneficial uses. These include, but not limited to provision of drinking water; provision of water for crop irrigation, for livestock, for industrial and commercial processes, for aquaculture, for fire protection, for

¹ Current Eastern Virginia Groundwater Management Area includes the counties of Charles City, Isle of Wight, James City, King William, New Kent, Prince George, Southampton, Surry, Sussex, and York; the areas of

drought relief; provision of non-use services (e.g. wetlands supported by groundwater, bequest motivations); and provision of supplemental discharge to surface water supplies.

According to Department of Environmental Quality (DEQ) groundwater levels in the proposed expansion areas are continuing to decline two to four feet per year. Since the entire coastal plain aquifer system is interconnected, the system must be managed as a whole to maintain a sustainable future groundwater supply.

With the proposed changes, entities withdrawing 300,000 gallons or more of groundwater per month will be required to obtain a permit. The permits will be for a period of ten years. The levels of initial permitted withdrawals will be based on the historical withdrawal levels to make sure the current users are not forced to reduce their usage for a period of ten years. After the initial ten-year period, the current users may be required to reduce their usage or no permit may be issued depending on the review of the application.

The proposed regulations will introduce compliance costs on the regulated users of groundwater. There will be an application fee of \$1,200 for initial permits based on historic groundwater withdrawals for a ten-year permit term. No fees are required for agricultural withdrawals. Since there are 111 known entities are expected to be affected, approximately \$133,200 in total application fees will be paid by the regulated entities during the initial ten-year period. After the initial ten-year period, application fee for a subsequent permit is \$6,000.

In some cases an aquifer test may be required. This test is needed when an applicant disagrees with the area of impact determined by DEQ or the model used for evaluating drawdown impacts is known to have problems predicting drawdowns in a specific area. The cost of an aquifer test typically ranges from \$10,000 to \$25,000.

The new users are required to provide a geophysical log which is estimated to cost approximately \$1,200, but may vary depending on the depth of the well. If a camera survey is required, costs may range from \$1,000 to \$2,000 depending on whether the pump must be removed and the depth of the well.

When there is enough uncertainty whether a proposed withdrawal can meet the drawdown criteria, monitoring wells may be required. The cost of monitoring wells can range from \$50,000 to \$100,000 depending on the depth and number of wells.

In cases, where no permits can be issued, the users will have to absorb the cost differences between the groundwater and the alternate water source chosen. Alternate water sources may include developing surface water reservoirs, withdrawals from existing lakes or rivers, desalination of salt water, reuse of water for non-potable uses, or water conservation measures. The size of the economic effects in these cases will primarily depend on the differential cost of the alternate water source and the quantity of water needed.

Also, according to DEQ, there are 27 known local government withdrawals. These local governments may pass some or all of the additional compliance costs onto their end users. The ability of an entity passing additional regulatory compliance costs on their customers is generally determined by the strength of the demand for the product which is groundwater in this case.

The proposed regulations will also introduce administrative costs on DEQ due to the additional permit workload anticipated. DEQ estimates that approximately six full-time staff will be needed to accommodate the additional workload. At a cost of \$40,000 per full-time position, the total staffing costs is expected to be about \$240,000 per year. However, since the current users will be able to continue to withdraw their historical usage levels, DEQ anticipates that the need for the additional staff may be phased in over time.

The main benefit of the proposed regulations is to achieve a sustainable future groundwater supply. As mentioned before, DEQ estimates that the groundwater levels in the proposed expansion areas are continuing to decline two to four feet per year. The recharge rate, on the other hand, is estimated to be 1/10th of an inch per year for some aquifers. Thus, it takes a very long time for groundwater to recharge to its pre-withdrawal levels. Furthermore, significant reductions in groundwater levels may lead to dewatering of aquifers, which causes irreversible damage to the aquifers.

Also, since the entire coastal plain aquifer system is interconnected, withdrawals from one well may affect others. According to DEQ, the mechanics of Virginia's coastal plain aquifer system is such that groundwater levels start declining along the fall line first (approximately Interstate 95 line) and propagate toward the Atlantic Ocean. For example, a major user's

withdrawal in the Tidewater region may reduce the level of groundwater first in Richmond area and then in Tidewater area. Thus, the protection of groundwater levels is anticipated to benefit the areas closer to the fall line more than the others since they are at more risk.

