WATER AND SEWER MASTER PLAN

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EXECUTIVE SUMMARY

Background

The original Comprehensive Water and Wastewater Study for Bedford County was prepared in 1994. After significant growth in the 1990's, an update to the study was completed in 2000. Continued growth in the County led to the authorization in 2007 for a second update to the study. This document reports the results of the 2008 update.

This update documents the existing infrastructure associated with public water and sewer service. The update provides a roadmap of project work which will likely be needed in coming years to meet the water and sewer demands of County residents and businesses as growth in the County continues. The report can be used by the Bedford County Public Service Authority (BCPSA) for orderly planning and budgeting for future water and wastewater system improvements. Most importantly, the program of improvements identified in the report is flexible. Projects may be added, removed or rescheduled to fit the needs of BCPSA.

Overview (See Report Section 1.0)

With regard to water supply, Bedford County enjoys a location which can be served from any one or a combination of three major water sources, namely 1) Western Virginia Water Authority (WVWA), 2) City of Lynchburg and 3) Smith Mountain Lake. These supplies are situated on the western, eastern and southern borders of the County respectively. There is a good opportunity to provide regional transmission mains across the County to encourage water exchange and drought resistance. In addition, there is a key opportunity for BCPSA to expand its source on Smith Mountain Lake and expand its role in serving water throughout the County and beyond. A system of regional projects has been identified in this report for transmission of major water volumes.

BCPSA currently operates water systems in 1) Stewartsville area, 2) Boonsboro, Forest and New London areas, 3) Smith Mountain Lake area and 4) Hillcrest, just west of the City of Bedford. Montvale Water Company (MWC) operates a system in the Montvale area. The City of Bedford provides water service throughout the City and to some areas of the County near the city limits. These local areas of service have been reviewed in this report and recommendations are made for the improvement of the stand-alone systems.

When considering sewer service in the County, the 2000 update suggested some major regional sewer collection and treatment initiatives. However, in 2003, a separate study examined the viability of regional wastewater service and suggested instead that BCPSA concentrate on the development of sewers in the local areas, to maintain affordability of service to the BCPSA customers. This report does not consider regional interconnections, but provides recommendations for local improvements in the BCPSA systems, namely 1) Montvale, 2) Boonsboro, Forest, and New London areas, and 3) Smith Mountain Lake/ Moneta. In addition, sewer service in the Stewartsville area is anticipated in the near future, to be operated by BCPSA. The City of Bedford also provides sewer service throughout the City and to some areas of the County near the city limits.

In identifying improvements in the County, care has been taken to avoid installation of water and sewer infrastructure in agricultural areas and areas unprepared for growth. The Bedford County 2025 Comprehensive Plan, adopted June 25, 2007, and the draft Region 2000 Water Supply Plan have been consulted for coordination of improvements. Improvements are programmed for significant highway corridors and planned growth areas.

Demand Projections (See Report Section 2.0)

Considering population increases and the extension of water services into new areas of the County, water demand projections for the next 20 years were developed as shown in Table ES-1 (same as Table 5 in report):

Table ES-1: Projection of BCPSA Water Demands (Billings)

System	2008 Est. Demand (gpd)	2018 Est. Demand (gpd)	2028 Est. Demand (gpd)	Rates of Increase By Decade [1]
Stewartsville[2] (Blue Ridge)	20,523	32,990	38,224	5.0/1.1
Hillcrest[3] (Central)	8,870	8,870	8,870	0.0/0.0
Forest[4] (Jefferson)	1,398,419	1,953,632	2,179,487	3.4/1.1
High Point[5] (Lakes)	220,462	475,961	571,419	8.0/1.5
Totals	1,648,274	2,471,453	2,798,000	4.0/1.1

1. The first number is the rate of change from 2008 to 2018. The second number is the rate of change from 2018 to 2028.
2. The Stewartsville System relies on an agreement with WVWA.
3. Hillcrest uses groundwater.
4. Forest is fed from Lynchburg under an active agreement.
5. The majority of the Lakes systems will be served by the 1.0 MGD HPWTP; Mountain View Shores and Valley Mills Crossing use groundwater.

Similarly, sewer service demand projections were made, but with a lower level of construction attention than will be evident for water system expansion. See Table ES-2 (same as Table 6 in report):

Table ES-2: Projections of BCPSA Sewer Demands (Billings)

System	2008 Est. Demand (gpd)	2018 Est. Demand (gpd)	2028 Est. Demand (gpd)	Rates of Increase By Decade [1]
Stewartsville[2] (Blue Ridge)	0	30,000	67,500	NA/8.4
Montvale[3] (Blue Ridge)	2,000	20,000	40,000	25.8/7.2
Forest Central[4] (Jefferson)	330,000	560,000	660,000	5.5/1.7
Moneta[5] (Lakes)	40,000	221,600	270,000	18.8/2.0
Totals	372,000	831,600	1,037,500	8.4/2.2

1. The first number is the rate of change from 2008 to 2018. The second number is the rate of change from 2018 to 2028.
2. Stewartsville could be served by a local 150,000 gpd WWTP.
3. Montvale local WWTP is 50,000 gpd
4. Forest wastewater is conveyed to and treated at the Lynchburg Regional WWTP, with 1.0 mgd average capacity having been purchased.
5. Lakes local WWTP at Moneta is 0.5 mgd

Analysis Methods (See Report Section 3.0)

Water and sewer projects recommended in the prior report and update have been included in this update. Several of the previously recommended projects, along with others, have been constructed and are shown as existing infrastructure on the Figures 2 through 18 of this report. In addition to prior recognized projects, new water extensions and loops to designated growth areas have been recommended to provide the backbone for future water service to developments planned for the growth areas. Sewer extensions have been prescribed as denoted in the separate 2003 study, since it was the most recent assessment of sewer requirements in the County.

Similar to the original report and first update, the County was divided into five areas for the analysis of water and sewer systems. However, contrary to the previous reports, this report uses the existing magisterial districts of the County for the five areas. The areas include 1) Blue Ridge, 2) Center, 3) Jefferson, 4) Lakes and 5) Peaks.

In cost estimating for the recommended improvements, capital costs have been estimated based upon 2008 economy and dollars. In addition, the increased annual Operation and Maintenance costs have been estimated. Net present value of each improvement has been calculated on the basis of a 20 year operation period, with value of money changing at 6% per year.

Water System Results and Recommendations (See Report Section 4.0)

The analysis of regional water systems included a number of options for increasing the capacity of the High Point Water Treatment Plant (HPWTP), and/or relocation of the Water Treatment Plant to County lands at Camp 24 Correctional Facility. The regional options also considered major water mains to connect systems in the Lakes area with Franklin County, Stewartsville, Montvale, City of Bedford and Forest (Boonsboro, Forest and New London). The regional projects are shown on Figure 2 in the report. Table ES-3 shows the regional project cost estimates (same as a portion of Table 10 in report).

Table ES-3: Summary of Proposed Regional Water Costs

Proposed Alternative REGIONAL PLANNING AREA	Project Cost Estimate	Present Value Cost Estimate
Lake Region WTP (2.0 MGD)	$ 4,206,800	$ 8,524,078
Lake Region WTP (5.0 MGD)	$ 24,796,200	$ 33,357,349
Lake Region WTP (10.0 MGD)	$ 44,421,000	$ 59,921,452
Lake Region WTP, City of Bedford Interconnect	$ 12,877,150	$ 12,971,892
Lake Region WTP, Stewartsville Interconnect	$ 9,468,550	$ 10,009,471
Stewartsville – Montvale Interconnect	$ 6,445,400	$ 6,512,728
Bedford – Montvale Interconnect	$ 4,409,600	$ 4,455,594
Bedford County Forest Interconnect (Route 460)	$ 6,276,400	$ 6,706,866
Bedford – Forest Interconnect (Route 221)	$ 6,724,900	$ 7,168,786

Local water projects were identified on Figures 4 through 13 in this report. Table ES-4 shows the local project cost estimates for water projects (same as portion of Table 10 in report)

Table ES-4: Summary of Proposed Planning Area Water Costs

Proposed Alternative	Project Cost Estimate	Present Value Cost Estimate
BLUE RIDGE PLANNING AREA		
Vinton East	$ 128,050	$ 330,035
Stewartsville West Loop	$ 549,900	$ 557,700
Stewartsville East	$ 2,671,500	$ 2,696,963
Vinton to Hardy	$ 2,534,350	$ 2,561,534
Stewartsville to Hardy (Rt. 635)	$ 702,000	$ 711,176
Stewartsville to Hardy (Rt. 619)	$ 1,591,200	$ 1,608,061
Chamblissburg Extension	$ 3,130,400	$ 3,163,204
Industrial Commerce Park Extension	$ 481,650	$ 488,188
BLUE RIDGE WATER PROJECT TOTALS	$ 11,789,050	$ 12,116,860
CENTER PLANNING AREA		
Bedford City to Otter River School	$ 1,673,100	$ 1,691,337
Timber Ridge Extension	$ 2,275,000	$ 2,297,940
Route 460 Extension	$ 2,288,000	$ 2,312,890
Bedford City to Hillcrest	$ 687,700	$ 696,417
Casaloma/ Goode Loop	$ 585,000	$ 591,308
CENTER WATER PROJECT TOTALS	$ 7,508,800	$ 7,589,892

Proposed Alternative	Project Cost Estimate	Present Value Cost Estimate
JEFFERSON PLANNING AREA		
Route 643 Loop	$ 363,350	$ 368,282
Goode Loop	$ 1,296,750	$ 1,314,070
Valleywood Manor Loop	$ 118,300	$ 119,906
Route 622 Loop	$ 2,109,250	$ 2,131,502
Route 609 Extension	$ 1,294,800	$ 1,308,736
Route 221 Extension	$ 863,200	$ 872,032
Woods on Wiggington Loop	$ 436,150	$ 442,000
Route 621 Loop, Phase I	$ 551,200	$ 556,935
Route 621 Loop, Phase II	$ 798,850	$ 807,338
Boonsboro West Loop	$ 1,729,000	$ 1,747,811
Howard Drive	$ 565,500	$ 573,644
Holcomb Rock Road	$ 841,100	$ 850,161
Trents Ferry Road	$ 803,400	$ 813,952
Everett Road Loop	$ 296,400	$ 300,070
New London South Loop	$ 624,000	$ 632,602
JEFFERSON WATER PROJECT TOTALS	$ 12,691,250	$ 12,839,040
LAKES PLANNING AREA		
Upgrade High Point WTP to 1.0 MGD	$ 650,000	$ 2,058,506
Mountain View Shores Connector	$ 3,797,300	$ 3,837,101
Hendricks Store to Diamond Hill	$ 2,150,200	$ 2,253,429
LAKES WATER PROJECT TOTALS	$ 6,597,500	$ 8,149,036
PEAKS PLANNING AREA		
None	$ 0	$ 0
PEAKS PLANNING AREA TOTALS	$ 0	$ 0
GROWTH AREA PROJECTS		
Perennial Lane Loop (Center)	$ 1,072,500	$ 1,084,658
Belleview Road Extension (Center and Jefferson)	$ 1,350,700	$ 1,368,822
Goode Road Extension (Center and Jefferson)	$ 1,907,100	$ 1,932,563
Lee Jackson Highway Loop (Jefferson)	$ 3,334,500	$ 3,368,680
White House Road Loop (Lakes)	$ 1,527,500	$ 1,543,443
Radford Church Road Loop (Lakes)	$ 2,657,200	$ 2,684,957
Emmaus Loop (Lakes, Blue Ridge)	$ 5,153,850	$ 5,209,250
Goodview Town Road Loop (Blue Ridge)	$ 2,400,450	$ 2,425,913
GROWTH AREA PROJECT TOTALS	$ 19,403,800	$ 19,618,286

Sewer System Results And Recommendations (See Report Section 5.0)

Local sewer projects were identified on Figures 14 through 18 in the report. Table ES-5 shows the local project cost estimates for sewer projects (same as Table 12 in report).

Table ES-5: Summary of Proposed Planning Area Wastewater Costs

Proposed Alternative	Project Cost Estimate	Present Value Cost Estimate
BLUE RIDGE PLANNING AREA		
Stewartsville Area	$ 9,902,588	$ 11,676,870
Vinton East	$ 1,194,700	$ 1,302,976
Montvale	$ 2,588,950	$ 2,714,087
BLUE RIDGE WASTEWATER PROJECT TOTALS	$ 13,686,238	$ 15,693,933
CENTER PLANNING AREA		
NO CENTER PROJECTS	$ 0	$ 0
JEFFERSON PLANNING AREA		
New London/Elk Creek Drainage Basin	$ 23,713,950	$ 25,134,729
Lake Vista Interceptor	$ 2,025,400	$ 2,038,017
North Forest Area	$ 8,366,800	$ 8,451,219
Judith Creek	$ 2,453,100	$ 2,483,954
JEFFERSON WASTEWATER PROJECT TOTALS	$ 36,559,250	$ 38,107,919
LAKES PLANNING AREA		
Smith Mountain Lake Sewer Project Phases 1-6	$ 12,868,993	$ 15,267,238
Collectors	$ 8,309,600	$ 9,974,918
LAKES WASTEWATER PROJECT TOTALS	$ 21,178,593	$ 25,242,156
PEAKS PLANNING AREA		
NO PEAKS PROJECTS	$ 0	$ 0

Funding Options (See Report Section 6.0)

Water and sewer utility owners have a number of avenues to pursue when they need to finance capital improvement projects. Third party funding programs can include grant funds, 0% interest loans or low interest loans. Alternatively, projects can be funded using market rate loans or special fee assessments. More detail is provided in Section 6.0 of the report.

Conclusions and Recommendations (See Report Section 7.0)

Conclusions for Water

The Forest area of the County currently relies on the Lynchburg water system as a source. Projected growth in the Forest area, though rapid, is not expected to tax the available capacity in the Lynchburg system.

The Montvale water system has limited expansion capability. Therefore, future extensions or improvements may be necessary to allow for future growth. The private nature of this system may limit the expansion options for BCPSA.

The Stewartsville area of the County has the Western Virginia Water Authority (WVWA) water system as a source with some expansion capability. The projected growth in the Stewartsville area will not exceed the capacity of the WVWA water system.

The expansion of the High Point water treatment plant in the Lakes area of the County can provide treated water to most of the Lakes region with its expansion capability.

Recommendations for Water

Blue Ridge Planning Area

Continue to use the WVWA as a source. Plan to extend the Stewartsville system to the Stewartsville East, Vinton East, Chamblissburg, and Hardy areas.

As the Lakes and the Stewartsville growth areas continue to develop, provide long term water service to the Stewartsville area from the Lakes Region Water Treatment Plant on Smith Mountain Lake.

Continue water service for the Montvale Growth area through the Montvale Water Company.

Plan for future extensions to the Montvale area from Stewartsville and the City of Bedford to supplement the Montvale source if necessary.

Center Planning Area

Negotiate with the City of Bedford regarding participation in expansion of the Lakes Region Water Treatment Plant and of a transmission main from the Lakes area to supplement the needs of the City of Bedford.

Jefferson Planning Area

Within the term of the existing water agreement with Lynchburg, negotiate to obtain a long term commitment for providing water service to meet the needs of the entire Forest area, and possibly supplement the City of Bedford.

Depending on the water agreements worked out with the City of Lynchburg, transmission mains between Forest and the City of Bedford should be constructed to serve the long-term needs of the City of Bedford and the Center growth area.

Lakes Planning Area

Continue to develop the High Point water treatment plant to link each water system of the Lakes.

The High Point water treatment plant should be of an ultimate design capacity to serve the Lakes, Blue Ridge and Central planning areas. As discussed, this will eventually involve the construction of a new facility near the County's Camp 24 property.

Peaks Planning Area

No plans in the Peaks area.

Conclusions for Wastewater

Continued growth in the Jefferson planning area has caused the need for continued expansion of the Forest Central sewer system, and the need for a collection system and treatment facilities in the New London Area.

With the proposed industrial and commercial growth in the Montvale area, expanded wastewater facilities will be needed.

With the waterline being installed in Stewartsville, there is now a need for wastewater facilities.

Failing septic systems, lake contamination, and the desire for commercial development around Smith Mountain Lake has led to the need for wastewater facilities there.

Recommendations for Wastewater

Blue Ridge Planning Area

Construct a local treatment facility near Falling Creek. The facility should have an ultimate capacity to treat the flows from Vinton East, and Stewartsville.

Construct sewer extensions in the Montvale system.

Center Planning Area

No plans in the Center Area.

Jefferson Planning Area

Construct the proposed Elk Creek wastewater system to serve the New London, Ashton Ridge areas, and the Elk Creek Drainage Basin of Bedford County.

Work with the City of Lynchburg in determining line capacity in their system so that the Lake Vista Pump Station can be taken off line. If sufficient capacity is not available in the Lynchburg System, the Lake Vista force main can be extended to flow into Elk Creek Interceptor.

Lakes Planning Area

Due to the presence of failing septic systems in the Lakes region, continue development of the Smith Mountain Lake Sewer Project Phases 1 through 6.

Phasing of the lakes projects can be constructed as capacity and funding allow.

Peaks Planning Area

No plans in the Peaks area.

1.0

INTRODUCTION

1.0 INTRODUCTION

1.1 Purpose of this Study

The original Comprehensive Water and Wastewater Study for Bedford County was prepared in 1994, by Anderson & Associates, Inc., of Blacksburg, Virginia. Due to significant growth in the late 1990's, the study was revisited in the Bedford County Comprehensive Water & Sewer Study 2000 Update, also completed by Anderson & Associates, Inc. Continued growth in the County has led to the authorization of this second update to the study. With each study or update, Bedford County and the Bedford County Public Service Authority (BCPSA) have received the benefit of a guidance document to assist them in the planning, funding, engineering and implementation of water and sewer improvements. It is noted that many of the projects recommended in the original study and the first update have been completed.

The purpose of this report is to update the prior studies taking into account changed conditions in the County and its water and sewer infrastructure. This document will be used as a tool to acquaint the reader with the Authority's existing water and sewer systems. Most importantly, this report will be used by the Authority for orderly planning and budgeting of future water and wastewater system improvements. Projects may be added, removed, or rescheduled as the Authority's priorities change. The BCPSA mission statement is "*As an independent Authority the Bedford County Public Service Authority exists to anticipate the needs of the County for clean, high quality, water and wastewater services. We shall strive to provide these services to the people of Bedford County, when and where economically possible, at rates that are reasonable and just.*" This report is prepared to comply with the mission statement.

1.2 Background

In the original Water and Wastewater Study, the County was divided into five planning areas for organizational purposes. These five areas were identified as Blue Ridge, Center, Forest, Lakes and Peaks. Existing water and wastewater systems were identified, population projections were developed, and future water demands were determined for each of these areas. The original study also identified existing problems and potential service areas.

The 2000 update retained the five planning areas of the original study. The update did not reevaluate all of the features and factors of the original study. Only select areas, identified by the BCPSA as potential future service areas, or areas that had experienced many water and sewer changes were evaluated. Many of the projects that were proposed as part of the 1994 study had been constructed by the time of the update. These system changes were reflected in the update.

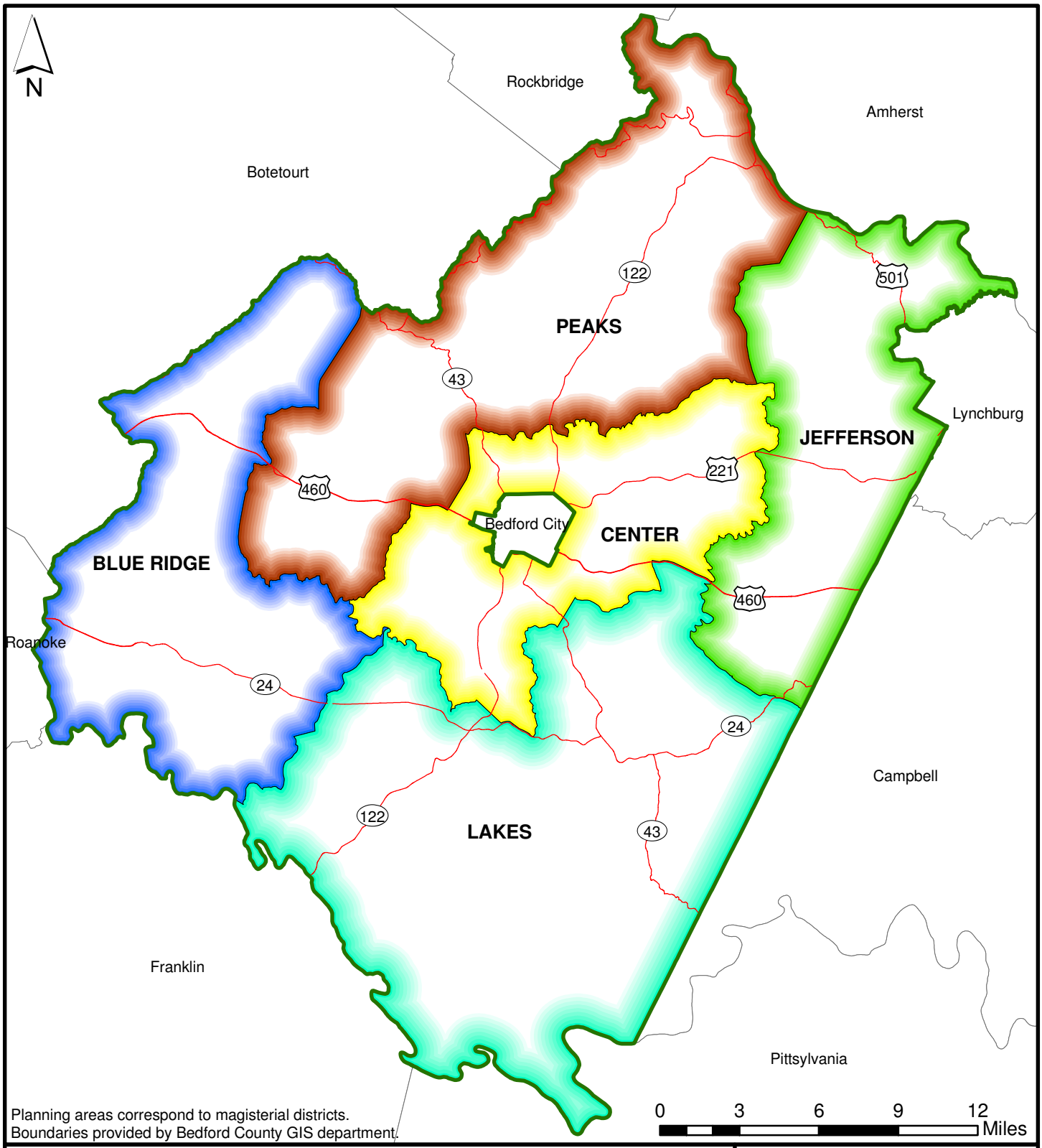
This 2008 Water and Sewer Master Plan revisits population projections and water demand projections and focuses upon those areas of the County which are likely to be future BCPSA service areas or continue to experience significant growth, potentially requiring public water or sewer extensions for service in the future. Many of the recommended projects in the first update have now been constructed. This 2008 Plan includes these system changes in updated maps and recommendations for future action.

It is worth noting that this Plan has been conducted with due consideration of the Bedford County 2025 Comprehensive Plan, adopted June 25, 2007 and the Region 2000 Water Supply Plan, being conducted concurrently with this Study. For better coordination with the County's Comprehensive Plan, the five planning areas of the prior studies have been slightly modified. The new areas are the magisterial districts of Blue Ridge, Center, Jefferson, Lakes and Peaks, which correspond exactly to the planning areas defined in the County's Comprehensive Plan. These areas are shown on a County map in Figure 1.

Specifically, this report will evaluate the following:

a. Water

1) Emphasize the use of the High Point Water Treatment Plant (HPWTP) as a regional plant to serve other parts of Bedford County, and possibly surrounding communities as well. This includes a possible relocation of the HPWTP to property owned by the County adjacent to the Blue Ridge Regional Jail Authority (BRRJA) Camp 24 site, for delivery of higher volumes of water (called Lakes Region Water Treatment Plant herein).



Planning areas correspond to magisterial districts.
Boundaries provided by Bedford County GIS department.

Planning Areas

Bedford County PSA
Comprehensive Water and Wastewater Study Update
Bedford County, Virginia

SCALE: to fit

PLAN NO. B05123-06

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DESIGNED GRM
DRAWN SMF
CHECKED GRM
DATE 12-26-08

FIGURE
1

2) Update the mapping to show recently constructed lines, primarily in the higher growth Blue Ridge, Jefferson and Lakes Areas, and to show additional potential line extensions desirable to satisfy zoning conditions and increase development incentives in targeted areas.

3) Water system deficiencies and recommend extensions to add dependability and redundancy where needed for reliable operations, particularly in the Jefferson Area, and

4) Evaluate connectivity of the Jefferson or Lakes Areas with the City of Bedford to provide redundancy and efficiencies to both the City and BCPSA systems.

b. Wastewater

1) Update the mapping to show recently constructed collectors, primarily in the higher growth Jefferson and Lakes Areas, and

2) To show additional potential system extensions desirable to satisfy zoning conditions and increase development in targeted areas.

1.3 Zoning

The Bedford County 2025 Comprehensive Plan includes both a zoning map and a land use map, as shown in Appendix C of this report. Chapter 7 of the Comprehensive Plan discusses the utilities in Bedford County, and lists the adoption of this Water and Sewer Master Plan as an objective. After the initial presentation of the Comprehensive Plan, the BCPSA became concerned with providing water and sewer service to all residential, commercial, and industrial districts; the effort to provide this service continues at this time. The Bedford County Zoning Ordinance also discusses the desired availability of water and sewer in each of the planning zones. Some of the zones identified in the Comprehensive Plan and Zoning Ordinance state that water and sewer are intended to be provided in the zones, while others are specifically intended not to include water and sewer service. Table 1 lists the zones and the intentions relative to utility coverage.

