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8.0 STATEMENT OF NEED

8.1 Methodology

Using the water demand projections in Section 5.0 and the known capacities of water resources in the MRPDC Region, timeframes can be projected when the existing capacities of the systems will become inadequate to provide for the demands. In accordance with the Regulations (9 VAC 25-780-130), a water supply plan shall determine the adequacy of existing water sources to meet current and projected demand based upon the information and analyses conducted by 9 VAC 25-780-70 through 9 VAC 25-780-110. Table 8.1.1 below summarizes the total existing capacity, along with the limiting capacity factor for each community in the MRPDC region.

Table 8.1.1 Summary of PWS Capacities for MRPDC Localities

Community	Total Existing PWS Capacity (MG yr^{-1})	Total Existing PWS Capacity (MGD)	Limiting Factor
Bland County	146	0.40	WTP Design Capacity (0.40 MGD)
Carroll County	434	1.19	WTP Design Capacity (1.19 MGD)
Grayson County	37	0.10	No Capacity – All water is purchased
Smyth County	303	0.83	VDH Permitted Capacity (0.83 MGD)
Washington County	2,385	6.53	VDH Permitted Capacity (6.53 MGD)
Wythe County	1,800	4.93	WTP Design Capacity (4.93 MGD)
City of Bristol	3,653	10.00	VDH Permitted Capacity (10.00 MGD)
City of Galax	1,461	4.00	VDH Permitted Capacity (4.00 MGD)
Town of Chilhowie	511	1.40	VDH Permitted Capacity (1.40 MGD)
Town of Fries	105	0.29	Eagle Bottom Creek Safe Yield (0.29 MGD)
Town of Hillsville	219	0.60	VDH Permitted Capacity (0.60 MGD)
Town of Independence	84	0.23	WTP Design Capacity (0.23 MGD)
Town of Marion	1,096	3.00	WTP Design Capacity (3.00 MGD)
Town of Rural Retreat	183	0.50	Phillipi Well Capacity (0.50 MGD)
Town of Saltville	210	0.58	VDH Permitted Capacity (0.58 MGD)
Town of Troutdale	12.42	0.034	VDH Permitted Capacity (0.034 MGD)
Town of Wytheville	1,461	4.00	VDH Permitted Capacity (4.00 MGD)

8.2 Statements of Need by Community

The water needs of each community are identified in the following sections along with graphical representation of the surplus/deficit expected for each utility from 2006 through 2060.

8.2.1 Bland County

Based upon the water demand projections, Bland County currently maintains a surplus (0.25 MGD) in available water resources. Bland County does not rely on bulk water purchases. Figure 8.2.1.1 shows that Bland County will not experience a water deficit in 2060 but will maintain a surplus of approximately 0.22 MGD. Public water supply in Bland County comes from a groundwater well in the Town of Bland, and a combination of the Rocky Gap and Bastian Water Works, Bruce and Walker Springs. The Town of Bland groundwater well has a limiting design capacity of 0.17 MGD and the Bruce and Walker Springs VDH permitted withdrawal amount is 0.23 MGD for a total limiting capacity of 0.40 MGD.

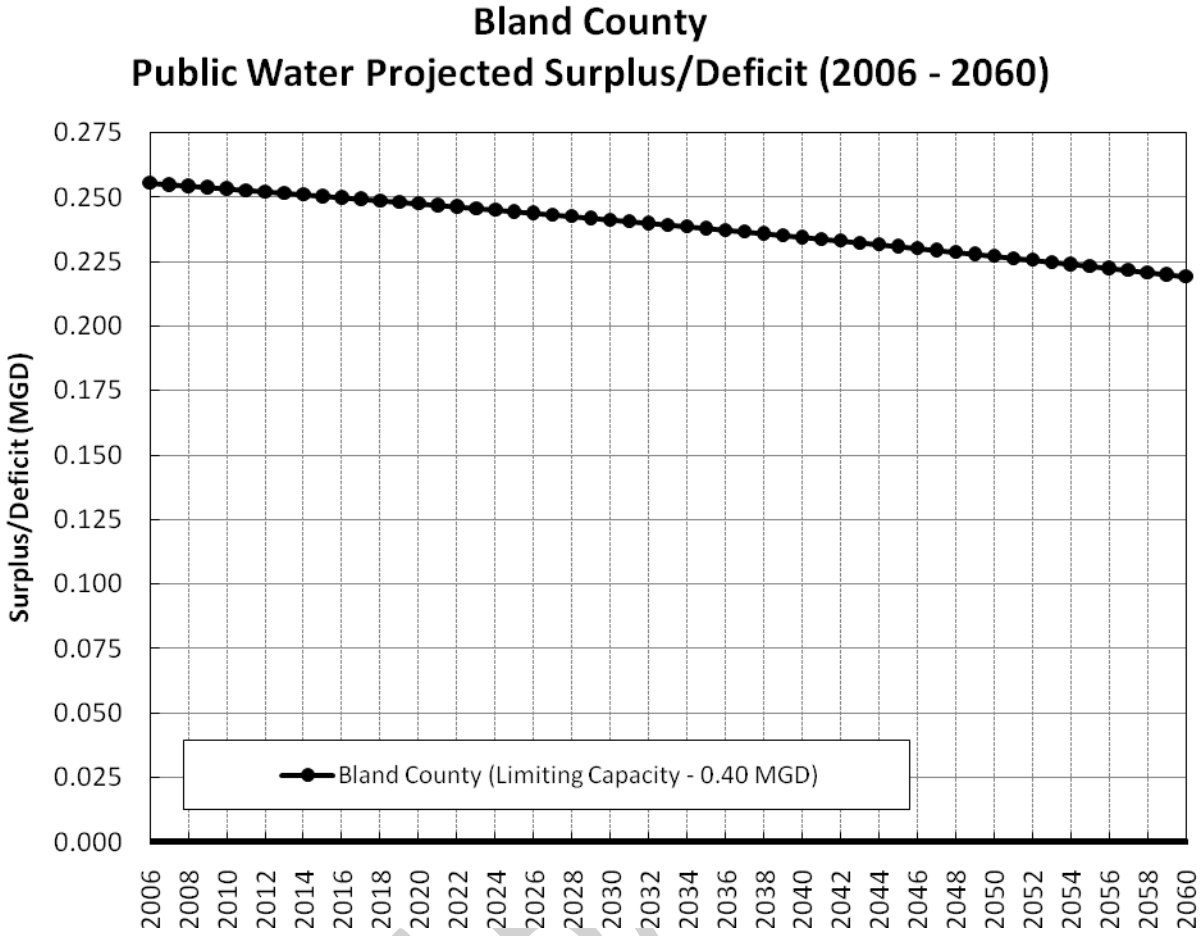

Figure 8.2.1.1 MRPDC Water Supply Plan Statement of Needs - Bland County

8.2.2 Carroll County

Based upon the water demand projections, Carroll County currently maintains a surplus (0.50 MGD) in available water resources. Carroll County relies on water supplied by the New River Water Authority WTP and bulk water purchases of 0.15 MGD from the Town of Hillsville. Figure 8.2.2.1 shows that Carroll County will not experience a water deficit in 2060 but will maintain a surplus of approximately 0.41 MGD. Public water supply in Carroll County comes from four groundwater systems (Cana Regional, Route 100, Gladeville/Cranberry, Woodlawn) for a total of 1.04 MGD capacity. Carroll County also purchases 0.15 MGD from the Town of Hillsville to service the Carroll County Industrial Park and Tower Road. Carroll County's limiting capacity is a VDH permitted withdrawal amount of 1.04 MGD from all Carroll County sources.

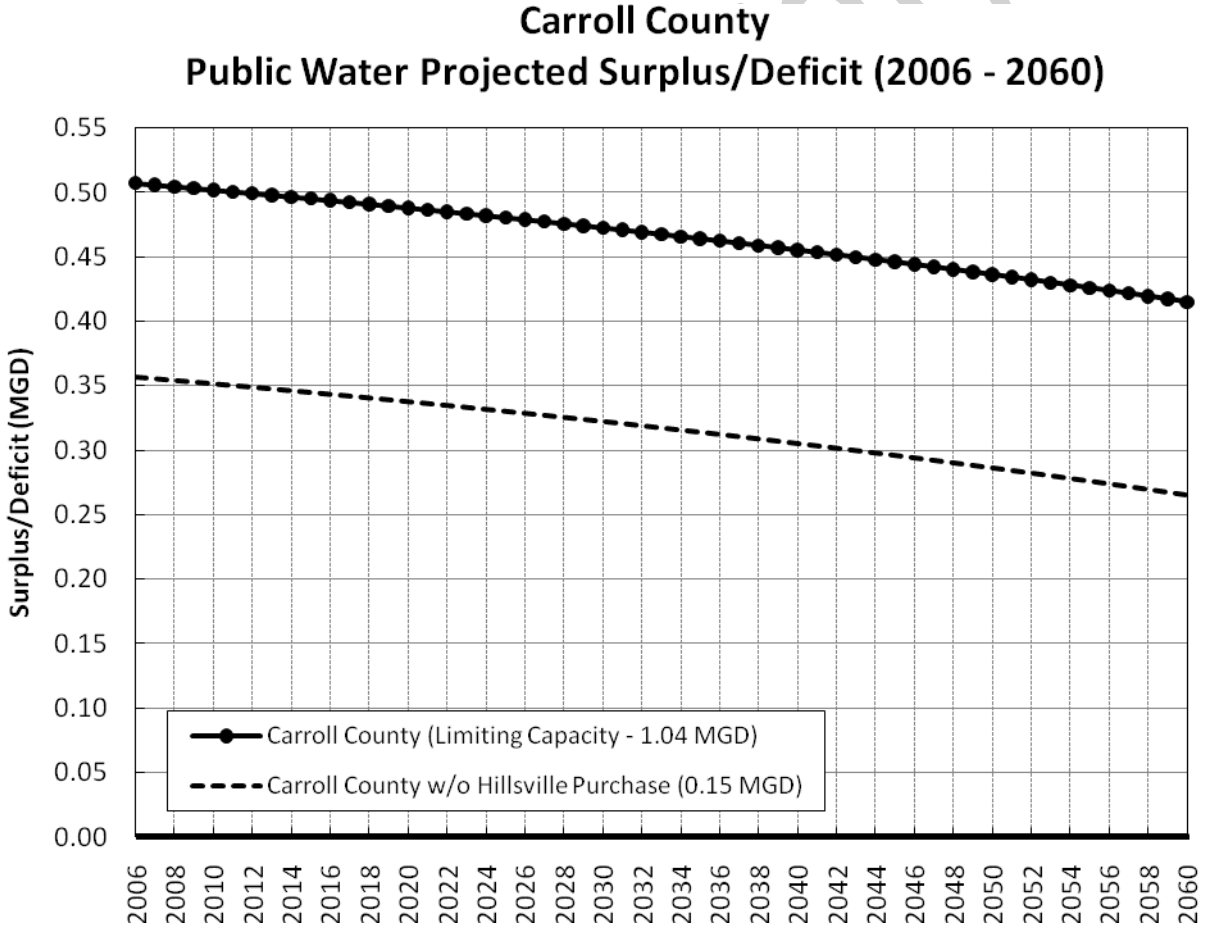

Figure 8.2.2.1 MRPDC Water Supply Plan Statement of Needs – Carroll County

8.2.3 Grayson County

Grayson County relies on bulk water purchases from the City of Galax, which are allotted at 0.10 MGD. Figure 8.2.3.1 shows that Grayson County is currently experiencing a water surplus and will continue to experience this same surplus in 2060 since they currently have full capacity provisions from the City of Galax. Public water supply in Grayson County comes from the City of Galax Fairview Water System and the Old Town System. Since the County doesn't maintain a source or have any capacity, the limiting factor is the amount of water allotted to the County through the interconnection with the Galax systems (0.10 MGD). Without the interconnection, Grayson County would currently experience a 0.075 MGD deficit.

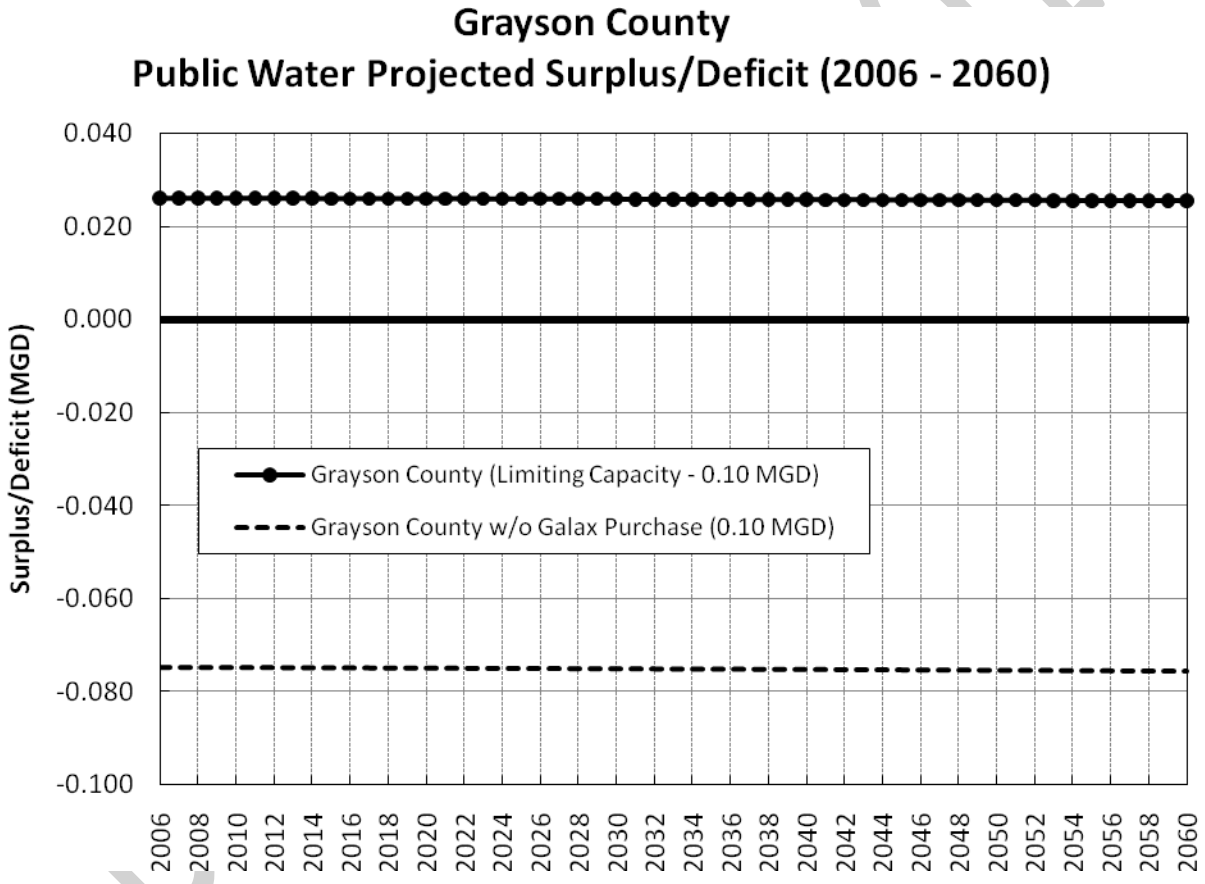

Figure 8.2.3.1 MRPDC Water Supply Plan Statement of Needs – Grayson County

8.2.4 Smyth County

Based upon water demand projections, Smyth County is currently experiencing a surplus (0.40 MGD) in available water resources. Smith County has an available capacity of 0.39 MGD and relies on bulk water purchases from the Town of Marion, the Town of Chilhowie and Thomas Bridge Water Works for an additional 0.44 MGD. Figure 8.2.4.1 shows that Smyth County will not experience a water deficit in 2060 and will likely maintain a surplus of 0.25 MGD. If only the Smyth County capacity of 0.39 MGD is used, then Smyth County would require alternate sources of water to maintain surplus conditions. Public water supply in Smyth County comes from two groundwater wells at Hutton Branch and Watson's Water Gap. The Smyth County groundwater wells have a total limiting VDH permitted withdrawal amount of 0.39 MGD.

