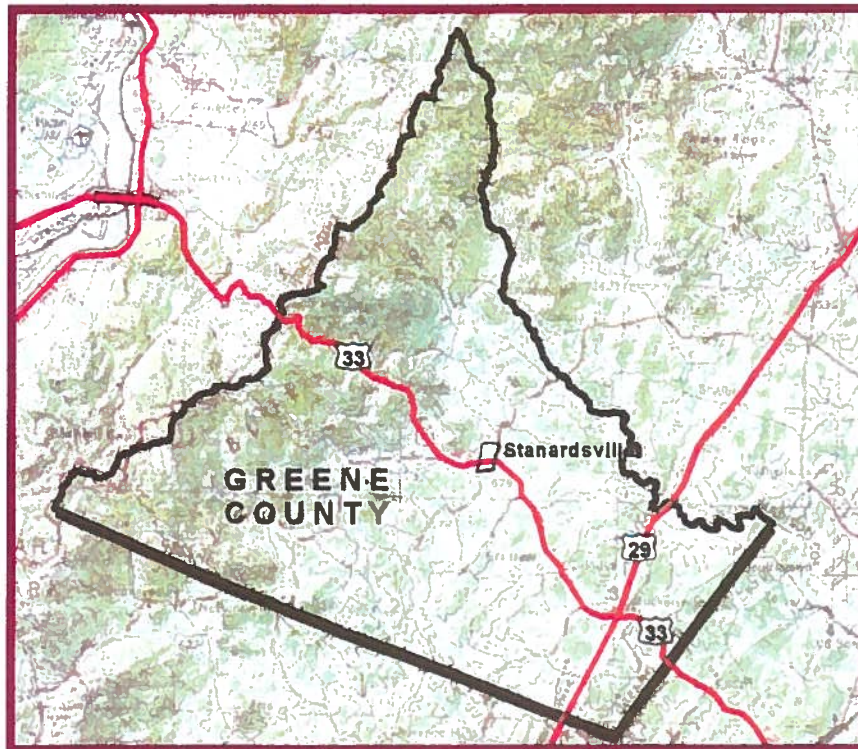


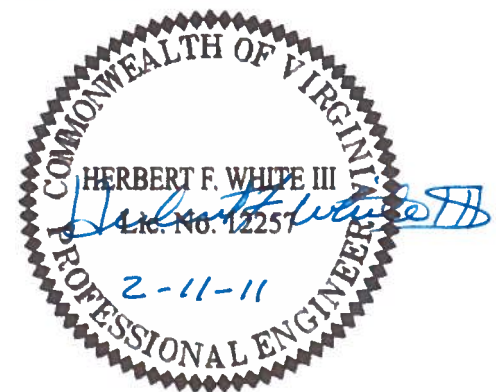


# REGIONAL WATER SUPPLY PLAN FOR GREENE COUNTY, VIRGINIA AND THE TOWN OF STANARDSVILLE



December 8, 2009  
Revised February 11, 2011

Prepared by:



3040 Avemore Square Place  
Charlottesville, VA 22911  
Phone: 434-984-2700

**W**  
**W** ENGINEERS  
SURVEYORS  
PLANNERS  
**ASSOCIATES**  
www.wvassociates.net

PO Box 4119  
Lynchburg VA 24502  
Phone: 434-316-6080

## Executive Summary

---



On November 2, 2005, the Commonwealth of Virginia adopted 9 VAC 25-780, Local and Regional Water Supply Planning. The regulation establishes a required planning process that local governments must use in the development of a local or regional water supply plan. The final regulations state that the supply plan will be reviewed by the Department of Environmental Quality (DEQ) and a determination will be made by the State Water Control Board on whether the plans comply with the regulation. Within five years of submission, the plans are reviewed to determine the adequacy of the document. The supply plan is required to be updated and resubmitted to DEQ every ten years. Greene County and the Town of Stanardsville have opted to prepare a regional water supply plan.

Local governments are required to adopt a local or regional supply plan that complies with regulations set forth in 9 VAC 25-780. The purpose of the supply plan is to ensure that adequate and safe drinking water is available, encourage and protect all beneficial uses of the existing water sources, encourage and promote alternative water sources, and promote conservation. The deadline for submission for a regional supply plan is November 2, 2011, however Greene County and the Town of Stanardsville plan to adopt their regional water supply plan in the spring of 2011. DEQ intends to take the local and regional plans into consideration and develop a State Water Plan.

The regional supply plan shall contain the items listed below and shall be derived from existing, readily available information.

- A description of existing water source in accordance with the requirements of 9 VAC 25-780-70.
- A description of existing water use in accordance with the requirements of 9 VAC 25-780-80.
- A description of existing water resource conditions in accordance with the requirements of 9 VAC 25-780-90.