Table 1: Zoning Area Service Objectives

Zone	Coverage Anticipated
AP – Agricultural Rural Preserve	No Public Water or Sewer Service
AR – Agricultural Residential	Limited Public Water and Sewer Service
AV – Agricultural Village	Public Water and Sewer Service, if convenient
C-1 – Office	Public Water and Sewer Service
C-2 - Commercial	Public Water and Sewer Service
EP – Explore Park	Public Water and Sewer Service
I-1 - Low Intensity Industrial	Public Water and Sewer Service
I-2 – Higher Intensity Industrial	Public Water and Sewer Service
NC – Neighborhood Commercial	Public Water and Sewer Service
PCD – Planned Commercial Development	Public Water and Sewer Service
PD-1 – Planned Development	Public Water and Sewer Service
PID – Planned Industrial Development	Public Water and Sewer Service
PRD – Planned Residential Development	Public Water and Sewer Service
R-1 – Low Density Residential	Public Water and Sewer Service
R-2 – Medium Density Residential	Public Water and Sewer Service
R-3 – Medium Density Multi-Family Residential	Public Water and Sewer Service
City of Bedford	No service by BCPSA

With the future extension of infrastructure, the County would like to avoid encouraging development in the agricultural and special purpose districts. This report addresses these concerns by showing proposed projects targeted for the developable areas of the County.

2.0

POPULATION AND WATER DEMAND PROJECTIONS

2.0 POPULATION AND WATER DEMAND PROJECTIONS

2.1 Population

The 2000 Census showed Bedford County to be populated by 60,371 persons. The distribution of those persons and the relative growth rankings (1 is highest) of each area were identified as shown in Table 2 below:

Table 2: Bedford County 2000 Census Population by Magisterial District

Magisterial District	Population 2000 Census	Growth Rank
Jefferson	18,664	1
Lakes	11,711	2
Blue Ridge	14,407	3
Center	8,632	4
Peaks	6,957	5
Total	60,371	

The Weldon Cooper Initiative (W-C) and the Virginia Economic Commission (VEC) have projected population growth in the County. The following figures, shown in Table 3, are found in the Bedford County Comprehensive Plan, adopted June 25, 2007.

Table 3: Bedford County Population Projections

Year	Estimate	Source
2006	65,033	W-C
2010	69,400	VEC
2020	77,400	VEC
2030	83,200	VEC

2.2 Water Demand Projections

The Region 2000 Water Supply Plan, as drafted in 2008, has reported that the served population of the water systems operated by Bedford County Public Service Authority is about 17,500. As of December 1, 2008 the Authority had 8,041 water connections and 1,344 wastewater connections; a breakdown of these connections is shown in Table 4.

Table 4: BCPSA Connection Details as of December 1, 2008

District	System	Connections
Water Systems		
Jefferson	Forest Central	6,875
Lakes	SML Central	811
Lakes	Mountain View Shores	189
Lakes	Valley Mills Crossing	27
Central	Hillcrest	52
Blue Ridge	Stewartsville	87
	Total	8,041
Wastewater Systems		
Jefferson	Forest Central	1,198
Lakes	Moneta	141
Blue Ridge	Montvale	5
	Total	1,344

Public service, by population, represents about 26% of the total County population, if we choose to accept the Weldon Cooper estimate of population in 2006 as representative for today. Intuitively, one would project that the water and sewer infrastructure will inevitably be expanded to provide service to many of the existing residents currently on individual wells or within privately supplied systems, as well as many of the new residents anticipated in the population growth projections. Accordingly, water demands should grow at a faster rate than population. An approximation of current and future water flows are provided in Table 5.

Table 5: Projection of BCPSA Water Demands (Billings)

System	2008 Est. Demand (gpd)	2018 Est. Demand (gpd)	2028 Est. Demand (gpd)	Rates of Increase By Decade [1]
Stewartsville[2] (Blue Ridge)	20,523	32,990	38,224	5.0/1.1
Hillcrest[3] (Central)	8,870	8,870	8,870	0.0/0.0
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1. The first number is the rate of change from 2008 to 2018. The second number is the rate of change from 2018 to 2028.
2. The Stewartsville System relies on an agreement with WVWA.
3. Hillcrest uses groundwater.
4. Forest is fed from Lynchburg under an active agreement.
5. The majority of the Lakes systems will be served by the 1.0 MGD HPWTP; Mountain View Shores and Valley Mills Crossing use groundwater.

The Water Supply Plan has projected overall growth in public water supply demand for Bedford County systems (BCPSA and Montvale) at 4% per year for the first ten years of study, followed by 1.1% growth henceforth. The distribution of increased water demand is estimated as follows for the primary service areas. The service areas are shown on a map in Appendix D.

2.3 Sewage Demand Projections

Sewer service is currently offered in only the Blue Ridge, Jefferson and Lakes areas of the County. The service areas are shown on a map in Appendix E. Stewartsville currently has no sewer system. Montvale is served by the Montvale wastewater treatment plant, rated at 50,000 gpd capacity. The Forest Central Sewer System is served by wholesale connections to the City of Lynchburg. The current Lynchburg agreement allows for average flows of 1.0 MGD into the City's wastewater treatment plant. The Moneta Sewer System is served by a 0.5 MGD wastewater treatment plant owned and operated by the BCPSA. Areas adjacent to the City of Bedford utilize the Bedford sewer system as direct customers of the City. An approximation of current and future sewer flows are provided in Table 6. The table reflects the potential for development of a sewer system in Stewartsville within the study period.

Table 6: Projection of BCPSA Sewer Demands (Billings)

System	2008 Est. Demand (gpd)	2018 Est. Demand (gpd)	2028 Est. Demand (gpd)	Rates of Increase By Decade [1]
Stewartsville[2] (Blue Ridge)	0	30,000	67,500	NA/8.4
Montvale[3] (Blue Ridge)	2,000	20,000	40,000	25.8/7.2
Forest Central[4] (Jefferson)	330,000	560,000	660,000	5.5/1.7
Moneta[5] (Lakes)	40,000	221,600	270,000	18.8/2.0
Totals	372,000	831,600	1,037,500	8.4/2.2

1. The first number is the rate of change from 2008 to 2018. The second number is the rate of change from 2018 to 2028.
2. Stewartsville could be served by a local 150,000 gpd WWTP.
3. Montvale local WWTP is 50,000 gpd
4. Forest wastewater is conveyed to and treated at the Lynchburg Regional WWTP, with 1.0mgd average capacity having been purchased.
5. Lakes local WWTP at Moneta is 0.5 mgd

3.0

IMPROVEMENTS ANALYSIS METHODOLOGY

3.0 IMPROVEMENTS ANALYSIS METHODOLOGY

3.1 General

In order to make recommendations concerning the expansion of water and wastewater infrastructure, it is necessary to have a basic understanding of current demands for water and wastewater service and areas into which service will be required in the future. Much of the analysis for these extensions was completed in the studies of 1994 and 2000. To the credit of those studies, many of the recommended projects have come to fruition and have been incorporated into the BCPSA network without financial hardship or high service rates. This is evidence that the recommended projects, at least to a certain extent, appropriately projected the needs of the service areas.

While local project improvements were made in most of the planning areas, regional interconnections recommended in the 2000 study have not been implemented to date. It can be argued that the time for regional interconnections is yet to come, and that sufficient numbers of potential service connections are not yet available along the interconnection routes or in the growth areas to make the projects affordable. For that reason, the regional projects introduced in the 2000 study have been retained in this study for analysis. GIS mapping of Bedford County was used for the mapping of existing infrastructure, location of existing services and identification of unserved but improved parcels in the County. The review of this mapping provided some insight into the current proximity of water and sewer services to proposed growth areas, and the effort required to extend services into those areas. The growth areas were outlined in the County's Comprehensive Plan. Maps showing the Comprehensive Plan Zoning and Land Use, overlain with the existing and proposed water and sewer projects can be found in Appendix C.

3.2 Capital Cost Estimates

The primary features of each project have been identified on the project mapping and in a capital cost estimate. Water mains, gravity sewers and sewer force mains have been estimated on the basis of installation cost per foot of pipe, in 2008 dollars. In addition, a current zoning map from the Comprehensive Plan is included in Appendix C.

The water piping system estimates in Appendix A include allowances for easement acquisition, fire hydrants, air release valves, blow off valves, sampling stations, gate valves and appurtenances. Highway crossings, stream crossings, rail crossings, pressure reducing valve stations, treatment facilities, water tanks and pump stations are estimated individually per project, since those costs are specific to the project and not easily accounted for in a pipeline price per foot.

Similarly, sewer and force main piping system estimates in Appendix B include allowances for easement acquisition, manholes, flushing connections, air release valves, main line valves and appurtenances. Highway crossings, stream crossings, rail crossings, treatment facilities, equalization facilities and booster pump stations are estimated individually per project.

Capital cost estimates are increased by 30% after summation to account for market, local and seasonal price variations, engineering, legal and other non-construction related costs.

Table 7 lists the water project unit costs used for the water project capital cost estimates.

Table 7: Water System Unit Costs For Project Cost Estimating

Item	Cost
6-inch Water Main	$60/linear foot
8-inch Water Main	$65/linear foot
10-inch Water Main	$75/linear foot
12-inch Water Main	$80/linear foot
16-inch Water Main	$95/linear foot
20-inch Water Main	$110/linear foot
24-inch Water Main	$130/linear foot
30-inch Water Main	$165/linear foot
6-inch Road or Stream Crossing	$150/linear foot
8-inch Road or Stream Crossing	$200/linear foot
10-inch Road or Stream Crossing	$250/linear foot
12-inch Road or Stream Crossing	$300/linear foot
16-inch Road or Stream Crossing	$350/linear foot
20-inch Road or Stream Crossing	$400/linear foot
24-inch Road or Stream Crossing	$450/linear foot
30-inch Road or Stream Crossing	$500/linear foot
6-inch Railroad Crossing	$300/linear foot
8-inch Railroad Crossing	$350/linear foot
10-inch Railroad Crossing	$400/linear foot
12-inch Railroad Crossing	$450/linear foot
16-inch Railroad Crossing	$500/linear foot
20-inch Railroad Crossing	$550/linear foot
24-inch Railroad Crossing	$600/linear foot
30-inch Railroad Crossing	$650/linear foot
Pressure Reducing Valve Stations	$25,000 each
Master Meter Vault	$15,000 each
1.0 MGD WTP Upgrades	$500,000 each
2.0 MGD Water Treatment Plant	$7,000,000 each
5.0 MGD Water Treatment Plant	$16,000,000 each
10.0 MGD Water Treatment Plant	$30,000,000 each
Ground Level Water Tanks (<0.5 MG)	$0.90/gallon
Ground Level Water Tanks (>0.5 MG)	$0.75/gallon
Elevated Water Tanks (<0.2 MG)	$3.00/gallon
Elevated Water Tanks (>0.2 MG)	$2.50/gallon
Water Pump Stations (<500 gpm)	$250,000 each
Water Pump Stations (500-1500 gpm)	$400,000 each
Water Pump Stations (1500-3000 gpm)	$600,000 each

Table 8 lists the wastewater project unit costs used for the wastewater project capital cost estimates.

Table 8: Wastewater System Unit Costs For Project Cost Estimating

Item	Cost
8-inch Sewer	$70/linear foot
10-inch Sewer	$75/linear foot
12-inch Sewer	$85/linear foot
15-inch Sewer	$100/linear foot
18 - 21-inch Sewer	$120/linear foot
24-inch Sewer	$140/linear foot
4-inch Force Main	$45/linear foot
6-inch Force Main	$55/linear foot
8-inch Force Main	$60/linear foot
10-inch Force Main	$65/linear foot
12-inch Force Main	$75/linear foot
14 - inch Force Main	$83/linear foot
15 - 16-inch Force Main	$90/linear foot
18-inch Force Main	$105/linear foot
4 - 6-inch Road or Stream Crossing	$150/linear foot
8-inch Road or Stream Crossing	$200/linear foot
10-inch Road or Stream Crossing	$250/linear foot
12-inch Road or Stream Crossing	$300/linear foot
14-inch Road or Stream Crossing	$325/linear foot
15 - 16-inch Road or Stream Crossing	$350/linear foot
18 - 20-inch Road or Stream Crossing	$400/linear foot
24-inch Road or Stream Crossing	$450/linear foot
6-inch Railroad Crossing	$300/linear foot
8-inch Railroad Crossing	$350/linear foot
10-inch Railroad Crossing	$400/linear foot
12-inch Railroad Crossing	$450/linear foot
15 - 16-inch Railroad Crossing	$500/linear foot
18 - 20-inch Railroad Crossing	$550/linear foot
24-inch Railroad Crossing	$600/linear foot
Master Meter Vault	$15,000 each
0.15 MGD Wastewater Treatment Plant	$2,500,000 each
0.30 MGD Wastewater Treatment Plant	$3,500,000 each
Flow Equalization Facilities	$1.750/gallon
Lift Pump Stations (<500 gpm)	$250,000 each
Lift Pump Stations (500-1500 gpm)	$400,000 each
Lift Pump Stations (1500-3000 gpm)	$600,000 each

3.3 Operation and Maintenance Cost Estimates

Operation and maintenance cost estimates have been compiled on the basis of traditional costs of labor, power, chemicals etc. The estimates have been based upon the proposed project components in each project and summed into an annual O&M cost. The unit costs used for this evaluation are as shown in Table 9.

Table 9: Operation and Maintenance Unit Costs For Annual Cost Estimates

Item	Cost
Labor	$35/manhour
Electrical Power Unit	$0.15/Kilowatt hour
Electrical Power Water Treatment	$75,000/yr per MGD
Electrical Power Wastewater Treatment	$100,000/yr per MGD
Line System Maintenance	$0.10/linear foot
Bulk Water Service from WVWA	$3.50/1,000 gallons
Bulk Water Service from Lynchburg	$2.50/1,000 gallons
Bulk Sewer Service from Lynchburg	$1.50/1,000 gallons
Water Treatment Chemicals	$25,000/yr per MGD
Wastewater Treatment Chemicals	$15,000/yr per MGD

3.4 Net Present Value Calculations

Net Present Value (NPV) has been determined based upon the capital cost of a project plus its cost of operation and maintenance over a twenty year period considering a 6% annual inflation rate, expressed in 2008 dollars. The net present value amount represents the estimated capital the Owner would need to have on hand in 2008 to sustain the project for twenty years from the reserve funds alone. Net present values are calculated in Appendices A and B and are used as a measure of total economy for each project.

4.0

WATER

4.0 WATER

4.1 General

Since the prior Comprehensive Countywide Studies were produced in 1994 and 2000, several of the proposed projects, and other projects not listed in those reports, have been constructed. The mapping in Figures 2 to 13 has been updated to show these new additions as existing. In addition, due to the rapid growth of Bedford County, several new service areas, added in the 2000 update, have been retained in this update. Projects constructed since the 1994 study are identified in the following paragraphs.

4.2 Constructed Projects – Regional

The first step towards a regional water system was made with the construction of the High Point Water Treatment Plant (HPWTP) on Smith Mountain Lake. The plant startup capacity was 60,000 gallons per day (gpd). However, the plant has since been expanded to a treatment capacity of 1.0 MGD and the raw water intake is designed for an ultimate capacity of 1.0 MGD. Currently the HPWTP has a withdrawal permit from American Electric Power (AEP) and the Federal Energy Regulatory Commission (FERC) for 0.5 MGD and 1.0 MGD from the Virginia Department of Environmental Quality (DEQ). Raw water pumps can feed the plant at 1.0 MGD with a standby unit available. The finished water pumps can provide up to 0.75 MGD with a standby unit available. To allow the plant to provide up to 1.0 MGD should be relatively simple with minor equipment improvements and permitting approvals. If proposed interconnections require the HPWTP to produce over 1.0 MGD, the plant would then need to be rebuilt or moved to the County property adjacent to Camp 24 in order to expand.

4.3 Constructed Projects – By Planning Area

In the Blue Ridge planning area, the Stewartsville water system was constructed in 2000. The project consisted of connecting to Roanoke City, now the Western Virginia Water Authority (Falling Creek Reservoir) water system at Route 24 and extending east to Route 757. This system not only provides water to the Stewartsville Elementary School and to the Goodview Elementary School off Route 757 South, but also to the adjacent homes and businesses.

The Center planning area includes the City of Bedford. There have been minor extensions of water service from the City system over the last fifteen years. None of the recommended projects from the 1994 and 2000 studies were completed in this area.

The Jefferson Planning Area continues to grow rapidly. There have been thirteen of the recommended projects completed in this area since the 1994 study, along with numerous water extensions not included in the study. These completed projects are the Boonsboro North, London Downs Loop, Ashton Ridge Extension, Route 704 Loop, Cottontown Road Loop, Homestead Connectors, Hawkins Farm Road/Coffey Road Extension, Campbell County Connectors, Route 622/Route 811 Interconnect, Route 811/Route 460, Turkeyfoot Road Extension, Terrace View Extension, and Mount Haven water projects.

In the Lakes planning area, Smith Mountain Lake shore development has resulted in the connection of residences to the supply fed from the HPWTP. Waterline connectors identified as Unit 24 Prison Camp to High Point, 20-inch Regional, Unit 24 Prison Camp to Beechwood, Route 655 Extension to Hendricks Store, and Hendricks Store to Hales Ford Bridge have been completed. Lake shore development can be expected to be a focus of future water system capital improvements.

In the Peaks planning area, no projects from the 1994 and 2000 studies were completed by the BCPSA in the past fifteen years.

4.4 Proposed Water Projects

This section contains newly recommended projects or yet unconstructed recommended projects from the prior studies. These projects were developed to meet the continually growing water needs in Bedford County. The advantages and disadvantages for each alternative are discussed as part of this evaluation. The cost estimates for the alternatives are shown in Appendix A and a summary of the estimated costs for each project is provided in Table 10 at the end of this section. These costs have been updated to 2008 dollars and should be considered preliminary for planning purposes. For each individual project a preliminary engineering report will be necessary to further develop the individual project design scope and cost.

4.4.1 Regional Alternatives – Water Treatment Plant Alternatives

With the construction and expansions of the HPWTP, there is now an emphasis on linking the Lakes Planning area systems to other parts of Bedford County to implement a working regional system. All the interconnections addressed in the prior studies are still applicable.

The PSA now operates systems that rely on three major sources; the City of Lynchburg, Western Virginia Water Authority and Smith Mountain Lake. With ownership of the Smith Mountain Lake water supply under the PSA, there are benefits to maximizing the use of that source and becoming less dependent upon the sources operated by others. This update includes discussions on constructing a regional plant located near Camp 24. Several potential upgrade sizes have been identified. This information will be useful in planning the ultimate size of the plant based upon the feasibility of transmission and distribution of its water to various locations within the County or to a bulk user (e.g. Franklin County). The regional alternatives are shown in Figure 2. Table 11, at the end of this Section, compares the treatment plant alternatives.

1. Lakes Region WTP (2.0 MGD)
    a) Discussion: This alternative would involve the acquisition of property near Camp 24, construction of 14,000 feet of 12" raw water line to the plant site, extensive modification of the raw water intake and pump station as well as the construction of a new microfiltration water treatment plant.
    b) Advantages: This alternative should handle most of the long term water requirements for the Lakes planning area of Bedford County.
    c) Disadvantages: High initial costs. This alternative would not provide excess water for other regions of the County or for sale to Franklin County. Potential problems with withdrawal permit from Smith Mountain Lake.

2. Lakes Region WTP (5.0 MGD)
    a) Discussion: This alternative would involve the acquisition of property near Camp 24, construction of 14,000 feet of 24" raw water line to the plant site, extensive modification of the raw water intake and pump station as well as the construction of a new microfiltration water treatment plant.

b) Advantages: This alternative will handle all of the Lakes planning area water requirements and still provide water to other areas of Bedford and Franklin County.
c) Disadvantages: High initial costs and operational costs. Potential problems with the withdrawal permit from Smith Mountain Lake.

3. Lakes Region WTP (10.0 MGD)
   a) Discussion: This alternative would involve the acquisition of property near Camp 24, construction of 14,000 feet of 30" raw water line to the plant site, construction of a new raw water intake and pump station as well as the construction of a new microfiltration water treatment plant.
   b) Advantages: This alternative will handle the long term water needs for the Lakes region, Stewartsville, the City of Bedford, other areas of Bedford County and Franklin County as may be required.
   c) Disadvantages: High initial costs and operational costs. Potential problems with the withdrawal permit from Smith Mountain Lake.

4.4.2 Regional Alternatives - Interconnections

With the construction of the Lakes Region Water Treatment Plant, there will be an emphasis on linking the Lakes planning area systems to other parts of Bedford County to implement a regional system. All the interconnections addressed in the prior studies are still applicable.

With the installation of the water main to Stewartsville, the PSA now operates systems that rely on three major sources; the City of Lynchburg, Western Virginia Water Authority and Smith Mountain Lake. The locations of these sources are such that they could be interconnected once each system is sufficiently extended. Each source could provide redundant water supply to the others in times of emergency or water shortage. The latest proposed interconnections are addressed below and shown in Figure 2.

1. Lakes Region WTP – City of Bedford Interconnect (HG 1223 to 1102)
   a) Discussion: This project would connect the Lakes Region WTP to the City of Bedford, increasing system reliability for both the City and BCPSA systems. The alternative includes 67,000 feet of 20-inch and 15,600 feet of 24-inch water main along Route 122. An agreement between the City and BCPSA would also be required.

b) Advantages include redundancy for both the City and BCPSA systems. Two growth areas of the County can be accommodated without reliance on a source outside the County.

c) Disadvantages: High initial costs and operational costs. Lakes Region WTP would need to be constructed prior to this project.

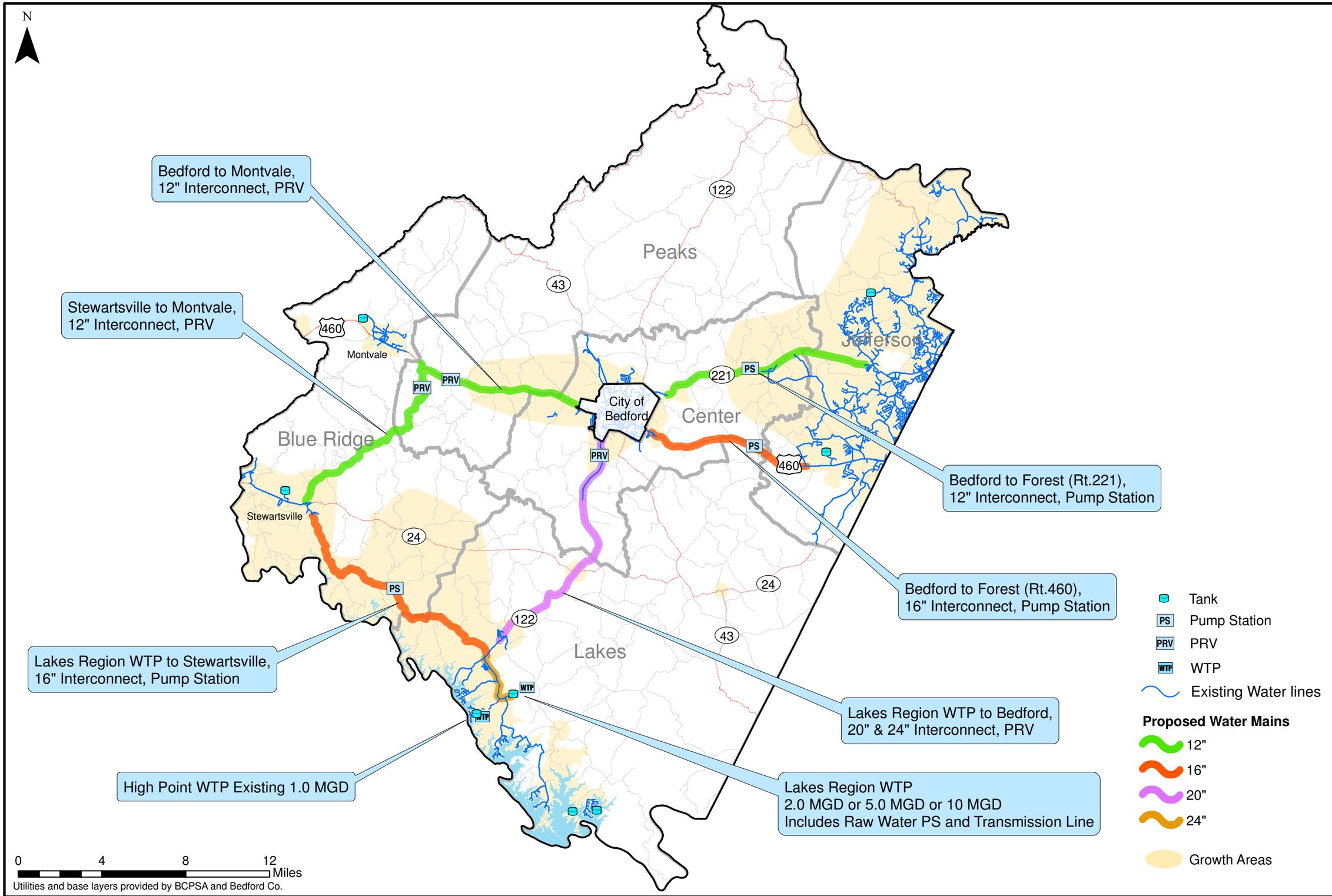
2. Lakes Region WTP – Stewartsville Interconnect (HG 1223 to 1329)
   a) Discussion: This project would connect the Lakes Region WTP to Stewartsville, which is fed from Western Virginia Water Authority (WVWA). The alternative includes 69,100 feet of 16-inch water main and a pump station.
   b) Advantages include reliability for Stewartsville (or WVWA) and Lakes Region (HPWTP), both of which only have one source at the present time.
   c) Disadvantages: High initial costs and operational costs. Insufficient number of connections available to make project affordable to users. Current zoning does not entirely support the project route. Lakes Region WTP would need to be constructed prior to this project.

3. Stewartsville – Montvale Interconnect (HG 1329 to 1132)
   a) Discussion: This project would connect the Montvale water system to Stewartsville along Routes 619 and 726. The project would include 58,700 feet of 12-inch water main.
   b) Advantages: More reliable water service to the hamlet of Montvale and ultimately a redundant source for Stewartsville from the City of Bedford. Water service could be offered to residents along Routes 619 and 726.
   c) Disadvantages: High Cost. The Stewartsville East project would need to be completed prior to construction of this project. An agreement would be needed with the Montvale Water Company.

4. Bedford – Montvale Interconnect (HG 1102 to 1132)
   a) Discussion: This project would connect Montvale with the City of Bedford along Route 460. The project would include 12,100 feet of 12-inch water main.
   b) Advantages: Completes one more leg of a looped water system in the County. Would provide water service to many businesses and residents along Route 460 and encourage development. The project would provide more reliable water service to Montvale.
   c) Disadvantages: High initial costs. An agreement would be needed with Montvale Water Company. Requires an agreement and cooperation with the City of Bedford.