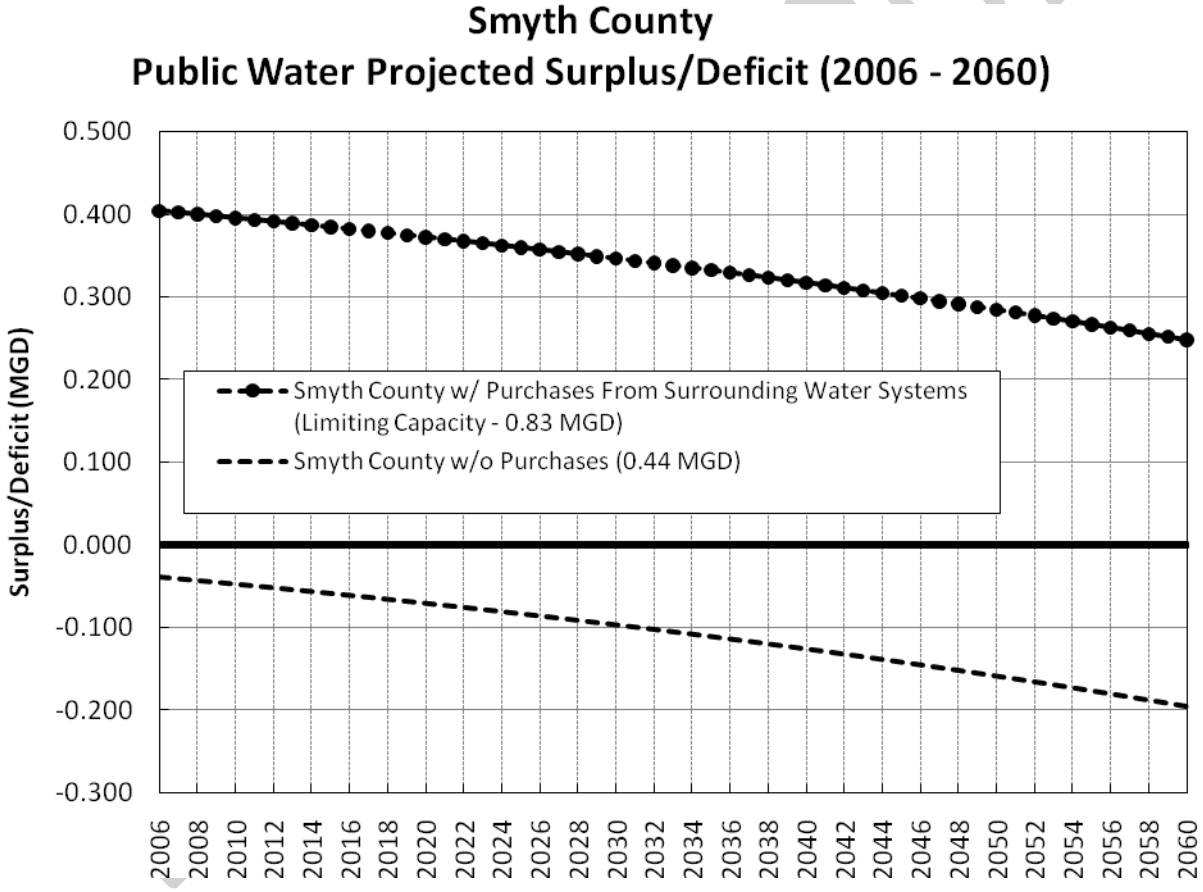

Figure 8.2.4.1 MRPDC Water Supply Plan Statement of Needs - Smyth County

8.2.5 Washington County

Based upon the water demand projections, Washington County is currently experiencing a deficit (0.59 MGD) in available water resources. Washington County relies on bulk water purchases from BVU. Figure 8.2.5.1 shows that Washington County will continue to experience a water deficit in 2060 of approximately 4.75 MGD if alternate sources are not explored and only Washington County sources are utilized. Public water supply in Washington County comes from a groundwater well in the lower Poore Valley (Mendota Well), the Middle Fork of the Holston River and a combination of the Reservation and Cole Springs for a design capacity total of 8.00 MGD. However, Washington County has a limiting VDH permitted withdrawal amount of 6.53 MGD. If all VDH permitted capacities were revised to match design capacities of 8.00 MGD, Washington County would realize a current surplus of approximately 0.70 MGD with deficit beginning in 2020.

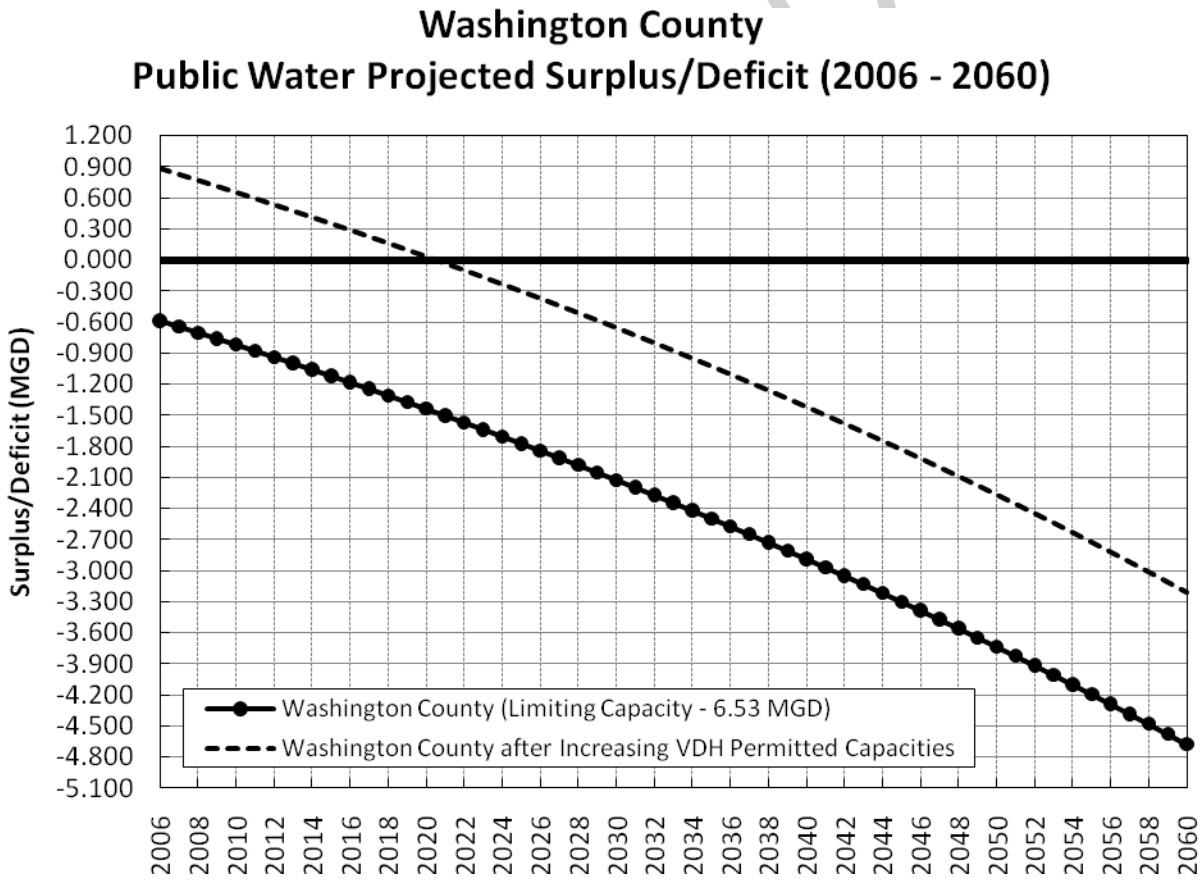

Figure 8.2.5.1 MRPDC Water Supply Plan Statement of Needs – Washington County

8.2.6 Wythe County

Wythe County currently experiences no deficit in available water resources due to a 4.00 MGD purchase from the New River Regional Water Authority WTP. Figure 8.2.6.1 shows that Wythe County will not experience a water deficit in 2060. Public water supply in Wythe County comes from two groundwater wells (Speedwell and Ivanhoe/Max Meadows), and the New River with 4.00 MGD from the New River Regional Water Authority WTP for a total of 4.56 MGD. The County WTP has a limiting design capacity which provides an additional 0.37 MGD for a County total supply of 4.93 MGD.

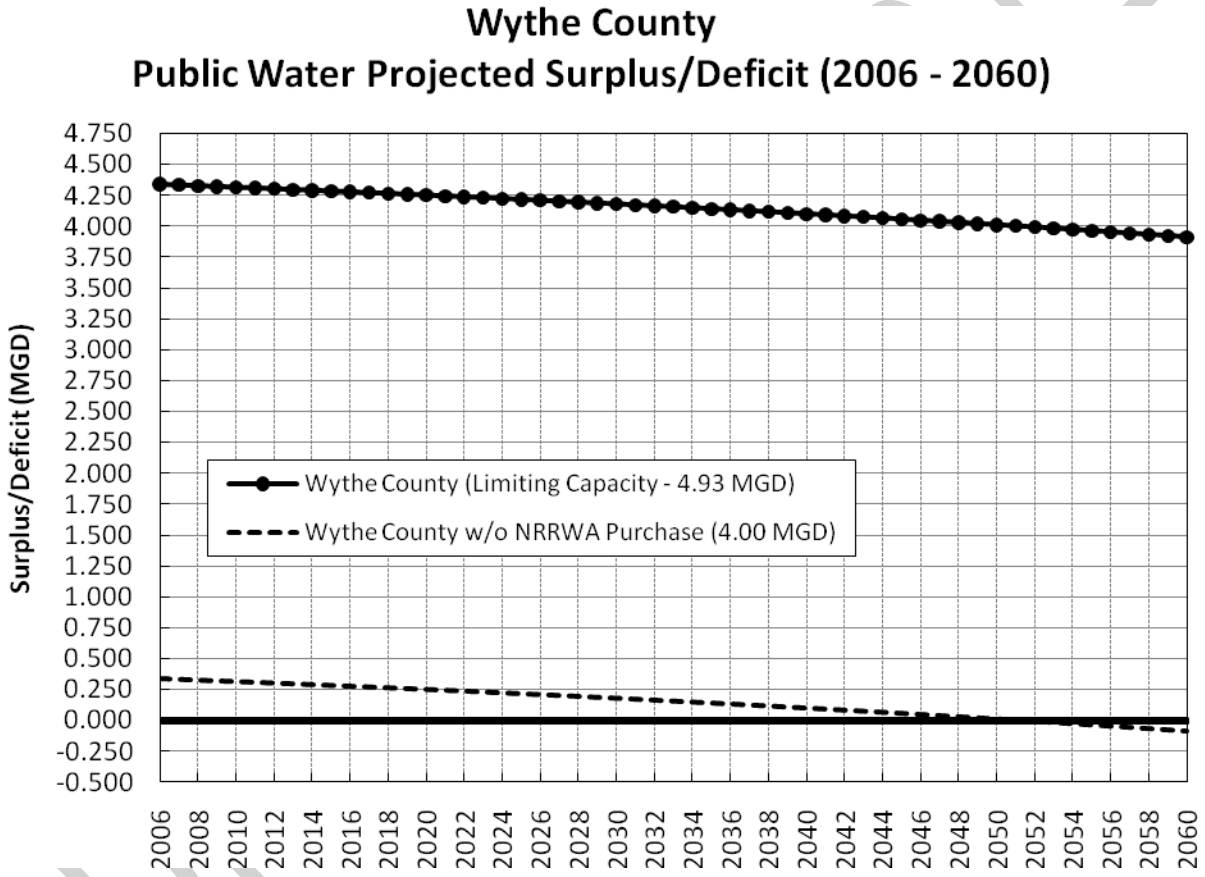

Figure 8.2.6.1 MRPDC Water Supply Plan Statement of Needs – Wythe County

8.2.7 City of Bristol

The City of Bristol currently maintains a surplus (6.25 MGD) in available water resources. The City does not rely on bulk water purchases. Figure 8.2.7.1 shows that the City of Bristol will not experience a water deficit in 2060 but will maintain a surplus of approximately 4.00 MGD. Public water supply in the City of Bristol comes from the South Holston Lake. The City of Bristol/BVU WTP has a VDH permitted capacity and a limiting design capacity of 10.00 MGD.

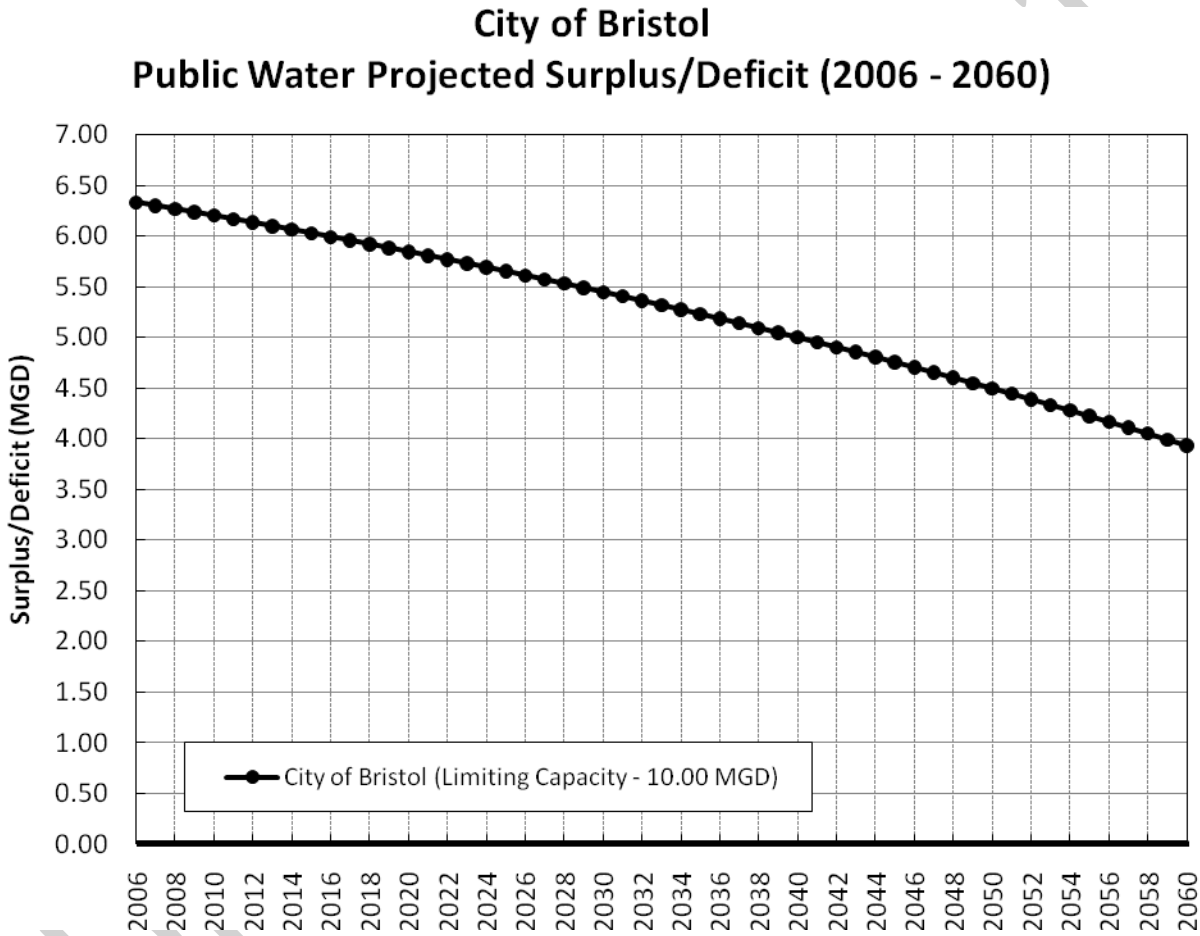

Figure 8.2.7.1 MRPDC Water Supply Plan Statement of Needs – City of Bristol

8.2.8 City of Galax

Based upon the water demand projections, the City of Galax currently maintains a surplus (2.00 MGD) in available water resources. The City of Galax does not rely on bulk water purchases. Figure 8.2.8.1 shows that the City of Galax will not experience a water deficit in 2060 but will maintain a surplus of approximately 1.30 MGD. Public water supply in the City of Galax comes from Chestnut Creek. For the City of Galax, Chestnut Creek has a VDH permitted withdrawal amount of 4.00 MGD.

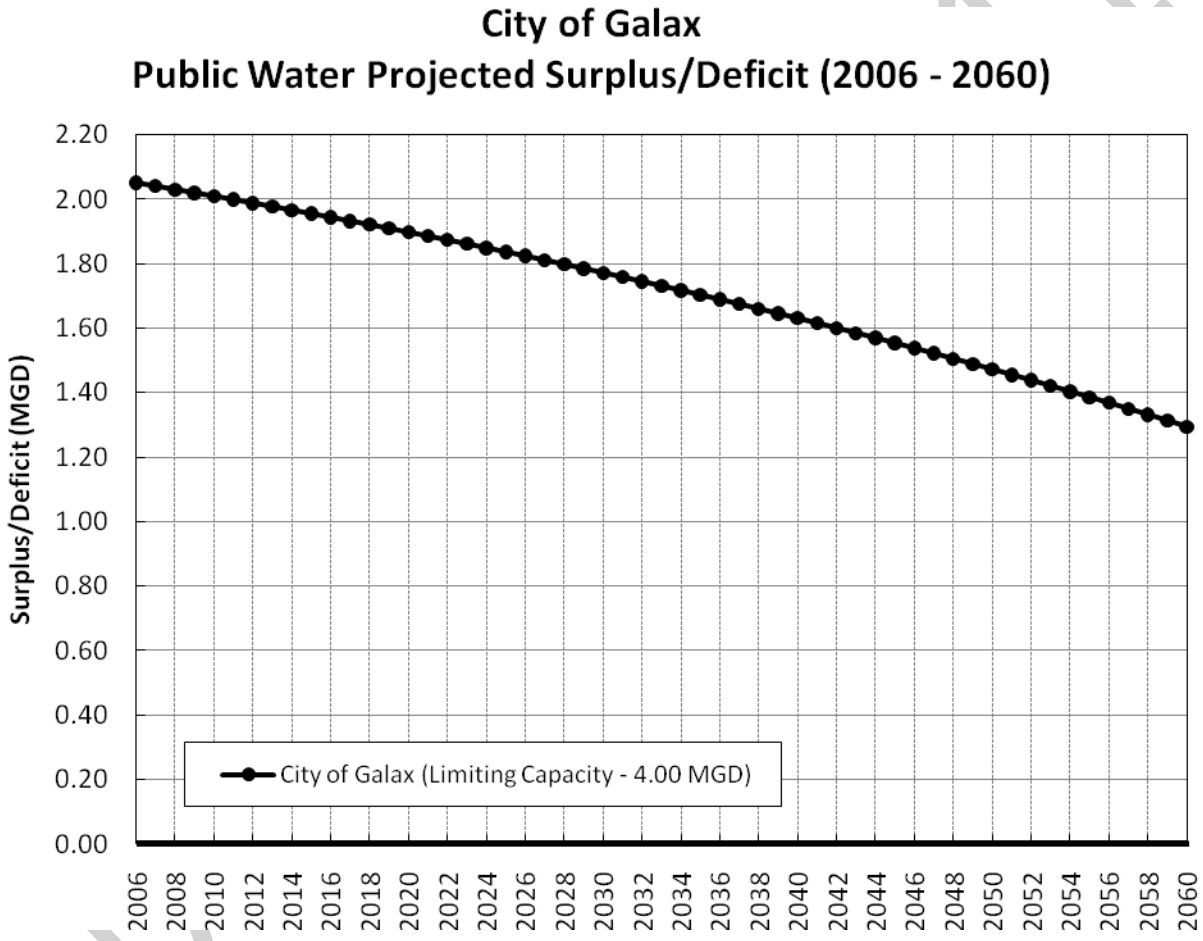

Figure 8.2.8.1 MRPDC Water Supply Plan Statement of Needs – City of Galax

8.2.9 Town of Chilhowie

Based upon the water demand projections, the Town of Chilhowie currently maintains a surplus (0.44 MGD) in available water resources. The Town of Chilhowie does not rely on bulk water purchases. Figure 8.2.9.1 shows that the Town of Chilhowie will not experience a water deficit in 2060 but will maintain a surplus of approximately 0.025 MGD. Public water supply in the Town comes from a combination of Cole, Widener, Jones and Gross Springs. The Town of Chilhowie has a VDH permitted withdrawal amount and limiting capacity of 1.40 MGD.