Furthermore, the proposed regulations are expected to mitigate negative externalities that could exist in an unregulated groundwater management area and lead to an improved allocation of groundwater among different users. When actions of an individual impose involuntary costs on somebody else, a negative externality is said to exist. In the example given, a groundwater user in Tidewater may force the user in Richmond to develop alternate water sources and impose involuntary costs.

A negative externality obscures the true price of a commodity and consequently leads to inefficient allocation of that resource. For example, the user in Tidewater would not pay the full cost of his or her usage and would tend to consume more groundwater than he or she would if he or she was paying the full price which would include the costs imposed on the user in Richmond. On the other hand, the user in Richmond would tend to consume less than the optimal level as he or she is paying more than what the resource would have cost if there were no externalities. As the proposed regulations will reduce negative externalities and bring the actual cost of groundwater closer to its true cost, an improvement in the efficient allocation of groundwater resources in the proposed groundwater management areas and possibly in some of the current management areas may be expected.

Businesses and Entities Affected

There are 111 known users of groundwater withdrawing 300,000 gallons or more in the proposed expansion area. Of these, 27 are local governments.

Localities Particularly Affected

The proposed expansion of the Eastern Virginia Groundwater Management Area includes the counties of Essex, Gloucester, King George, King and Queen, Lancaster, Mathews, Middlesex, Northumberland, Richmond, and Westmoreland, and the areas of Arlington, Caroline, Fairfax, Prince William, Spotsylvania, and Stafford counties east of Interstate 95.

Projected Impact on Employment

The demand for labor to review applications by DEQ and to prepare the applications for the users by the consultants is expected to increase. It is conceivable that a sustainable future supply of groundwater may lead to a sustainable economic activity and have a positive impact on demand for labor in the long term. However, the withdrawals of new users or of existing users after the initial ten-year period may be limited or prohibited in the expanded management area. If such reduction or prohibition of groundwater withdrawals causes some economic activities to slow down or cease, a reduction in demand for labor may result.

Effects on the Use and Value of Private Property

Similarly, the permit fees and compliance costs may reduce the use and value of private property in the proposed expansion areas. It is conceivable that a sustainable future supply of groundwater may preserve the use and value of private property in the long term. However, the withdrawals of new users or of existing users after the initial ten-year period may be limited or prohibited in the expanded management area. If such reduction or prohibition of groundwater withdrawals occurs, a negative impact on the use and value of private property may be expected.

Small Businesses: Costs and Other Effects

Of the 111 known entities using more than 300,000 gallons of groundwater, 8 are estimated to be small businesses. The costs and other effects on the small businesses are the same as the ones discussed above which include permit fees and costs and added cost of alternate source of water if no permit is issued for groundwater.

Small Businesses: Alternative Method that Minimizes Adverse Impact

There is no known alternative that accomplishes the same goals.

Real Estate Development Costs

If a real estate development project relies on groundwater as a resource, permit fees, other permit costs, and the added cost of alternate source of water may contribute to the development costs of the real estate project. Otherwise, no significant effect on real estate development costs is expected.

Legal Mandate

The Department of Planning and Budget (DPB) has analyzed the economic impact of this proposed regulation in accordance with Section 2.2-4007.H of the Administrative Process Act and Executive Order Number 107 (09). Section 2.2-4007.H requires that such economic impact analyses include, but need not be limited to, the projected number of businesses or other entities to whom the regulation would apply, the identity of any localities and types of businesses or other entities particularly affected, the projected number of persons and employment positions to be affected, the projected costs to affected businesses or entities to implement or comply with the regulation, and the impact on the use and value of private property. Further, if the proposed regulation has adverse effect on small businesses, Section 2.2-4007.H requires that such economic impact analyses include (i) an identification and estimate of the number of small businesses subject to the regulation; (ii) the projected reporting, recordkeeping, and other administrative costs required for small businesses to comply with the regulation, including the type of professional skills necessary for preparing required reports and other documents; (iii) a statement of the probable effect of the regulation on affected small businesses; and (iv) a description of any less intrusive or less costly alternative methods of achieving the purpose of the regulation. The analysis presented above represents DPB's best estimate of these economic impacts.