5. Bedford – Forest Interconnect (Route 460) (HG 1102 to 1075)
    a) Discussion: This alternative would involve construction of 42,800 feet of 16-inch water main and a pump station along Route 460 from the City of the Bedford to existing water lines in the Forest system in the Jefferson planning area.
    b) Advantages: Provides the area with an alternate source of water. The project would provide water service along and adjacent to Route 460 between Forest and the City of Bedford.
    c) Disadvantages: High initial costs. Requires an agreement and cooperation with the City of Bedford. Current zoning does not entirely support the project route.

6. Bedford – Forest Interconnect (Route 221) (HG 1102 to 1075)
    a) Discussion: This alternative would involve construction of 54,500 feet of 12-inch water main and a pump station along Route 221 from the City of Bedford to the existing water lines in the Forest system in the Jefferson planning area.
    b) Advantages: Provides the area with an alternate source of water. The project would provide water for service along and adjacent to Route 221 between Forest and the City of Bedford.
    c) Disadvantages: High initial costs. Requires an agreement and cooperation with City of Bedford. Current zoning does not entirely support the project route.



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Regional Water System Projects

Bedford County PSA - Comprehensive Water and Wastewater Study Update

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CHECKED GRM
DATE 12-26-08

Scale: to fit
Plan No. B05123-06

Figure

2

N

NOTE: Service pressures are based on Lakes System HGL

Bedford City System
Approx HGL 1102'

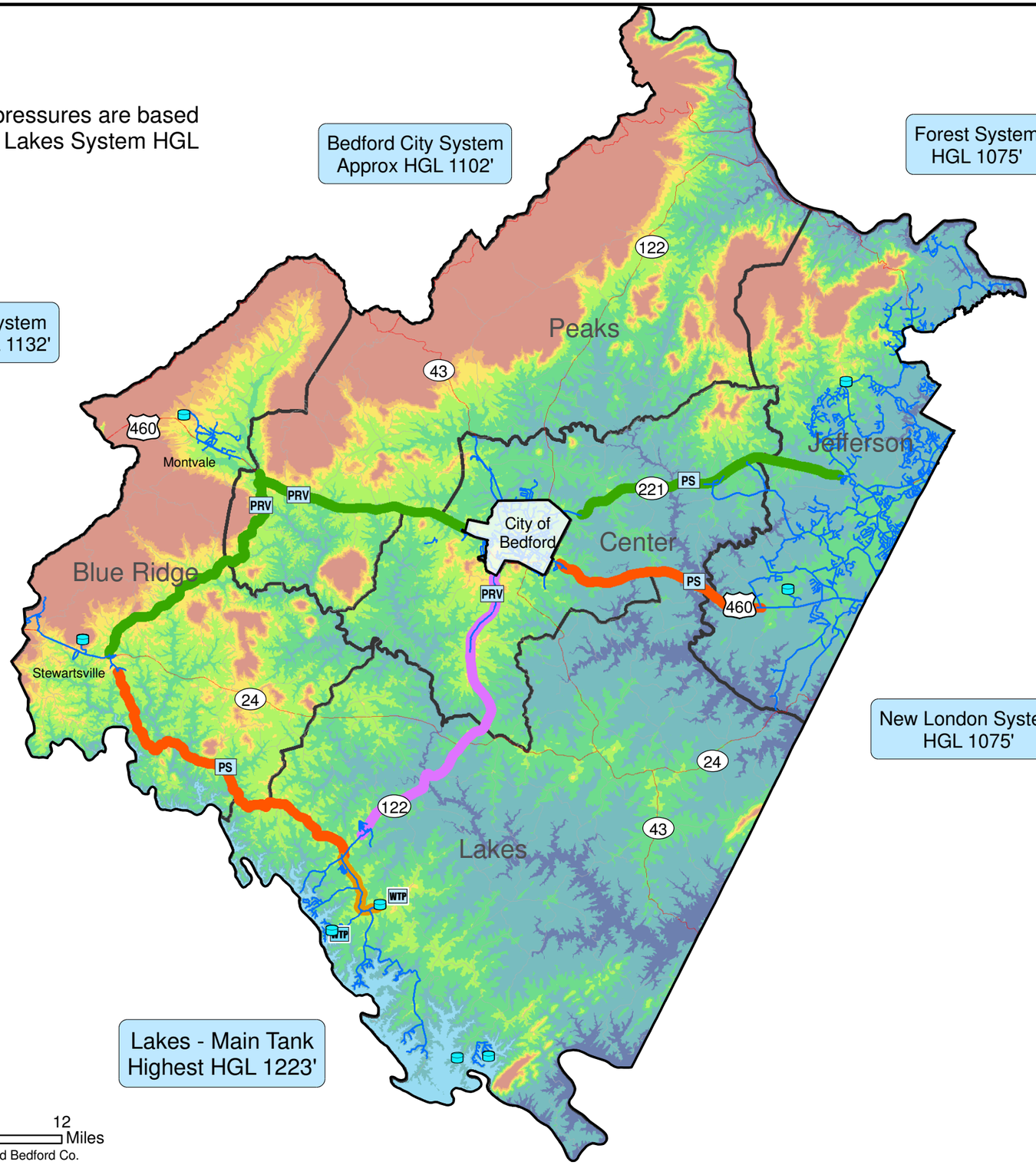
Forest System
HGL 1075'

Montvale System
Approx HGL 1132'

Stewartsville System
HGL 1329'

New London System
HGL 1075'

Lakes - Main Tank
Highest HGL 1223'



Pressure Zones (Elevation)
Based on Lakes System

- < 0 psi (> 1223')
- 0 - 40 psi (1130.6' - 1223')
- 40 - 80 psi (1038.2' - 1130.6')
- 80 - 120 psi (946' - 1038.2')
- 120 - 160 psi (853.4' - 946')
- 160+ psi (700' - 853.4')
- (< 700')

- Tank
- PS Pump Station
- PRV PRV
- WTP WTP
- Existing Water lines

Proposed Water Mains

- 12"
- 16"
- 20"
- 24"

Growth Areas

0 4 8 12 Miles

Utilities and base layers provided by BCPSA and Bedford Co.

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County Wide - Water Service Pressure Map

Bedford County PSA - Comprehensive Water and Wastewater Study Update

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Figure 3

4.4.3 Blue Ridge Planning Area

With the construction of the Stewartsville Water System, this area will continue to develop. The existing system operates at a hydraulic grade elevation of 1329 feet. The 1994 study showed extension of water service to the Vinton East and Stewartsville East areas from this water system. In addition to these projects, the 2000 update evaluated extensions to the Chamblissburg and Hardy areas from the Stewartsville system. The current agreement between Western Virginia Water Authority and Bedford County Public Service Authority provides for purchase of water for the Stewartsville area. This agreement should provide adequate capacity for all the proposed water project improvements. These proposed extensions are addressed below.

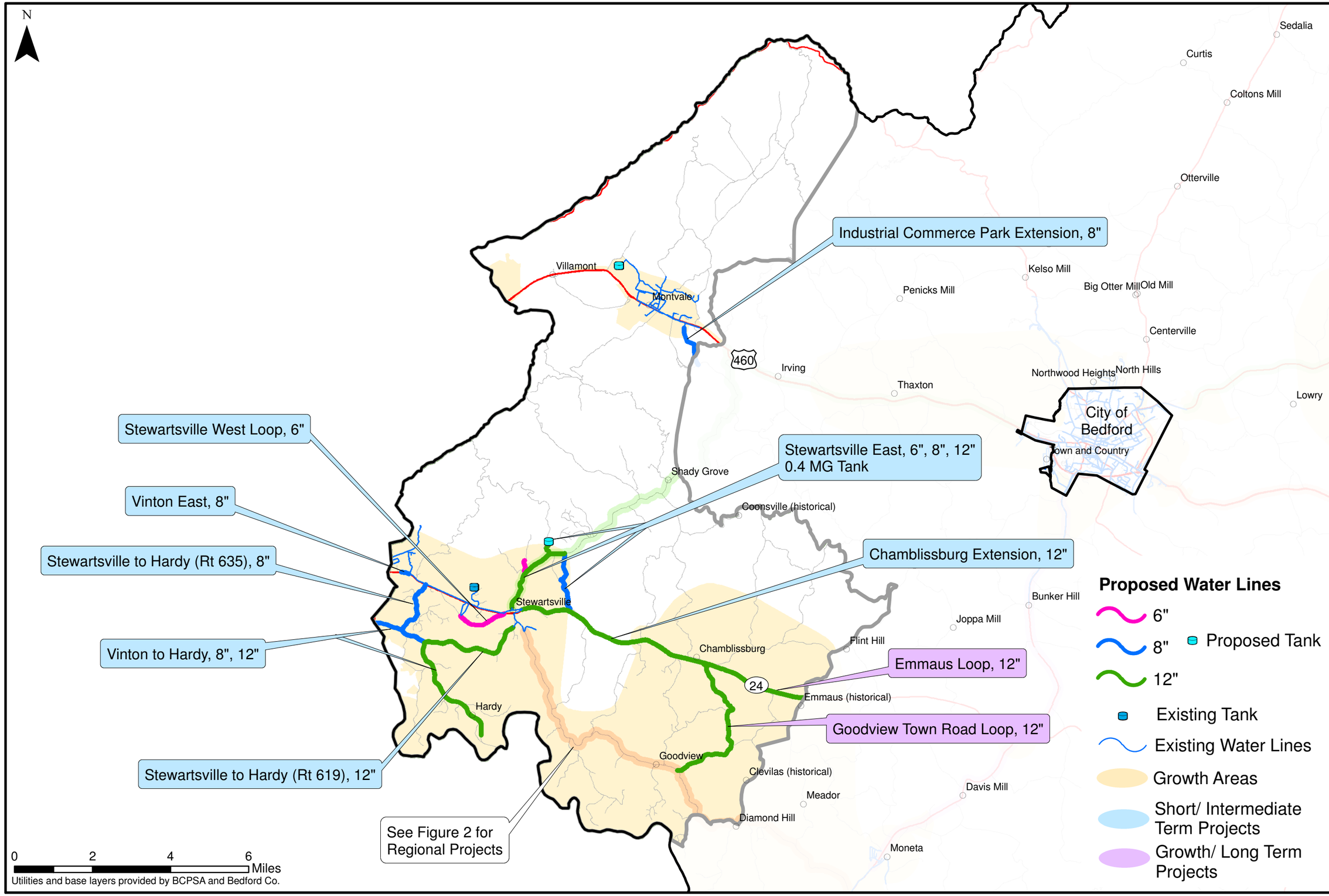
The Montvale Water Company provides water service to the Montvale area. Improvements over the past 15 years include expansion to the water system to extend an 8 inch water main along Route 460 to the Montvale Elementary School. Recently, the County has been promoting Industrial and Commercial growth in this area. The current capacity of the Montvale system, which uses a well supply, is adequate to serve anticipated demands. Projected water demands should be satisfied using the current source facilities. The system operates at a hydraulic grade elevation of 1132 feet.

Blue Ridge Planning Area proposed projects are shown on Figure 4. A service pressure map is provided as Figure 5. These improvements are described below.

1. Vinton East
    a) Discussion: The project would serve the residents in the Vinton East area along Route 24. This project would connect to the PSA's existing Stewartsville water system. It consists of approximately 1,100 feet of 8-inch water line along Stewartsville Road between Jeters Chapel Road and Parkway Lane. Service pressures in this area would range between 40 and 80 psi.
    b) Advantages: Service to additional residents in a designated growth area. Enhances potential for economic development along Route 24.
    c) Disadvantages: May require modification of existing water rates with the Western Virginia Water Authority. Means will need to

be provided to limit Disinfection Byproducts (DBP) in this system until growth is realized.

2. Stewartsville West Loop
    a) Discussion: The project will serve the residences along Route 886. It consists of approximately 6,800 feet of 6-inch water line along Drewry's Hill Road between Irene Drive and Stewartsville Road. Service pressures of 80 to 160 psi would be typical.
    b) Advantages: The loop will provide additional reliability to the water system.
    c) Disadvantages: Means will need to be provided to limit Disinfection Byproducts (DBP) in this system until growth is realized.
3. Stewartsville East
    a) Discussion: Connects the Stewartsville East area to the Stewartsville Phase 1 project. Includes a 400,000 gallon storage tank. It consists of approximately 2,000 feet of 6-inch waterline along Jeters Mill Road and Mountain Valley Road west of Jordantown Road, approximately 8,600 feet of 8-inch waterline along Lover's Lane between Stewartsville Road and Jordantown Road, and approximately 11,600 feet of 12-inch water line along Jordantown Road between Stewartvile Road and Slow Walk Lane and up Jeters Chapel Road to the tank. Service pressures will run from 40 to 160 psi, depending upon location within the project.
    b) Advantages: Service to approximately 819 residents in a designated growth area. Provides a reliable source of water if long term agreements are reached with Western Virginia Water Authority.
    c) Disadvantages: May require modification of existing water rates with the Western Virginia Water Authority. Means will need to be provided to limit Disinfection Byproducts (DBP) in this system until growth is realized



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Blue Ridge Planning Area - Proposed Water Projects

Bedford County PSA - Comprehensive
Water and Wastewater Study Update

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DATE 12-26-08

Scale: to fit
Plan No. B05123-06

Figure
4

N

NOTE: Service pressures are based on Stewartsville System HGL

Montvale System
Approx HGL 1132'

Bedford City System
Approx HGL 1102'

Stewartsville System
HGL 1329'

Proposed Water Lines

6"

8" Proposed Tank

12"

Existing Tank

Existing Water Lines

Villamont
Montvale
Stewartsville
Hardy
Goodview
Shady Grove
Union
Irving
460
Reba
Penicks Mill
Sedalia
Curtis
Coltons Mill
Otterville
Peaksville
Kelso Mill
Big Otter Mill
Old Mill
Centerville
Northwood Heights
North Hills
Thaxton
Lowry
City of Bedford
Town and Country
Coonsville (historical)
Robertsons (historical)
Five Forks
Joppa Mill
Flint Hill
Chamblissburg
24
Emmaus (historical)
Clevilas (historical)
Meador
Diamond Hill
Davis Mill
Moneta

Stewartsville System Pressure Zones (Elevation)

- < 0 psi (> 1329.0')
- 0 - 40 psi (1236.6' - 1329.0')
- 40 - 80 psi (1144.2 - 1236.6')
- 80 - 120 psi (1051.8 - 1144.2')
- 120 - 160 psi (959.4' - 1051.8')
- 160+ psi (800' - 959.4')
- (< 800')

0 2 4 6 Miles

Utilities and base layers provided by BCPSA and Bedford Co.

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Blue Ridge Planning Area - Water Service Pressure Map

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Figure 5

4. Vinton to Hardy
    a) Discussion: Connects the Hardy area to the existing Vinton system along Hardy Road, Route 631, with approximately 7,600 feet of 8-inch waterline between Turner Branch Road and Blue Ridge Parkway, and approximately 16,100 feet of 12-inch waterline between Old Station Loop and Turner Branch Road. Service pressures would range from 80 to 160 psi.
    b) Advantages: Provides water to the rapidly growing Hardy area.
    c) Disadvantages: May require modification of existing water rates with the Western Virginia Water Authority. Means will need to be provided to limit Disinfection Byproducts (DBP) in this system until growth is realized.
5. Stewartsville to Hardy (Rt. 635)
    a) Discussion: Connects the Hardy area to the Stewartsville Phase 1 water system along the Route 635 corridor, Beagle Club Road. It consists of approximately 8,000 feet of 8-inch waterline between Washington Ave and Hardy Road. Service pressures from 80 to 120 psi would be experienced.
    b) Advantages: Provides water to the rapidly growing Hardy area.
    c) Disadvantages: May require modification of existing water rates with the Western Virginia Water Authority. Means will need to be provided to limit Disinfection Byproducts (DBP) in this system until growth is realized. Prior attempts to provide water service in this corridor met with objections from the residents.
6. Stewartsville to Hardy (Rt. 619)
    a) Discussion: Connects the Hardy area to the Stewartsville Phase 1 water system along the Route 619 corridor, Turner Branch Road. It consists of approximately 14,700 feet of 12-inch waterline between Stewartsville Road and Hardy Road. Service pressures would range from 80 to 160 psi.
    b) Advantages: Provides water to the rapidly growing Hardy area, and provides a system loop (when connected to the Stewartsville to Hardy Rte. 635 project) for the Stewartsville Phase 1 project.
    c) Disadvantages: May require modification of existing water rates with the Western Virginia Water Authority. Means will need to be provided to limit Disinfection Byproducts (DBP) in this system until growth is realized.
7. Chamblissburg Extension
    a) Discussion: Connects the Stewartsville area water system to the Chamblissburg area via Route 24. This project includes approximately 28,600 feet of 12-inch waterline along Stewartsville Road from Jordantown Road to Dickerson Mill Road. Service pressures would run from 80 to 160 psi.
    b) Advantages: Provides water to the Chamblissburg area of Bedford County. Allows for additional development along Route 24.

c) Disadvantages: This alternative cannot be completed until the Stewartsville East water project is completed. Means will need to be provided to limit Disinfection Byproducts (DBP) in this system until growth is realized.

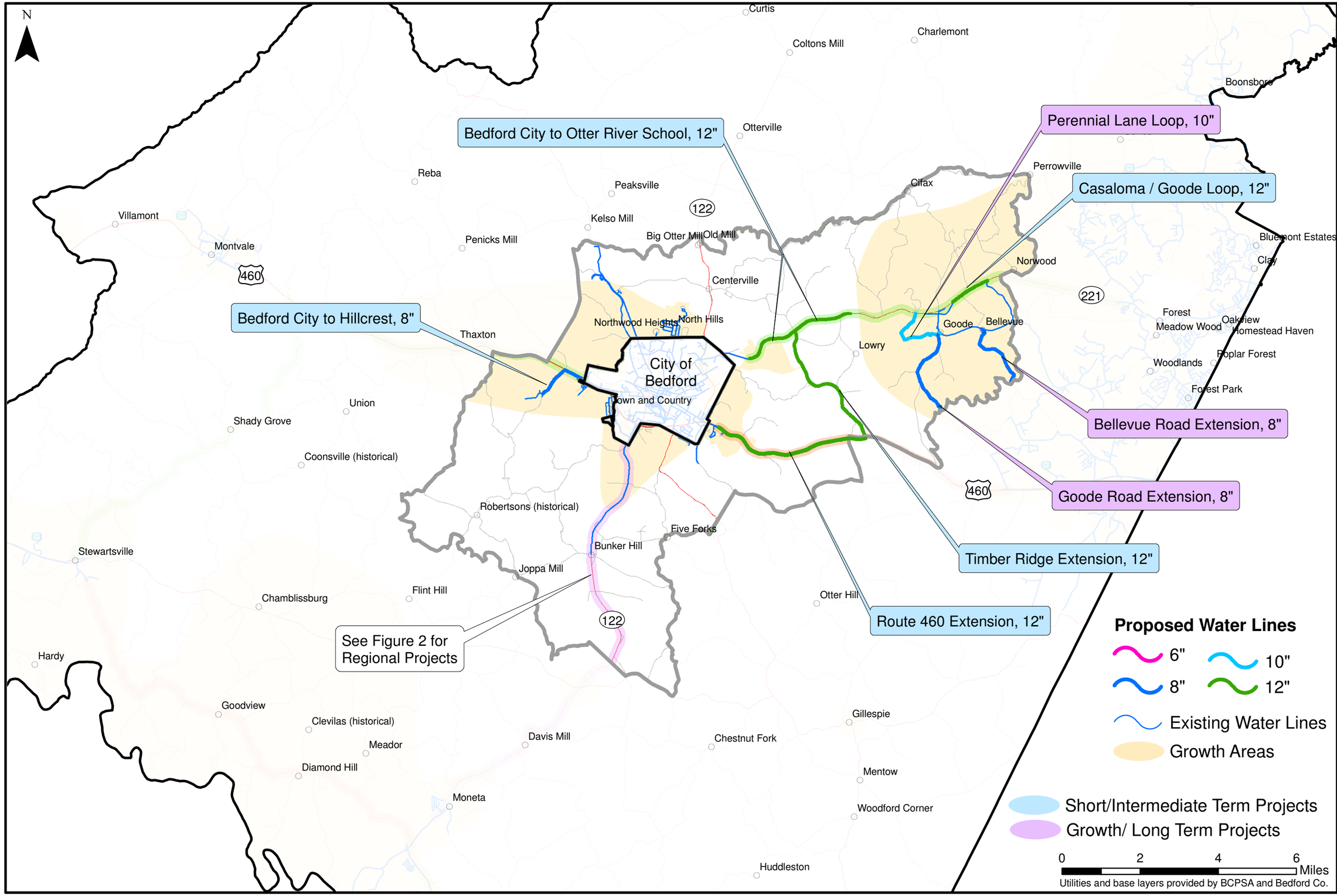
8. Industrial Commerce Park Extension
   a) Discussion: The project would involve the construction of approximately 5,700 feet of 8-inch water main from Route 460 through the industrial commerce park to Quarterwood Road. Service pressures in this area would range from 80 to 160 psi.
   b) Advantages: Encourages new industries to locate in the industrial park.
   c) Disadvantages: Cost of Improvements. The BCPSA would need an agreement with the Montvale Water Company.

9. Growth Projects
   There are two recommended projects to extend service into Blue Ridge growth areas. The primary advantage of these projects is the expansion of service to growth areas, thereby encouraging development within targeted areas, and discouraging development in agricultural areas. The disadvantage of these projects is their high cost for service to a relatively small number of people. These projects likely are for construction 20 years or more in the future. Means will need to be provided to limit Disinfection Byproducts (DBP) in this system until growth is realized.

   - Emmaus Loop – 48,300 feet of 12-inch main (80 to 160 psi)
   - Goodview Town Road Loop – 22,200 feet of 12-inch main (80 to 160 psi)

4.4.4 Center Planning Area

The Center planning area was outlined for a number of projects in the 1994 study. All projects would be served from the City of Bedford. It is believed that the City water supply is generally adequate to serve new customers. It is noted that recent drought conditions have stressed the City's system, and addition of capacity to the system is recommended in concert with new service extensions. The City's system operates at hydraulic grade elevation of 1102 feet. Center Planning Area proposed projects are shown on Figure 6. A service pressure map is provided as Figure 7.



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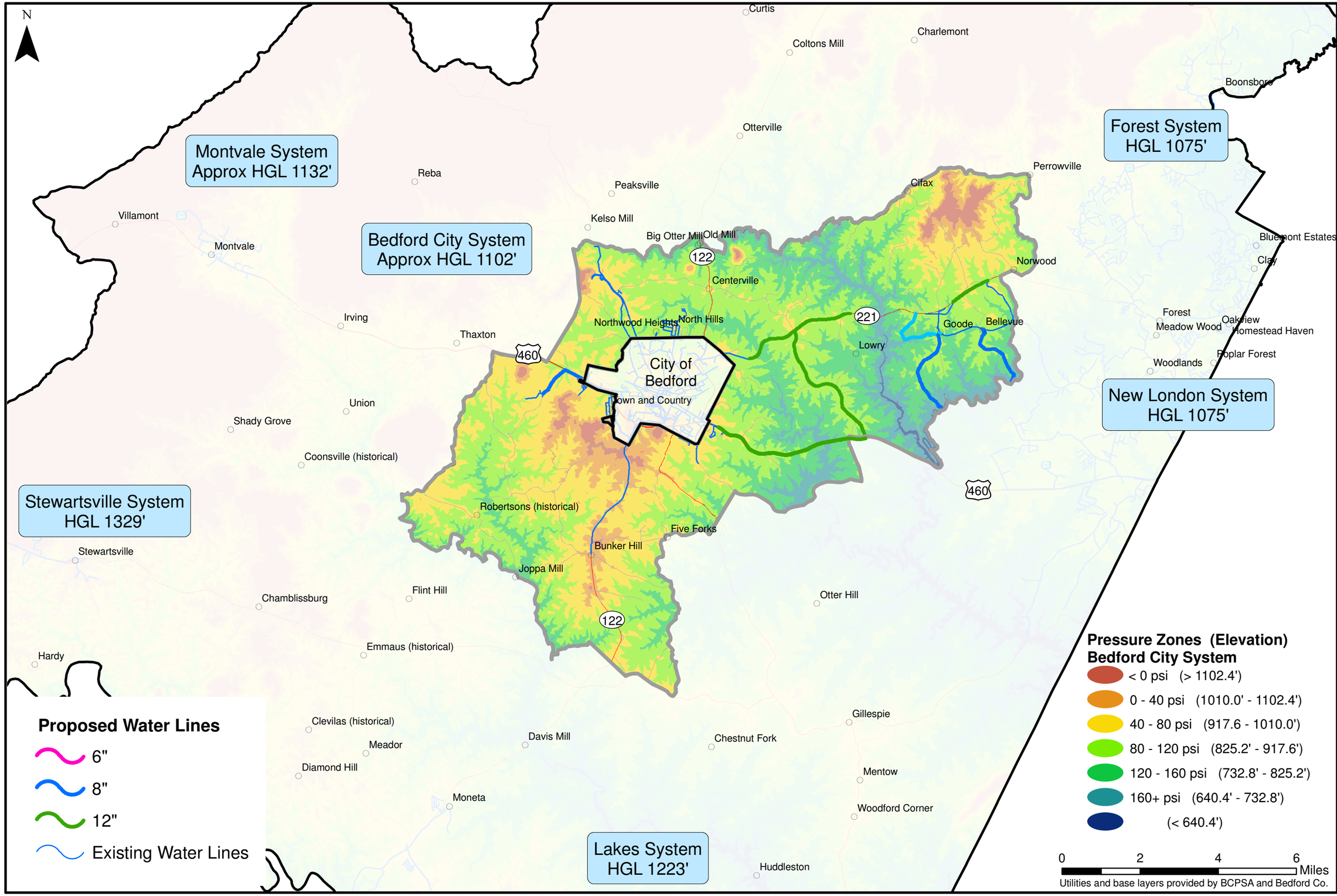
Center Planning Area - Proposed Water Projects

Bedford County PSA - Comprehensive Water and Wastewater Study Update

DESIGNED GRM
DRAWN SMF
CHECKED GRM
DATE 12-26-08

Scale: to fit
Plan No. B05123-06

Figure 6



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Center Planning Area - Water Service Pressure Map

Bedford County PSA - Comprehensive Water and Wastewater Study Update

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Figure
7

1. Bedford City to Otter River School
    a) Discussion: This line would extend from the City of Bedford to the Otter River Elementary School along Route 221, approximately 15,900 feet of 12-inch waterline. It would also be a portion of the regional Bedford to Forest Interconnect water main project. Service pressures would range from 80 to 120 psi.
    b) Advantages: Supplies water to a designated growth area and a school.
    c) Disadvantages: Relatively high cost due to the size and length of the lines required for the project. Requires agreement from the City of Bedford to supply water for the project.
2. Timber Ridge Extension
    a) Discussion: This project, with a Route 460 Extension, would loop the City of Bedford's water system from Route 221 to Route 460 east of the City limits, approximately 20,000 feet of 12-inch waterline along Timber Ridge Road. Service pressures would range from 40 to 120 psi.
    b) Advantages: Would provide system reliability for the City of Bedford. Large potential for developer driven projects to follow water line projects in a designated high growth area.
    c) Disadvantages: High initial cost. Few initial connections. Requires agreement from the City of Bedford to supply water for the project.
3. Route 460 Extension
    a) Discussion: This project, with the Timber Ridge Extension, would loop the City of Bedford's water system from Route 221 to Route 460 east of the City limits, approximately 21,700 feet of 12-inch waterline along Route 460. Service pressures would range from 40 to 160 psi.
    b) Advantages: Would provide system reliability for the City of Bedford. Large potential for developer driven projects to follow water line projects in a designated high growth area.
    c) Disadvantages: High initial cost. Few initial connections. Requires agreement from the City of Bedford to supply water for the project.
4. Bedford City to Hillcrest
    a) Discussion: This project would replace the community well system currently being used in the Hillcrest subdivision west of the City. Residents along the extension route could also benefit by public water service. This project would involve approximately 7,600 feet of 8-inch waterline along Rt. 460 and Wheatland Road. Service pressures will be from 40 to 80 psi.
    b) Advantages: Supplies water in a designated growth area at relatively low cost per customer. Will eliminate frequent operational issues with quantity of water supply.

c) Disadvantages: Requires agreement from the City of Bedford to supply water to the project.