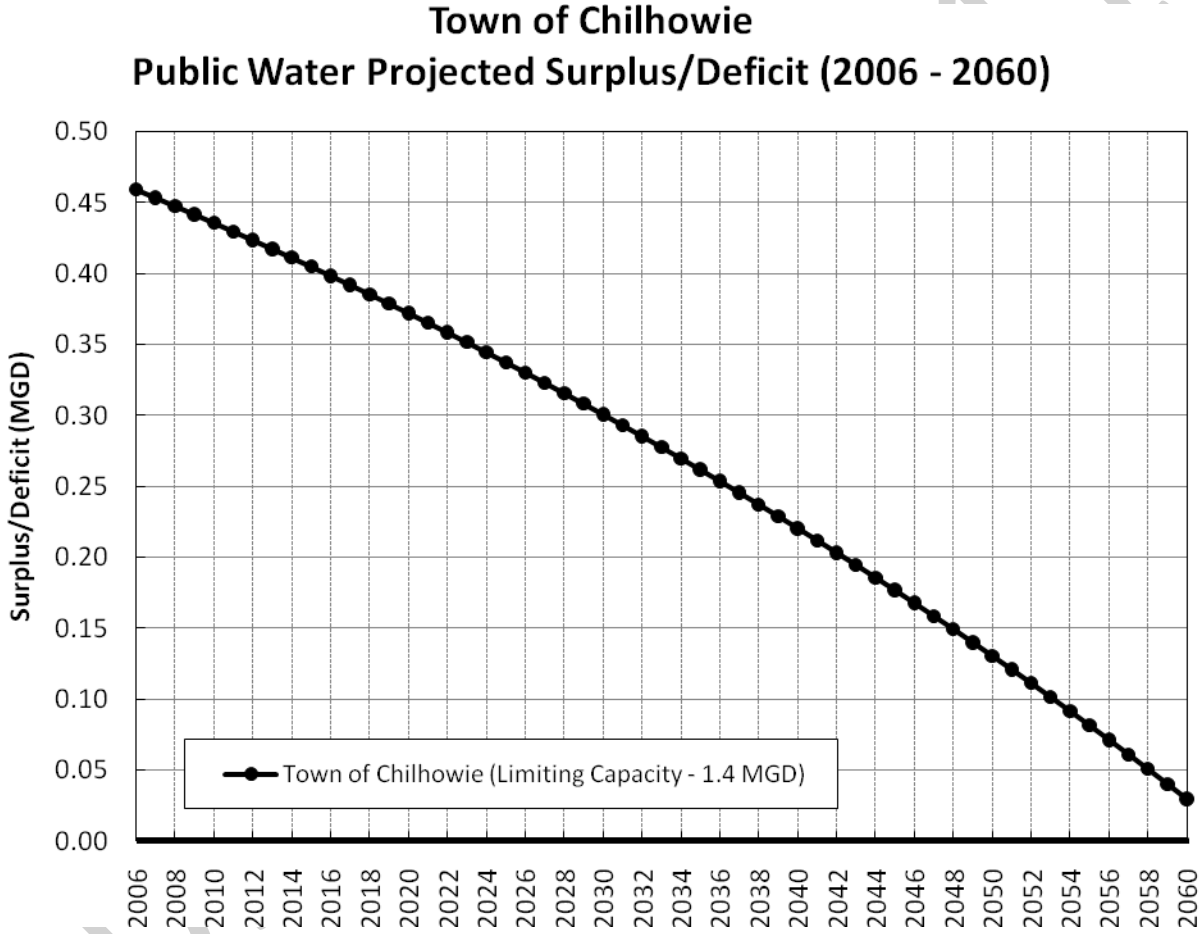

Figure 8.2.9.1 MRPDC Water Supply Plan Statement of Needs – Town of Chilhowie

8.2.10 Town of Fries

Based upon the water demand projections, the Town of Fries currently maintains a surplus (0.25 MGD) in available water resources. The Town does not rely on bulk water purchases. Figure 8.2.10.1 shows that the Town of Fries will not experience a water deficit in 2060 but will maintain a surplus of approximately 0.24 MGD. Public water supply in the Town of Fries comes from Eagle Bottom Creek with a safe yield capacity of 0.29 MGD. The Town of Fries also maintains an emergency water supply from the New River. The Town of Fries would only use the New River as a resource in an emergency; therefore, the limiting capacity of Eagle Bottom Creek (0.29 MGD) is used.

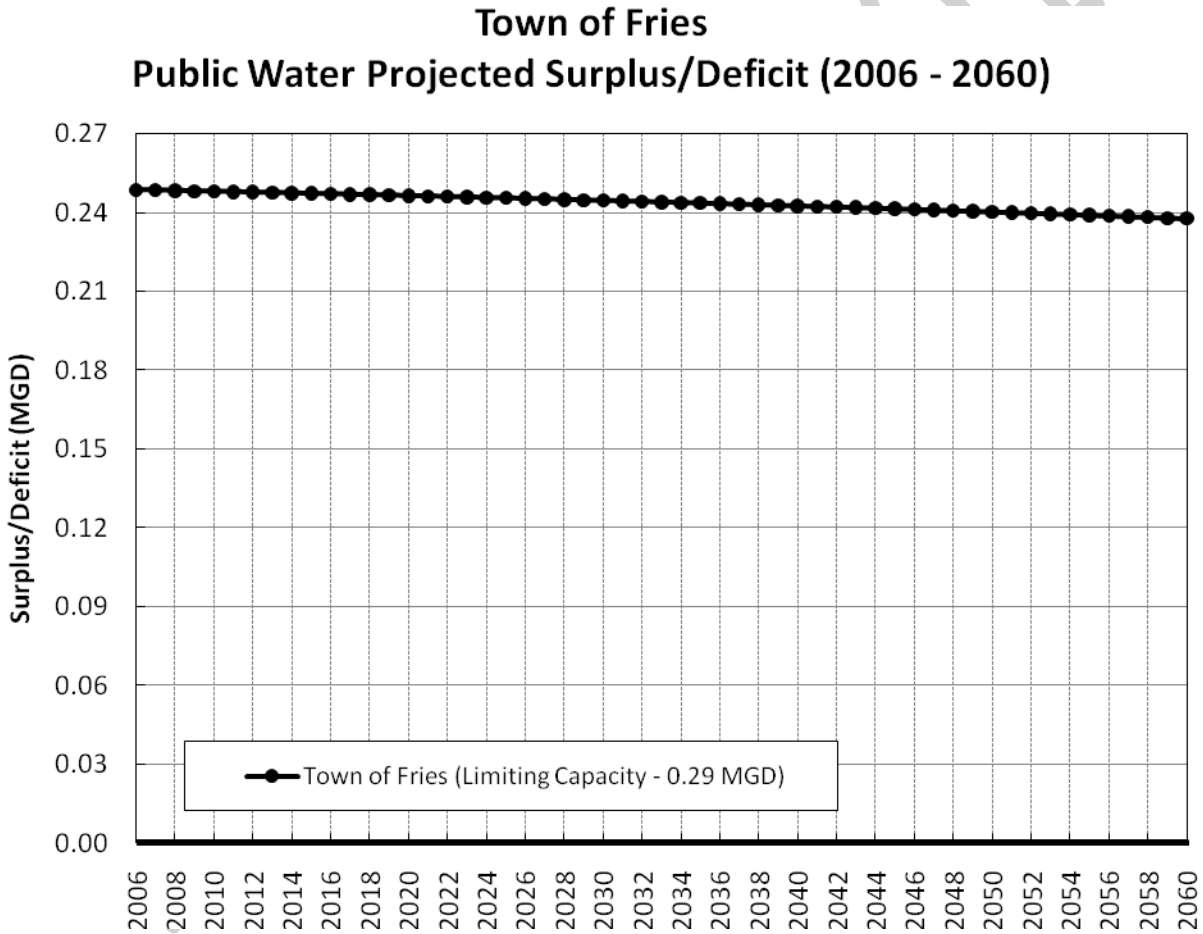

Figure 8.2.10.1 MRPDC Water Supply Plan Statement of Needs – Town of Fries

8.2.11 Town of Hillsville

Based upon the water demand projections, the Town of Hillsville currently maintains a surplus (0.32 MGD) in available water resources. The Town of Hillsville does not rely on bulk water purchases but does sell 0.15 MGD to Carroll County. Figure 8.2.11.1 shows that the Town of Hillsville will not experience a water deficit in 2060 but will maintain a surplus of approximately 0.22 MGD. Public water supply in the Town of Hillsville comes from the Little Reed Island Creek. The Town has a VDH permitted withdrawal amount of 0.60 MGD from the Little Reed Island Creek and a WTP design capacity of 0.60 MGD as well.

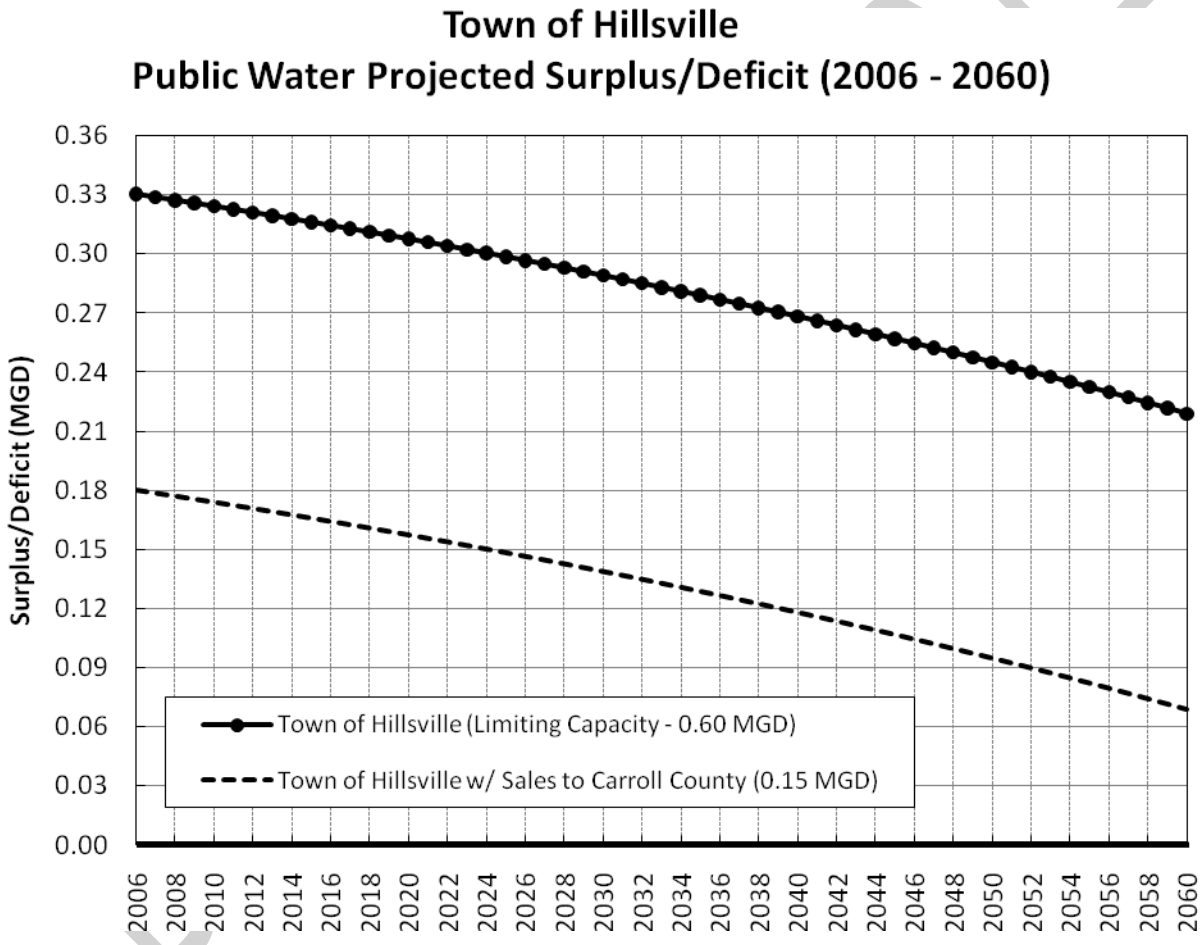

Figure 8.2.11.1 MRPDC Water Supply Plan Statement of Needs - Town of Hillsville

8.2.12 Town of Independence

The Town of Independence currently maintains a surplus (0.075 MGD) in available water resources. The Town does not rely on bulk water purchases. Figure 8.2.12.1 shows that the Town of Independence will not experience a water deficit in 2060 but will maintain a surplus of approximately 0.006 MGD. Public water supply in the Town comes from a groundwater well in the Town of Independence. The Town's groundwater well has a limiting design capacity of 0.23 MGD.

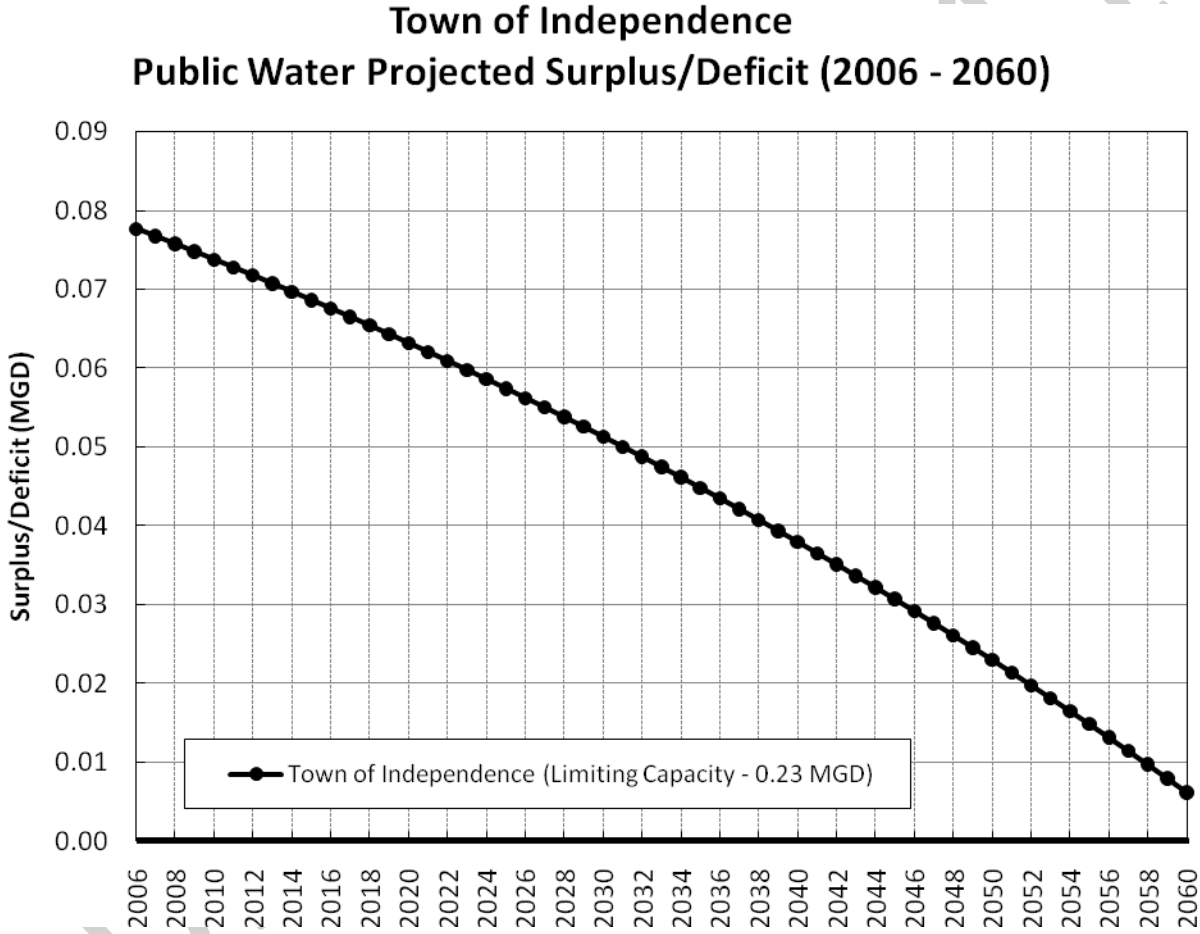

Figure 8.2.12.1 MRPDC Water Supply Plan Statement of Needs - Town of Independence

8.2.13 Town of Marion

The Town of Marion currently maintains a surplus (2.6 MGD) in available water resources. The Town of Marion relies on a very small bulk purchase of water from Smyth County of 0.004 MGD however; the Town also sells approximately 0.20 MGD to Smyth County as well. Figure 8.2.13.1 shows that the Town of Marion will not experience a water deficit in 2060. Public water supply in the Town of Marion comes from a Town Springs (1.64 MGD) and the Middle Fork of the Holston River (3.00 MGD). The Town's VDH permitted withdrawal amount is 4.64 MGD, with a WTP design capacity of 3.00 MGD, Based on current information, Marion will maintain a surplus water supply of approximately 1.2 MGD in 2060.