- An assessment of projected water demand in accordance with the requirements of 9 VAC 25-780-100.
- A description of water management actions in accordance with the requirements of 9 VAC 25-780-120.
- A statement of need in accordance with the requirements of 9 VAC 25-780-130.
- A map or maps identifying important elements of the program that may include existing water uses, and proposed new sources.
- A copy of the adopted program documents including any local plans or ordinances or amendments that incorporate the local program elements required by this chapter.
- A resolution approving the plan from each local government that is party to the plan.
- A record of the local public hearing, a copy of all written comments and the submitter's response to all written comments received.

### **Section 2, Existing Water Sources and Section 3, Existing Water Use**

The Rapidan Service Authority (RSA) municipal community water system provides water to both Greene County and the Town of Stanardsville. RSA utilizes a 1.15 million gallon per day (MGD) water treatment plant to serve customers along the U.S. Route 29 corridor south of Ruckersville and the U.S. Route 33 corridor between Ruckersville and Stanardsville. The water treatment plant capacity is limited by the safe yield of the Rapidan River at this point. In 2008, RSA produced 223 million gallons of water for both residential and non-residential accounts, for an average daily demand of 0.61 MGD.

The two major private community groundwater systems in Greene County are the Blue Ridge School and the Mountain Lakes Water Company serving the Greene Mountain Lake and Twin Lakes communities. The Blue Ridge School, located in St. George, uses six groundwater wells to provide approximately 8.0 million gallons of water annually.



The Mountain Lakes Water Company utilizes nineteen groundwater wells to produce an estimated total of 40 million gallons annually.

In 2008, RSA provided water to approximately 6,000 residents. This is approximately a third of the total population of Greene County, estimated at 17,964 in 2008 by the U.S. Census Bureau. The remaining residents of the County use either private community groundwater well systems or individual wells.

### **Section 4, Existing Resource Conditions**

In accordance with 9 VAC 25-780-90 of the Local and Regional Water Supply Planning Regulations, the water supply plan includes a description of environmental conditions that may affect current or future water supply sources. The following environmental conditions are analyzed in the supply plan:

- Existing geologic conditions within the planning area.
- Existing hydrologic conditions within the planning area.
- Meteorological conditions within the planning area.
- State or federal listed threatened or endangered species or habitats of concern.
- Anadromous, trout and other significant fisheries.
- River segments that have recreational significance including state scenic river status.
- The presence of impaired streams and the type of impairment.
- The location of point source discharges.
- Sites of historic and archaeological significance.
- Wetlands
- Riparian buffers and conservation easements.



**Section 5, Water Demand Projections**

Three methods are presented in this report to project the future municipal community water system demands of Greene County and the Town of Stanardsville. These methods are the Historical Production Projection Method, the Sectoral Method, and the VEC Growth Rate Method. A summary of the results of the three projection methods is included in Tables E-1 and E-2. All three of the projection methods are discussed in detail in Section 5.

<b>Table E-1</b>			
<b>Municipal Community Water System Demand Projections</b>			
<b>Average Daily Demand (MGD) Comparison</b>			
<b>Year</b>	<b>Historical Production Method</b>	<b>Sectoral Method</b>	<b>VEC Growth Rate Method</b>
2010	0.7	0.8	0.8
2020	1.1	1.2	1.3
2030	1.6	1.8	1.8
2040	2.4	2.7	2.4
2050	3.7	3.7	3.1

<b>Table E-2</b>			
<b>Municipal Community Water System Demand Projections</b>			
<b>Peak Day Demand (MGD) Comparison</b>			
<b>Year</b>	<b>Historical Production Method</b>	<b>Sectoral Method</b>	<b>VEC Growth Rate Method</b>
2010	1.2	1.3	1.3
2020	1.8	2.1	2.2
2030	2.7	3.1	3.1
2040	4.1	4.6	4.1
2050	6.2	6.3	5.3



Various growth rates were also applied to the water usage for the private community water systems, self-supplied users greater than 300,000 gallons per month, and self-supplied users less than 300,000 gallons per month. A summary of the projections for all systems and users is included in Table E-3 below; the municipal community water system projections reflect an average of results of the three projection methods given in Table E-2.

<b>Table E-3</b>						
<b>Summary of All Systems</b>						
<b>Estimated Average Daily Use Projections (MGD)</b>						
	<b>Year</b>					
	<b>2008</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>
Municipal Community Water System	0.65	0.77	1.2	1.73	2.5	3.5
Private Community Water Systems	0.124	0.126	0.138	0.151	0.164	0.177
Self-Supplied Users > 300,000 Gal./Mo.	0.045	0.045	0.045	0.045	0.045	0.045
Self-Supplied Users < 300,000 Gal./Mo.	1.01	1.02	1.07	1.13	1.19	1.25
<b>Total Projected Demand (MGD)</b>	<b>1.8</b>	<b>2.0</b>	<b>2.5</b>	<b>3.1</b>	<b>3.9</b>	<b>5.0</b>

**Section 6, Water Management Actions**

As required by 9 VAC 25-789-110, the supply plan details a water demand management plan and a drought management and response plan. A water demand management plan consists of long-term water supply and conservation strategies that focus on maintaining a balance between supply and demand. A drought management and response plan consists of short-term, emergency water conservation strategies that are put into effect when the available quantities of source water are greatly reduced by environmental factors.