5. Casaloma/Goode Loop
   a) Discussion: This project would connect two sections of water line to improve circulation in the system. The connection would require about 5,500 feet of 12-inch water main. Service pressures will range from 40 psi to 120 psi.
   b) Advantages: Completes a system loop within the water system to provide reliability of the system and reduce the potential for formation of excessive disinfection byproducts.
   c) Disadvantages: Minimum number of new connections to provide revenue to fund the project.
6. Growth Projects

   There are some recommended projects to extend service into growth areas. Advantages to these projects include the expansion of service to growth areas, and they provide looping for improved reliability and water quality. The disadvantage of these projects is their high cost for service to a relatively small number of customers. Some of these projects cross planning area boundaries. These projects likely are for construction 20 years or more in the future.

   Perennial Lane Loop – 10,600 feet of 10-inch water main (80 to 160 psi)
   Bellevue Road Extension – 12,700 feet of 8-inch water main (80 to 120 psi)
   Goode Road Extension – 11,300 feet of 8-inch water main (120 to 160 psi)

4.4.5 Jefferson Planning Area

The Jefferson Area has seen extensive growth, and the water system in this area is continuously expanding. Projects proposed in 1994 and 2000, but not yet complete, continue to be relevant. These projects provide looping of the distribution system and additional storage in the Forest system. Jefferson Planning Area proposed projects are shown on Figure 8. A service pressure map is provided as Figure 9. These improvements are described in more detail below.

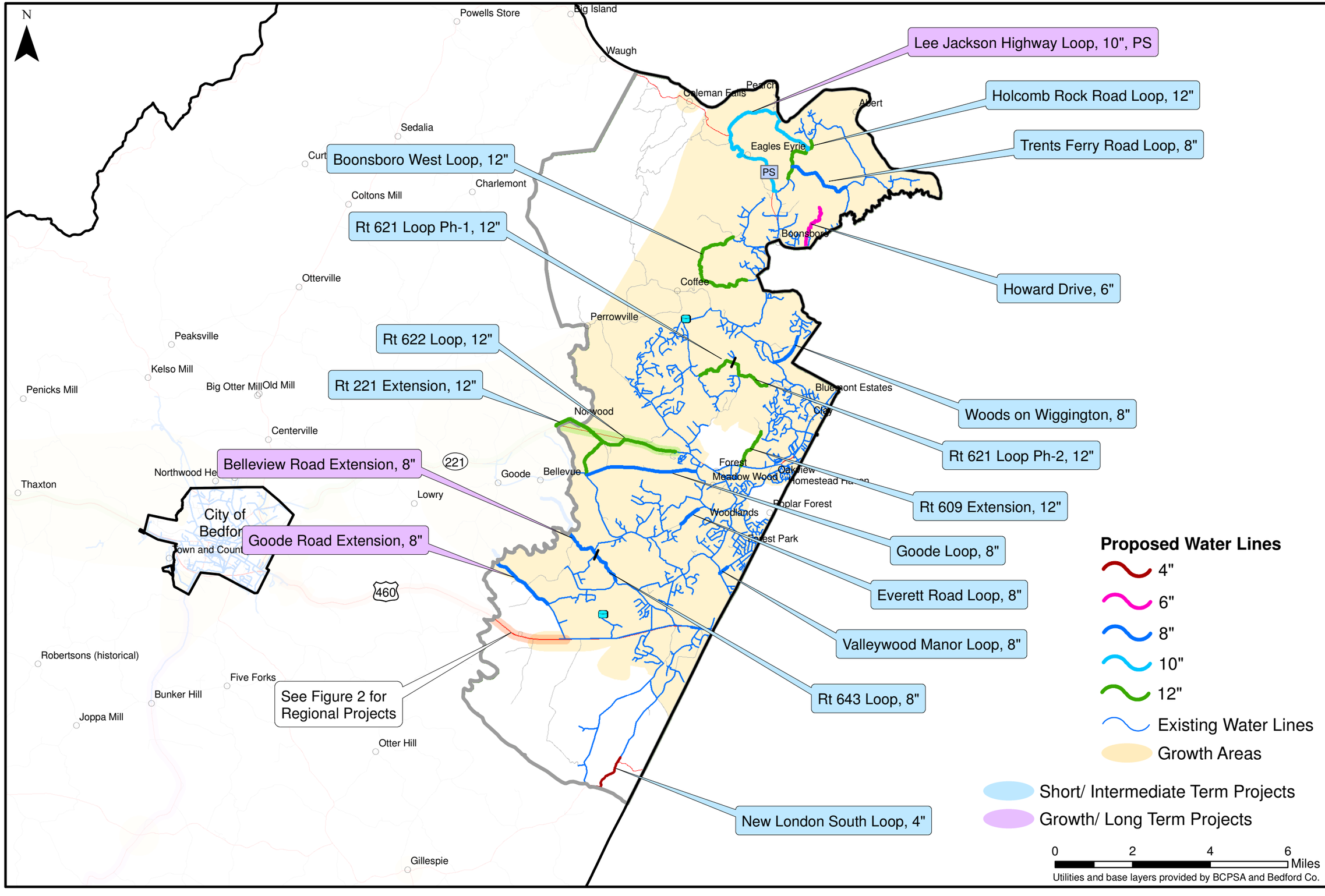
1. Route 643 Loop
   a) Discussion: This project interconnects the Forest water system along Route 704, Route 643, and Route 622 with approximately 4,300 feet of 8-inch waterline. Service pressures would range from 80 to 160 psi.
   b) Advantages: Increases system reliability and fire flow capacity.
   c) Disadvantages: Few new connections
2. Goode Loop
   a) Discussion: This project would include 15,100 feet of 8-inch main on Elkton Farm Road to connect two segments of the Forest

Central Water System. Service pressures would be from 80 to 160 psi.

b) Advantages: Significantly increases system reliability and hydraulic capacity. Water quality should also benefit from the project.

c) Disadvantages: Few initial customers and low potential for future connections along the path of the proposed water line.

3. Valleywood Manor Loop
    a) Discussion: This project is a approximately 1,400 feet of 8-inch extension main providing a loop to benefit circulation of water in the existing system. This project connects Turkey Foot Road to Jane Randolph St. Service pressures from 40 to 80 psi would be typical.
    b) Advantages: Improved water circulation would reduce water age and potential for increased disinfection byproducts in the system.
    c) Disadvantages: Capital cost with few new customers.
4. Route 622 Loop
    a) Discussion: This loop would connect the end of the Route 221 extension project to the area near the Brookstone subdivision using approximately 19,400 feet of 12-inch waterline along Forest Road. Service pressures will range from 40 to 160 psi.
    b) Advantages: Significant improvements to the reliability of the southern portion of the Forest system. Ability to serve a large area which is likely to be developed.
    c) Disadvantages: High Initial cost with few initial customers.
5. Route 609 Extension
    a) Discussion: Connects the existing Lake Vista lines to the existing Route 221 lines with approximately 12,150 feet of 12-inch waterline along Gumtree Road. Service pressures will range from 80 to 160 psi.
    b) Advantages: This would increase the system reliability while providing service to numerous new residents.
    c) Disadvantages: Few initial connections and high cost



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Jefferson Planning Area - Proposed Water Projects

Bedford County PSA - Comprehensive Water and Wastewater Study Update

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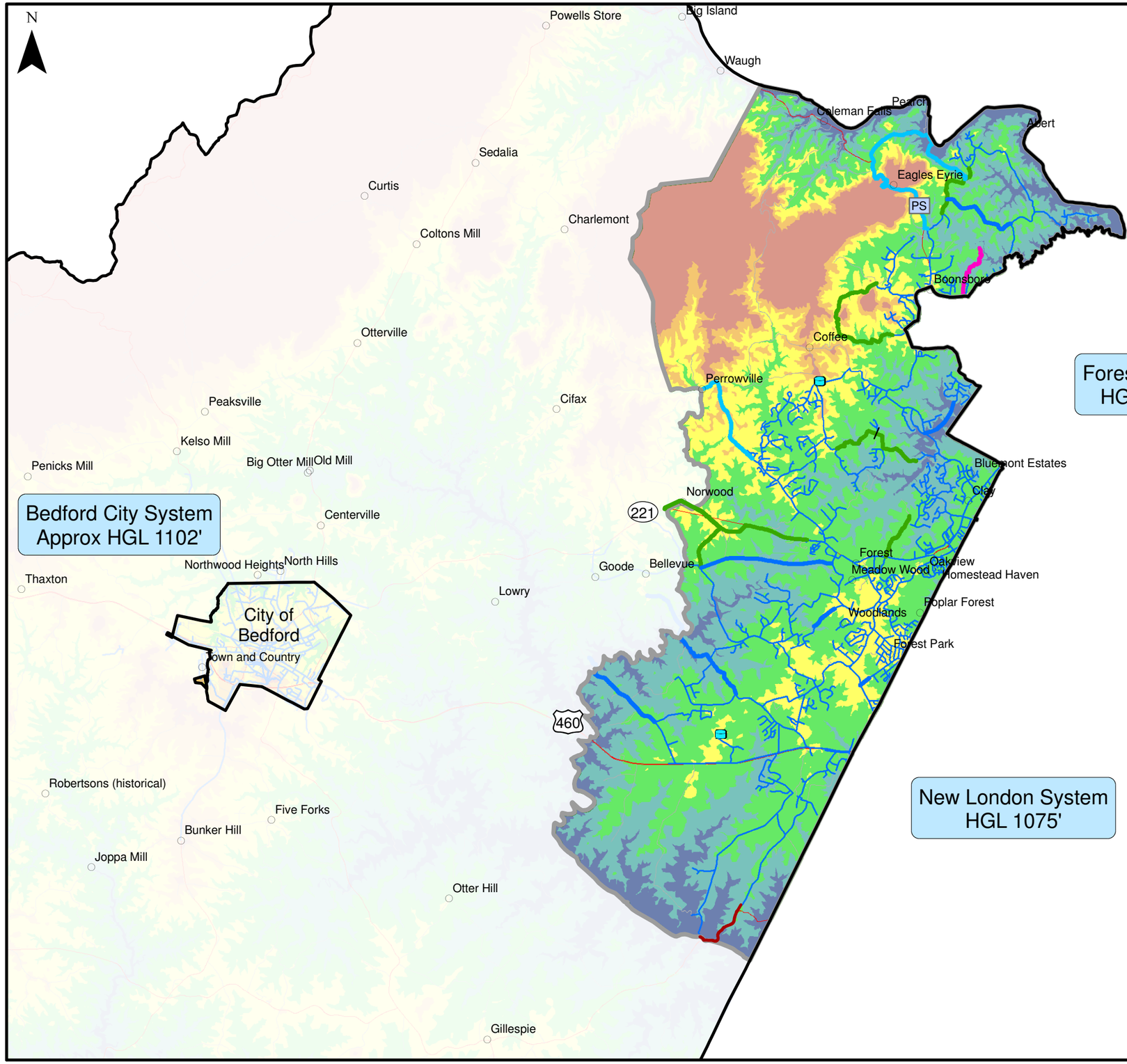
DRAWN SMF
CHECKED GRM
DATE 12-26-08

Scale: to fit
Plan No. B05123-06

Figure

8



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Bedford County PSA - Comprehensive
Water and Wastewater Study Update

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Figure
9

6. Route 221 Extension
    a) Discussion: This extension would take the Forest Central system out to Virginia Memorial Park along Route 221. The project would consist of approximately 7,700 feet of 12-inch water line. If a regional water supply system was to develop between the planning areas of Center and Forest, all of the water line for this project should be sized over the 12-inch that is allowed for this project. Service pressures of 40 to 120 psi can be expected.
    b) Advantages: This line would lay the backbone for several future projects to connect. It also would be the first step to connecting the Forest Planning area to the Center Planning area in the future.
    c) Disadvantages: High Cost. Uncertainty of future road improvements for alignment determination.
7. Woods on Wiggington Loop
    a) Discussion: This line would directly connect the Woods on Wiggington subdivision to the PSA's Forest system with approximately 5,100 feet of 8-inch waterline. Currently the Woods on Wiggington subdivision is being served from a main directly from Lynchburg and is metered through a master meter. This would increase the system reliability by adding a connection point to feed water from a different connection to the City's system. Pressures of 80 to 160 psi would be typical.
    b) Advantages: Increased system reliability.
    c) Disadvantages: No initial new connections.
8. Route 621 Loop, Phase I
    a) Discussion: This line would connect the completed Cottontown Road loop to the existing Lake Vista lines with approximately 5,000 feet of 12-inch waterline. The line would run along Route 621, allowing the residents along the road to connect onto the project. Pressures of 80 to 120 psi would be normal.
    b) Advantages: Significantly increased system reliability and fire flow capacity by looping long runs of 12-inch and 8-inch waterline. High potential for numerous connections.
    c) Disadvantages: Road alignment is unfavorable. Future road improvements may allow better location for water main.
9. Route 621 Loop, Phase II
    a) Discussion: This line would connect the completed Cottontown Road loop to the existing Lake Vista lines with approximately 7,400 feet of 12-inch waterline. The line would run along Route 621, allowing the residents along the road to connect onto the project. Pressures of 80 to 160 psi would be normal.
    b) Advantages: Significantly increased system reliability and fire flow capacity. High potential for numerous connections.
    c) Disadvantages: None.

10. Boonsboro West Loop
    a) Discussion: This project would provide service to the rapidly growing area west of Boonsboro. The lines would run west along Route 644, and north along Route 624. The project would consist of approximately 16,400 linear feet of 12-inch water main. Pressures of 40 to 120 psi would occur.
    b) Advantages: Additional service to residents, and increased system reliability.
    c) Disadvantages: Few initial connections.
11. Howard Drive
    a) Discussion: This line would serve the Bedford residents along Howards Drive (just east of the Mill Lane Pump Station). The project consists of approximately 7,100 feet of 6-inch waterline. Pressures would be from 80 to 160 psi.
    b) Advantages: The water line would serve many customers along Howard Drive. The project would connect onto the existing Mill Lane Woods master meter from Lynchburg. Existing 3-inch main from Mill Lane Woods to Howard Drive would be replaced.
    c) Disadvantages: Some of the residents have adequate wells and may not connect to the public system.
12. Holcomb Rock Road Loop
    a) Discussion: This loop would connect the Boonsboro area of the County to the Woods Landing area near the river along Holcomb Rock Road with approximately 7,900 feet of 12-inch waterline. Service pressures would be 80 to 120 psi.
    b) Advantages: This would provide additional support and reliability to both the Woods Landing System and the North Forest System.
    c) Disadvantages: Few initial connections.
13. Trents Ferry Road Loop
    a) Discussion: This project would connect the proposed Holcomb Rock Road loop project to the Lynchburg system with approximately 9,200 feet of 8-inch waterline along Trents Ferry Road. Lynchburg has a 30" line which runs along Trents Ferry Road until just past the Bedford County line; at which point it crosses private land to connect up to their system along Route 501. Pressures would be 80 to 120 psi.
    b) Advantages: Allows another connection to the City of Lynchburg for additional hydraulic capacity for the system and provides water to additional residents.
    c) Disadvantages: None.
14. Everett Road Loop
    a) Discussion: This project would include 3,200 feet of 8-inch main to form a system loop. Service pressures will be 40 psi to 120 psi.
    b) Advantages: This project would provide a strong feeder between two populated areas.
    c) Disadvantages: Few new customers.

15. New London South Loop
    a) Discussion: This project would include 7,500 feet of 4-inch main to form a system loop. Service pressures will be from 120 psi to over 160 psi.
    b) Advantages: The project would connect two very long dead end mains to reduce water quality issues.
    c) Disadvantages: Few new customers.
16. Growth Projects

    There are several recommended projects to extend service into growth areas. Advantages to these projects include the expansion of service to growth areas, and they provide looping for improved reliability and water quality. The disadvantage of these projects is their high cost for service to a relatively small number of people. Some of these projects cross planning area boundaries. These projects likely are for construction 20 years or more in the future.

    Goode Road Extension - 11,300 feet of 8-inch water main (80 to 160 psi)
    Bellevue Road Extension - 12,700 feet of 8-inch water main (80 to 160 psi)
    Lee Jackson Highway Loop -29,800 feet of 10-inch water main (under 40 to 120 psi w/PS)

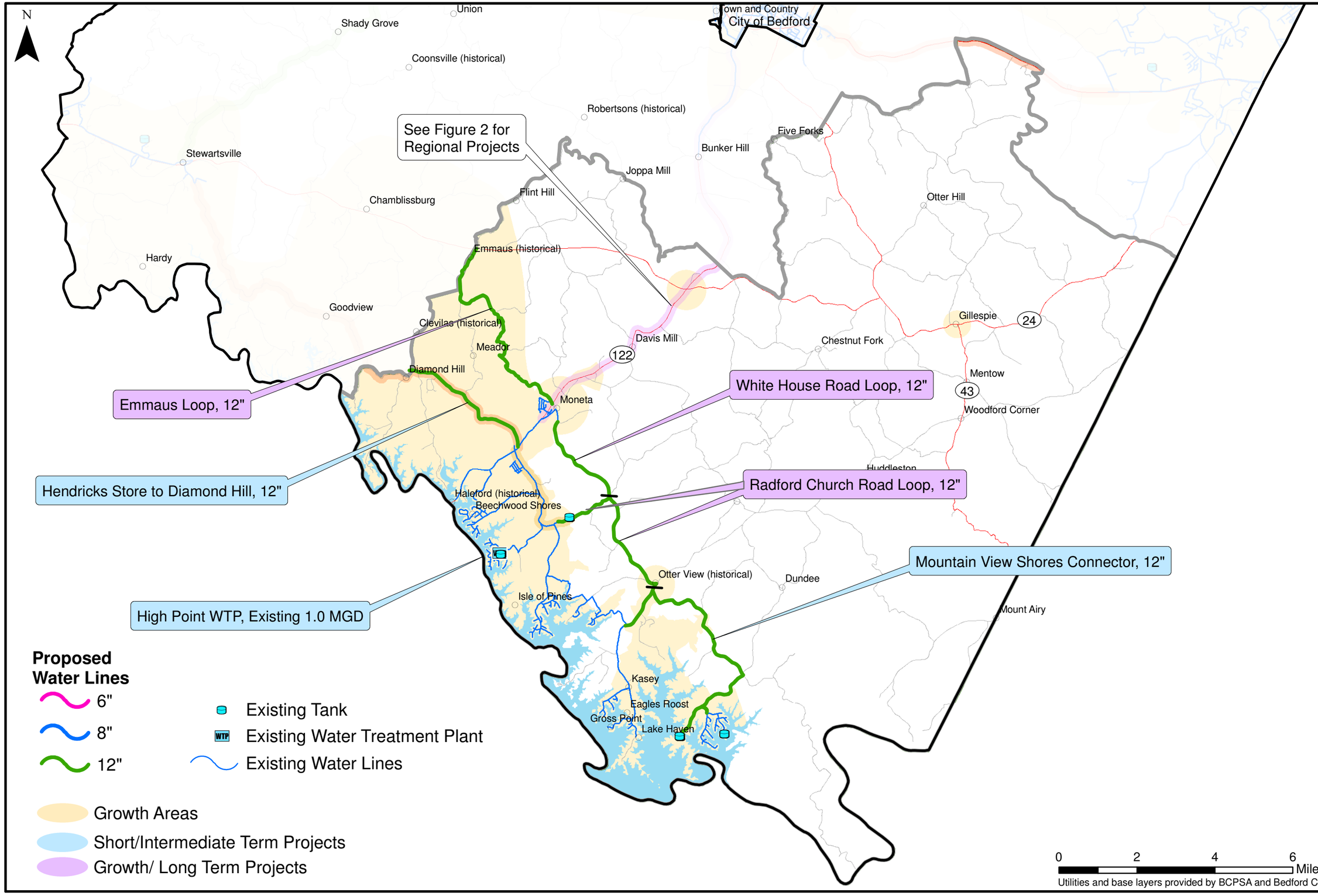
4.4.6 Lakes Planning Area

Lakes proposed projects are shown on Figure 10. A service pressure map is provided as Figure 11. These improvements are described in more detail below.

1. Upgrades High Point WTP for 1.0 MGD
    a) Discussion: This project will expand the plant to its ultimate capacity of 1.0 MGD at its current location. This upgrade would require new finished water pumps.
    b) Advantages: The plant, when designed, incorporated this ultimate capacity, and the required improvements are known. No additional property or line work will be required for this alternative.
    c) Disadvantages: This expansion will meet the initial needs of the High Point area and some of the Lakes planning area. However, the project will not meet the long term water requirements for the Lakes planning area.
2. Mountain View Shores Connector
    a) Discussion: Connects the Mountain View shores and other surrounding communities to the Forty Acres connection line using approximately 34,700 feet of 12-inch waterline. Service pressures would range from 80 to 160 psi.
    b) Advantages: Continues with the regional connection to supply more people water. The Mountain View Shores WTP and Valley Mills WTP would be removed from service, thereby reducing overall water treatment costs for BCPSA.

c) Disadvantages: Relative high cost per initial customer.

3. Hendricks Store to Diamond Hill
   a) Discussion: This project is only advantageous as a part of a regional water system and consists of approximately 20,000 feet of 12-inch waterline. It would serve as estimated 198 customers in the Lakes growth area. Service pressures would range from 80 to 120 psi.
   b) Advantages: Helps extend water from the Route 122 area toward the Blue Ridge growth area.
   c) Disadvantages: High Cost.
4. Growth Projects
   - White House Road Loop – 13,900 feet of 12-inch water main (80 to 120 psi)
   - Radford Church Road Loop – 24,200 feet of 12-inch water main (40 to 120 psi)
   - Emmaus Loop – 48,300 feet of 12-inch water main (80 to 160 psi)



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Lakes Planning Area - Proposed Water Projects

Bedford County PSA - Comprehensive Water and Wastewater Study Update

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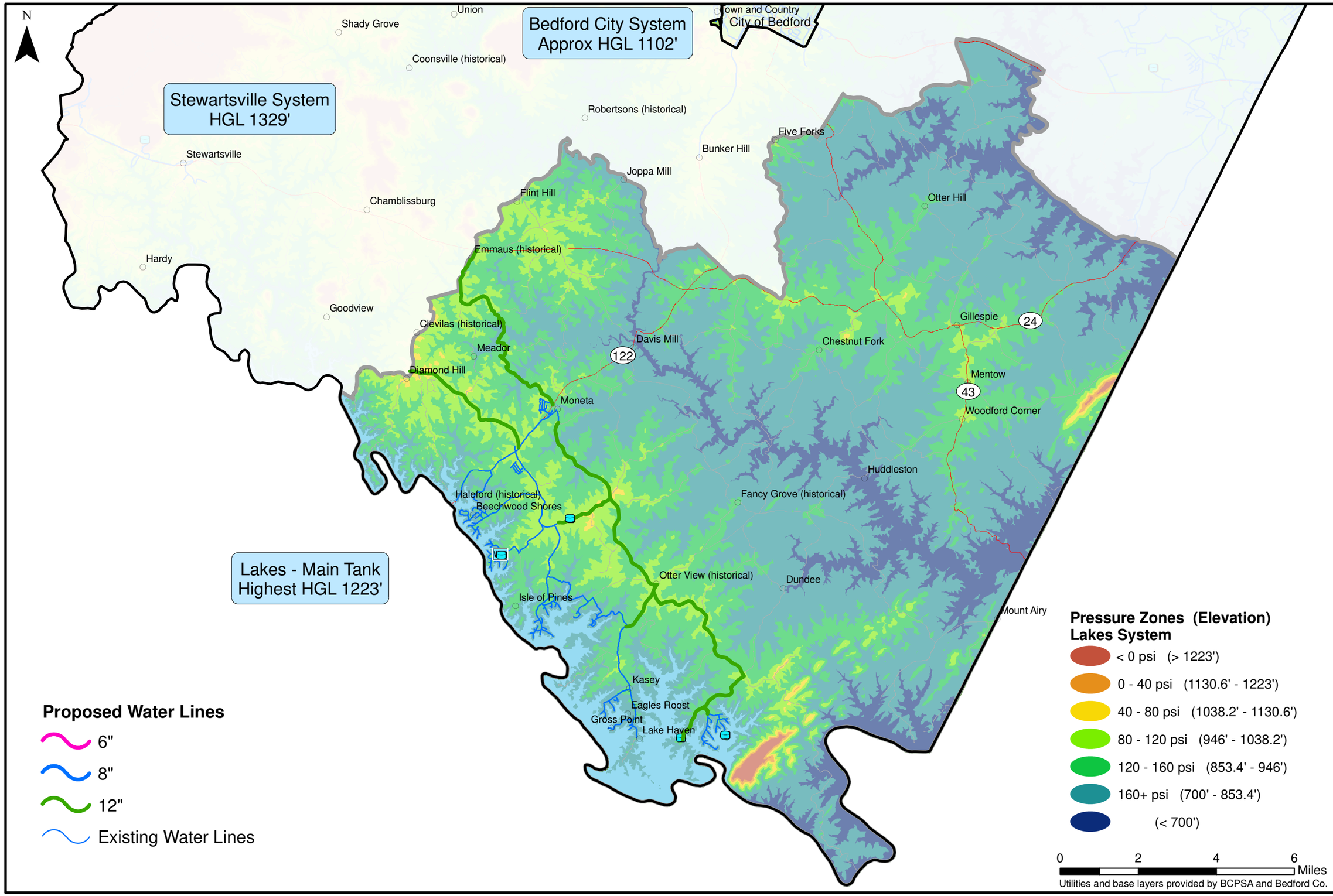
Plan No. B05123-06

Figure 10



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Lakes Planning Area - Water Service Pressure Map

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Plan No. B05123-06

Figure 11

4.4.7 Peaks Planning Area

There are no projects proposed for the Peaks Planning Area as shown in Figure 12. A service pressure map is provided as Figure 13.