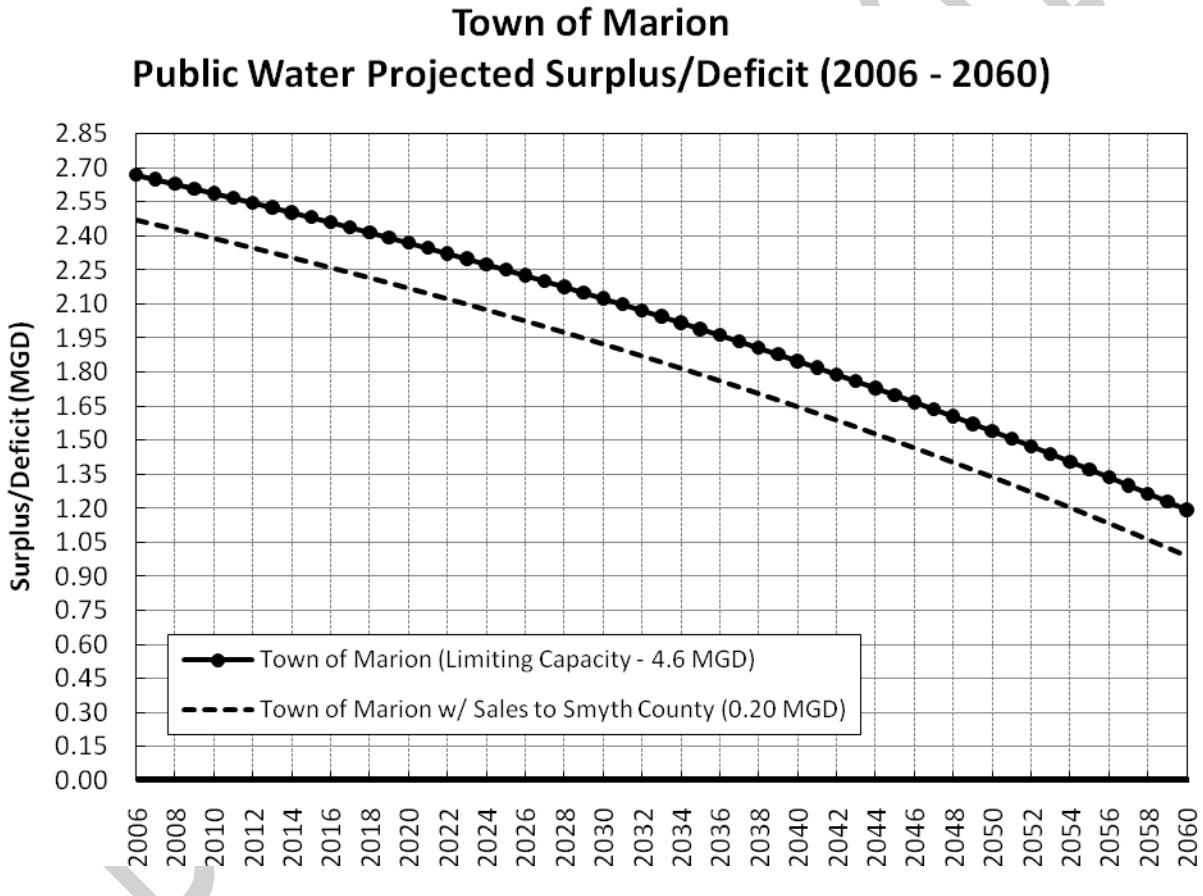

Figure 8.2.13.1 MRPDC Water Supply Plan Statement of Needs - Town of Marion

8.2.14 Town of Rural Retreat

Based upon the water demand projections, the Town of Rural Retreat currently maintains a surplus (0.20 MGD) in available water resources. The Town of Rural Retreat does not rely on bulk water purchases. Figure 8.2.14.1 shows that the Town will not experience a water deficit in 2060 but will maintain a surplus of approximately 0.02 MGD. Public water supply in the Town of Rural Retreat comes from a combination of the Phillipi Spring and Well (0.680). The Town has a limiting design capacity of 0.50 MGD for the Phillipi Well, thereby making the total limiting capacity 0.50 MGD.

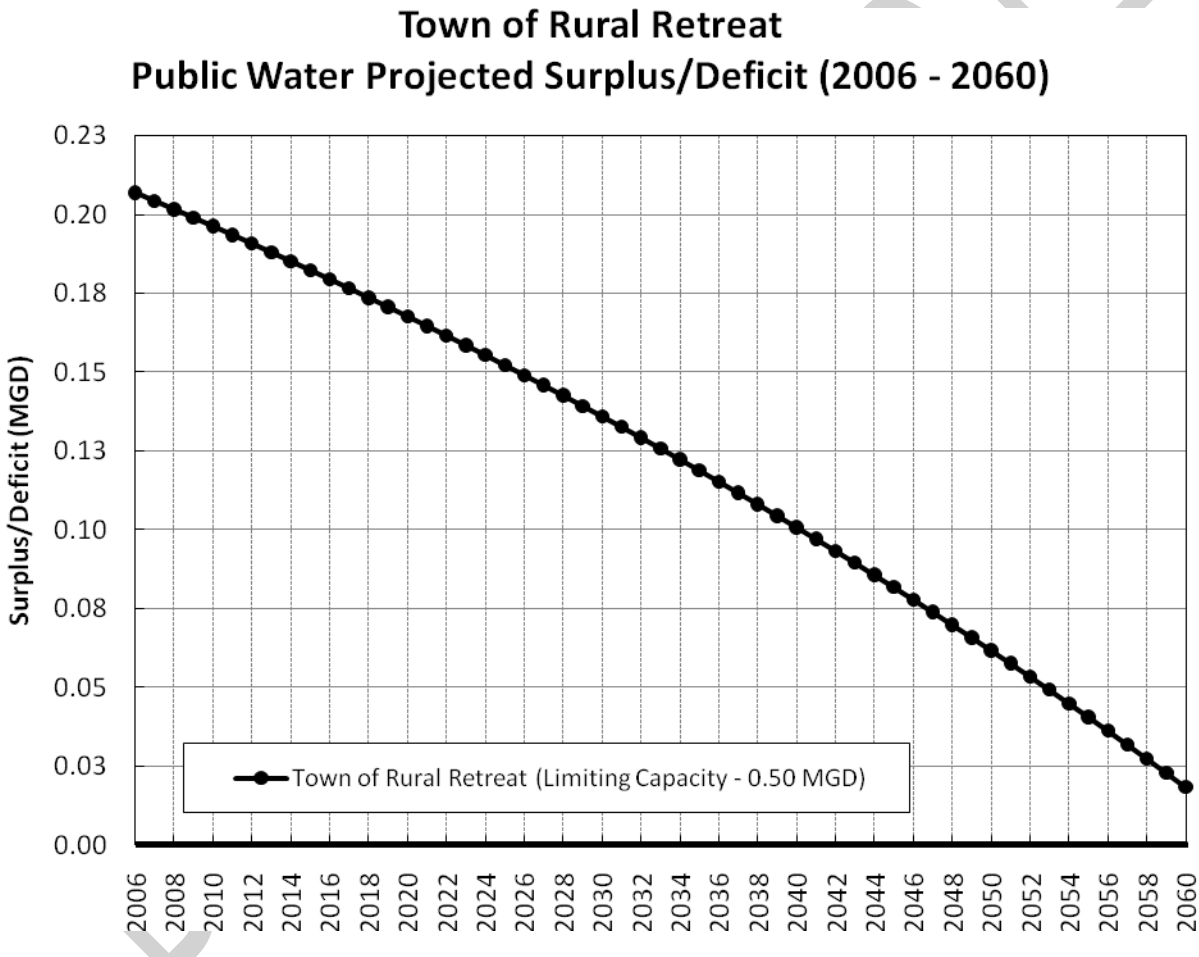

Figure 8.2.14.1 MRPDC Water Supply Plan Statement of Needs - Town of Rural Retreat

8.2.15 Town of Saltville

Based upon the water demand projections, the Town of Saltville currently experiences a deficit (0.32 MGD) in available water resources. The Town of Saltville does not rely on bulk water purchases. Figure 8.2.15.1 shows that the Town of Saltville is currently experiencing a water deficit and if additional water sources are not explored by 2060 will continue to maintain a water deficit of approximately 0.68 MGD. Public water supply in the Town of Saltville comes from two groundwater wells in the Town of Saltville (Cardwell Well, Well No. 10) for a total of 1.04 MGD, and Witt Spring (0.12 MGD) for a total capacity of 1.16 MGD. However, the Town of Saltville has a limiting VDH permitted withdrawal amount of 0.58 MGD. If the Town upgraded VDH withdrawal capacities to design capacities, the town would experience a surplus into 2049. The Town of Saltville numbers were derived from actual withdrawals since capacities were not provided.

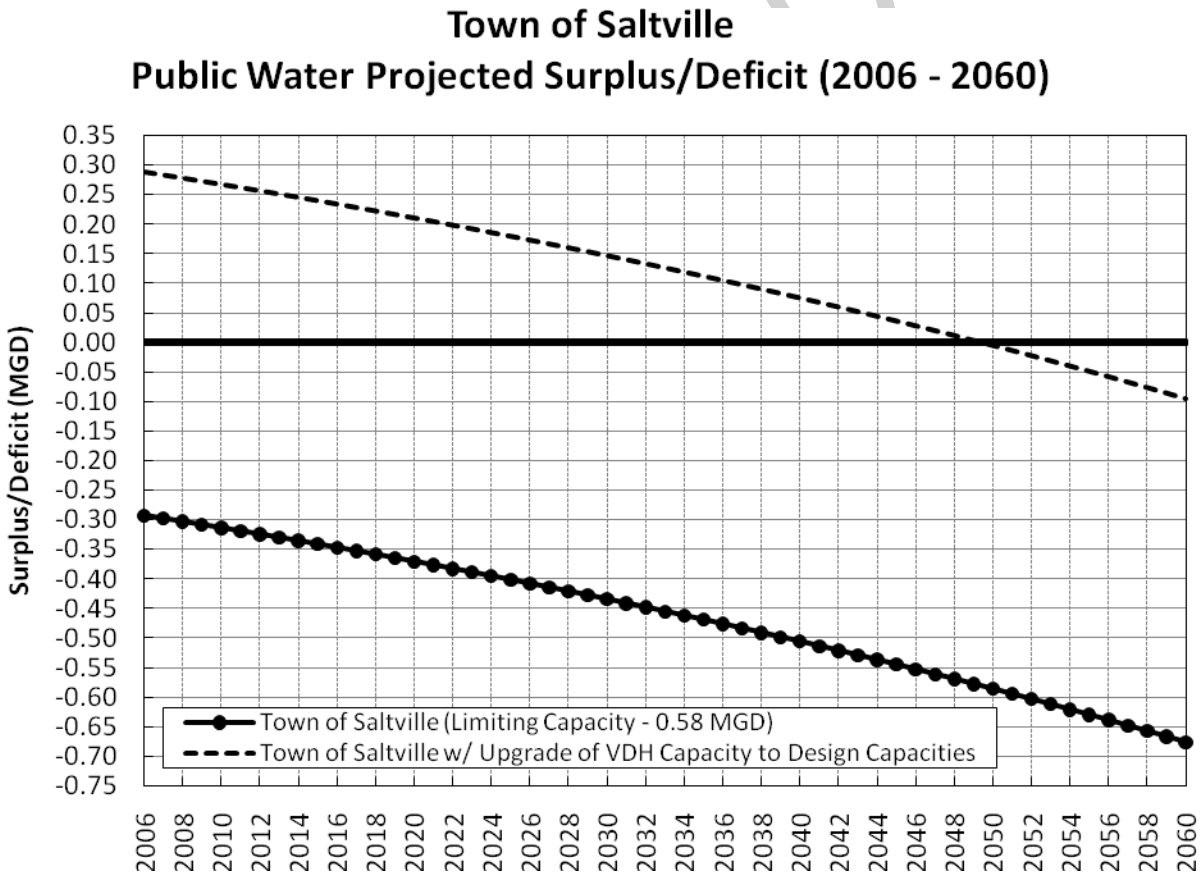

Figure 8.2.15.1 MRPDC Water Supply Plan Statement of Needs - Town of Saltville

8.2.16 Town of Troutdale

The Town of Troutdale currently maintains a surplus (0.009 MGD) in available water resources. The Town does not rely on bulk water purchases. Figure 8.2.16.1 shows that the Town of Troutdale will not experience a water deficit in 2060 but will maintain a surplus of 0.002 MGD. Public water supply in the Town of Troutdale comes from three groundwater wells (Mr. Casuals, Ross, Westinghouse). The Town's groundwater wells have total limiting VDH permitted withdrawal amounts of 0.034 MGD.

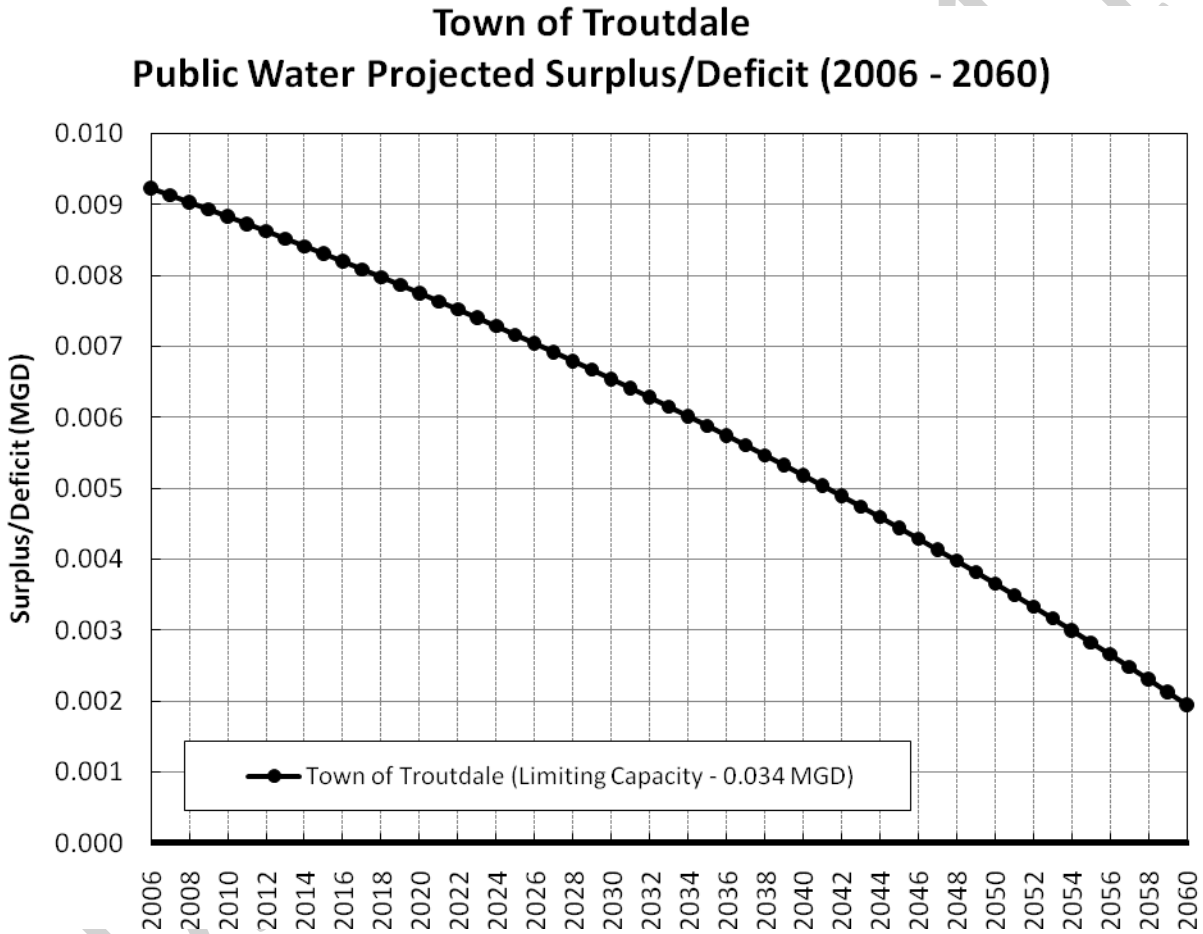

Figure 8.2.16.1 MRPDC Water Supply Plan Statement of Needs – Town of Troutdale

8.2.17 Town of Wytheville

Based upon the water demand projections, the Town of Wytheville currently maintains a surplus (1.15 MGD) in available water resources. Some water is supplied to the Town by the New River Water Authority WTP. Figure 8.2.17.1 shows that the Town of Wytheville will not experience a water deficit until 2041 and in 2060 will experience a deficit of approximately 0.85 MGD. Public water supply in the Town of Wytheville comes from Reed Creek. The Town of Wytheville has a limiting VDH permitted withdrawal amount of 4.00 MGD.