The water demand management plan introduces long-term water conservation strategies that have been put into effect or are being considered by Greene County and the Town of

Stanardsville. The following conservation measures are recommended for future consideration in Greene County and the Town of Stanardsville:

- Amend landscape standards in their zoning ordinance to allow only low-water use landscaping, including requirements for irrigation systems to be designed and installed by professionals certified through the Irrigation Association (IA).
- Encourage the use of gray water irrigation systems.
- Increased rates for higher water users.
- Encourage RSA to partner with the Environmental Protection Agency (EPA) in its WaterSense® program.
- Encourage the use of low-flow water closet and showerhead retrofits.
- Support RSA in rate increases during peak months or high use periods. RSA already increases the rates by \$1.00 per 1,000 gallons in the summer months.
- Educational workshops in the public schools and advertised to the general population.
- Require or offer individual water audits for its high-use costumers.

The drought response and contingency plan allows the General Manager of the RSA to declare specific drought stages based upon drought indicators and current demand for water. When the Greene County Administrator is notified by RSA that a declaration is required, the County Administrator will promptly take the necessary steps to notify the public of the change in drought stage and any restrictions in effect during this stage. The primary indicators used to determine the drought stage are past and forecasted precipitation and stream flow. The four unique drought stages are detailed below:

- Normal Conditions – During normal conditions, Greene County, the Town of Stanardsville, and the RSA will continue all of the long-term conservation measures.



- Drought Watch Stage – A public notice will be issued to water users through the RSA’s use of fliers, in monthly billing statements, and through posters at the RSA office. The RSA will implement a notification program of high water users through monthly billings or fliers. Construction contractors that are using large amounts of water for flushing lines or irrigating newly sodded or seeded lawns will be contacted. Announcements and educational information will be posted on the Greene County website and in the Greene County Record.
- Drought Warning Stage – The drought management ordinance will be in effect at this stage. RSA, Greene County, and the Town of Stanardsville will advertise mandatory water conservation measures and restrictions. RSA may initiate meter checks and testing.
- Drought Emergency Stage – RSA, Greene County, and the Town of Stanardsville will advertise more stringent emergency mandatory water conservation measures and restrictions. The RSA will notify high water users by phone. Per RSA policy, users that do not comply with the mandatory conservation measures and restrictions can have their water services terminated.

If at any time in this sequence of drought stages the Governor issues an executive order declaring a statewide drought emergency (or a regional drought emergency including the Northern Piedmont Drought Evaluation Region), Greene County, the Town of Stanardsville, and the RSA will evaluate whether a change to the local drought stage status is warranted.

### **Section 7, Statement of Need**

The future adequacy of the Greene County and Town of Stanardsville water systems was evaluated by comparing the current capacity of the systems with the projected future demands. For the municipal community water system, an average of the Historical Production Projection Method, the Sectoral Method, and VEC Growth Rate Method were used in the adequacy analysis.





It is anticipated that the RSA municipal community water system in Greene County and the Town of Stanardsville will need a water supply source or sources that can provide an average daily demand of approximately 3.5 MGD and a peak day demand of approximately 5.9 MGD in the Year 2050. The current system is not adequate to meet the projected demands for 2050.

For the private community water systems, the current system at the Blue Ridge School is adequate to meet the projected average daily and peak day demands for 2050, but the current Mountain Lakes Water Company system is not adequate to meet the projected peak day demands for 2050. The Mountain Lakes Water Company system will need a water supply source or sources that can provide an average daily demand of approximately 0.15 MGD and a peak day demand of approximately 0.3 MGD in the Year 2050.

Because most self-supplied users do not have a permit that includes the design capacity of their water source(s), it difficult to ascertain whether or not the sources supporting these self-supplied users are adequate to meet projected demands for the Year 2050.

### **Section 8, Alternative Analysis**

As required by 9 VAC 25-789-130 of the regulations, the supply plan analyzes potential alternatives for increasing water supply. The alternatives for the municipal community water system serving Greene County and the Town of Stanardsville include water conservation, wastewater reclamation, continued groundwater exploration, development of a reservoir, and interconnections with adjacent localities.

Greene County and the Town of Stanardsville are moving forward with groundwater investigation and development efforts. Greene County and the Town of Stanardsville are also continuing to perform further analysis and evaluation of potential reservoir sites. This analysis and evaluation is required to determine which location will least impact wetlands, open waters, streams, threatened and endangered species, historic resources,

## Executive Summary

---



and archaeological sites. When the selected alternative is identified, Greene County will proceed with the submission of the Joint Permit Application (JPA) for the site and, if a pumped storage location is selected, for the development of a new intake on the Rapidan River. Prior to the in-depth environmental screening completed for the JPA, five (5) of the nine (9) reservoir alternatives have been eliminated from further reservoir alternative analysis, either because they were deemed impracticable due to other impacts or were considered not comparable with the other alternatives. This process and the alternatives are discussed in detail in Section 8.

Alternatives available to private community groundwater systems and to self-supplied users are also discussed in this plan.