N

Major
Big Island
Powells Store
Waugh
Coleman Falls
Pearch
Albert
Sedalia
Curtis
122
Eagles Eyrie
Charlemont
Coltons Mill
No Proposed Projects
Boonsboro
Otterville
Coffee
43
Perrowville
Reba
Peaksville
Cifax
Villamont
Kelso Mill
Montvale
Penicks Mill
Big Otter Mill
Old Mill
Centerville
See Figure 2 for Regional Projects
Irving
Northwood Heights
North Hills
Goode
Thaxton
460
Lowry
City of Bedford
Town and Country
Union
Shady Grove
Coonsville (historical)

Proposed Water Lines

6" 10"
8" 12"

Existing Water Lines
Growth Areas

Short/ Intermediate Term Projects
Growth/ Long Term Projects

0 2 4 6 Miles

Utilities and base layers provided by BCPSA and Bedford Co.

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Peaks Planning Area - Proposed Water Projects

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Figure 12

N

NOTE: Service pressures are based on the Bedford City System (1102')

Pressure Zones (Elevation)
Bedford City System

- < 0 psi (> 1102.4')
- 0 - 40 psi (1010.0' - 1102.4')
- 40 - 80 psi (917.6 - 1010.0')
- 80 - 120 psi (825.2' - 917.6')
- 120 - 160 psi (732.8' - 825.2')
- 160+ psi (640.4' - 732.8')
- (< 640.4')

No Proposed Projects

Bedford City System
Approx HGL 1102'

City of Bedford

Major
Big Island
Powells Store
Waugh
Coleman Falls
Pearch
Albert
Sedalia
Curtis
122
Eagles Eyrie
Charlemont
Coltons Mill
Boonsboro
Otterville
Coffee
43
Perrowville
Reba
Peaksville
Cifax
Villamont
Kelso Mill
Big Otter Mill
Old Mill
Bluemont Estates
Montvale
Penicks Mill
Clay
Norwood
Centerville
Irving
Northwood Heights
North Hills
Goode
Bellevue
Thaxton
460
Lowry
Union
Shady Grove
Coonsville (historical)
Town and Country

Proposed Water Lines

- 6"
- 10"
- 8"
- 12"
- Existing Water Lines

0 2 4 6 Miles

Utilities and base layers provided by BCPSA and Bedford Co.

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Peaks Planning Area - Water Service Pressure Map

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Plan No. B05123-06

Figure 13

4.4.8 Water Improvement Cost Estimates

Table 10 summarizes the project cost estimate from the detailed tabulations in Appendix A.

Table 10: Summary of Proposed Water Costs

Proposed Alternative	Project Cost Estimate	Present Value Cost Estimate
REGIONAL PLANNING AREA		
Lakes Region WTP (2.0 MGD)	$ 4,206,800	$ 8,524,078
Lake Region WTP (5.0 MGD)	$ 24,796,200	$ 33,357,349
Lakes Region WTP (10.0 MGD)	$ 44,421,000	$ 59,921,452
Lakes Region WTP - City of Bedford Interconnect	$ 12,877,150	$ 12,971,892
Lakes Region WTP - Stewartsville Interconnect	$ 9,468,550	$ 10,009,471
Stewartsville - Montvale Interconnect	$ 6,445,400	$ 6,512,728
Bedford - Montvale Interconnect	$ 4,409,600	$ 4,455,594
Bedford - Forest Interconnect (Route 460)	$ 6,276,400	$ 6,706,866
Bedford - Forest Interconnect (Route 221)	$ 6,724,900	$ 7,168,786
BLUE RIDGE PLANNING AREA		
Vinton East	$ 128,050	$ 330,035
Stewartsville West Loop	$ 549,900	$ 557,700
Stewartsville East	$ 2,671,500	$ 2,696,963
Vinton to Hardy	$ 2,534,350	$ 2,561,534
Stewartsville to Hardy (Rt. 635)	$ 702,000	$ 711,176
Stewartsville to Hardy (Rt. 619)	$ 1,591,200	$ 1,608,061
Chamblissburg Extension	$ 3,130,400	$ 3,163,204
Industrial Commerce Park Extension	$ 481,650	$ 488,188
BLUE RIDGE WATER PROJECTTOTALS	$ 11,789,050	$ 12,116,860
CENTER PLANNING AREA		
Bedford City to Otter River School	$ 1,673,100	$ 1,691,337
Timber Ridge Extension	$ 2,275,000	$ 2,297,940
Route 460Extension	$ 2,288,000	$ 2,312,890
Bedford City to Hillcrest	$ 687,700	$ 696,417
Casaloma/Goode Loop	$ 585,000	$ 591,308
CENTER WATER PROJECT TOTALS	$ 7,508,800	$ 7,589,892

Proposed Alternative	Project Cost Estimate	Present Value Cost Estimate
JEFFERSON PLANNING AREA		
Route 643 Loop	$ 363,350	$ 368,282
Goode Loop	$ 1,296,750	$ 1,314,070
Valleywood Manor Loop	$ 118,300	$ 119,906
Route 622 Loop	$ 2,109,250	$ 2,131,502
Route 609 Extension	$ 1,294,800	$ 1,308,736
Route 221 Extension	$ 863,200	$ 872,032
JEFFERSON PLANNING AREA		
Woods on Wiggington Loop	$ 436,150	$ 442,000
Route 621 Loop, Phase I	$ 551,200	$ 556,935
Route 621 Loop, Phase II	$ 798,850	$ 807,338
Boonsboro West Loop	$ 1,729,000	$ 1,747,811
Howard Drive	$ 565,500	$ 573,644
Holcomb Rock Road Loop	$ 841,100	$ 850,161
Trents Ferry Road Loop	$ 803,400	$ 813,952
Everett Road Loop	$ 296,400	$ 300,070
New London South Loop	$ 624,000	$ 632,602
JEFFERSON WATER PROJECT TOTALS	$ 12,691,250	$ 12,839,040
LAKES PLANNING AREA		
Upgrade High Point WTP to 1.0 MGD	$ 650,000	$ 2,058,506
Mountain View Shores Connector	$ 3,797,300	$ 3,837,101
Hendricks Store to Diamond Hill	$ 2,150,200	$ 2,253,429
LAKES WATER PROJECT TOTALS	$ 6,597,500	$ 8,149,036
PEAKS PLANNING AREA		
None	$ 0	$ 0
PEAKS PLANNING AREA TOTALS	$ 0	$ 0
GROWTH AREA PROJECTS		
Perennial Lane Loop (Center)	$ 1,072,500	$ 1,084,658
Belleview Road Extension (Center and Jefferson)	$ 1,350,700	$ 1,368,822
Goode Road Extension (Center and Jefferson)	$ 1,907,100	$ 1,938,563
Lee Jackson Highway Loop (Jefferson)	$ 3,334,500	$ 3,368,680
White House Road Loop (Lakes)	$ 1,527,500	$ 1,543,443
Radford Church Road Loop (Lakes)	$ 2,657,200	$ 2,684,957
Emmaus Loop (Lakes, Blue Ridge)	$ 5,153,850	$ 5,209,250
Goodview Town Road Loop (Blue Ridge)	$ 2,400,450	$ 2,425,913
GROWTH AREA PROJECT TOTALS	$ 19,403,800	$ 19,618,286

4.4.9 Comparison of Water Treatment Plant Options

Table 11 provides some detail concerning the options for water treatment capacity on Smith Mountain Lake.

Table 11: Regional Water Treatment Plant Alternatives

Treatment Capacity (average):	1.0 MGD	2.0 MGD	5.0 MGD	10.0 MGD
Withdrawal Permit Modification	No	No	Yes	Yes
Intake Modifications	No	Upgrade Intake	Upgrade Intake	Upgrade Intake
Intake P.S. Modifications	No	Upgrade Pump Station	Upgrade Pump Station	Upgrade Pump Station
14,000 L.F. Raw W.L	No	12”	24”	30”
Expand HPWTP to 1.0 MGD	New Finished Water Pumps	N/A	N/A	N/A
New Plant Near Camp 24[1]	Use existing WTP	Use existing WTP	New Treatment Facility	New Treatment Facility
TOTAL PROJECT COST	$650,000	$3,452,800	$24,796,200	$44,421,000

Projected Water Use in 2028

Lakes Systems	0.57 MGD
Stewartsville (including Hardy and Goodview)	0.04 MGD
City of Bedford[2]	3 MGD
Franklin County	1, 2, or 3 MGD
Forest	2.8 MGD

[1] High Point to Hales Ford Bridge Phase 1 will need to be constructed to provide finished water to the High Point Area

[2] City of Bedford currently operates a 3.0 MGD water treatment plant

5.0

WASTEWATER

5.0 WASTEWATER

5.1 General

Since the prior Comprehensive Countywide Studies were produced in 1994 and 2000, some of the proposed projects, and other projects not listed in those reports, have been constructed. The mapping in Figures 14 to 18 have been updated to show these new systems as existing. In addition, due to the rapid growth of Bedford County, several new service areas, added in the 2000 update, have been retained in this update. Projects constructed since the 1994 study are identified in Section 5.2.

In December 2003, Bedford County Public Service Authority received a report from WW Associates of Lynchburg, VA, entitled "Wastewater Collection, Conveyance and Treatment Preliminary Engineering Report." The report provided a review of regional alternatives for sewer in Bedford County. The new service areas considered in the report included Stewartsville, New London, and the Lakes area. These areas were considered along with the existing Montvale, Boonsboro and Forest areas. Regional service plans developed in the 2000 study were considered in the evaluation of alternatives. The 2003 report concluded that more localized conveyance and treatment options should be pursued at this time, rather than the larger regional projects identified in the 2000 study.

5.2 Constructed Projects – By Planning Area

In the Blue Ridge planning area, some sewer extensions have been completed in the Montvale area, along with sewage treatment improvements. In addition, the Stewartsville area has been studied closely for sewer service.

The Center planning area includes the City of Bedford. None of the recommended projects from the 1994 and 2000 studies were completed in this area.

The Jefferson Planning Area continues to grow rapidly. Some of the recommended projects have been completed in this area since the 1994 study. The completed projects include the Radford Interceptor and portions of the New London Sewer project.

In the Lakes planning area, Smith Mountain Lake shore development has resulted in the connection of residences to the Moneta Sewer Project, which includes a 0.5 MGD Wastewater Treatment Plant and collection system with four lift stations. Portions of the overall project have been completed. Lake shore development can be expected to be a focus of future sewer system capital improvements.

In the Peaks planning area, no projects from the 1994 and 2000 studies were completed in the past fifteen years.

5.3 Proposed Wastewater Projects

As noted above, the 2003 study proposed localized projects in place of the larger regional projects identified in the 2000 study. This section contains projects remaining from the 1994 and 2000 study and includes projects proposed in 2003. All of these projects were developed to meet the continually growing wastewater needs in Bedford County. The advantages and disadvantages for each alternative are discussed as part of this evaluation. The cost estimates for the alternatives are shown in Appendix B and a summary of the estimated costs for each project is provided in Table 12 at the end of this chapter. As with the water projects, these costs should be considered preliminary for planning purposes. For each individual project a preliminary engineering report will be necessary to further develop the individual project design scope and cost. Since the 2003 report was provided as a preliminary engineering report, minimal additional work may be needed to support those projects for regulatory approval.

5.3.1 Blue Ridge Planning Area

With the installation of the waterline in the Stewartsville area, the need for sewer service has become a high priority in this area without sewers. Most of this area is located within the Beaver Dam Creek Drainage Basin, which flows into Smith Mountain Lake. Due to treatment restrictions and political issues, a discharge into Smith Mountain Lake is undesirable. However, the 2003 study recommended collection of wastes with treatment at a new Falling Creek Wastewater Treatment Plant, tributary to Smith Mountain Lake. Regulatory discussions at that time resulted in optimism that a wastewater discharge could be placed at the desired

location with reasonable wastewater discharge limits. The development of the collection systems is discussed more in the projects below.

As previously discussed, the Montvale area should see a significant increase in industrial and commercial development in the near future. This will drive the need for a wastewater collection and treatment facility for the area. An existing plant now serves Montvale. The existing plant has a capacity of 50,000 gpd. The current discharge permit from DEQ is limited to 50,000 gpd. The treatment facility should not need to be expanded within the study period. Blue Ridge Area proposed projects are shown on Figure 14. The extension of the collection system for Montvale, and the alternatives for extension to the regional plant are discussed more in the projects below.

1. Stewartsville Area Projects
    a) Discussion: The Stewartsville area projects would involve the installation of a collection system for the community and installation of a 150,000 gpd wastewater treatment plant. One pump station would be needed in an area east of Jordantown Road. This system would gravity flow to the proposed site of the Falling Creek WWTP. The collection system has been divided into the following segments, which would include 36,200 feet of 8-inch sewer, 13,100 feet of 10-inch sewer, 7,900 feet of 15-inch sewer and 4,700 feet of 6-inch force main.
        Falling Creek
        Sandy Creek
        Route 757
        Nat Branch
        Jordantown
        Stewartsville
    b) Advantages: Service for numerous residents in an area with predominantly poor soils for septic systems, and sewer capacity for further economic development.
    c) Disadvantages: Permitting of the wastewater treatment plant discharge and relatively high treatment costs, translating to high user rates.

N

Montvale
Gravity Line 8-inch and 12-inch
Force Main 8-inch

Existing 20,000 gpd Lift Station

Existing 50,000 gpd Wastewater Treatment Plant

Vinton East
Gravity Mains 8-inch and 10-inch
Force Main 8-inch

Stewartsville Area Projects
Collection System
Falling Creek Wastewater Treatment Plant
Commercial Pump Station

PS
Jordantown
Villamont
Montvale
FS
WWTP
460
Irving
Reba
Peaksville
Kelso Mill
Old Mill
Centerville
Northwood Heights
North Hills
Thaxton
Lowry
Sedalia
Curtis
Coltons Mill
Otterville
City of Bedford
Own and Country
Union
Shady Grove
Coonsville (historical)
Robertsons (historical)
Five Forks
Bunker Hill
Joppa Mill
Flint Hill
Chamblissburg
24
Emmaus (historical)
Davis Mill
Goodview
Clevilas (historical)
Meador
Diamond Hill
Moneta
Hardy
Sandy Creek
Gravity Line 8-inch
and 10-inch
Falling Creek
Gravity Line 10-inch
Nat Branch
Gravity Line 8-inch
Jordantown
Gravity Line 8-inch
Stewartsville
Stewartsville
Gravity Line 15-inch and 8-inch
Force Main 10-inch
Route 757
Gravity Line 8-inch
Force Main 6-inch

Proposed Gravity Line
Proposed Force Main
PS Proposed Pump Station
WWTP Proposed WWTP
Existing Sewer Lines
PS Existing Pump Station
WWTP Existing WWTP
Growth Areas

0 2 4 6 Miles

Utilities and base layers provided by BCPSA and Bedford Co.

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Blue Ridge Planning Area - Proposed Sewer Projects

Bedford County PSA - Comprehensive
Water and Wastewater Study Update

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Figure
14

2. Vinton East
    a) Discussion: The Vinton East project would involve the installation of a collection system for the community and a pump station and force main to pump into the proposed sewage collection system for Stewartsville. The project would include 2,500 feet of 8-inch sewer, 1,600 feet of 10-inch sewer and 5,300 feet of 6-inch force main.
    b) Advantages: Service for numerous residents in an area with predominantly poor soils for septic systems, and sewer capacity for further economic development.
    c) Disadvantages: Can only be completed following or in conjunction with the Stewartsville collection system and regional treatment facility.
3. Montvale
    a) Discussion: This project would extend sewer service in the Montvale Community. The system would involve the construction of 18,200 feet of 8-inch collection pipe, a pump station and 5,900 feet of 8-inch force main.
    b) Advantages: Provides the sewer needs for the proposed industrial and commercial expansions. Provides sewer for residents in an area with predominantly poor soil conditions for septic systems.
    c) Disadvantages: High cost.

5.3.2 Center Planning Area

There are no projects proposed for the Center Planning Area, as shown in Figure 15. An agreement would need to be provided between the City of Bedford and BCPSA before any projects could be considered at the City's perimeter.

5.3.3 Jefferson Planning Area

The Jefferson Planning Area has seen extensive growth in all three of its major localities, and the sewer needs in this area are continuously expanding. Needed sewer projects for this area include the extension of a gravity line from the existing Forest Central Sewer System so that the Lake Vista Pump Station can be taken off-line, the need for a collection system in the New London area, and sewer service in the Boonsboro system. Jefferson Area proposed projects are shown in Figure 16. The proposed improvements for the Jefferson Planning Area are described in more detail below.

1. New London/Elk Creek Drainage Basin

a.) Discussion: The New London/Elk Creek Drainage Basin area includes projects that would involve the installation of a collection system for the communities between and around Routes 221 and 460, in the Elk Creek drainage basin. The New London area would be served by a collection system and pump station that would pump to the existing New London Pump Station and then subsequently on to the existing Forest Central Sewer System. These improvements have been divided into the following project segments, which will include 29,700 feet of 8-inch sewer, 7,100 feet of 12-inch sewer, 27,900 feet of 18-inch sewer, 50,100 feet of 24-inch sewer, 12,900 feet of 6-inch force main, 18,500 feet of 10-inch force main and 17,500 feet of 12-inch force main.

Elk Creek Interceptor

Ashton Ridge

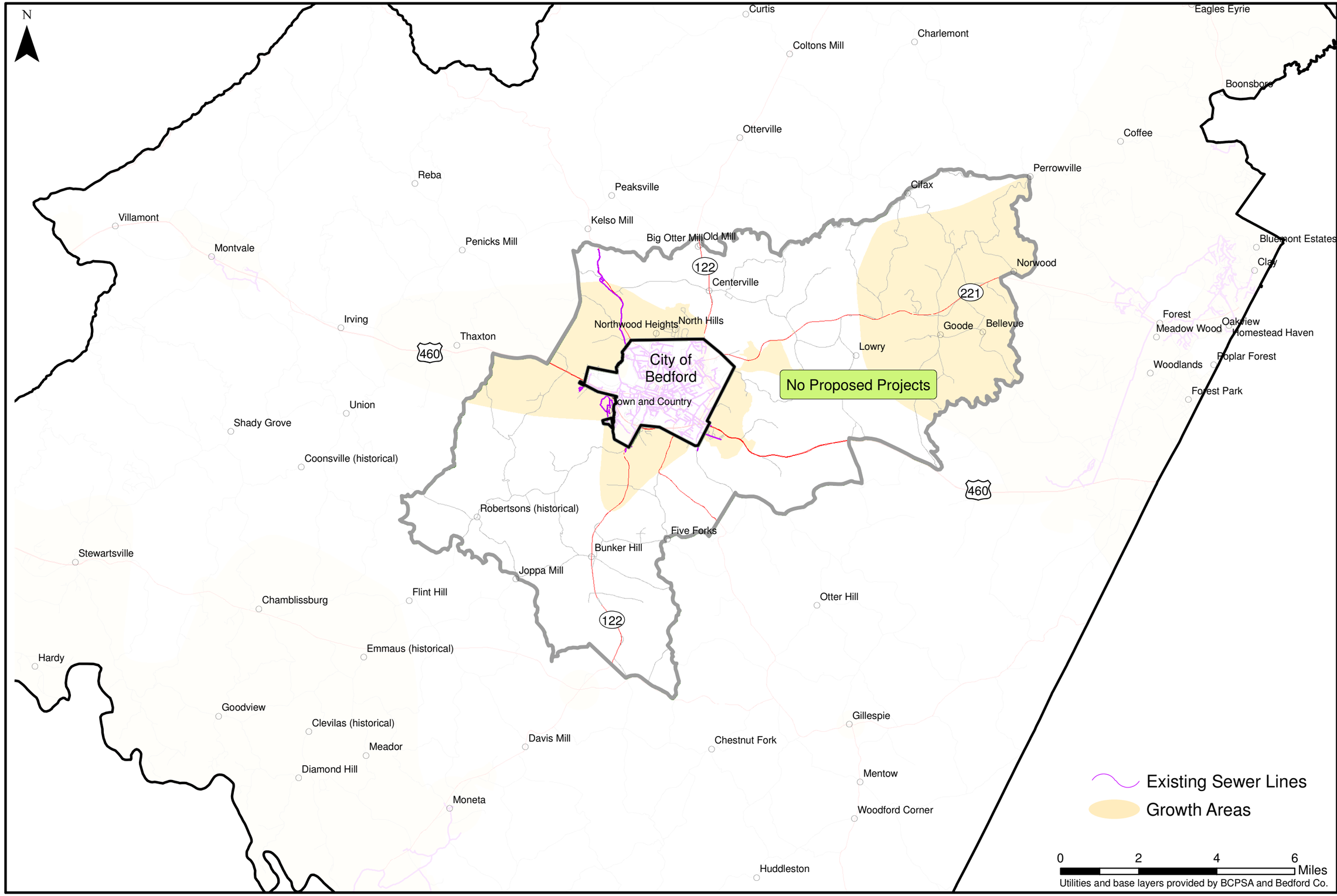
London Downs (Phase 1&2)

Lick Run

Route 643

b) Advantages: Provides new service to numerous residents and commercial customers. Provides ability to expand service to future adjoining subdivisions.

c) Disadvantages: High cost. Annual operation and maintenance.



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Center Planning Area - Proposed Sewer Projects

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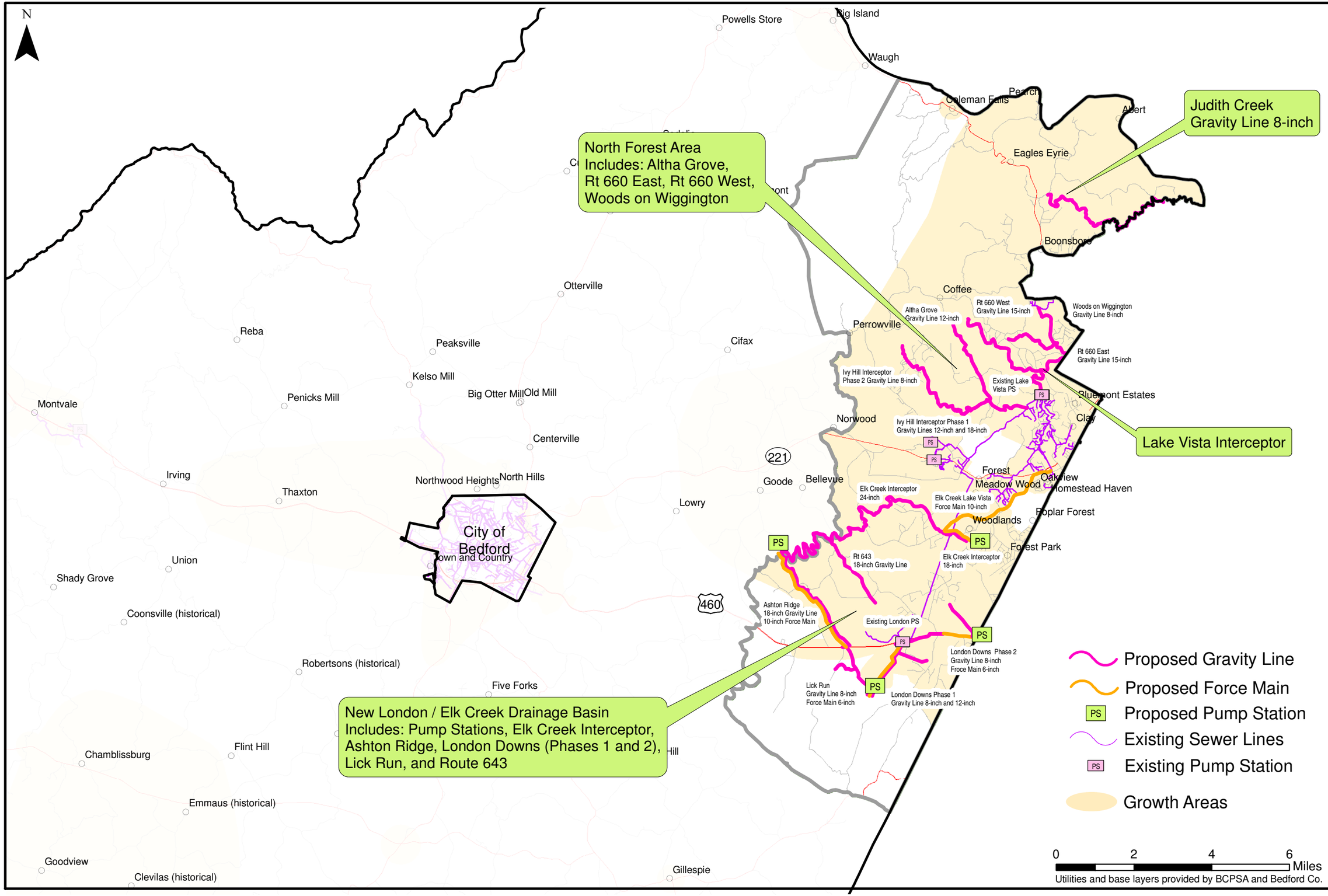
Figure
15



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Jefferson Planning Area - Proposed Sewer Projects

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Figure
16

2. Lake Vista Interceptor
    a) Discussion: To allow the abandonment of the Lake Vista Pump Station, this project would involve the installation of a gravity sewer line from the existing Lake Vista Pump Station to the existing 36 inch Lynchburg interceptor located along Ivy Creek. Sewer capacity in the Lynchburg interceptor needs to be evaluated prior to the implementation of this project. This project would include 11,000 feet of 24-inch collector sewer.
    b) Advantages: Eliminates the need for the Lake Vista Pump Station, therefore reducing operation and maintenance costs.
    c) Disadvantages: High cost and would not serve any additional customers. Other projects in the City of Lynchburg are needed before the Interceptor project can be started. The BCPSA agreement with Lynchburg may need to be modified.
3. North Forest Area
    a) Discussion: The projects in the North Forest area will provide this rapidly growing area with sewer service. These lines will feed into the Lake Vista drainage area, and therefore will be conveyed to Lynchburg through the Ivy Creek Interceptor. The collection system has been divided into the following segments, which will include 24,000 feet of 8-inch sewer, 26,400 feet of 12-inch sewer, 16,600 feet of 15-inch sewer and 6,600 feet of 18-inch sewer.