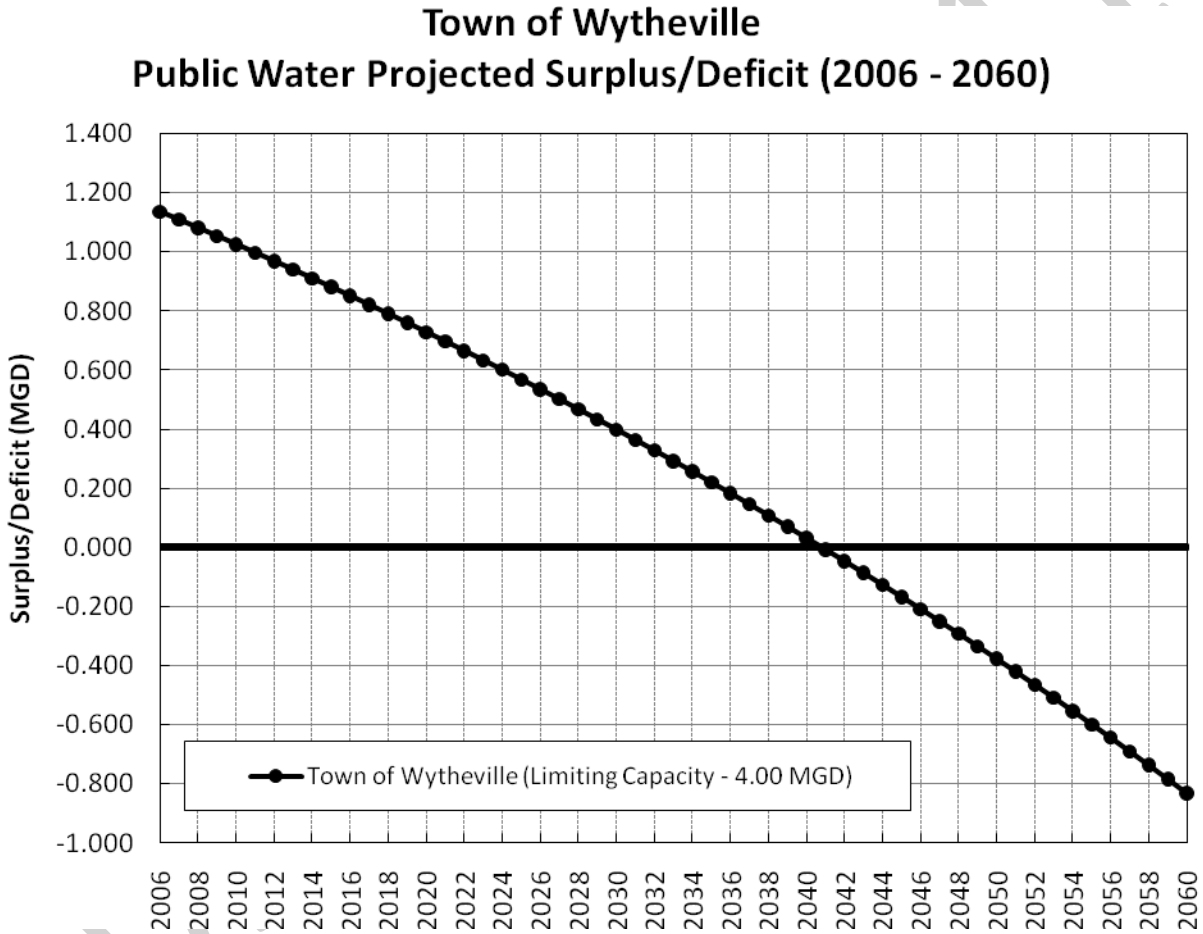

Figure 8.2.17.1 MRPDC Water Supply Plan Statement of Needs – Town of Wytheville

8.2.18 Lee County

The Lee County PSA owns and operates eleven (11) public water systems in the County. The PSA's Lee County water system receives potable water produced at the KVS Quarry WTP (supplied with water from the KVS Quarry) and water produced at the Blue Spring WTP (supplied with water from Blue Spring). An interconnection with the Arthur Shawnee WTP in Tennessee is existing and would allow additional supply of water to the PSA system. The 2040 projected demand of 267 million gallons is sixty-five percent (65%) of the WTPs' combined capacities.

PSA's Keokee system is supplied from the Town of Appalachia system. The 2040 projected demand of 17 million gallons is six percent (6%) of the Appalachia WTP's capacity.

The Town of Big Stone Gap supplies potable water to the PSA's Jasper and Eastern Lee County systems. The 2040 projected demand of 66 million gallons is five percent (5%) of the WTP's capacity.

The Town of Pennington Gap supplies potable water to several PSA systems: Big Hill system, Millers Chapel system, Ely & Puckett Creek system (via the St. Charles Water Authority), Robbins Chapel system (via the St. Charles Water Authority), and Old Woodway Road system (via the Dryden Water Authority). The 2040 projected demand of 79 million gallons is eleven percent (11%) of the WTP's capacity.

The Town of Jonesville supplies the PSA's Fleenortown system. The 2040 projected demand of 8 million gallons is five percent (5%) of the Jonesville WTP's capacity.

The PSA's Stickleyville water system is supplied potable water from the Scott County PSA Duffield WTP. The 2040 projected demand of 32 million gallons is eighteen percent (18%) of the Duffield WTP's capacity.

The Dryden Water Authority water system and the St. Charles Water Authority system are supplied potable water from the Town of Pennington Gap WTP. The Woodway Water Authority system delivers water received from either the Pennington Gap WTP or the Jonesville WTP. Harvest Baptist Ministries operates a water system supplied by a well.

The portion supplied to PSA systems from other systems and the treatment capacity of those systems utilized by PSA systems is given in million gallons per year and percentage, respectively: Appalachia WTP (17 MG, 6%), Big Stone Gap WTP (66 MG, 5%), Pennington Gap WTP (79 MG, 11%), Scott County PSA Duffield WTP (32 MG, 18%), Jonesville WTP (8 MG, 5%). For each WTP referenced above, the 2040 projected demand is less than eighty percent (80%) of available WTP capacity.

The 2040 projected demands for the Dryden Water Authority system, St. Charles Water Authority system, and the Woodway Water Authority system have been included in the demands on the Pennington Gap WTP and Jonesville WTP. Sufficient treatment capacity exists to supply the projected demands from these systems in 2040.

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.19 Scott County

The Scott County PSA owns and operates six (6) public water systems in the County. The PSA's Duffield water system receives potable water produced at the Duffield WTP, supplied with water from the North Fork Clinch River and Spurlock Branch. This system delivers water to the Lee County PSA Stickleyville system. The 2040 projected demand of 46 million gallons is twenty-five percent (25%) of the WTP's capacity.

The PSA's Moccasin Gap water system receives potable water produced at the Moccasin Gap WTP, supplied with water from Big Moccasin Creek. This system delivers a portion of potable water to the Town of Gate City's system. The 2040 projected demand of 102 million gallons is thirty-seven percent (37%) of the WTP's capacity.

The PSA's Daniel Boone water system receives potable water produced at the Gate City WTP, supplied with water from Big Moccasin Creek. The 2040 projected demand of 20 million gallons is eleven percent (11%) of the Gate City WTP's capacity.

The PSA's ECV water system receives potable water produced from the Lynn Mar Well, as well as from the Bloomingdale Utility District WTP (BUD) in Tennessee. The purchase agreement with BUD is for up to 100,000 gallons per day (36 million gallons annually). The 2040 projected demand of 17 million gallons is forty-seven percent (47%) of the purchase agreement capacity.

The PSA's Boozy Creek water system receives potable water produced at the BUD WTP. The 2040 projected demand of 7 million gallons is twenty percent (20%) of the purchase agreement with BUC.

The PSA's Cove Creek water system receives potable water from the Washington County Service Authority (WCSA). The 2040 projected demand of 1 million gallons is less than one percent (<1%) of the WCSA system capacity.

The Spring Valley Subdivision water system and the East Carters Valley water system are owned and operated by the BUD. Their 2040 projected demands of 16 million gallons and 18 million gallons, respectively, constitute five percent (5%) of the BUD WTP capacity. Reedy Creek is the source of water for the BUD WTP.

The 2040 projected aggregated annual water demand for the PSA's systems is 193 million gallons. This projected demand is forty-two percent (42%) of the annual permitted capacity of the Duffield WTP and Moccasin Gap WTP identified above. This results in a projected available water delivery capacity of fifty-eight percent (58%), not including available capacity at the Gate City WTP or the BUD WTP.

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.20 Wise County

The Wise County PSA owns and operates eight (8) public water systems in the County. The PSA's Regional water system utilizes potable water produced at the Carfax WTP, supplied with water from the Clinch River. This system delivers water to the Dickenson County PSA's Sandy Ridge system and also provides a portion of the water used by the City of Norton water system and the City's Norton – U.S. 58 East system. The PSA Regional system also has physical connections that enable conveyance of water to the Town of Coeburn system, the Town of Wise system, the Town of Pound system, and the Bold Camp water system. The 2040 projected demand of 395 million gallons is fifty-four percent (54%) of the WTP's capacity.

The PSA's Dunbar water system receives potable water produced by the Drilled Well. The 2040 projected demand of 4 million gallons is sixty-one percent (61%) of the well's VDH approved capacity for withdrawal.

The PSA's Appalachia #1 water system receives potable water produced at the Appalachia WTP, supplied with water from Bens Branch Reservoir. The 2040 projected demand of 17 million gallons is six percent (6%) of the Appalachia WTP's capacity.

The PSA's Norton #1 water system and Blackwood water system receive potable water from the City's water system. The 2040 projected demand of 49 million gallons (combined from these two (2) systems) is nine percent (9%) of the City WTP's capacity.

The PSA's Wise #2 water system receives potable water from the Town of Wise water system. The 2040 projected demand of 21 million gallons is eight percent (8%) of the Town WTP's capacity.

The PSA's South Mountain water system receives potable water from the Town of Pound water system. The 2040 projected demand of 14 million gallons is eight percent (8%) of the Town WTP's capacity.

The PSA's Mill Branch water system receives potable water from the Bold Camp water system. The 2040 projected demand of 14 million gallons is less than one percent (<1%) of the John Flannagan WTP's capacity.

The PSA's Flatwoods water system receives potable water from the Town of Coeburn water system. The 2040 projected demand of 4 million gallons is one percent (1%) of the Town WTP's capacity.

The Bold Camp water system receives potable water from the John Flannagan WTP (via the Town of Clintwood system). This system conveys water to the PSA's Mill Branch system. The 2040 projected demand of 17 million gallons is seven percent (7%) of the Town of Clintwood system capacity.

The 2040 projected aggregated annual water demand for the PSA's systems is 518 million gallons. This projected demand is seventy-one percent (71%) of the annual permitted capacity of the Carfax WTP identified above. This results in a projected available water delivery capacity of twenty-nine percent (29%), not including available capacity at the Norton City WTP or the Coeburn WTP.

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

Additional non-potable consumption is projected to be one million gallons per day at the proposed Dominion Virginia City Hybrid Energy facility (power plant). This volume of water will be withdrawn from either of two (2) existing intakes on the Clinch River: the Town of St. Paul water system intake or the Wise County PSA water intake. The projected daily volume is less than the available water withdrawal permits for either intake.

8.2.21 City of Norton

The City of Norton water system is supplied potable water produced at the City's WTP. The Upper Norton Reservoir and Lower Norton Reservoir provide the source of water to the WTP. A portion of the City system receives potable water from the Wise County PSA system. Potable water from the City WTP supplies the City's Norton – U.S. 58 East water system.

The City delivers potable water to two (2) of the Wise County PSA systems: Blackwood and Norton #1.

An interconnection is in place between the City's system and the Town of Big Stone Gap water system that would allow supply of water from one system to the other in the event such a need occurred.

The 2040 projected annual water demand for the City's system is 300 million gallons. The WTP's annual permitted capacity is 526 million gallons. The 2040 projected demand is fifty-seven percent (57%) of available capacity. This results in a projected available water delivery capacity of forty-three percent (43%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.22 Town of Appalachia

The Town of Appalachia water system is supplied potable water produced at the Town's WTP. Bens Branch Reservoir provides water to the WTP for treatment. The Town also has an intake on the Powell River from which additional source water can be pumped to Bens Branch Reservoir.

The Town's system supplies all water to both the Lee County PSA Keokee water system and the Wise County PSA Appalachia #1 system.

The 2040 projected annual water demand for the Town's system is 120 million gallons. This projected demand is forty-four percent (44%) of the Town WTP's annual permitted capacity of 274 million gallons. This results in a projected available water delivery capacity of fifty-six percent (56%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. Funding has been secured to construct an interconnection between the Town's system and the Town of Big Stone Gap system. This interconnection will augment the available supply to each system, and improve reliability of the Town's system.

8.2.23 Town of Big Stone Gap

The Town of Big Stone Gap water system is supplied potable water produced at the Town's WTP. Big Cherry Reservoir supplies water to the WTP for treatment. The Town's system supplies all water to the Lee County PSA Eastern Lee water system and the PSA's Jasper water system. Potable water can be further conveyed from those systems to the Scott County PSA Duffield system and the Dryden Water Authority Systems.

The 2040 projected annual water demand for the Town's system is 344 million gallons. This projected demand is twenty-four percent (24%) of the Town WTP's annual permitted capacity of 1,460 million gallons. This results in a projected available water delivery capacity of seventy-six percent (76%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. Funding has been secured to construct an interconnection between the Town's system and the Town of Appalachia system. This interconnection will improve the available supply to each system, and improve reliability of both systems.

8.2.24 Town of Clinchport

The Town of Clinchport's water system is supplied potable water produced at the Town's two (2) wells. The 2040 projected annual water demand for the Town's system is 2.4 million gallons. The water system's annual permitted capacity is 11 million gallons. The 2040 projected demand is twenty-two percent (22%) of available WTP capacity. The projected available water delivery capacity of the Town's system is seventy-eight percent (78%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.25 Town of Coeburn

The Town of Coeburn is supplied potable water produced at the Town's WTP. Sources of water for treatment include the Tom's Creek Reservoir and the Jenny Mine Well. The Town also receives a portion of water for its system from the Wise County PSA.

The 2040 projected annual water demand for the Town's system is 206 million gallons. This projected demand is forty-nine percent (49%) of the Town WTP's annual permitted capacity of 420 million gallons. This results in a projected available water production capacity of fifty-one percent (51%). Water delivery capacity is available to meet the Town's projected demand.

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.26 Town of Dungannon

The Town of Dungannon water system receives potable water from the Town's membrane WTP. The Town's two (2) wells are the source of water to the WTP.

The 2040 projected annual water demand for the Town's system is 14.4 million gallons. The WTP's annual permitted capacity is 28.1 million gallons. The 2040 projected demand is fifty-one percent (51%) of available capacity. This results in a projected available water delivery capacity of forty-nine percent (49%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.27 Town of Gate City

The Town of Gate City water system is supplied potable water produced at the Town's WTP. Big Moccasin Creek is the sole source of water to the WTP. The Town's system supplies all water to Scott County PSA's Daniel Boone water system.

The 2040 projected annual water demand for the Town's system is 154 million gallons. The WTP's annual permitted capacity is 182 million gallons. The 2040 projected demand is eighty-five percent (85%) of available capacity. This results in a projected available water delivery capacity of fifteen percent (15%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. The available capacity is less than the twenty percent recognized by the VDH, however, an interconnection with the Scott County PSA Moccasin Gap system is in place which could supply additional water to the Town.

8.2.28 Town of Jonesville

The Town of Jonesville water system is supplied potable water produced at the Town's WTP. Wynn Spring is the sole source of water to the WTP. The Town has identified another source, Slemp Spring, although the capacity has not been determined nor permitted. The Town's system supplies all water to Lee County PSA's Fleenortown water system, and supplies a portion of water used in the Woodway Water Authority system.

The 2040 projected annual water demand for the Town's system is 124 million gallons. The WTP's annual permitted capacity is 184 million gallons. The 2040 projected demand is sixty-seven percent (67%) of available capacity. This results in a projected available water delivery capacity of thirty-three percent (33%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.29 Town of Nickelsville

The Town of Nickelsville is supplied potable water supplied from the Town's six (6) wells.

The 2040 projected annual water demand for the Town's system is 27.6 million gallons. This projected demand is eighty-eight percent (88%) of the Town's annual permitted capacity of 31.4 million gallons. This results in a projected available water delivery capacity of twelve percent (12%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. However, the VDH Office of Drinking Water requires a water system to submit plans for meeting demand

when the system exceeds eighty percent (80%) of its capacity for three (3) consecutive months. Demand on the system is currently above eighty percent (80%) of capacity, but no additional demand is projected.

8.2.30 Town of Pennington Gap

The Town of Pennington Gap is supplied potable water produced at the Pennington Gap WTP. The Powell River is the sole source of water to the WTP. The Town's system supplies a portion of water used in the Woodway Water Authority system and all water used in the Dryden Water Authority system and in the St. Charles Water and Sewer Authority system. The Town delivers water directly to Lee County PSA's Miller Chapel water system and Big Hill water system. The Town is the source of potable water used in the Lee County PSA Old Woodway Road system (delivered through the Dryden Water Authority), and in the Lee County PSA Robbins Chapel system and Ely & Puckett Creek system (delivered through the St. Charles W&S Authority).

The 2040 projected annual water demand for the Town's system is 574 million gallons. This projected demand is seventy-nine percent (79%) of the Town WTP's annual permitted capacity of 730 million gallons. This will result in a projected available water production capacity of twenty-one percent (21%). Water delivery capacity is available to meet the Town's projected demand.

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.31 Town of Pound

The Town of Pound is supplied potable water produced at the Town's WTP. Source water to the WTP is withdrawn from the Pound Reservoir. The Town also operates the Bold Camp water system, which receives potable water from the Town of Clintwood system treated at the John Flannagan WTP. The Pound water system supplies water to the Wise County PSA South Mountain water system.

The 2040 projected annual water demand for the Town's system is 107 million gallons. This projected demand is fifty-nine percent (59%) of the Town WTP's annual permitted capacity of 182 million gallons. This results in a projected available water production capacity of forty-one percent (41%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.32 Town of St. Paul

The Town of St. Paul is supplied potable water produced at the St. Paul WTP. Source water to the WTP is withdrawn from the Clinch River. The Town supplies water to the Castlewood Water and Sewer Authority in Russell County.

The 2040 projected annual water demand for the Town's system is 69.6 million gallons. This projected demand is thirty-eight percent (38%) of the St. Paul WTP's annual permitted capacity of 182 million gallons. This results in a projected available water production capacity of sixty-two percent (62%). Water delivery capacity is available to meet the Town's projected demand.

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.33 Town of Wise

The Town of Wise is supplied potable water produced at the Town's WTP. Sources of water for treatment include the Bear Creek Reservoir and the White Oak Mine Well. The Town supplies water to the Wise County PSA Wise #2 system.

The 2040 projected annual water demand for the Town's system is 256 million gallons. This projected demand is forty-seven percent (47%) of the Town WTP's annual permitted capacity of 548 million gallons. This results in a projected available water production capacity of fifty-three percent (53%). Water delivery capacity is available to meet the Town's projected demand.