        Altha Grove

        Route 660 West

        Route 660 East

        Woods on Wiggington
    b) Advantages: Provides sewer service to a rapidly growing area of the County.
    c) Disadvantages: May require analysis of Lynchburg system for additional capacity. Also may require re-negotiation of sewer agreement with City of Lynchburg. The gravity interceptor at Lake Vista will need to be completed prior to these projects.
4. Judith Creek
    a) Discussion: The Judith Creek project consists of 26,900 feet of 8-inch sewer line that connects the Judith Creek drainage basin to the City of Lynchburg system.
    b) Advantages: Provides sewer service to a rapidly growing area of the County.
    c) Disadvantages: May require analysis of Lynchburg System for additional capacity.

5.3.4 Lakes Planning Area

Concerns of failing septic systems and high contaminants in Smith Mountain Lake, along with the strong desire for development, have driven the need for a

wastewater collection system in this area. However, due to the topography around the lake and environmental issues regarding discharges into the lake, a conventional collection system is not practical to serve this area.

A likely alternative to gravity sewer for the area would be a low-pressure collection system. A system such as this would not require gravity flow as in a conventional system, therefore, it would not be limited by topography around the lake. However, before such a system can be fully evaluated and implemented, there are a number of issues that need to be addressed regarding design, operation and maintenance of such a system. The low pressure collection systems would pump to a series of centralized pump stations which would convey the sewage to a new Lakes Region WWTP at Camp 24, and pumped discharge to Goose Creek. Lakes Area proposed projects are shown on Figure 17.

1. Smith Mountain Lake Sewer Project Phases 1-6
    a) Discussion: This project would provide a series of pump stations and force mains along Routes 122, 655, 853, and 608, between Hales Ford Bridge and Mountain View Shores. This system would feed into the 0.5 MG regional treatment facility at Moneta. The project includes 19,500 feet of 8-inch sewer, 11,000 feet of 10-inch sewer, 3,000 feet of 15-inch sewer, 15,700 feet of 8-inch force main, 4,200 feet of 10-inch force main, 18,700 feet of 12-inch force main, 27,600 feet of 14-inch force main, 3,500 feet of 15-inch force main and 12,700 feet of 18-inch force main.
    b) Advantages: Provides sewer for residents in an area with predominantly poor soil conditions for septic systems. Provides sewer service for commercial development. Prevents discharge into Smith Mountain Lake.
    c) Disadvantages: High cost.

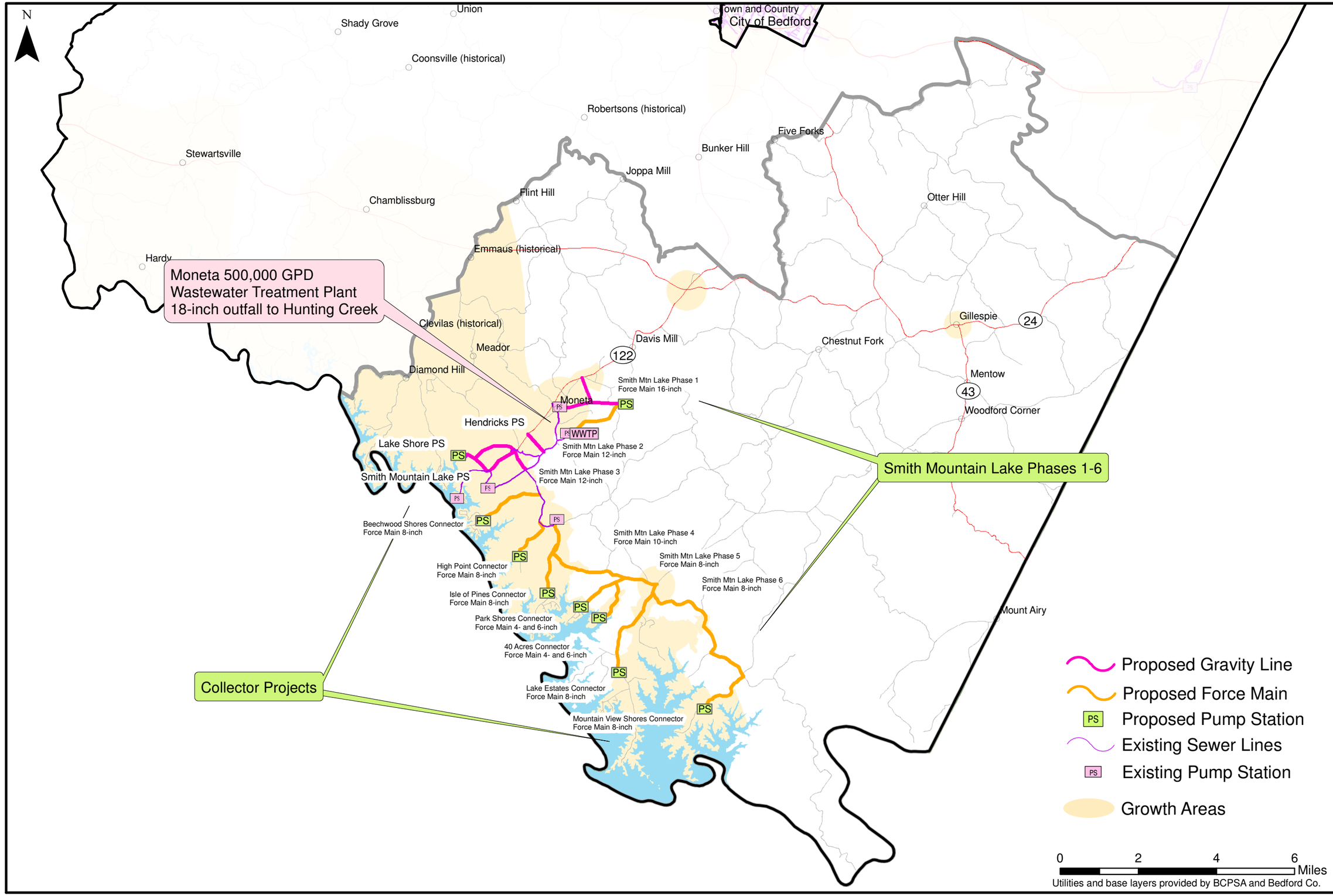

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Figure

17

2. Collectors

a) Discussion: These projects would provide a pump station and force main for each development around Smith Mountain Lake. Each property owner would be responsible for installing a residential pump station and portions of shared low-pressure force mains to pump to the area pump station. This system would feed into Smith Mountain Lake Sewer Project and then to the proposed Lakes Region WWTP. The collection system has been divided into the following segments shown, which will include 5,200 feet of 4-inch force main, 9,200 feet of 6-inch force main and 62,500 feet of 8-inch force main.

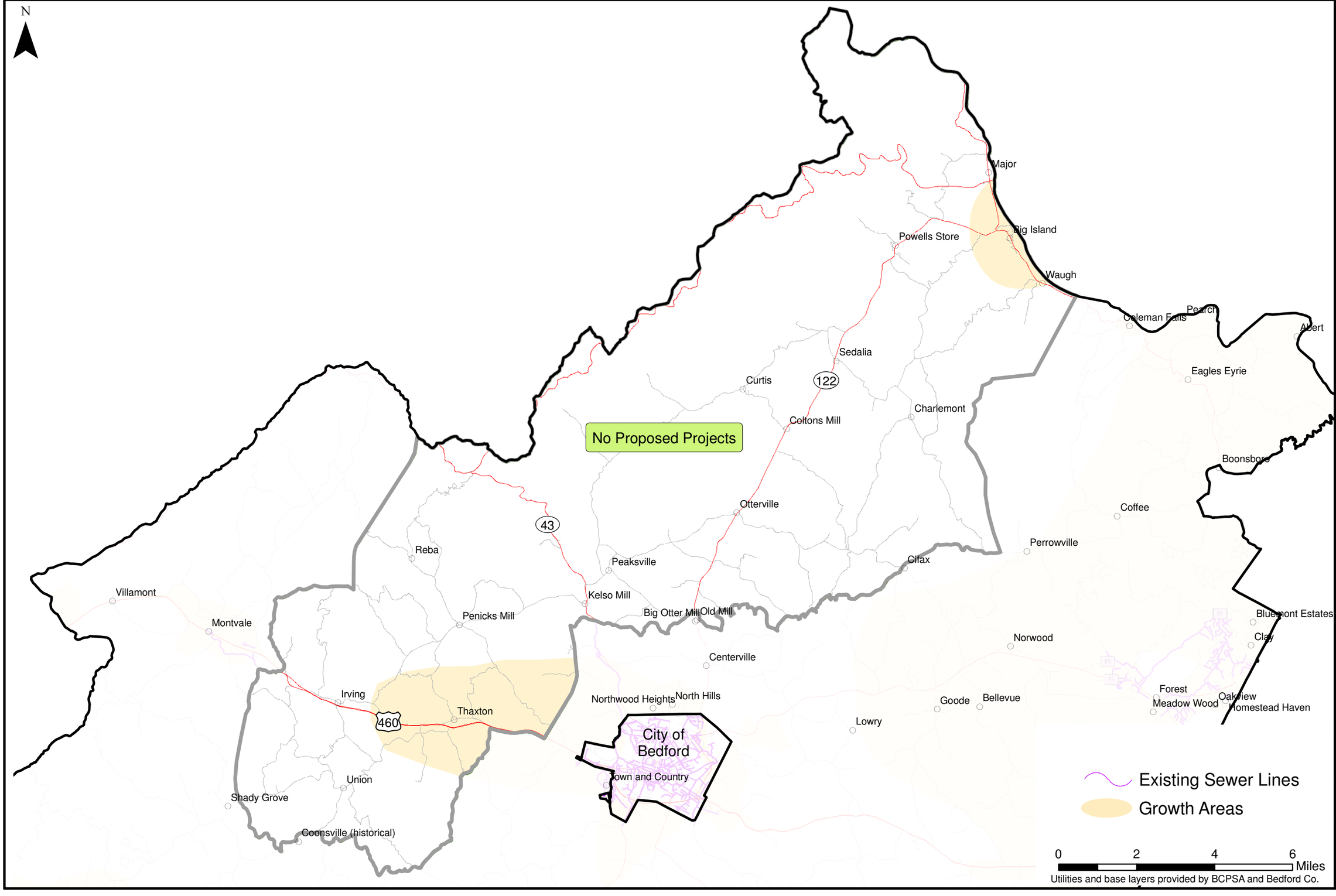
Beechwood Shores Collector
Highpoint Collector
Isle of Pines Collector
Park Shores Collector40 Acres Collector
Lake Estates Collector
Mountain View Shores Collector

b) Advantages: Provides sewer for residents in an area with predominantly poor soil conditions for septic systems. Prevents discharge into Smith Mountain Lake.

c) Disadvantages: High cost. Must be completed following or in conjunction with all downstream phases of the Smith Mountain Lake Sewer Project.

5.3.5 Peaks Planning Area

There are no projects proposed for the Peaks Planning Area, as shown in Figure 18.



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Peaks Planning Area - Proposed Sewer Projects

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Figure
18

5.3.6 Wastewater Improvement Cost Estimates

Table 12 summarizes the project cost estimates, from the detailed tabulations in Appendix B

Table 12: Summary of Proposed Wastewater Costs

Proposed Alternative	Project Cost Estimate	Present Value Cost Estimate
BLUE RIDGE PLANNING AREA		
Stewartsville Area	$ 9,902,588	$ 11,676,870
Vinton East	$ 1,194,700	$ 1,302,976
Montvale	$ 2,588,950	$ 2,714,087
BLUE RIDGE WASTEWATER PROJECT TOTALS	$ 13,686,238	$ 15,693,933
CENTER PLANNING AREA		
NO CENTER PROJECTS	$ 0	$ 0
JEFFERSON PLANNING AREA		
New London/Elk Creek Drainage Basin	$ 23,713,950	$ 25,134,729
Lake Vista Interceptor	$ 2,025,400	$ 2,038,017
North Forest Area	$ 8,366,800	$ 8,451,219
Judith Creek	$ 2,453,100	$ 2,483,954
JEFFERSON WASTEWATER PROJECT TOTALS	$ 36,559,250	$ 38,107,917
LAKES PLANNING AREA		
Smith Mountain Lake Sewer Project Phases 1-6	$ 12,868,993	$ 15,267,238
Collectors	$ 8,309,600	$ 9,974,918
LAKES WASTEWATER PROJECT TOTALS	$ 21,178,593	$ 25,242,156
PEAKS PLANNING AREA		
NO PEAKS PROJECTS	$ 0	$ 0

6.0

FUNDING OPTIONS

6.0 FUNDING OPTIONS

6.1 Introduction and Funding Options

In order to accomplish the projects included in the project lists, Bedford County needs to be able to charge user fees that are reasonable and affordable and that are adequate to recover the costs of funding and operating the systems. Low-interest loans and grants or significant contributions from the County's general fund or private developers will be required. The following sources are potential funding options for capital projects in Bedford County:

- Virginia Community Development Block Grants for Community Facilities
- Rural Development Administration
- Virginia Water Facilities Revolving Fund
- Virginia Water Supply Revolving Loan Fund
- Southeast Rural Community Assistance Project
- Virginia Resources Authority
- Revenue Bonds
- Connection Fees
- Contributions from Developers
- Contributions from County General Fund

Competition for funding in today's market is competitive. Water and wastewater projects of the type included in this report frequently require several sources of funding. The following is a brief description of the sources listed above:

6.1.1 Virginia Community Development Block Grants for Community Facilities (VCBG)

Block grants are awarded on an annual basis through the Virginia Department of Housing and Community Development. Applications are submitted in March and selections are usually announced in June each year. A maximum grant of $1,000,000 is available for community facilities projects. Community facilities projects include water services, wastewater services, drainage improvements, and street improvements. VCDBG assistance under this option is generally targeted to

projects involving water and wastewater improvements, particularly those involving new services to low and moderate income persons.

Low and moderate income persons cannot be charged a connection fee for facilities using VCDBG funding and connection fees are not VCDBG eligible expenses. However, the cost of making the physical connection is eligible for VCDBG funding. To the extent feasible, public water service proposals must include a project design that accommodates appropriate fire protection measures in the project area.

The project must address the needs of low and moderate income (LMI) households. At least 51% of the households served by a project must be LMIs. To be competitive in the grant process, the percentage of LMI households benefiting from the project should be much higher. In addition, addressing housing needs along with water or wastewater needs help in receiving grants.

6.1.2 Rural Development Administration (RD)

The Rural Development Administration provides financial assistance for water and wastewater projects to rural areas and towns across the State.

Water and Wastewater Disposal Direct Loans may be made to develop water and wastewater systems in rural areas and to cities and towns with a population of 10,000 or less. Priority is given to areas with less than 5,500 people, to restore a deteriorating water supply, or to improve, enlarge, or modify a water facility or an inadequate waste facility. This is a loan program with fixed interest rates currently ranging between 2.75% and 4.5%. The rates are reviewed each quarter by RD and do change from time to time. The loan period is not to exceed forty (40) years.

Water and Wastewater Disposal Grants can be made to reduce water and wastewater disposal costs to a reasonable level for the users of the system. Grants can be made for up to 75% of the eligible project costs, but are generally limited to less than $1 million per project.

While RD accepts funding applications at any time, the fiscal year for this federally-funded program begins on October 1st. It is therefore advisable to submit a funding application prior to October 1st.

6.1.3 Virginia Water Facilities Revolving Fund (VWFRF)

The Virginia Water Facilities Revolving Fund program is jointly funded by the USEPA and the State of Virginia. The Virginia Department of Environmental Quality administers this sewer program. The funds can be used for new facilities or upgrades to existing facilities. Funding is provided on an annual basis with applications being submitted to VDEQ in the summer of each year. Application deadlines are announced annually. The program seeks to address existing environmental problems.

Interest rates on the loans from the VWFRF can range from 0% to the "ceiling rate" which is one percentage point below market rates (the ceiling has recently been 4.5% or less, but varies from year to year). The term of a loan from the VWFRF cannot exceed twenty years.

6.1.4 Virginia Water Supply Revolving Fund (VWSRF)

The Virginia Water Supply Revolving Fund program is also jointly funded by the USEPA and the State of Virginia. This water program is administered by the Virginia Department of Health. The funds can be used for new facilities or upgrades to existing facilities. Funding is provided on an annual basis with applications being submitted to VDH in the spring of each year. Application deadlines are announced annually. The program seeks to address existing drinking water quality or water quantity problems.

Interest rates on the loans from the VWSRF can range from 0% to the "ceiling rate" which is one percentage point below market rates (the ceiling is usually 4.5% or less, but varies from year to year). The term of a loan from the VWSRF can be twenty or thirty years. The VWSRF also provides some grant funds.

6.1.5 Southeast Rural Community Assistance Project (SE/R-CAP)

SE/R-CAP's Loan Fund serves rural communities with less than 25,000 residents. Low-interest loans are available for water and wastewater projects as well as housing and community economic development projects. The project population must be 10,000 or less and at least 30% of the project population must be low-to-moderate income. With a maximum loan of $250,000 and an interest rate from 4% to 7%, communities can use these funds to extend new service, construct community facilities, or leverage the funds in order to seek larger grants and loans from state, federal and private sources.

Additionally SE/R-CAP provides grants for preliminary engineering studies and a maximum of $400 per hookup is available for connection fees.

6.1.6 Virginia Resources Authority (VRA)

The Virginia Resources Authority provides funds through the sale of bonds for financing projects for water, wastewater, and solid waste. The loan period is usually twenty to thirty years with interest based on market trends. Revenues from the facilities constructed with the bond proceeds would typically be used to secure the bonds. Bonds can also be supported by the moral obligation of the County. Based on recent VRA bond issues, the interest rate for a loan for a term of 20 – 30 years would have an interest rate of slightly more than 5.0%. The VRA's Pooled Loan Bond Program offers borrowers the opportunity to issue bonds with other communities and reduce the issuance costs associated with the bond sale.

6.1.7 Revenue Bonds

Revenue bonds can be issued to provide funding for water and sewer improvements. Typically, revenue bonds would be issued for a term of 20 to 30 years. Revenues from the facilities constructed with the bond proceeds would typically be used to secure the bonds. Bonds can also be supported by the moral obligation of the County.

6.1.8 Connection Fees

Connection fees are an important part of funding a new project as well as establishing a reserve fund for future system improvements. Connection fees relate to the value of the service, including treatment systems, transmission lines, storage facilities, pumping stations, etc. Connection fees collected from the initial customers to the system can be used to offset or reduce the original debt while future customers will assist in paying annual debt service.

6.1.9 County Contributions

In many cases until an adequate customer base has been established, the County may have to make annual contributions from General Fund revenues or other revenues sources to assist in the payment of operations and maintenance cost and debt service. These contributions are made to keep the cost of service to the customers at a fair and reasonable rate. As the customer base increases, contributions may decrease or be eliminated.

Due to the number of capital projects needed in the county, it may be desirable to pursue grant money as well as the lowest-rate and longest-term financing available for the proposed improvements. Even with optimal funding, the systems may need subsidy from County funds until the customer base increases enough to pay the operating expenses and debt service of the projects. A blending of the above funding sources listed above may be necessary to make these projects feasible.

7.0

CONCLUSIONS AND RECOMMENDATIONS

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Mission Statement

The BCPSA's mission statement is as follows:

"*As an independent Authority the Bedford County Public Service Authority exists to anticipate the needs of the County for clean, high quality, water and wastewater services. We shall strive to provide these services to the people of Bedford County, when and where economically possible, at rates that are reasonable and just.*"

This report was prepared to comply with that mission, by studying the proposed facilities that are necessary for the Authority to operate properly and efficiently.

7.2 Water

7.2.1 Conclusions

1. The Forest area of the County currently relies on the Lynchburg water system as a source. Projected growth in the Forest area, though rapid, is not expected to tax the available capacity in the Lynchburg system.
2. The Montvale water system has limited expansion capability. Therefore, future extensions or improvements may be necessary to allow for future growth. The private nature of this system may limit the expansion options for BCPSA.
3. The Stewartsville area of the County has the Western Virginia Water Authority (WVWA) water system as a source with some expansion capability. The projected growth in the Stewartsville area will not likely exceed the capacity of the WVWA water system.
4. The expansion of the High Point water treatment plant in the Lakes area of the County can provide treated water to most of the Lakes region with its expansion capability. Additional expansions are possible to extend the service from this area to other parts of the County as well.

7.2.2 Recommendations

1. Blue Ridge Planning Area
   a) Continue to use the WVWA as a source. Plan to extend the Stewartsville system to the Stewartsville East, Vinton East, Chamblissburg, and Hardy areas.
   b) As the Lakes and the Stewartsville growth areas continue to develop, provide long term water service to the Stewartsville area from the Lakes Region Water Treatment Plant on Smith Mountain Lake.
   c) Continue water service for the Montvale Growth area through the Montvale Water Company.

d) Plan for future extensions to the Montvale area from Stewartsville and the City of Bedford to supplement the Montvale source if necessary.

2. Center Planning Area
   a) Negotiate with the City of Bedford regarding participation in expansion of the Lakes Region Water Treatment Plant and of a transmission main from the Lakes area to supplement the needs of the City of Bedford.
3. Jefferson Planning Area
   a) Within the term of the existing water agreement with Lynchburg, negotiate to obtain a long term commitment for providing water service to meet the needs of the entire Forest area, and possibly supplement the City of Bedford.
   b) Depending on the water agreements worked out with the City of Lynchburg, transmission mains between Forest and the City of Bedford should be constructed to serve the long-term needs of the City of Bedford and the Center growth area.
4. Lakes Planning Area
   a) Continue to develop the High Point water treatment plant to link each water system of the Lakes Planning Area.
   b) The High Point water treatment plant should be of an ultimate design capacity to serve the Lakes, Blue Ridge and Central planning areas. As discussed, this will eventually involve the construction of a new facility near the County's Camp 24 property.
5. Peaks Planning Area
   a) Little attention needs to be given to development of water infrastructure in the Peaks Planning Area.

7.3 Wastewater

7.3.1 Conclusions

1. Continued growth in the Jefferson planning area has caused the need for continued expansion of the Forest Central sewer system, and the need for a collection system and treatment facilities in the New London Area.
2. With the proposed industrial and commercial growth in the Montvale area, expanded wastewater facilities will be needed.
3. With the waterline being installed in Stewartsville, there is now a need for wastewater facilities.
4. Failing septic systems, lake contamination, and the desire for commercial development around Smith Mountain Lake has led to the need for wastewater facilities there.

7.3.2 Recommendations

1. Blue Ridge Planning Area
   a) Construct a local treatment facility near Falling Creek. The facility should have an ultimate capacity to treat the flows from Vinton East, and Stewartsville.
   b) Construct sewer extensions in the Montvale system.
2. Center Planning Area
   a) No plans in the Center Area.
3. Jefferson Planning Area
   a) Construct the proposed Elk Creek wastewater system to serve the New London, Ashton Ridge areas, and the Elk Creek Drainage Basin of Bedford County.
   b) Work with the City of Lynchburg in determining line capacity in their system so that the Lake Vista Pump Station can be taken off line. If sufficient capacity is not available in the Lynchburg System, the Lake Vista force main can be extended to flow into Elk Creek Interceptor.
4. Lakes Planning Area
   a) Due to the presence of failing septic systems in the Lakes region, continue development of the Smith Mountain Lake Sewer Project Phases 1 through 6.
   b) Phasing of the lakes projects can be constructed as capacity and funding allow.
5. Peaks Planning Area
   a) No plans in the Peaks area.

APPENDICES

APPENDIX A

Summary of Proposed Water Projects
Arranged by Planning Areas
Bedford County

Planning Area	Proposed Alternative	Project Cost Esimate	Present Value
Regional	Upgrade of High Point WTP to 2.0 MGD	$ 4,206,800	$ 8,524,078
	Lakes Region WTP (5.0 MGD)	$ 24,796,200	$ 33,357,349
	Lakes Region WTP (10.0 MGD)	$ 44,421,000	$ 59,921,452
	Lakes Region WTP - City of Bedford Interconnect	$ 12,877,150	$ 12,971,892
	Lakes Region WTP - Stewartsville Interconnect	$ 9,468,550	$ 10,009,471
	Stewartsville - Montvale Interconnect	$ 6,445,400	$ 6,512,728
	Bedford - Montvale Interconnect	$ 4,409,600	$ 4,455,594
	Bedford - Forest Interconnect (Route 460)	$ 6,276,400	$ 6,706,866
	Bedford - Forest Interconnect (Route 221)	$ 6,724,900	$ 7,168,786
	REGIONAL WATER PROJECT TOTALS	$ 119,626,000	$ 149,628,217
Blue Ridge	Vinton East	$ 128,050	$ 330,035
	Stewartsville West Loop	$ 549,900	$ 557,700
	Stewartsville East	$ 2,671,500	$ 2,696,963
	Vinton to Hardy	$ 2,534,350	$ 2,561,534
	Stewartsville to Hardy (Rt. 635)	$ 702,000	$ 711,176
	Stewartsville to Hardy (Rt. 619)	$ 1,591,200	$ 1,608,061
	Chamblissburg Extension	$ 3,130,400	$ 3,163,204
	Industrial Commerce Park Extension	$ 481,650	$ 488,188
	BLUE RIDGE WATER PROJECT TOTALS	$ 11,789,050	$ 12,116,860
Center	Bedford City to Otter River School	$ 1,673,100	$ 1,691,337
	Timber Ridge Extension	$ 2,275,000	$ 2,297,940
	Route 460 Extension	$ 2,288,000	$ 2,312,890
	Bedford City to Hillcrest	$ 687,700	$ 696,417
	Casaloma Goode Loop	$ 585,000	$ 591,308
	CENTER WATER PROJECT TOTALS	$ 7,508,800	$ 7,589,892
Jefferson	Route 643 Loop	$ 363,350	$ 368,282
	Goode Loop	$ 1,296,750	$ 1,314,070
	Valleywood Manor Loop	$ 118,300	$ 119,906
	Route 622 Loop	$ 2,109,250	$ 2,131,502
	Route 609 Extension	$ 1,294,800	$ 1,308,736
	Route 221 Extension	$ 863,200	$ 872,032
	Woods on Wiggington Loop	$ 436,150	$ 442,000
	Route 621 Loop - Phase I	$ 551,200	$ 556,935
	Route 621 Loop - Phase II	$ 798,850	$ 807,338
	Boonsboro West Loop	$ 1,729,000	$ 1,747,811
	Howard Drive	$ 565,500	$ 573,644
	Holcomb Rock Road Loop	$ 841,100	$ 850,161
	Trents Ferry Road Loop	$ 803,400	$ 813,952
	Everett Road Loop	$ 296,400	$ 300,070
	New London South Loop	$ 624,000	$ 632,602
	JEFFERSON WATER PROJECT TOTALS	$ 12,691,250	$ 12,839,040

Planning Area	Proposed Alternative	Project Cost Esimate	Present Value
Lakes	Upgraded High Point WTP to 1.0 MGD	$ 650,000	$ 2,058,506
	Mountain View Shores Connector	$ 3,797,300	$ 3,837,101
	Hendricks Store to Diamond Hill	$ 2,150,200	$ 2,253,429
	LAKES WATER PROJECT TOTALS	$ 6,597,500	$ 8,149,036
Peaks	None	$ -	$ -
Growth Projects			
	Perennial Lane Loop	$ 1,072,500	$ 1,084,658
	Belleview Road Extension	$ 1,350,700	$ 1,368,822
	Goode Road Extension	$ 1,907,100	$ 1,932,563
	Lee Jackson Highway Loop	$ 3,334,500	$ 3,368,680
	White House Road Loop	$ 1,527,500	$ 1,543,443
	Radford Church Road Loop	$ 2,657,200	$ 2,684,957
	Emmaus Loop	$ 5,153,850	$ 5,209,250
	Goodview Town Road Loop	$ 2,400,450	$ 2,425,913
	GROWTH PROJECT TOTALS	$ 19,403,800	$ 19,618,288

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Regional
Service Area: Upgrade of High Point WTP to 2.0 MGD

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	14,000	LF	80	$	1,120,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing	120	LF	300	$	36,000
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrade Highpoint WTP to 1.0 MGD		EA	500,000	$	-
	Upgrade Highpoint WTP to 2.0 MGD	1	EA	1,500,000	$	1,500,000
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)	200,000	GAL	0.90	$	180,000
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)	1	EA	400,000	$	400,000
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	3,236,000
Related Costs		30%	Construction Costs	$ 3,236,000	$	970,800
TOTAL Estimated Project Cost					$	4,206,800
Operation and Maintenance Costs					$	-
	Labor	5,000	HRS	35	$	175,000
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment	2	MGD	75,000	$	150,000
	Line System Maintenance	14,000	LF	0.10	$	1,400
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals	2	MGD	25,000	$	50,000
TOTAL Estimated Annual Operation and Maintenance Costs					$	376,400
Present Value Operation and Maintenance Costs					$	4,317,278
Total Estimated Present Value					$	8,524,078

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Regional
Service Area: Lakes Region WTP (5.0 MGD)

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main	14,000	LF	130	$	1,820,000
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing	120	LF	450	$	54,000
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant	1	EA	16,000,000	$	16,000,000
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)	2	EA	600,000	$	1,200,000
Subtotal (Construction Costs)					$	19,074,000
Related Costs		30%	Construction Costs	$ 19,074,000	$	5,722,200
TOTAL Estimated Project Cost					$	24,796,200
Operation and Maintenance Costs					$	-
	Labor	7,000	HRS	35	$	245,000
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment	5	MGD	75,000	$	375,000
	Line System Maintenance	14,000	LF	0.10	$	1,400
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals	5	MGD	25,000	$	125,000
TOTAL Estimated Annual Operation and Maintenance Costs					$	746,400
Present Value Operation and Maintenance Costs					$	8,561,149
Total Estimated Present Value					$	33,357,349

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Regional
Service Area: Lakes Region WTP (10.0 MGD)

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main	14,000	LF	165	$	2,310,000
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing	120	LF	500	$	60,000
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant	1	EA	30,000,000	$	30,000,000
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)	3	EA	600,000	$	1,800,000
Subtotal (Construction Costs)					$	34,170,000
Related Costs		30%	Construction Costs	$ 34,170,000	$	10,251,000
TOTAL Estimated Project Cost					$	44,421,000
Operation and Maintenance Costs					$	-
	Labor	10,000	HRS	35	$	350,000
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment	10	MGD	75,000	$	750,000
	Line System Maintenance	14,000	LF	0.10	$	1,400
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals	10	MGD	25,000	$	250,000
TOTAL Estimated Annual Operation and Maintenance Costs					$	1,351,400
Present Value Operation and Maintenance Costs					$	15,500,452
Total Estimated Present Value					$	59,921,452

Proposed Water Projects | Preliminary Cost Estimate | Bedford County

Region: Regional

Service Area: Lakes Region WTP - City of Bedford Interconnect

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main		LF	80	$ -
	16-inch Water Main		LF	95	$ -
	20-inch Water Main	67,000	LF	110	$ 7,370,000
	24-inch Water Main	15,600	LF	130	$ 2,028,000
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing		LF	300	$ -
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing	980	LF	400	$ 392,000
	24-inch Road or Stream Crossing	140	LF	450	$ 63,000
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing	50	LF	550	$ 27,500
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations	1	EA	25,000	$ 25,000
	Master Meter Vault		EA	15,000	$ -
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 9,905,500
Related Costs		30%	Construction Costs	$ 9,905,500	$ 2,971,650
TOTAL Estimated Project Cost					$ 12,877,150
Operation and Maintenance Costs					$ -
	Labor		HRS	35	$ -
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	82,600	LF	0.10	$ 8,260
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 8,260
Present Value Operation and Maintenance Costs					$ 94,742
Total Estimated Present Value					$ 12,971,892

Proposed Water Projects | Preliminary Cost Estimate | Bedford County

Region: Regional

Service Area: Lakes Region WTP - Stewartsville Interconnect

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main		LF	80	$ -
	16-inch Water Main	69,100	LF	95	$ 6,564,500
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing		LF	300	$ -
	16-inch Road or Stream Crossing	840	LF	350	$ 294,000
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing	50	LF	500	$ 25,000
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault		EA	15,000	$ -
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)	1	EA	400,000	$ 400,000
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 7,283,500
Related Costs		30%	Construction Costs	$ 7,283,500	$ 2,185,050
TOTAL Estimated Project Cost					$ 9,468,550
Operation and Maintenance Costs					$ -
	Labor	400	HRS	35	$ 14,000
	Electrical Power Unit	175,000	KWHRS	0.15	$ 26,250
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	69,100	LF	0.10	$ 6,910
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 47,160
Present Value Operation and Maintenance Costs					$ 540,921
Total Estimated Present Value					$ 10,009,471

Proposed Water Projects | Preliminary Cost Estimate | Bedford County

Region: Regional

Service Area: Stewartsville - Montvale Interconnect

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	58,700	LF	80	$	4,696,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing	740	LF	300	$	222,000
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations	1	EA	25,000	$	25,000
	Master Meter Vault	1	EA	15,000	$	15,000
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	4,958,000
Related Costs		30%	Construction Costs	$ 4,958,000	$	1,487,400
TOTAL Estimated Project Cost					$	6,445,400
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	58,700	LF	0.10	$	5,870
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	5,870
Present Value Operation and Maintenance Costs					$	67,328
Total Estimated Present Value					$	6,512,728

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Regional
Service Area: Bedford - Montvale Interconnect

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main	40,100	LF	80	$ 3,208,000
	16-inch Water Main		LF	95	$ -
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing	480	LF	300	$ 144,000
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations	1	EA	25,000	$ 25,000
	Master Meter Vault	1	EA	15,000	$ 15,000
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 3,392,000
Related Costs		30%	Construction Costs	$ 3,392,000	$ 1,017,600
TOTAL Estimated Project Cost					$ 4,409,600
Operation and Maintenance Costs					$ -
	Labor		HRS	35	$ -
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	40,100	LF	0.10	$ 4,010
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 4,010
Present Value Operation and Maintenance Costs					$ 45,994
Total Estimated Present Value					$ 4,455,594

Proposed Water Projects | Preliminary Cost Estimate | Bedford County

Region: Regional

Service Area: Bedford - Forest Interconnect (Route 460)

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main		LF	80	$ -
	16-inch Water Main	42,800	LF	95	$ 4,066,000
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing		LF	300	$ -
	16-inch Road or Stream Crossing	420	LF	350	$ 147,000
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault	1	EA	15,000	$ 15,000
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)	1	EA	600,000	$ 600,000
Subtotal (Construction Costs)					$ 4,828,000
Related Costs		30%	Construction Costs	$ 4,828,000	$ 1,448,400
TOTAL Estimated Project Cost					$ 6,276,400
Operation and Maintenance Costs					$ -
	Labor	200	HRS	35	$ 7,000
	Electrical Power Unit	175,000	KWHRS	0.15	$ 26,250
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	42,800	LF	0.10	$ 4,280
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 37,530
Present Value Operation and Maintenance Costs					$ 430,466
Total Estimated Present Value					$ 6,706,866

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Regional
Service Area: Bedford - Forest Interconnect (Route 221)

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main	54,500	LF	80	$ 4,360,000
	16-inch Water Main		LF	95	$ -
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing	660	LF	300	$ 198,000
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault	1	EA	15,000	$ 15,000
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)	1	EA	600,000	$ 600,000
Subtotal (Construction Costs)					$ 5,173,000
Related Costs		30%	Construction Costs	$ 5,173,000	$ 1,551,900
TOTAL Estimated Project Cost					$ 6,724,900
Operation and Maintenance Costs					$ -
	Labor	200	HRS	35	$ 7,000
	Electrical Power Unit	175,000	KWHRS	0.15	$ 26,250
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	54,500	LF	0.10	$ 5,450
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 38,700
Present Value Operation and Maintenance Costs					$ 443,886
Total Estimated Present Value					$ 7,168,786

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Blue Ridge Planning Area
Service Area: Vinton East

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main	1,100	LF	65	$	71,500
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing	60	LF	200	$	12,000
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault	1	EA	15,000	$	15,000
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	98,500
Related Costs		30%	Construction Costs	$ 98,500	$	29,550
TOTAL Estimated Project Cost					$	128,050
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	1,100	LF	0.10	$	110
	Bulk Water Service from WVWA	5,000	THOU GAL	3.50	$	17,500
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	17,610
Present Value Operation and Maintenance Costs					$	201,985
Total Estimated Present Value					$	330,035

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Blue Ridge Planning Area
Service Area: Stewartsville West Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main	6,800	LF	60	$	408,000
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing	100	LF	150	$	15,000
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	423,000
Related Costs		30%	Construction Costs	$ 423,000	$	126,900
TOTAL Estimated Project Cost					$	549,900
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	6,800	LF	0.10	$	680
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	680
Present Value Operation and Maintenance Costs					$	7,800
Total Estimated Present Value					$	557,700

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Blue Ridge Planning Area
Service Area: Stewartsville East

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main	2,000	LF	60	$	120,000
	8-inch Water Main	8,600	LF	65	$	559,000
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	11,600	LF	80	$	928,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing	140	LF	200	$	28,000
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing	200	LF	300	$	60,000
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)	400,000	GAL	0.90	$	360,000
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	2,055,000
Related Costs		30%	Construction Costs	$ 2,055,000	$	616,500
TOTAL Estimated Project Cost					$	2,671,500
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	22,200	LF	0.10	$	2,220
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	2,220
Present Value Operation and Maintenance Costs					$	25,463
Total Estimated Present Value					$	2,696,963

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Blue Ridge Planning Area
Service Area: Vinton to Hardy

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main	7,600	LF	65	$	494,000
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	16,100	LF	80	$	1,288,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing	200	LF	200	$	40,000
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing	300	LF	300	$	90,000
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing	50	LF	450	$	22,500
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault	1	EA	15,000	$	15,000
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	1,949,500
Related Costs		30%	Construction Costs	$ 1,949,500	$	584,850
TOTAL Estimated Project Cost					$	2,534,350
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	23,700	LF	0.10	$	2,370
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	2,370
Present Value Operation and Maintenance Costs					$	27,184
Total Estimated Present Value					$	2,561,534

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Blue Ridge Planning Area
Service Area: Stewartsville to Hardy (Rt. 635)

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main	8,000	LF	65	$ 520,000
	10-inch Water Main		LF	75	$ -
	12-inch Water Main		LF	80	$ -
	16-inch Water Main		LF	95	$ -
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing	100	LF	200	$ 20,000
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing		LF	300	$ -
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault		EA	15,000	$ -
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 540,000
Related Costs		30%	Construction Costs	$ 540,000	$ 162,000
TOTAL Estimated Project Cost					$ 702,000
Operation and Maintenance Costs					$ -
	Labor		HRS	35	$ -
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	8,000	LF	0.10	$ 800
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 800
Present Value Operation and Maintenance Costs					$ 9,176
Total Estimated Present Value					$ 711,176

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Blue Ridge Planning Area
Service Area: Stewartsville to Hardy (Rt. 619)

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main	14,700	LF	80	$ 1,176,000
	16-inch Water Main		LF	95	$ -
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing	160	LF	300	$ 48,000
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault		EA	15,000	$ -
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 1,224,000
Related Costs		30%	Construction Costs	$ 1,224,000	$ 367,200
TOTAL Estimated Project Cost					$ 1,591,200
Operation and Maintenance Costs					$ -
	Labor		HRS	35	$ -
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	14,700	LF	0.10	$ 1,470
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 1,470
Present Value Operation and Maintenance Costs					$ 16,861
Total Estimated Present Value					$ 1,608,061

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Blue Ridge Planning Area
Service Area: Chamblissburg Extension

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main	28,600	LF	80	$ 2,288,000
	16-inch Water Main		LF	95	$ -
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing	400	LF	300	$ 120,000
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault		EA	15,000	$ -
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 2,408,000
Related Costs		30%	Construction Costs	$ 2,408,000	$ 722,400
TOTAL Estimated Project Cost					$ 3,130,400
Operation and Maintenance Costs					$ -
	Labor		HRS	35	$ -
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	28,600	LF	0.10	$ 2,860
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 2,860
Present Value Operation and Maintenance Costs					$ 32,804
Total Estimated Present Value					$ 3,163,204

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Blue Ridge Planning Area
Service Area: Industrial Commerce Park Extension

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main	5,700	LF	65	$	370,500
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	370,500
Related Costs		30%	Construction Costs	$ 370,500	$	111,150
TOTAL Estimated Project Cost					$	481,650
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	5,700	LF	0.10	$	570
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	570
Present Value Operation and Maintenance Costs					$	6,538
Total Estimated Present Value					$	488,188

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Center Planning Area
Service Area: Bedford City to Otter River School

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main	15,900	LF	80	$ 1,272,000
	16-inch Water Main		LF	95	$ -
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing		LF	300	$ -
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault	1	EA	15,000	$ 15,000
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 1,287,000
Related Costs		30%	Construction Costs	$ 1,287,000	$ 386,100
TOTAL Estimated Project Cost					$ 1,673,100
Operation and Maintenance Costs					$ -
	Labor		HRS	35	$ -
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	15,900	LF	0.10	$ 1,590
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 1,590
Present Value Operation and Maintenance Costs					$ 18,237
Total Estimated Present Value					$ 1,691,337

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Center Planning Area
Service Area: Timber Ridge Extension

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	20,000	LF	80	$	1,600,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing	500	LF	300	$	150,000
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	1,750,000
Related Costs		30%	Construction Costs	$ 1,750,000	$	525,000
TOTAL Estimated Project Cost					$	2,275,000
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	20,000	LF	0.10	$	2,000
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	2,000
Present Value Operation and Maintenance Costs					$	22,940
Total Estimated Present Value					$	2,297,940

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Center Planning Area
Service Area: Route 460 Extension

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	21,700	LF	80	$	1,736,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing	60	LF	150	$	9,000
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault	1	EA	15,000	$	15,000
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	1,760,000
Related Costs		30%	Construction Costs	$ 1,760,000	$	528,000
TOTAL Estimated Project Cost					$	2,288,000
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	21,700	LF	0.10	$	2,170
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	2,170
Present Value Operation and Maintenance Costs					$	24,890
Total Estimated Present Value					$	2,312,890

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Center Planning Area
Service Area: Bedford City to Hillcrest

Item	Quantity	Units	Unit Price	Cost
Capital Costs				
6-inch Water Main		LF	60	$ -
8-inch Water Main	7,600	LF	65	$ 494,000
10-inch Water Main		LF	75	$ -
12-inch Water Main		LF	80	$ -
16-inch Water Main		LF	95	$ -
20-inch Water Main		LF	110	$ -
24-inch Water Main		LF	130	$ -
30-inch Water Main		LF	165	$ -
6-inch Road or Stream Crossing		LF	150	$ -
8-inch Road or Stream Crossing	100	LF	200	$ 20,000
10-inch Road or Stream Crossing		LF	250	$ -
12-inch Road or Stream Crossing		LF	300	$ -
16-inch Road or Stream Crossing		LF	350	$ -
20-inch Road or Stream Crossing		LF	400	$ -
24-inch Road or Stream Crossing		LF	450	$ -
30-inch Road or Stream Crossing		LF	500	$ -
6-inch Railroad Crossing		LF	300	$ -
8-inch Railroad Crossing		LF	350	$ -
10-inch Railroad Crossing		LF	400	$ -
12-inch Railroad Crossing		LF	450	$ -
16-inch Railroad Crossing		LF	500	$ -
20-inch Railroad Crossing		LF	550	$ -
24-inch Railroad Crossing		LF	600	$ -
30-inch Railroad Crossing		LF	650	$ -
Pressure Reducing Valve Stations		EA	25,000	$ -
Master Meter Vault	1	EA	15,000	$ 15,000
Upgrades to Highpoint WTP		EA	500,000	$ -
2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
Water Pump Stations (<500 gpm)		EA	250,000	$ -
Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)				$ 529,000
Related Costs	30%	Construction Costs	$ 529,000	$ 158,700
TOTAL Estimated Project Cost				$ 687,700
Operation and Maintenance Costs				$ -
Labor		HRS	35	$ -
Electrical Power Unit		KWHRS	0.15	$ -
Electrical Power Water Treatment		MGD	75,000	$ -
Line System Maintenance	7,600	LF	0.10	$ 760
Bulk Water Service from WVWA		THOU GAL	3.50	$ -
Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs				$ 760
Present Value Operation and Maintenance Costs				$ 8,717
Total Estimated Present Value				$ 696,417

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Center Planning Area
Service Area: Casaloma Goode Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	5,500	LF	80	$	440,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing	50	LF	200	$	10,000
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	450,000
Related Costs		30%	Construction Costs	$ 450,000	$	135,000
TOTAL Estimated Project Cost					$	585,000
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	5,500	LF	0.10	$	550
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	550
Present Value Operation and Maintenance Costs					$	6,308
Total Estimated Present Value					$	591,308

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: Route 643 Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main	4,300	LF	65	$	279,500
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	279,500
Related Costs		30%	Construction Costs	$ 279,500	$	83,850
TOTAL Estimated Project Cost					$	363,350
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	4,300	LF	0.10	$	430
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	430
Present Value Operation and Maintenance Costs					$	4,932
Total Estimated Present Value					$	368,282

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: Goode Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main	15,100	LF	65	$	981,500
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing	80	LF	200	$	16,000
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	997,500
Related Costs		30%	Construction Costs	$ 997,500	$	299,250
TOTAL Estimated Project Cost					$	1,296,750
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	15,100	LF	0.10	$	1,510
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	1,510
Present Value Operation and Maintenance Costs					$	17,320
Total Estimated Present Value					$	1,314,070

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: Valleywood Manor Loop

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main	1,400	LF	65	$ 91,000
	10-inch Water Main		LF	75	$ -
	12-inch Water Main		LF	80	$ -
	16-inch Water Main		LF	95	$ -
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing		LF	300	$ -
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault		EA	15,000	$ -
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 91,000
Related Costs		30%	Construction Costs	$ 91,000	$ 27,300
TOTAL Estimated Project Cost					$ 118,300
Operation and Maintenance Costs					$ -
	Labor		HRS	35	$ -
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	1,400	LF	0.10	$ 140
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 140
Present Value Operation and Maintenance Costs					$ 1,606
Total Estimated Present Value					$ 119,906

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: Route 622 Loop

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main	19,400	LF	80	$ 1,552,000
	16-inch Water Main		LF	95	$ -
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing	160	LF	300	$ 48,000
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing	50	LF	450	$ 22,500
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault		EA	15,000	$ -
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 1,622,500
Related Costs		30%	Construction Costs	$ 1,622,500	$ 486,750
TOTAL Estimated Project Cost					$ 2,109,250
Operation and Maintenance Costs					$ -
	Labor		HRS	35	$ -
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	19,400	LF	0.10	$ 1,940
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 1,940
Present Value Operation and Maintenance Costs					$ 22,252
Total Estimated Present Value					$ 2,131,502

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: Route 609 Extension

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	12,150	LF	80	$	972,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing	80	LF	300	$	24,000
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	996,000
Related Costs		30%	Construction Costs	$ 996,000	$	298,800
TOTAL Estimated Project Cost					$	1,294,800
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	12,150	LF	0.10	$	1,215
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	1,215
Present Value Operation and Maintenance Costs					$	13,936
Total Estimated Present Value					$	1,308,736

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: Route 221 Extension

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main	7,700	LF	80	$ 616,000
	16-inch Water Main		LF	95	$ -
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing	160	LF	300	$ 48,000
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault		EA	15,000	$ -
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 664,000
Related Costs		30%	Construction Costs	$ 664,000	$ 199,200
TOTAL Estimated Project Cost					$ 863,200
Operation and Maintenance Costs					$ -
	Labor		HRS	35	$ -
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	7,700	LF	0.10	$ 770
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 770
Present Value Operation and Maintenance Costs					$ 8,832
Total Estimated Present Value					$ 872,032

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: Woods on Wiggington Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main	5,100	LF	65	$	331,500
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing	20	LF	200	$	4,000
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	335,500
Related Costs		30%	Construction Costs	$ 335,500	$	100,650
TOTAL Estimated Project Cost					$	436,150
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	5,100	LF	0.10	$	510
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	510
Present Value Operation and Maintenance Costs					$	5,850
Total Estimated Present Value					$	442,000

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: Route 621 Loop - Phase I

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	5,000	LF	80	$	400,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing	80	LF	300	$	24,000
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	424,000
Related Costs		30%	Construction Costs	$ 424,000	$	127,200
TOTAL Estimated Project Cost					$	551,200
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	5,000	LF	0.10	$	500
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	500
Present Value Operation and Maintenance Costs					$	5,735
Total Estimated Present Value					$	556,935

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: Route 621 Loop - Phase II

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	7,400	LF	80	$	592,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing	75	LF	300	$	22,500
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	614,500
Related Costs		30%	Construction Costs	$ 614,500	$	184,350
TOTAL Estimated Project Cost					$	798,850
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	7,400	LF	0.10	$	740
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	740
Present Value Operation and Maintenance Costs					$	8,488
Total Estimated Present Value					$	807,338

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: Boonsboro West Loop

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main	16,400	LF	80	$ 1,312,000
	16-inch Water Main		LF	95	$ -
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing	60	LF	300	$ 18,000
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault		EA	15,000	$ -
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 1,330,000
Related Costs		30%	Construction Costs	$ 1,330,000	$ 399,000
TOTAL Estimated Project Cost					$ 1,729,000
Operation and Maintenance Costs					$ -
	Labor		HRS	35	$ -
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	16,400	LF	0.10	$ 1,640
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 1,640
Present Value Operation and Maintenance Costs					$ 18,811
Total Estimated Present Value					$ 1,747,811

Proposed Water Projects | Preliminary Cost Estimate | Bedford County

Region: Jefferson Planning Area

Service Area: Howard Drive

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main	7,100	LF	60	$	426,000
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing	60	LF	150	$	9,000
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	435,000
Related Costs		30%	Construction Costs	$ 435,000	$	130,500
TOTAL Estimated Project Cost					$	565,500
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	7,100	LF	0.10	$	710
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	710
Present Value Operation and Maintenance Costs					$	8,144
Total Estimated Present Value					$	573,644

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: Holcomb Rock Road Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	7,900	LF	80	$	632,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing	50	LF	300	$	15,000
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	647,000
Related Costs		30%	Construction Costs	$ 647,000	$	194,100
TOTAL Estimated Project Cost					$	841,100
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	7,900	LF	0.10	$	790
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	790
Present Value Operation and Maintenance Costs					$	9,061
Total Estimated Present Value					$	850,161

Proposed Water Projects | Preliminary Cost Estimate | Bedford County

Region: Jefferson Planning Area

Service Area: Trents Ferry Road Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main	9,200	LF	65	$	598,000
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing	100	LF	200	$	20,000
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	618,000
Related Costs		30%	Construction Costs	$ 618,000	$	185,400
TOTAL Estimated Project Cost					$	803,400
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	9,200	LF	0.10	$	920
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	920
Present Value Operation and Maintenance Costs					$	10,552
Total Estimated Present Value					$	813,952

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: Everett Road Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main	3,200	LF	65	$	208,000
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing	100	LF	200	$	20,000
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	228,000
Related Costs		30%	Construction Costs	$ 228,000	$	68,400
TOTAL Estimated Project Cost					$	296,400
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	3,200	LF	0.10	$	320
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	320
Present Value Operation and Maintenance Costs					$	3,670
Total Estimated Present Value					$	300,070