8.2.34 Buchanan County

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.Buchanan County

The Buchanan County PSA owns and operates the public water systems in the County. The vast majority of potable water used by the PSA systems is produced at the John Flannagan WTP. John Flannagan Reservoir is the sole source of water to the WTP. The PSA owns and operates the Kennel Gap WTP near Keen Mountain Correctional Facility. This WTP is supplied water from the Lower Banner Seam (abandoned mine). Tazewell County PSA's Baptist Valley/Bandy water system provides less than one percent of the water used in the Buchanan County PSA system.

The PSA's main system delivers water to nine of Dickenson County PSA's water systems, as well as to two systems operated by the Tazewell County PSA.

The 2040 projected annual water demand for the PSA's systems is 1,476 million gallons. This projected demand is based on a reduction in the amount of unaccounted-for water to thirty percent (30%). The John Flannagan WTP's annual permitted capacity is 2,686 million gallons. The 2040 projected demand is fifty-five percent (55%) of available WTP capacity. When the projected demands of all systems supplied by the WTP are combined, the projected available water delivery capacity of the WTP is thirty-six percent (36%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. However, the projected demand in 2040 was predicated on achieving improvement in existing water delivery accountability to seventy percent (70%), because VDH considers water accountability less than seventy percent to be a significant system deficiency. This will require a reduction in "lost water" from the current fifty percent to thirty percent. Funding will be needed to rehabilitate and replace leaking water lines in order to achieve seventy percent delivery accountability. If the accountability cannot be improved to seventy percent by the end of the planning period, additional treated water from the John Flannagan WTP will be required.

A challenging portion of increasing water accountability will require corrections in the existing transmission lines that convey water from the WTP to the PSA system. These lines, experiencing apparent infrastructure deterioration, are located in terrain that is difficult to access and lacks sufficient working area for conventional installation of replacement lines. This impacts system reliability in addition to addressing the gross demand for potable water. The PSA may evaluate the economic potential for installation of additional water treatment facilities.

Self-supplied, non-agricultural, non-residential user water consumption is 315 million gallons annually. Ninety-two percent is from surface water sources and eight percent from ground water sources. The cumulative demand is twenty-one percent (21%) of the projected 2040 demand from community water systems. This self-supplied demand is not projected to increase during the planning period.

8.2.35 Dickenson County

The Dickenson County PSA owns and operates the public water systems in the County. The PSA systems are supplied potable water produced at the John Flannagan WTP. John Flannagan Reservoir is the sole source of water to the WTP. Water from the WTP is conveyed to the PSA systems through transmission lines owned by the Dickenson County PSA, Buchanan County PSA, or by the Town of Clintwood. The PSA's Sandy Ridge water system is supplied by the Wise County PSA's regional system, whose source is the Clinch River.

The PSA's Bartlick/Breaks water system further delivers water to Buchanan County PSA's Grassy Creek water system.

The 2040 projected annual water demand (aggregated) for the PSA's systems is 197 million gallons. The John Flannagan WTP's annual permitted capacity is 2,686 million gallons. The 2040 projected demand is seven percent (7%) of available WTP capacity. When the projected demands of all systems supplied by the WTP are combined, the projected available water delivery capacity of the WTP is thirty-six percent (36%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. However, as noted for Buchanan County above, delivery of potable water from the WTP via the Buchanan County PSA and Town of Clintwood is a concern, due to the apparent infrastructure deterioration and water losses in the existing transmission line between the WTP and the PSA and Town systems.

Self-supplied, non-agricultural, non-residential user water consumption is 388 million gallons annually. Ninety-seven percent is from surface water sources and three percent from ground water sources. The cumulative demand is equivalent to one hundred, ninety-seven percent of the projected 2040 demand from water systems operated by the PSA. This self-supplied demand is not projected to increase during the planning period.

8.2.36 Russell County

Russell County has two authorities that provide water within the County: the Russell County PSA and the Castlewood Water and Sewer Authority (CWSA). The PSA's Green Valley Estates system is supplied potable water from two wells, the PSA's Swords Creek system is supplied water from the Richlands WTP (source is the Clinch River) via the Tazewell County PSA Raven-Doran system, the PSA's Belfast/Rosedale system is supplied from the Tazewell County PSA's Claypool Hill WTP (source is the Little River), the PSA's Poor Farm system is supplied water from the Town of Lebanon WTP (source is Big Cedar Creek), and the PSA's Hansonville system is also supplied water from the Lebanon WTP. Plans are to ultimately incorporate the Poor Farm system into the Belfast/Rosedale system and to allow the system to be supplied by either Tazewell or Lebanon.

The CWSA water system is supplied from wells and springs with treatment occurring at the two CWSA WTPs. A small portion of potable water used in the CWSA system is provided by the Town of St. Paul's WTP, using water withdrawn from the Clinch River.

The PSA's Hansonville system currently provides water to the Altamont Manor water system in Russell County.

The 2040 projected annual water demand for the County's systems is 503 million gallons. The combined annual permitted capacity is 2,559 million gallons. These sources of potable water include the three (3) WTPs in Tazewell County (Richlands WTP, Greater Tazewell Regional

WTP, and Claypool Hill WTP). The 2040 projected demand is twenty percent (20%) of available WTP capacity. When included with the projected demand of all other systems on the WTPs, the projected available water delivery capacity of the WTP is seventy-four percent (74%).

From evaluation of water demand aggregated throughout the County, no additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand in the County as a whole, but specific community water systems appear to need additional supply.

The annual equivalent of the permitted capacity of the CWSA system is 151 million gallons, but the actual demand is projected to exceed this amount by twenty-five percent (25%) by 2010 and by sixty-one percent (61%) by 2020, decreasing the amount of water losses to twenty-five percent (25%) by 2040. Unaccounted-for water losses decrease after 2020.

Additional demand in the PSA system will occur due to extension of service to areas currently unserved by a community water system. Much of the demand due to extension of service in the PSA service areas could be provided from the Claypool Hill WTP. However, current capacity in that WTP would be sufficient for only eighty-eight percent (88%) of the projected 2040 demand.

Self-supplied, non-agricultural, non-residential user water consumption is 728 million gallons annually, and is all from surface water sources. The cumulative demand is equivalent to one hundred forty-four percent (144%) of the projected 2040 demand from community water systems operated by the CWSA and PSA. This self-supplied demand is not projected to increase during the planning period.

8.2.37 Tazewell County

Water service outside of the incorporated towns in Tazewell County (Bluefield, Cedar Bluff, Pocahontas, Richlands, and Tazewell) is provided through systems owned and operated by the Tazewell County PSA, as well as through the Bluefield Valley Waterworks located in Bluefield, WV. The PSA operates two treatment facilities: the Greater Tazewell Regional WTP and the Claypool Hill WTP. The Claypool Hill WTP withdraws water from the Little River. The three (3) sources of water to Greater Tazewell Regional WTP are the Clinch River, Cox Branch Reservoir, and Lake Witten (Cavitts Creek). Other PSA systems are supplied potable water produced at the Town of Richlands WTP. The Clinch River is the sole source of water to the Richlands WTP.

The PSA's Raven-Doran system conveys water to Russell County PSA's Swords Creek and the Buchanan County PSA's Shortts Gap water system. The PSA's Claypool Hill system conveys water to Russell County PSA's Belfast system and the Town of Cedar Bluff water system. The PSA's Baptist Valley system conveys water to and receives water from Buchanan County PSA's water system.

The 2040 projected annual water demand for all the PSA's systems is 1,404 million gallons. The combined annual permitted capacity of the three (3) WTPs is 2,248 million gallons. [This includes the approved but not yet constructed increase in capacity at the Greater Tazewell Regional WTP]. The 2040 projected demand is sixty-two percent (62%) of available WTPs capacities. When the projected demand on the WTPs from of systems outside of the county are included, the projected available water delivery capacity of the WTP is twenty-seven percent (27%).

The Bluefield Valley Waterworks provides water to a service area south of the Town of Bluefield and is supplied potable water from West Virginia American Water Company's Ada WTP in Bluefield, WV. An interconnection with the Town of Bluefield water system allows transfer of potable water into the Town's system if needed. The 2040 projected annual water demand for the Bluefield Valley system is 41 million gallons. This projected demand is seven percent (7%) of available capacity of the Ada WTP. Water delivery capacity is available to meet the Bluefield Valley system's 2040 projected demand.

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. However, as noted for Russell County above, the Claypool Hill WTP may not have sufficient capacity to supply water service extension projects identified in Russell County.

Self-supplied, non-agricultural, non-residential user water consumption is 27 million gallons annually. Sixty-three percent (63%) is from surface water sources and thirty-seven percent (37%) from ground water sources. The cumulative demand is less than two percent (<2%) of the projected 2040 demand from community water systems. This self-supplied demand is not projected to increase during the planning period.

8.2.38 Town of Bluefield

The Town of Bluefield water system is supplied potable water produced at the Town's WTP. The Bluestone River is the sole source of water to the WTP. Dill Spring is a groundwater source to the Town.

System interconnections are in place which allow supply of water to the Town from the Bluefield Valley Waterworks (supplied by the Ada WTP in Bluefield, WV) or from Tazewell County PSA's Eastern Tazewell County water system (supplied by the Greater Tazewell Regional WTP).

The 2040 projected annual water demand for the Town's system is 532 million gallons. The WTP's annual permitted capacity is 548 million gallons. The 2040 projected demand is ninety-seven percent (97%) of available capacity. This results in a projected available water delivery capacity of three percent (3%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. However, the VDH Office of Drinking Water requires a water system to submit plans for meeting demand when the system exceeds eighty percent (80%) of its capacity for three (3) consecutive months. Demand on the Town's water system currently approaches eighty percent of the Town's WTP capacity. However, interconnection with Bluefield Valley water system increases available water capacity, resulting in the projected 2040 demand accounting for less than eighty percent (<80%) of capacity. The WTP supplying the Bluefield Valley system currently has 1.5 MGD capacity available. In addition, connection with the Eastern Tazewell water system would increase the amount of potable water available to the Town's system.

8.2.39 Town of Cedar Bluff

The Town of Cedar Bluff water system is supplied potable water produced at the Town of Richland's WTP, as well as a small portion (less than five percent) from the Tazewell County PSA Claypool Hill WTP.

The 2040 projected annual water demand for the Town's system is 56 million gallons. This projected demand is six percent (6%) of the Richlands WTP's annual permitted capacity of 912 million gallons. Water delivery capacity is available to meet the Town's projected demand.

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.40 Town of Cleveland

The Town of Cleveland water system is supplied potable water produced at the Town's wells.

The 2040 projected annual water demand for the Town's system is 8 million gallons. The WTP's annual permitted capacity is 29 million gallons. The 2040 projected demand is twenty-eight percent (28%) of available capacity. This results in a projected available water delivery capacity of seventy-two percent (72%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.41 Town of Clintwood

The Town of Clintwood's water system is supplied potable water produced at the John Flannagan WTP. John Flannagan Reservoir is the sole source of water to the WTP.

The Town's system delivers water to Dickenson County PSA's Skeetrock water system, Osborns Gap water system, Honey Camp water system, Rush Creek water system, and the Bold Camp water system in Wise County.

The 2040 projected annual water demand for the Town's system is 238 million gallons. The John Flannagan WTP's annual permitted capacity is 2,686 million gallons. The 2040 projected demand is nine percent (9%) of available WTP capacity. When the projected demands of all systems supplied by the WTP are combined, the projected available water delivery capacity of the WTP is thirty-six percent (36%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. However, as noted for Buchanan County above, delivery of potable water from the WTP to the Town through the existing transmission line is a concern, due to apparent infrastructure deterioration.

8.2.42 Town of Honaker

The Town of Honaker water system is supplied potable water produced from the Town's wells.

The 2040 projected annual water demand for the Town's system is 57 million gallons. The WTP's annual permitted capacity is 85 million gallons. The 2040 projected demand is sixty-seven percent (67%) of available capacity. This results in a projected available water delivery capacity of thirty-three percent (33%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.43 Town of Lebanon

The Town of Lebanon water system is supplied potable water produced at the Town's WTP. Big Cedar Creek is the sole source of water to the WTP.

The Town's system supplies all water to Russell County PSA's Poor Farm community water system.

The 2040 projected annual water demand for the Town's system is 217 million gallons. The WTP's annual permitted capacity is 456 million gallons. The 2040 projected demand is forty-eight percent (48%) of available capacity. This results in a projected available water delivery capacity of fifty-two percent (52%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.44 Town of Pocahontas

The Town of Pocahontas water system is supplied potable water produced at the Town's WTP. Big Spring (Abbs Creek) is the sole source of water to the WTP.

The Town's system delivers water to Tazewell County PSA's Falls Mills water system.

The 2040 projected annual water demand for the Town's system is 109 million gallons. The WTP's annual permitted capacity is 181 million gallons. The 2040 projected demand is sixty percent (60%) of available capacity. This results in a projected available water delivery capacity of forty percent (40%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.45 Town of Richlands

The Town of Richlands water system is supplied potable water produced at the Town's WTP. The Clinch River is the sole source of water to the WTP.

The Town's system delivers water to Tazewell County PSA's Daw Road water system and Raven Doran water system, from which water is conveyed to Buchanan County PSA's Shortts Gap system.

The 2040 projected annual water demand for the Town's system is 576 million gallons. The WTP's annual permitted capacity is 912 million gallons. The 2040 projected demand is sixty-three percent (63%) of available capacity. This results in a projected available water delivery capacity of thirty-seven percent (37%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.46 Town of Tazewell

The Town of Tazewell is supplied potable water produced at the Greater Tazewell Regional WTP.

The 2040 projected annual water demand for the Town's system is 650 million gallons. This projected demand is eighty-nine percent (89%) of the Greater Tazewell Regional WTP's annual permitted capacity of 730 million gallons. Plans have been designed and approved to increase the WTP capacity from current 1.95 MGD to 2.66 MGD, matching the permitted withdrawal capacity from all sources. This will result in a projected available water production capacity of thirty-three percent (33%). Water delivery capacity is available to meet the Town's projected demand.

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.47 Regional Overview

Based upon the individual statements of need, a summary of the water supply surplus and deficits is shown below. A regional surplus of 5.52 MGD will be realized if the existing public water systems implement the use of system interconnections to provide shared water sources by 2060. Also, an additional 8.91 MGD could be used by private systems and individual well owners in 2060. Some uncertainty in these numbers should be expected when projecting 50 years into the future. Data is based on projected demands and current limiting capacities as reported by each community.

Table 8.2.12.1 Summary of 2060 Water Needs by Community and as the Total Region

Community	2060 Water Demand Projections			Total Existing PWS Capacity	Public WS Surplus or Deficit	Private WS Additions
	Public Systems	Private Systems	Total			
	MGD	MGD	MGD	MGD	MGD	MGD
Bland County	0.18	0.90	1.08	0.40	0.22	0.06
Carroll County[1]	0.62	2.64	3.26	1.04	0.42	0.10
Grayson County[2]	0.08	2.48	2.56	0.10	0.02	0.02
Smyth County[3]	0.58	6.94	7.52	0.83	0.25	2.35
Washington County	11.20	8.43	19.63	6.53	-4.67	2.94
Wythe County	1.02	9.80	10.82	4.93	3.91	3.40
City of Bristol	6.07	0.00	6.07	10.00	3.93	0.00
City of Galax[4]	2.71	0.01	2.72	4.00	1.29	0.00
Town of Chilhowie[5]	1.37	0.00	1.37	1.40	0.03	0.00
Town of Fries[6]	0.05	0.00	0.05	0.29	0.24	0.00

Community	2060 Water Demand Projections			Total Existing PWS Capacity	Public WS Surplus or Deficit	Private WS Additions
	Public Systems	Private Systems	Total			
	MGD	MGD	MGD	MGD	MGD	MGD
Town of Hillsville[7]	0.38	0.00	0.38	0.60	0.22	0.00
Town of Independence	0.22	0.00	0.22	0.23	0.01	0.00
Town of Marion[8]	3.45	0.00	3.45	4.60	1.15	0.00
Town of Rural Retreat	0.48	0.08	0.56	0.50	0.02	0.04
Town of Saltville[9,10]	1.25	0.00	1.25	0.58	-0.67	0.00
Town of Troutdale	0.032	0.00	0.032	0.034	0.002	0.00
Town of Wytheville	4.83	0.002	4.83	4.00	-0.83	0.001
Total	**34.52**	**31.28**	**65.80**	**40.06**	**5.54**	**8.91**

[1]Carroll County buys 0.15 MGD from the Town of Hillsville.

[2]Grayson County buys all water supply (0.10 MGD) from the City of Galax.

[3]Smyth County buys 0.035 MGD from Chilhowie, 0.20 MGD from Marion and 0.21 MGD from Thomas Bridge Water Works.

[4]The City of Galax sells 0.10 MGD to Grayson County.

[5]The Town of Chilhowie sells 0.035 MGD to Smyth County.

[6]The Town of Fries maintains an emergency New River source.

[7]The Town of Hillsville sells 0.15 MGD to Carroll County.

[8]The Town of Marion sells 0.20 MGD to Smyth County.

[9]The Town of Saltville sells 0.14 MGD to Smyth County.

[10]The Town of Saltville demands are based on actual withdrawals. Capacities were not provided.

Cumberland Plateau

In the Phase II Development of the Cumberland Plateau Water Supply Plan, the total water demand in the planning area was projected to increase approximately nineteen percent (19%) between 2010 and 2040 (see page 13 of the Phase II Report dated April 30, 2009).

As noted in the Phase II Development Report, projected water demand reflects the impact of four parameters: population changes, extension of existing water service to new areas, change in water use due to economic activities, and improvement in water system delivery efficiency.

Population changes increased projected water demand in Russell County and Tazewell County. No known economic activity in the planning area during the planning period was identified and documented that would increase water demand significantly.

Proposed extensions of existing water systems to areas currently unserved were quantified in Phase II of the report. Improvement in water system delivery efficiency was quantified by assuming that all systems would have achieved accountability of at least seventy percent (70%) by the end of the planning period.

The adequacy of existing supplies to meet demand projections at the end of the planning period (2040) is evaluated for the four (4) counties and nine (9) towns that maintain water systems in the Cumberland Plateau Regional Planning area.

The adequacy of existing supplies to meet demand projections at the end of the planning period (2040) was evaluated for Buchanan County, Dickenson County, Russell County, Tazewell County, and the Towns of Bluefield, Cedar Bluff, Cleveland, Clintwood, Honaker, Lebanon, Pocahontas, Richlands, and Tazewell.

Evaluation indicated that existing water supplies appear adequate to meet the demand projections of the localities examined, except for the Castlewood Water and Sewer Authority system in Russell County, the Russell County PSA systems served by the Claypool Hill WTP.

Water systems operated by the Buchanan County PSA, the Dickenson County PSA, and the Town of Clintwood are supplied potable water by the John Flannagan Water Authority through

transmission lines that convey water to the respective systems. The transmission lines will require rehabilitation during the planning period, and alternative delivery of potable water to portions of these systems may have greater viability from an economic standpoint.

A key component in determining demand projections was that all systems in the planning area would complete necessary improvements during the planning period to achieve a minimum water accountability of seventy percent (70%) in every system. For several systems, significant funding will be required to accomplish the necessary improvement in water accountability.

8.2.48 Buchanan County

The Buchanan County PSA owns and operates the public water systems in the County. The vast majority of potable water used by the PSA systems is produced at the John Flannagan WTP. John Flannagan Reservoir is the sole source of water to the WTP. The PSA owns and operates the Kennel Gap WTP near Keen Mountain Correctional Facility. This WTP is supplied water from the Lower Banner Seam (abandoned mine). Tazewell County PSA's Baptist Valley/Bandy water system provides less than one percent of the water used in the Buchanan County PSA system.

The PSA's main system delivers water to nine of Dickenson County PSA's water systems, as well as to two systems operated by the Tazewell County PSA.

The 2040 projected annual water demand for the PSA's systems is 1,476 million gallons. This projected demand is based on a reduction in the amount of unaccounted-for water to thirty percent (30%). The John Flannagan WTP's annual permitted capacity is 2,686 million gallons. The 2040 projected demand is fifty-five percent (55%) of available WTP capacity. When the projected demands of all systems supplied by the WTP are combined, the projected available water delivery capacity of the WTP is thirty-six percent (36%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. However, the projected demand in 2040 was predicated on achieving improvement in existing water delivery accountability to seventy percent (70%), because VDH considers water accountability less than

seventy percent to be a significant system deficiency. This will require a reduction in "lost water" from the current fifty percent to thirty percent. Funding will be needed to rehabilitate and replace leaking water lines in order to achieve seventy percent delivery accountability. If the accountability cannot be improved to seventy percent by the end of the planning period, additional treated water from the John Flannagan WTP will be required.

A challenging portion of increasing water accountability will require corrections in the existing transmission lines that convey water from the WTP to the PSA system. These lines, experiencing apparent infrastructure deterioration, are located in terrain that is difficult to access and lacks sufficient working area for conventional installation of replacement lines. This impacts system reliability in addition to addressing the gross demand for potable water. The PSA may evaluate the economic potential for installation of additional water treatment facilities.

Self-supplied, non-agricultural, non-residential user water consumption is 315 million gallons annually. Ninety-two percent is from surface water sources and eight percent from ground water sources. The cumulative demand is twenty-one percent (21%) of the projected 2040 demand from community water systems. This self-supplied demand is not projected to increase during the planning period.

8.2.49 Dickenson County

The Dickenson County PSA owns and operates the public water systems in the County. The PSA systems are supplied potable water produced at the John Flannagan WTP. John Flannagan Reservoir is the sole source of water to the WTP. Water from the WTP is conveyed to the PSA systems through transmission lines owned by the Dickenson County PSA, Buchanan County PSA, or by the Town of Clintwood. The PSA's Sandy Ridge water system is supplied by the Wise County PSA's regional system, whose source is the Clinch River.

The PSA's Bartlick/Breaks water system further delivers water to Buchanan County PSA's Grassy Creek water system.

The 2040 projected annual water demand (aggregated) for the PSA's systems is 197 million gallons. The John Flannagan WTP's annual permitted capacity is 2,686 million gallons. The

2040 projected demand is seven percent (7%) of available WTP capacity. When the projected demands of all systems supplied by the WTP are combined, the projected available water delivery capacity of the WTP is thirty-six percent (36%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. However, as noted for Buchanan County above, delivery of potable water from the WTP via the Buchanan County PSA and Town of Clintwood is a concern, due to the apparent infrastructure deterioration and water losses in the existing transmission line between the WTP and the PSA and Town systems.

Self-supplied, non-agricultural, non-residential user water consumption is 388 million gallons annually. Ninety-seven percent is from surface water sources and three percent from ground water sources. The cumulative demand is equivalent to one hundred, ninety-seven percent of the projected 2040 demand from water systems operated by the PSA. This self-supplied demand is not projected to increase during the planning period.

8.2.50 Russell County

Russell County has two authorities that provide water within the County: the Russell County PSA and the Castlewood Water and Sewer Authority (CWSA). The PSA's Green Valley Estates system is supplied potable water from two wells, the PSA's Swords Creek system is supplied water from the Richlands WTP (source is the Clinch River) via the Tazewell County PSA Raven-Doran system, the PSA's Belfast/Rosedale system is supplied from the Tazewell County PSA's Claypool Hill WTP (source is the Little River), the PSA's Poor Farm system is supplied water from the Town of Lebanon WTP (source is Big Cedar Creek), and the PSA's Hansonville system is also supplied water from the Lebanon WTP. Plans are to ultimately incorporate the Poor Farm system into the Belfast/Rosedale system and to allow the system to be supplied by either Tazewell or Lebanon.

The CWSA water system is supplied from wells and springs with treatment occurring at the two CWSA WTPs. A small portion of potable water used in the CWSA system is provided by the Town of St. Paul's WTP, using water withdrawn from the Clinch River.

The PSA's Hansonville system currently provides water to the Altamont Manor water system in Russell County.

The 2040 projected annual water demand for the County's systems is 503 million gallons. The combined annual permitted capacity is 2,559 million gallons. These sources of potable water include the three (3) WTPs in Tazewell County (Richlands WTP, Greater Tazewell Regional WTP, and Claypool Hill WTP). The 2040 projected demand is twenty percent (20%) of available WTP capacity. When included with the projected demand of all other systems on the WTPs, the projected available water delivery capacity of the WTP is seventy-four percent (74%).

From evaluation of water demand aggregated throughout the County, no additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand in the County as a whole, but specific community water systems appear to need additional supply.

The annual equivalent of the permitted capacity of the CWSA system is 151 million gallons, but the actual demand is projected to exceed this amount by twenty-five percent (25%) by 2010 and by sixty-one percent (61%) by 2020, decreasing the amount of water losses to twenty-five percent (25%) by 2040. Unaccounted-for water losses decrease after 2020.

Additional demand in the PSA system will occur due to extension of service to areas currently unserved by a community water system. Much of the demand due to extension of service in the PSA service areas could be provided from the Claypool Hill WTP. However, current capacity in that WTP would be sufficient for only eighty-eight percent (88%) of the projected 2040 demand.

Self-supplied, non-agricultural, non-residential user water consumption is 728 million gallons annually, and is all from surface water sources. The cumulative demand is equivalent to one hundred forty-four percent (144%) of the projected 2040 demand from community water systems

operated by the CWSA and PSA. This self-supplied demand is not projected to increase during the planning period.

8.2.51 Tazewell County

Water service outside of the incorporated towns in Tazewell County (Bluefield, Cedar Bluff, Pocahontas, Richlands, and Tazewell) is provided through systems owned and operated by the Tazewell County PSA, as well as through the Bluefield Valley Waterworks located in Bluefield, WV. The PSA operates two treatment facilities: the Greater Tazewell Regional WTP and the Claypool Hill WTP. The Claypool Hill WTP withdraws water from the Little River. The three (3) sources of water to Greater Tazewell Regional WTP are the Clinch River, Cox Branch Reservoir, and Lake Witten (Cavitts Creek). Other PSA systems are supplied potable water produced at the Town of Richlands WTP. The Clinch River is the sole source of water to the Richlands WTP.

The PSA's Raven-Doran system conveys water to Russell County PSA's Swords Creek and the Buchanan County PSA's Shortts Gap water system. The PSA's Claypool Hill system conveys water to Russell County PSA's Belfast system and the Town of Cedar Bluff water system. The PSA's Baptist Valley system conveys water to and receives water from Buchanan County PSA's water system.

The 2040 projected annual water demand for all the PSA's systems is 1,404 million gallons. The combined annual permitted capacity of the three (3) WTPs is 2,248 million gallons. [This includes the approved but not yet constructed increase in capacity at the Greater Tazewell Regional WTP]. The 2040 projected demand is sixty-two percent (62%) of available WTPs capacities. When the projected demand on the WTPs from of systems outside of the county are included, the projected available water delivery capacity of the WTP is twenty-seven percent (27%).

The Bluefield Valley Waterworks provides water to a service area south of the Town of Bluefield and is supplied potable water from West Virginia American Water Company's Ada WTP in Bluefield, WV. An interconnection with the Town of Bluefield water system allows

transfer of potable water into the Town's system if needed. The 2040 projected annual water demand for the Bluefield Valley system is 41 million gallons. This projected demand is seven percent (7%) of available capacity of the Ada WTP. Water delivery capacity is available to meet the Bluefield Valley system's 2040 projected demand.

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. However, as noted for Russell County above, the Claypool Hill WTP may not have sufficient capacity to supply water service extension projects identified in Russell County.

Self-supplied, non-agricultural, non-residential user water consumption is 27 million gallons annually. Sixty-three percent (63%) is from surface water sources and thirty-seven percent (37%) from ground water sources. The cumulative demand is less than two percent (<2%) of the projected 2040 demand from community water systems. This self-supplied demand is not projected to increase during the planning period.

8.2.52 Town of Bluefield

The Town of Bluefield water system is supplied potable water produced at the Town's WTP. The Bluestone River is the sole source of water to the WTP. Dill Spring is a groundwater source to the Town.

System interconnections are in place which allow supply of water to the Town from the Bluefield Valley Waterworks (supplied by the Ada WTP in Bluefield, WV) or from Tazewell County PSA's Eastern Tazewell County water system (supplied by the Greater Tazewell Regional WTP).

The 2040 projected annual water demand for the Town's system is 532 million gallons. The WTP's annual permitted capacity is 548 million gallons. The 2040 projected demand is ninety-seven percent (97%) of available capacity. This results in a projected available water delivery capacity of three percent (3%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. However, the VDH Office of Drinking Water requires a water system to submit plans for meeting demand when the system exceeds eighty percent (80%) of its capacity for three (3) consecutive months. Demand on the Town's water system currently approaches eighty percent of the Town's WTP capacity. However, interconnection with Bluefield Valley water system increases available water capacity, resulting in the projected 2040 demand accounting for less than eighty percent (<80%) of capacity. The WTP supplying the Bluefield Valley system currently has 1.5 MGD capacity available. In addition, connection with the Eastern Tazewell water system would increase the amount of potable water available to the Town's system.

8.2.53 Town of Cedar Bluff

The Town of Cedar Bluff water system is supplied potable water produced at the Town of Richland's WTP, as well as a small portion (less than five percent) from the Tazewell County PSA Claypool Hill WTP.

The 2040 projected annual water demand for the Town's system is 56 million gallons. This projected demand is six percent (6%) of the Richlands WTP's annual permitted capacity of 912 million gallons. Water delivery capacity is available to meet the Town's projected demand.

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.54 Town of Cleveland

The Town of Cleveland water system is supplied potable water produced at the Town's wells.

The 2040 projected annual water demand for the Town's system is 8 million gallons. The WTP's annual permitted capacity is 29 million gallons. The 2040 projected demand is twenty-eight percent (28%) of available capacity. This results in a projected available water delivery capacity of seventy-two percent (72%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.55 Town of Clintwood

The Town of Clintwood's water system is supplied potable water produced at the John Flannagan WTP. John Flannagan Reservoir is the sole source of water to the WTP.

The Town's system delivers water to Dickenson County PSA's Skeetrock water system, Osborns Gap water system, Honey Camp water system, Rush Creek water system, and the Bold Camp water system in Wise County.

The 2040 projected annual water demand for the Town's system is 238 million gallons. The John Flannagan WTP's annual permitted capacity is 2,686 million gallons. The 2040 projected demand is nine percent (9%) of available WTP capacity. When the projected demands of all systems supplied by the WTP are combined, the projected available water delivery capacity of the WTP is thirty-six percent (36%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. However, as noted for Buchanan County above, delivery of potable water from the WTP to the Town through the existing transmission line is a concern, due to apparent infrastructure deterioration.

8.2.56 Town of Honaker

The Town of Honaker water system is supplied potable water produced from the Town's wells.

The 2040 projected annual water demand for the Town's system is 57 million gallons. The WTP's annual permitted capacity is 85 million gallons. The 2040 projected demand is sixty-seven percent (67%) of available capacity. This results in a projected available water delivery capacity of thirty-three percent (33%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.57 Town of Lebanon

The Town of Lebanon water system is supplied potable water produced at the Town's WTP. Big Cedar Creek is the sole source of water to the WTP.

The Town's system supplies all water to Russell County PSA's Poor Farm community water system.

The 2040 projected annual water demand for the Town's system is 217 million gallons. The WTP's annual permitted capacity is 456 million gallons. The 2040 projected demand is forty-eight percent (48%) of available capacity. This results in a projected available water delivery capacity of fifty-two percent (52%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.58 Town of Pocahontas

The Town of Pocahontas water system is supplied potable water produced at the Town's WTP. Big Spring (Abbs Creek) is the sole source of water to the WTP.

The Town's system delivers water to Tazewell County PSA's Falls Mills water system.

The 2040 projected annual water demand for the Town's system is 109 million gallons. The WTP's annual permitted capacity is 181 million gallons. The 2040 projected demand is sixty percent (60%) of available capacity. This results in a projected available water delivery capacity of forty percent (40%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.59 Town of Richlands

The Town of Richlands water system is supplied potable water produced at the Town's WTP. The Clinch River is the sole source of water to the WTP.

The Town's system delivers water to Tazewell County PSA's Daw Road water system and Raven Doran water system, from which water is conveyed to Buchanan County PSA's Shortts Gap system.

The 2040 projected annual water demand for the Town's system is 576 million gallons. The WTP's annual permitted capacity is 912 million gallons. The 2040 projected demand is sixty-three percent (63%) of available capacity. This results in a projected available water delivery capacity of thirty-seven percent (37%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.60 Town of Tazewell

The Town of Tazewell is supplied potable water produced at the Greater Tazewell Regional WTP.

The 2040 projected annual water demand for the Town's system is 650 million gallons. This projected demand is eighty-nine percent (89%) of the Greater Tazewell Regional WTP's annual permitted capacity of 730 million gallons. Plans have been designed and approved to increase the WTP capacity from current 1.95 MGD to 2.66 MGD, matching the permitted withdrawal capacity from all sources. This will result in a projected available water production capacity of thirty-three percent (33%). Water delivery capacity is available to meet the Town's projected demand.

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.61 Summary

The adequacy of existing supplies to meet demand projections at the end of the planning period (2040) was evaluated for Buchanan County, Dickenson County, Russell County, Tazewell County, and the Towns of Bluefield, Cedar Bluff, Cleveland, Clintwood, Honaker, Lebanon, Pocahontas, Richlands, and Tazewell.

Evaluation indicated that existing water supplies appear adequate to meet the demand projections of the localities examined, except for the Castlewood Water and Sewer Authority system in Russell County, the Russell County PSA systems served by the Claypool Hill WTP.

Water systems operated by the Buchanan County PSA, the Dickenson County PSA, and the Town of Clintwood are supplied potable water by the John Flannagan Water Authority through transmission lines that convey water to the respective systems. The transmission lines will require rehabilitation during the planning period, and alternative delivery of potable water to portions of these systems may have greater viability from an economic standpoint.

A key component in determining demand projections was that all systems in the planning area would complete necessary improvements during the planning period to achieve a minimum water accountability of seventy percent (70%) in every system. For several systems, significant funding will be required to accomplish the necessary improvement in water accountability.

LENOWISCO

This section evaluates the adequacy of existing water sources to meet current and projected demand in the LENOWISCO Planning Area.

In the Phase II Development of the LENOWISCO Water Supply Plan, the total water demand in the planning area was projected to decrease approximately four percent (4%) between 2010 and 2040 (page 14 of 2008 report). This indicates that existing sources, if currently sufficient, should provide for the water supply needs of the planning area throughout the planning period.

As noted in the Phase II Development Report, projected water demand reflects the impact of four (4) parameters: population changes, extension of existing water service to new areas, change in water use due to economic activities, and improvement in water system delivery efficiency.

Population changes and economic activity did not impact projected water demand, because changes in population projections over the planning period were slight (0.1% per year). No known economic activity in the planning area during the planning period was identified and documented that would utilize additional water. Since completion of the Phase II report, the Dominion Virginia City Hybrid Energy Center has been proposed and is under construction. The additional annual demand of 365 million gallons would constitute approximately ten percent (10%) of the overall planning area demand. This volume has been accounted for in this analysis; however, the demand is not for potable (treated) water, and permitted capacity and infrastructure are both in place to address this additional demand.

Proposed extensions of existing water systems to areas currently unserved were quantified in Phase II of the report. Improvement in water system delivery efficiency was quantified by assuming that all systems would have achieved accountability of at least seventy percent (70%) by the end of the planning period.

The adequacy of existing supplies to meet demand projections at the end of the planning period (2040) is evaluated for the three (3) counties, one (1) city, and twelve (12) towns that maintain water systems.

The adequacy of existing supplies to meet demand projections at the end of the planning period (2040) was evaluated for Lee County, Scott County, Wise County, the City of Norton, and the Towns of Appalachia, Big Stone Gap, Clinchport, Coeburn, Dungannon, Gate City, Jonesville, Nickelsville, Pennington Gap, Pound, St. Paul, and Wise.

Evaluation indicated that existing water supplies appear adequate to meet the demand projections of all of the localities. However, demand projections for the Towns of Gate City and Nickelsville exceed eighty percent (80%) of system capacity, a threshold at which the Office of Drinking Water requires plans and specifications to be developed for expansion of the waterworks. The demand projections at the end of the planning period are equivalent to current demand for the two (2) towns.

However, plans and specifications for expansion are not required if the growth within the service area is limited and will not exceed the rated capacity of the waterworks (12 VAC 5-590-520). The demand projections for the water systems for the Towns of Gate City and Nickelsville do not exceed the rated capacity of the respective systems.

A key component in determining demand projections was that all systems in the planning area would complete necessary improvements during the planning period to achieve a minimum water accountability of seventy percent (70%) in every system. For several systems, significant funding will be required to accomplish the necessary improvement in water accountability.

This section evaluates the adequacy of existing water sources to meet current and projected demand in the Cumberland Plateau Regional Planning Area.

8.2.62 Lee County

The Lee County PSA owns and operates eleven (11) public water systems in the County. The PSA's Lee County water system receives potable water produced at the KVS Quarry WTP (supplied with water from the KVS Quarry) and water produced at the Blue Spring WTP (supplied with water from Blue Spring). An interconnection with the Arthur Shawnee WTP in Tennessee is existing and would allow additional supply of water to the PSA system. The 2040

projected demand of 267 million gallons is sixty-five percent (65%) of the WTPs' combined capacities.

PSA's Keokee system is supplied from the Town of Appalachia system. The 2040 projected demand of 17 million gallons is six percent (6%) of the Appalachia WTP's capacity.

The Town of Big Stone Gap supplies potable water to the PSA's Jasper and Eastern Lee County systems. The 2040 projected demand of 66 million gallons is five percent (5%) of the WTP's capacity.

The Town of Pennington Gap supplies potable water to several PSA systems: Big Hill system, Millers Chapel system, Ely & Puckett Creek system (via the St. Charles Water Authority), Robbins Chapel system (via the St. Charles Water Authority), and Old Woodway Road system (via the Dryden Water Authority). The 2040 projected demand of 79 million gallons is eleven percent (11%) of the WTP's capacity.

The Town of Jonesville supplies the PSA's Fleenortown system. The 2040 projected demand of 8 million gallons is five percent (5%) of the Jonesville WTP's capacity.

The PSA's Stickleyville water system is supplied potable water from the Scott County PSA Duffield WTP. The 2040 projected demand of 32 million gallons is eighteen percent (18%) of the Duffield WTP's capacity.

The Dryden Water Authority water system and the St. Charles Water Authority system are supplied potable water from the Town of Pennington Gap WTP. The Woodway Water Authority system delivers water received from either the Pennington Gap WTP or the Jonesville WTP. Harvest Baptist Ministries operates a water system supplied by a well.

The portion supplied to PSA systems from other systems and the treatment capacity of those systems utilized by PSA systems is given in million gallons per year and percentage, respectively: Appalachia WTP (17 MG, 6%), Big Stone Gap WTP (66 MG, 5%), Pennington Gap WTP (79 MG, 11%), Scott County PSA Duffield WTP (32 MG, 18%), Jonesville WTP (8

MG, 5%). For each WTP referenced above, the 2040 projected demand is less than eighty percent (80%) of available WTP capacity.

The 2040 projected demands for the Dryden Water Authority system, St. Charles Water Authority system, and the Woodway Water Authority system have been included in the demands on the Pennington Gap WTP and Jonesville WTP. Sufficient treatment capacity exists to supply the projected demands from these systems in 2040.

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.63 Scott County

The Scott County PSA owns and operates six (6) public water systems in the County. The PSA's Duffield water system receives potable water produced at the Duffield WTP, supplied with water from the North Fork Clinch River and Spurlock Branch. This system delivers water to the Lee County PSA Stickleyville system. The 2040 projected demand of 46 million gallons is twenty-five percent (25%) of the WTP's capacity.

The PSA's Moccasin Gap water system receives potable water produced at the Moccasin Gap WTP, supplied with water from Big Moccasin Creek. This system delivers a portion of potable water to the Town of Gate City's system. The 2040 projected demand of 102 million gallons is thirty-seven percent (37%) of the WTP's capacity.

The PSA's Daniel Boone water system receives potable water produced at the Gate City WTP, supplied with water from Big Moccasin Creek. The 2040 projected demand of 20 million gallons is eleven percent (11%) of the Gate City WTP's capacity.

The PSA's ECV water system receives potable water produced from the Lynn Mar Well, as well as from the Bloomingdale Utility District WTP (BUD) in Tennessee. The purchase agreement with BUD is for up to 100,000 gallons per day (36 million gallons annually). The 2040 projected demand of 17 million gallons is forty-seven percent (47%) of the purchase agreement capacity.

The PSA's Boozy Creek water system receives potable water produced at the BUD WTP. The 2040 projected demand of 7 million gallons is twenty percent (20%) of the purchase agreement with BUC.

The PSA's Cove Creek water system receives potable water from the Washington County Service Authority (WCSA). The 2040 projected demand of 1 million gallons is less than one percent (<1%) of the WCSA system capacity.

The Spring Valley Subdivision water system and the East Carters Valley water system are owned and operated by the BUD. Their 2040 projected demands of 16 million gallons and 18 million gallons, respectively, constitute five percent (5%) of the BUD WTP capacity. Reedy Creek is the source of water for the BUD WTP.

The 2040 projected aggregated annual water demand for the PSA's systems is 193 million gallons. This projected demand is forty-two percent (42%) of the annual permitted capacity of the Duffield WTP and Moccasin Gap WTP identified above. This results in a projected available water delivery capacity of fifty-eight percent (58%), not including available capacity at the Gate City WTP or the BUD WTP.

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.64 Wise County

The Wise County PSA owns and operates eight (8) public water systems in the County. The PSA's Regional water system utilizes potable water produced at the Carfax WTP, supplied with water from the Clinch River. This system delivers water to the Dickenson County PSA's Sandy Ridge system and also provides a portion of the water used by the City of Norton water system and the City's Norton – U.S. 58 East system. The PSA Regional system also has physical connections that enable conveyance of water to the Town of Coeburn system, the Town of Wise system, the Town of Pound system, and the Bold Camp water system. The 2040 projected demand of 395 million gallons is fifty-four percent (54%) of the WTP's capacity.

The PSA's Dunbar water system receives potable water produced by the Drilled Well. The 2040 projected demand of 4 million gallons is sixty-one percent (61%) of the well's VDH approved capacity for withdrawal.

The PSA's Appalachia #1 water system receives potable water produced at the Appalachia WTP, supplied with water from Bens Branch Reservoir. The 2040 projected demand of 17 million gallons is six percent (6%) of the Appalachia WTP's capacity.

The PSA's Norton #1 water system and Blackwood water system receive potable water from the City's water system. The 2040 projected demand of 49 million gallons (combined from these two (2) systems) is nine percent (9%) of the City WTP's capacity.

The PSA's Wise #2 water system receives potable water from the Town of Wise water system. The 2040 projected demand of 21 million gallons is eight percent (8%) of the Town WTP's capacity.

The PSA's South Mountain water system receives potable water from the Town of Pound water system. The 2040 projected demand of 14 million gallons is eight percent (8%) of the Town WTP's capacity.

The PSA's Mill Branch water system receives potable water from the Bold Camp water system. The 2040 projected demand of 14 million gallons is less than one percent (<1%) of the John Flannagan WTP's capacity.

The PSA's Flatwoods water system receives potable water from the Town of Coeburn water system. The 2040 projected demand of 4 million gallons is one percent (1%) of the Town WTP's capacity.

The Bold Camp water system receives potable water from the John Flannagan WTP (via the Town of Clintwood system). This system conveys water to the PSA's Mill Branch system. The 2040 projected demand of 17 million gallons is seven percent (7%) of the Town of Clintwood system capacity.

The 2040 projected aggregated annual water demand for the PSA's systems is 518 million gallons. This projected demand is seventy-one percent (71%) of the annual permitted capacity of the Carfax WTP identified above. This results in a projected available water delivery capacity of twenty-nine percent (29%), not including available capacity at the Norton City WTP or the Coeburn WTP.

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

Additional non-potable consumption is projected to be one million gallons per day at the proposed Dominion Virginia City Hybrid Energy facility (power plant). This volume of water will be withdrawn from either of two (2) existing intakes on the Clinch River: the Town of St. Paul water system intake or the Wise County PSA water intake. The projected daily volume is less than the available water withdrawal permits for either intake.

8.2.65 City of Norton

The City of Norton water system is supplied potable water produced at the City's WTP. The Upper Norton Reservoir and Lower Norton Reservoir provide the source of water to the WTP. A portion of the City system receives potable water from the Wise County PSA system. Potable water from the City WTP supplies the City's Norton – U.S. 58 East water system.

The City delivers potable water to two (2) of the Wise County PSA systems: Blackwood and Norton #1.

An interconnection is in place between the City's system and the Town of Big Stone Gap water system that would allow supply of water from one system to the other in the event such a need occurred.

The 2040 projected annual water demand for the City's system is 300 million gallons. The WTP's annual permitted capacity is 526 million gallons. The 2040 projected demand is fifty-seven percent (57%) of available capacity. This results in a projected available water delivery capacity of forty-three percent (43%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.66 Town of Appalachia

The Town of Appalachia water system is supplied potable water produced at the Town's WTP. Bens Branch Reservoir provides water to the WTP for treatment. The Town also has an intake on the Powell River from which additional source water can be pumped to Bens Branch Reservoir.

The Town's system supplies all water to both the Lee County PSA Keokee water system and the Wise County PSA Appalachia #1 system.

The 2040 projected annual water demand for the Town's system is 120 million gallons. This projected demand is forty-four percent (44%) of the Town WTP's annual permitted capacity of 274 million gallons. This results in a projected available water delivery capacity of fifty-six percent (56%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. Funding has been secured to construct an interconnection between the Town's system and the Town of Big Stone Gap system. This interconnection will augment the available supply to each system, and improve reliability of the Town's system.

8.2.67 Town of Big Stone Gap

The Town of Big Stone Gap water system is supplied potable water produced at the Town's WTP. Big Cherry Reservoir supplies water to the WTP for treatment. The Town's system supplies all water to the Lee County PSA Eastern Lee water system and the PSA's Jasper water system. Potable water can be further conveyed from those systems to the Scott County PSA Duffield system and the Dryden Water Authority Systems.

The 2040 projected annual water demand for the Town's system is 344 million gallons. This projected demand is twenty-four percent (24%) of the Town WTP's annual permitted capacity of

1,460 million gallons. This results in a projected available water delivery capacity of seventy-six percent (76%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. Funding has been secured to construct an interconnection between the Town's system and the Town of Appalachia system. This interconnection will improve the available supply to each system, and improve reliability of both systems.

8.2.68 Town of Clinchport

The Town of Clinchport's water system is supplied potable water produced at the Town's two (2) wells. The 2040 projected annual water demand for the Town's system is 2.4 million gallons. The water system's annual permitted capacity is 11 million gallons. The 2040 projected demand is twenty-two percent (22%) of available WTP capacity. The projected available water delivery capacity of the Town's system is seventy-eight percent (78%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.69 Town of Coeburn

The Town of Coeburn is supplied potable water produced at the Town's WTP. Sources of water for treatment include the Tom's Creek Reservoir and the Jenny Mine Well. The Town also receives a portion of water for its system from the Wise County PSA.

The 2040 projected annual water demand for the Town's system is 206 million gallons. This projected demand is forty-nine percent (49%) of the Town WTP's annual permitted capacity of 420 million gallons. This results in a projected available water production capacity of fifty-one percent (51%). Water delivery capacity is available to meet the Town's projected demand.

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.70 Town of Dungannon

The Town of Dungannon water system receives potable water from the Town's membrane WTP. The Town's two (2) wells are the source of water to the WTP.

The 2040 projected annual water demand for the Town's system is 14.4 million gallons. The WTP's annual permitted capacity is 28.1 million gallons. The 2040 projected demand is fifty-one percent (51%) of available capacity. This results in a projected available water delivery capacity of forty-nine percent (49%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.71 Town of Gate City

The Town of Gate City water system is supplied potable water produced at the Town's WTP. Big Moccasin Creek is the sole source of water to the WTP. The Town's system supplies all water to Scott County PSA's Daniel Boone water system.

The 2040 projected annual water demand for the Town's system is 154 million gallons. The WTP's annual permitted capacity is 182 million gallons. The 2040 projected demand is eighty-five percent (85%) of available capacity. This results in a projected available water delivery capacity of fifteen percent (15%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. The available capacity is less than the twenty percent recognized by the VDH, however, an interconnection with the Scott County PSA Moccasin Gap system is in place which could supply additional water to the Town.

8.2.72 Town of Jonesville

The Town of Jonesville water system is supplied potable water produced at the Town's WTP. Wynn Spring is the sole source of water to the WTP. The Town has identified another source,

Slemp Spring, although the capacity has not been determined nor permitted. The Town's system supplies all water to Lee County PSA's Fleenortown water system, and supplies a portion of water used in the Woodway Water Authority system.

The 2040 projected annual water demand for the Town's system is 124 million gallons. The WTP's annual permitted capacity is 184 million gallons. The 2040 projected demand is sixty-seven percent (67%) of available capacity. This results in a projected available water delivery capacity of thirty-three percent (33%).

No additional water source capacity is required to meet demand during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.73 Town of Nickelsville

The Town of Nickelsville is supplied potable water supplied from the Town's six (6) wells.

The 2040 projected annual water demand for the Town's system is 27.6 million gallons. This projected demand is eighty-eight percent (88%) of the Town's annual permitted capacity of 31.4 million gallons. This results in a projected available water delivery capacity of twelve percent (12%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand. However, the VDH Office of Drinking Water requires a water system to submit plans for meeting demand when the system exceeds eighty percent (80%) of its capacity for three (3) consecutive months. Demand on the system is currently above eighty percent (80%) of capacity, but no additional demand is projected.

8.2.74 Town of Pennington Gap

The Town of Pennington Gap is supplied potable water produced at the Pennington Gap WTP. The Powell River is the sole source of water to the WTP. The Town's system supplies a portion of water used in the Woodway Water Authority system and all water used in the Dryden Water Authority system and in the St. Charles Water and Sewer Authority system. The Town

delivers water directly to Lee County PSA's Miller Chapel water system and Big Hill water system. The Town is the source of potable water used in the Lee County PSA Old Woodway Road system (delivered through the Dryden Water Authority), and in the Lee County PSA Robbins Chapel system and Ely & Puckett Creek system (delivered through the St. Charles W&S Authority).

The 2040 projected annual water demand for the Town's system is 574 million gallons. This projected demand is seventy-nine percent (79%) of the Town WTP's annual permitted capacity of 730 million gallons. This will result in a projected available water production capacity of twenty-one percent (21%). Water delivery capacity is available to meet the Town's projected demand.

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.75 Town of Pound

The Town of Pound is supplied potable water produced at the Town's WTP. Source water to the WTP is withdrawn from the Pound Reservoir. The Town also operates the Bold Camp water system, which receives potable water from the Town of Clintwood system treated at the John Flannagan WTP. The Pound water system supplies water to the Wise County PSA South Mountain water system.

The 2040 projected annual water demand for the Town's system is 107 million gallons. This projected demand is fifty-nine percent (59%) of the Town WTP's annual permitted capacity of 182 million gallons. This results in a projected available water production capacity of forty-one percent (41%).

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.76 Town of St. Paul

The Town of St. Paul is supplied potable water produced at the St. Paul WTP. Source water to the WTP is withdrawn from the Clinch River. The Town supplies water to the Castlewood Water and Sewer Authority in Russell County.

The 2040 projected annual water demand for the Town's system is 69.6 million gallons. This projected demand is thirty-eight percent (38%) of the St. Paul WTP's annual permitted capacity of 182 million gallons. This results in a projected available water production capacity of sixty-two percent (62%). Water delivery capacity is available to meet the Town's projected demand.

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.77 Town of Wise

The Town of Wise is supplied potable water produced at the Town's WTP. Sources of water for treatment include the Bear Creek Reservoir and the White Oak Mine Well. The Town supplies water to the Wise County PSA Wise #2 system.

The 2040 projected annual water demand for the Town's system is 256 million gallons. This projected demand is forty-seven percent (47%) of the Town WTP's annual permitted capacity of 548 million gallons. This results in a projected available water production capacity of fifty-three percent (53%). Water delivery capacity is available to meet the Town's projected demand.

No additional water source capacity is required to meet demand of during the planning period. The available capacity appears to be adequate to meet the 2040 projected demand.

8.2.78 Summary

The adequacy of existing supplies to meet demand projections at the end of the planning period (2040) was evaluated for Lee County, Scott County, Wise County, the City of Norton, and the Towns of Appalachia, Big Stone Gap, Clinchport, Coeburn, Dungannon, Gate City, Jonesville, Nickelsville, Pennington Gap, Pound, St. Paul, and Wise.

Evaluation indicated that existing water supplies appear adequate to meet the demand projections of all of the localities. However, demand projections for the Towns of Gate City and Nickelsville exceed eighty percent (80%) of system capacity, a threshold at which the Office of Drinking Water requires plans and specifications to be developed for expansion of the waterworks. The demand projections at the end of the planning period are equivalent to current demand for the two (2) towns.

However, plans and specifications for expansion are not required if the growth within the service area is limited and will not exceed the rated capacity of the waterworks (12 VAC 5-590-520). The demand projections for the water systems for the Towns of Gate City and Nickelsville do not exceed the rated capacity of the respective systems.

A key component in determining demand projections was that all systems in the planning area would complete necessary improvements during the planning period to achieve a minimum water accountability of seventy percent (70%) in every system. For several systems, significant funding will be required to accomplish the necessary improvement in water accountability.

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