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: New London South Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main	7,500	LF	60	$	450,000
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing	200	LF	150	$	30,000
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	480,000
Related Costs		30%	Construction Costs	$ 480,000	$	144,000
TOTAL Estimated Project Cost					$	624,000
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	7,500	LF	0.10	$	750
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	750
Present Value Operation and Maintenance Costs					$	8,602
Total Estimated Present Value					$	632,602

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Lakes Planning Area
Service Area: Upgraded High Point WTP to 1.0 MGD

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main		LF	80	$ -
	16-inch Water Main		LF	95	$ -
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing		LF	300	$ -
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault		EA	15,000	$ -
	Upgrades to Highpoint WTP	1	EA	500,000	$ 500,000
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 500,000
Related Costs		30%	Construction Costs	$ 500,000	$ 150,000
TOTAL Estimated Project Cost					$ 650,000
Operation and Maintenance Costs					$ -
	Labor	2,080	HRS	35	$ 72,800
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Water Treatment	0.5	MGD	75,000	$ 37,500
	Line System Maintenance	-	LF	0.10	$ -
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals	0.5	MGD	25,000	$ 12,500
TOTAL Estimated Annual Operation and Maintenance Costs					$ 122,800
Present Value Operation and Maintenance Costs					$ 1,408,506
Total Estimated Present Value					$ 2,058,506

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Lakes Planning Area
Service Area: Mountain View Shores Connector

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	34,700	LF	80	$	2,776,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing	400	LF	300	$	120,000
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations	1	EA	25,000	$	25,000
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	2,921,000
Related Costs		30%	Construction Costs	$ 2,921,000	$	876,300
TOTAL Estimated Project Cost					$	3,797,300
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	34,700	LF	0.10	$	3,470
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	3,470
Present Value Operation and Maintenance Costs					$	39,801
Total Estimated Present Value					$	3,837,101

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Lakes Planning Area
Service Area: Hendricks Store to Diamond Hill

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main	20,000	LF	80	$ 1,600,000
	16-inch Water Main		LF	95	$ -
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing	180	LF	300	$ 54,000
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault		EA	15,000	$ -
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 1,654,000
Related Costs		30%	Construction Costs	$ 1,654,000	$ 496,200
TOTAL Estimated Project Cost					$ 2,150,200
Operation and Maintenance Costs					$ -
	Labor	200	HRS	35	$ 7,000
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	20,000	LF	0.10	$ 2,000
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 9,000
Present Value Operation and Maintenance Costs					$ 103,229
Total Estimated Present Value					$ 2,253,429

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Growth Projects
Service Area: Perennial Lane Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main	10,600	LF	75	$	795,000
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing	40	LF	250	$	10,000
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing	50	LF	400	$	20,000
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	825,000
Related Costs		30%	Construction Costs	$ 825,000	$	247,500
TOTAL Estimated Project Cost					$	1,072,500
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	10,600	LF	0.10	$	1,060
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	1,060
Present Value Operation and Maintenance Costs					$	12,158
Total Estimated Present Value					$	1,084,658

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Growth Projects
Service Area: Belleview Road Extension

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main	15,800	LF	65	$	1,027,000
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing	60	LF	200	$	12,000
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	1,039,000
Related Costs		30%	Construction Costs	$ 1,039,000	$	311,700
TOTAL Estimated Project Cost					$	1,350,700
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	15,800	LF	0.10	$	1,580
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	1,580
Present Value Operation and Maintenance Costs					$	18,122
Total Estimated Present Value					$	1,368,822

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Growth Projects
Service Area: Goode Road Extension

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main	22,200	LF	65	$	1,443,000
	10-inch Water Main		LF	75	$	-
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing	120	LF	200	$	24,000
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	1,467,000
Related Costs		30%	Construction Costs	$ 1,467,000	$	440,100
TOTAL Estimated Project Cost					$	1,907,100
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	22,200	LF	0.10	$	2,220
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	2,220
Present Value Operation and Maintenance Costs					$	25,463
Total Estimated Present Value					$	1,932,563

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Growth Projects
Service Area: Lee Jackson Highway Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main	29,800	LF	75	$	2,235,000
	12-inch Water Main		LF	80	$	-
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing	320	LF	250	$	80,000
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)	1	EA	250,000	$	250,000
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	2,565,000
Related Costs		30%	Construction Costs	$ 2,565,000	$	769,500
TOTAL Estimated Project Cost					$	3,334,500
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	29,800	LF	0.10	$	2,980
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	2,980
Present Value Operation and Maintenance Costs					$	34,180
Total Estimated Present Value					$	3,368,680

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Growth Projects
Service Area: White House Road Loop

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	6-inch Water Main		LF	60	$ -
	8-inch Water Main		LF	65	$ -
	10-inch Water Main		LF	75	$ -
	12-inch Water Main	13,900	LF	80	$ 1,112,000
	16-inch Water Main		LF	95	$ -
	20-inch Water Main		LF	110	$ -
	24-inch Water Main		LF	130	$ -
	30-inch Water Main		LF	165	$ -
	6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing		LF	300	$ -
	16-inch Road or Stream Crossing		LF	350	$ -
	20-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	30-inch Road or Stream Crossing		LF	500	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing	140	LF	450	$ 63,000
	16-inch Railroad Crossing		LF	500	$ -
	20-inch Railroad Crossing		LF	550	$ -
	24-inch Railroad Crossing		LF	600	$ -
	30-inch Railroad Crossing		LF	650	$ -
	Pressure Reducing Valve Stations		EA	25,000	$ -
	Master Meter Vault		EA	15,000	$ -
	Upgrades to Highpoint WTP		EA	500,000	$ -
	2.0 MGD Water Treatment Plant		EA	7,000,000	$ -
	5.0 MGD Water Treatment Plant		EA	16,000,000	$ -
	10.0 MGD Water Treatment Plant		EA	30,000,000	$ -
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$ -
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$ -
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$ -
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$ -
	Water Pump Stations (<500 gpm)		EA	250,000	$ -
	Water Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 1,175,000
Related Costs		30%	Construction Costs	$ 1,175,000	$ 352,500
TOTAL Estimated Project Cost					$ 1,527,500
Operation and Maintenance Costs					$ -
	Labor		HRS	35	$ -
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Water Treatment		MGD	75,000	$ -
	Line System Maintenance	13,900	LF	0.10	$ 1,390
	Bulk Water Service from WVWA		THOU GAL	3.50	$ -
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$ -
	Water Treatment Chemicals		MGD	25,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 1,390
Present Value Operation and Maintenance Costs					$ 15,943
Total Estimated Present Value					$ 1,543,443

Proposed Water Projects | Preliminary Cost Estimate | Bedford County

Region: Growth Projects

Service Area: Radford Church Road Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	24,200	LF	80	$	1,936,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing	240	LF	450	$	108,000
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	2,044,000
Related Costs		30%	Construction Costs	$ 2,044,000	$	613,200
TOTAL Estimated Project Cost					$	2,657,200
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	24,200	LF	0.10	$	2,420
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	2,420
Present Value Operation and Maintenance Costs					$	27,757
Total Estimated Present Value					$	2,684,957

Proposed Water Projects — Preliminary Cost Estimate — Bedford County
Region: Growth Projects
Service Area: Emmaus Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	48,300	LF	80	$	3,864,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing	260	LF	300	$	78,000
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing	50	LF	450	$	22,500
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	3,964,500
Related Costs		30%	Construction Costs	$ 3,964,500	$	1,189,350
TOTAL Estimated Project Cost					$	5,153,850
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	48,300	LF	0.10	$	4,830
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	4,830
Present Value Operation and Maintenance Costs					$	55,400
Total Estimated Present Value					$	5,209,250

Proposed Water Projects | Preliminary Cost Estimate | Bedford County

Region: Growth Projects

Service Area: Goodview Town Road Loop

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	6-inch Water Main		LF	60	$	-
	8-inch Water Main		LF	65	$	-
	10-inch Water Main		LF	75	$	-
	12-inch Water Main	22,200	LF	80	$	1,776,000
	16-inch Water Main		LF	95	$	-
	20-inch Water Main		LF	110	$	-
	24-inch Water Main		LF	130	$	-
	30-inch Water Main		LF	165	$	-
	6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing		LF	200	$	-
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing	160	LF	300	$	48,000
	16-inch Road or Stream Crossing		LF	350	$	-
	20-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	30-inch Road or Stream Crossing		LF	500	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing	50	LF	450	$	22,500
	16-inch Railroad Crossing		LF	500	$	-
	20-inch Railroad Crossing		LF	550	$	-
	24-inch Railroad Crossing		LF	600	$	-
	30-inch Railroad Crossing		LF	650	$	-
	Pressure Reducing Valve Stations		EA	25,000	$	-
	Master Meter Vault		EA	15,000	$	-
	Upgrades to Highpoint WTP		EA	500,000	$	-
	2.0 MGD Water Treatment Plant		EA	7,000,000	$	-
	5.0 MGD Water Treatment Plant		EA	16,000,000	$	-
	10.0 MGD Water Treatment Plant		EA	30,000,000	$	-
	Ground Level Water Tanks (<0.5 MG)		GAL	0.90	$	-
	Ground Level Water Tanks (>0.5 MG)		GAL	0.75	$	-
	Elevated Water Tanks (<0.2 MG)		GAL	3.00	$	-
	Elevated Water Tanks (>0.2 MG)		GAL	2.50	$	-
	Water Pump Stations (<500 gpm)		EA	250,000	$	-
	Water Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Water Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	1,846,500
Related Costs		30%	Construction Costs	$ 1,846,500	$	553,950
TOTAL Estimated Project Cost					$	2,400,450
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Water Treatment		MGD	75,000	$	-
	Line System Maintenance	22,200	LF	0.10	$	2,220
	Bulk Water Service from WVWA		THOU GAL	3.50	$	-
	Bulk Water Service from Lynchburg		THOU GAL	2.50	$	-
	Water Treatment Chemicals		MGD	25,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	2,220
Present Value Operation and Maintenance Costs					$	25,463
Total Estimated Present Value					$	2,425,913

APPENDIX B

Summary of Proposed Wastewater Projects
Arranged by Planning Areas
Bedford County

Planning Area	Proposed Alternative	Cost Esimate	Present Value
Blue Ridge	Stewartsville Area	$ 9,902,588	$ 11,676,870
	Vinton East	$ 1,194,700	$ 1,302,976
	Montvale	$ 2,588,950	$ 2,714,087
	BLUE RIDGE WATER PROJECT TOTALS	$ 13,686,238	$ 15,693,933
Center		$ -	$ -
	CENTER WATER PROJECT TOTALS	$ -	$ -
Jefferson	New London/Elk Creek Drainage Basin	$ 23,713,950	$ 25,134,729
	Lake Vista Interceptor	$ 2,025,400	$ 2,038,017
	North Forest Area	$ 8,366,800	$ 8,451,219
	Judith Creek	$ 2,453,100	$ 2,483,954
	JEFFERSON WATER PROJECT TOTALS	$ 36,559,250	$ 38,107,919
Lakes	Smith Mountain Lake Sewer Project Phases 1-6	$ 12,868,993	$ 15,267,238
	Collectors	$ 8,309,600	$ 9,974,918
	LAKES WATER PROJECT TOTALS	$ 21,178,593	$ 25,242,156
Peaks		$ -	$ -

Proposed Wastewater Projects — Preliminary Cost Estimate — Bedford County
Region: Blue Ridge Planning Area
Service Area: Stewartsville Area

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	8-inch Sewer	36,200	LF	70	$ 2,534,000
	10-inch Sewer	13,100	LF	75	$ 982,500
	12-inch Sewer		LF	85	$ -
	15-inch Sewer	7,900	LF	100	$ 790,000
	18-inch Sewer		LF	120	$ -
	24-inch Sewer		LF	140	$ -
	4-inch Force Main		LF	45	$ -
	6-inch Force Main	4,700	LF	55	$ 258,500
	8-inch Force Main		LF	60	$ -
	10-inch Force Main		LF	65	$ -
	12-inch Force Main		LF	75	$ -
	14-inch Force Main		LF	83	$ -
	15-inch Force Main		LF	90	$ -
	18-inch Force Main		LF	105	$ -
	4- or 6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing	300	LF	200	$ 60,000
	10-inch Road or Stream Crossing	140	LF	250	$ 35,000
	12-inch Road or Stream Crossing		LF	300	$ -
	14-inch Road or Stream Crossing		LF	325	$ -
	15-inch Road or Stream Crossing	280	LF	350	$ 98,000
	18-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	15-inch Railroad Crossing		EA	500	$ -
	18-inch Railroad Crossing		EA	550	$ -
	24-inch Railroad Crossing		EA	600	$ -
	Master Meter Vault		EA	15,000	$ -
	0.15 MGD Wastewater Treatment Plant	1	EA	2,500,000	$ 2,500,000
	0.3 MGD Wastewater Treatment Plant		EA	3,500,000	$ -
	0.5 MGD Wastewater Treatment Plant		EA	4,500,000	$ -
	2.0 MGD Wastewater Treatment Plant		EA	12,000,000	$ -
	5.0 MGD Wastewater Treatment Plant		GAL	20,000,000	$ -
	Flow Equalization Facilities	62,500	GAL	1.75	$ 109,375
	Lift Pump Stations (<500 gpm)	1	EA	250,000	$ 250,000
	Lift Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Lift Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 7,617,375
Related Costs		30%	Construction Costs	$ 7,617,375	$ 2,285,213
TOTAL Estimated Project Cost					$ 9,902,588
Operation and Maintenance Costs					$ -
	Labor	3,000	HRS	35	$ 105,000
	Electrical Power Unit	175,000	KWHRS	0.15	$ 26,250
	Electrical Power Wastewater Treatment	0.15	MGD	100,000	$ 15,000
	Line System Maintenance	61,900	LF	0.10	$ 6,190
	Sewer Service from Lynchburg		THOU GAL	1.50	$ -
	Wastewater Treatment Chemicals	0.15	MGD	15,000	$ 2,250
TOTAL Estimated Annual Operation and Maintenance Costs					$ 154,690
Present Value Operation and Maintenance Costs					$ 1,774,282
Total Estimated Present Value					$ 11,676,870

Proposed Wastewater Projects — Preliminary Cost Estimate — Bedford County
Region: Blue Ridge Planning Area
Service Area: Vinton East

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	8-inch Sewer	2,500	LF	70	$ 175,000
	10-inch Sewer	1,600	LF	75	$ 120,000
	12-inch Sewer		LF	85	$ -
	15-inch Sewer		LF	100	$ -
	18-inch Sewer		LF	120	$ -
	24-inch Sewer		LF	140	$ -
	4-inch Force Main		LF	45	$ -
	6-inch Force Main		LF	55	$ -
	8-inch Force Main	5,300	LF	60	$ 318,000
	10-inch Force Main		LF	65	$ -
	12-inch Force Main		LF	75	$ -
	14-inch Force Main		LF	83	$ -
	15-inch Force Main		LF	90	$ -
	18-inch Force Main		LF	105	$ -
	4- or 6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing	180	LF	200	$ 36,000
	10-inch Road or Stream Crossing	80	LF	250	$ 20,000
	12-inch Road or Stream Crossing		LF	300	$ -
	14-inch Road or Stream Crossing		LF	325	$ -
	15-inch Road or Stream Crossing		LF	350	$ -
	18-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	15-inch Railroad Crossing		EA	500	$ -
	18-inch Railroad Crossing		EA	550	$ -
	24-inch Railroad Crossing		EA	600	$ -
	Master Meter Vault		EA	15,000	$ -
	0.15 MGD Wastewater Treatment Plant		EA	2,500,000	$ -
	0.3 MGD Wastewater Treatment Plant		EA	3,500,000	$ -
	0.5 MGD Wastewater Treatment Plant		EA	4,500,000	$ -
	2.0 MGD Wastewater Treatment Plant		EA	12,000,000	$ -
	5.0 MGD Wastewater Treatment Plant		GAL	20,000,000	$ -
	Flow Equalization Facilities		GAL	1.75	$ -
	Lift Pump Stations (<500 gpm)	1	EA	250,000	$ 250,000
	Lift Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Lift Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 919,000
Related Costs		30%	Construction Costs	$ 919,000	$ 275,700
TOTAL Estimated Project Cost					$ 1,194,700
Operation and Maintenance Costs					$ -
	Labor	200	HRS	35	$ 7,000
	Electrical Power Unit	10,000	KWHRS	0.15	$ 1,500
	Electrical Power Wastewater Treatment		MGD	100,000	$ -
	Line System Maintenance	9,400	LF	0.10	$ 940
	Sewer Service from Lynchburg		THOU GAL	1.50	$ -
	Wastewater Treatment Chemicals		MGD	15,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 9,440
Present Value Operation and Maintenance Costs					$ 108,276
Total Estimated Present Value					$ 1,302,976

Proposed Wastewater Projects | Preliminary Cost Estimate | Bedford County

Region: Blue Ridge Planning Area

Service Area: Montvale

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	8-inch Sewer	18,200	LF	70	$ 1,274,000
	10-inch Sewer		LF	75	$ -
	12-inch Sewer		LF	85	$ -
	15-inch Sewer		LF	100	$ -
	18-inch Sewer		LF	120	$ -
	24-inch Sewer		LF	140	$ -
	4-inch Force Main		LF	45	$ -
	6-inch Force Main		LF	55	$ -
	8-inch Force Main	5,900	LF	60	$ 354,000
	10-inch Force Main		LF	65	$ -
	12-inch Force Main		LF	75	$ -
	14-inch Force Main		LF	83	$ -
	15-inch Force Main		LF	90	$ -
	18-inch Force Main		LF	105	$ -
	4- or 6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing	480	LF	200	$ 96,000
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing		LF	300	$ -
	14-inch Road or Stream Crossing		LF	325	$ -
	15-inch Road or Stream Crossing		LF	350	$ -
	18-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing		LF	450	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing	50	LF	350	$ 17,500
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	15-inch Railroad Crossing		EA	500	$ -
	18-inch Railroad Crossing		EA	550	$ -
	24-inch Railroad Crossing		EA	600	$ -
	Master Meter Vault		EA	15,000	$ -
	0.15 MGD Wastewater Treatment Plant		EA	2,500,000	$ -
	0.3 MGD Wastewater Treatment Plant		EA	3,500,000	$ -
	0.5 MGD Wastewater Treatment Plant		EA	4,500,000	$ -
	2.0 MGD Wastewater Treatment Plant		EA	12,000,000	$ -
	5.0 MGD Wastewater Treatment Plant		GAL	20,000,000	$ -
	Flow Equalization Facilities		GAL	1.75	$ -
	Lift Pump Stations (<500 gpm)	1	EA	250,000	$ 250,000
	Lift Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Lift Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 1,991,500
Related Costs		30%	Construction Costs	$ 1,991,500	$ 597,450
TOTAL Estimated Project Cost					$ 2,588,950
Operation and Maintenance Costs					$ -
	Labor	200	HRS	35	$ 7,000
	Electrical Power Unit	10,000	KWHRS	0.15	$ 1,500
	Electrical Power Wastewater Treatment		MGD	100,000	$ -
	Line System Maintenance	24,100	LF	0.10	$ 2,410
	Sewer Service from Lynchburg		THOU GAL	1.50	$ -
	Wastewater Treatment Chemicals		MGD	15,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 10,910
Present Value Operation and Maintenance Costs					$ 125,137
Total Estimated Present Value					$ 2,714,087

Proposed Wastewater Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: New London/Elk Creek Drainage Basin

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	8-inch Sewer	29,700	LF	70	$	2,079,000
	10-inch Sewer		LF	75	$	-
	12-inch Sewer	7,100	LF	85	$	603,500
	15-inch Sewer		LF	100	$	-
	18-inch Sewer	27,900	LF	120	$	3,348,000
	24-inch Sewer	50,100	LF	140	$	7,014,000
	4-inch Force Main		LF	45	$	-
	6-inch Force Main	12,900	LF	55	$	709,500
	8-inch Force Main		LF	60	$	-
	10-inch Force Main	18,500	LF	65	$	1,202,500
	12-inch Force Main	17,500	LF	75	$	1,312,500
	14-inch Force Main		LF	83	$	-
	15-inch Force Main		LF	90	$	-
	18-inch Force Main		LF	105	$	-
	4- or 6-inch Road or Stream Crossing	60	LF	150	$	9,000
	8-inch Road or Stream Crossing	180	LF	200	$	36,000
	10-inch Road or Stream Crossing	360	LF	250	$	90,000
	12-inch Road or Stream Crossing		LF	300	$	-
	14-inch Road or Stream Crossing		LF	325	$	-
	15-inch Road or Stream Crossing		LF	350	$	-
	18-inch Road or Stream Crossing	200	LF	400	$	80,000
	24-inch Road or Stream Crossing		LF	450	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	15-inch Railroad Crossing		EA	500	$	-
	18-inch Railroad Crossing		EA	550	$	-
	24-inch Railroad Crossing		EA	600	$	-
	Master Meter Vault		EA	15,000	$	-
	0.15 MGD Wastewater Treatment Plant		EA	2,500,000	$	-
	0.3 MGD Wastewater Treatment Plant		EA	3,500,000	$	-
	0.5 MGD Wastewater Treatment Plant		EA	4,500,000	$	-
	2.0 MGD Wastewater Treatment Plant		EA	12,000,000	$	-
	5.0 MGD Wastewater Treatment Plant		GAL	20,000,000	$	-
	Flow Equalization Facilities	90,000	GAL	1.75	$	157,500
	Lift Pump Stations (<500 gpm)		EA	250,000	$	-
	Lift Pump Stations (500-1500 gpm)	4	EA	400,000	$	1,600,000
	Lift Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	18,241,500
Related Costs		30%	Construction Costs	$ 18,241,500	$	5,472,450
TOTAL Estimated Project Cost					$	23,713,950
Operation and Maintenance Costs					$	-
	Labor	2,000	HRS	35	$	70,000
	Electrical Power Unit	250,000	KWHRS	0.15	$	37,500
	Electrical Power Wastewater Treatment		MGD	100,000	$	-
	Line System Maintenance	163,700	LF	0.10	$	16,370
	Sewer Service from Lynchburg		THOU GAL	1.50	$	-
	Wastewater Treatment Chemicals		MGD	15,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	123,870
Present Value Operation and Maintenance Costs					$	1,420,779
Total Estimated Present Value					$	25,134,729

Proposed Wastewater Projects | Preliminary Cost Estimate | Bedford County

Region: Jefferson Planning Area

Service Area: Lake Vista Interceptor

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	8-inch Sewer		LF	70	$ -
	10-inch Sewer		LF	75	$ -
	12-inch Sewer		LF	85	$ -
	15-inch Sewer		LF	100	$ -
	18-inch Sewer		LF	120	$ -
	24-inch Sewer	11,000	LF	140	$ 1,540,000
	4-inch Force Main		LF	45	$ -
	6-inch Force Main		LF	55	$ -
	8-inch Force Main		LF	60	$ -
	10-inch Force Main		LF	65	$ -
	12-inch Force Main		LF	75	$ -
	14-inch Force Main		LF	83	$ -
	15-inch Force Main		LF	90	$ -
	18-inch Force Main		LF	105	$ -
	4- or 6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing		LF	200	$ -
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing		LF	300	$ -
	14-inch Road or Stream Crossing		LF	325	$ -
	15-inch Road or Stream Crossing		LF	350	$ -
	18-inch Road or Stream Crossing		LF	400	$ -
	24-inch Road or Stream Crossing	40	LF	450	$ 18,000
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	15-inch Railroad Crossing		EA	500	$ -
	18-inch Railroad Crossing		EA	550	$ -
	24-inch Railroad Crossing		EA	600	$ -
	Master Meter Vault		EA	15,000	$ -
	0.15 MGD Wastewater Treatment Plant		EA	2,500,000	$ -
	0.3 MGD Wastewater Treatment Plant		EA	3,500,000	$ -
	0.5 MGD Wastewater Treatment Plant		EA	4,500,000	$ -
	2.0 MGD Wastewater Treatment Plant		EA	12,000,000	$ -
	5.0 MGD Wastewater Treatment Plant		GAL	20,000,000	$ -
	Flow Equalization Facilities		GAL	1.75	$ -
	Lift Pump Stations (<500 gpm)		EA	250,000	$ -
	Lift Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Lift Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 1,558,000
Related Costs		30%	Construction Costs	$ 1,558,000	$ 467,400
TOTAL Estimated Project Cost					$ 2,025,400
Operation and Maintenance Costs					$ -
	Labor		HRS	35	$ -
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Wastewater Treatment		MGD	100,000	$ -
	Line System Maintenance	11,000	LF	0.10	$ 1,100
	Sewer Service from Lynchburg		THOU GAL	1.50	$ -
	Wastewater Treatment Chemicals		MGD	15,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 1,100
Present Value Operation and Maintenance Costs					$ 12,617
Total Estimated Present Value					$ 2,038,017

Proposed Wastewater Projects — Preliminary Cost Estimate — Bedford County
Region: Jefferson Planning Area
Service Area: North Forest Area

	Item	Quantity	Units	Unit Price	Cost
Capital Costs					
	8-inch Sewer	24,000	LF	70	$ 1,680,000
	10-inch Sewer		LF	75	$ -
	12-inch Sewer	26,400	LF	85	$ 2,244,000
	15-inch Sewer	16,600	LF	100	$ 1,660,000
	18-inch Sewer	6,600	LF	120	$ 792,000
	24-inch Sewer		LF	140	$ -
	4-inch Force Main		LF	45	$ -
	6-inch Force Main		LF	55	$ -
	8-inch Force Main		LF	60	$ -
	10-inch Force Main		LF	65	$ -
	12-inch Force Main		LF	75	$ -
	14-inch Force Main		LF	83	$ -
	15-inch Force Main		LF	90	$ -
	18-inch Force Main		LF	105	$ -
	4- or 6-inch Road or Stream Crossing		LF	150	$ -
	8-inch Road or Stream Crossing	20	LF	200	$ 4,000
	10-inch Road or Stream Crossing		LF	250	$ -
	12-inch Road or Stream Crossing	20	LF	300	$ 6,000
	14-inch Road or Stream Crossing		LF	325	$ -
	15-inch Road or Stream Crossing	120	LF	350	$ 42,000
	18-inch Road or Stream Crossing	20	LF	400	$ 8,000
	24-inch Road or Stream Crossing		LF	450	$ -
	6-inch Railroad Crossing		LF	300	$ -
	8-inch Railroad Crossing		LF	350	$ -
	10-inch Railroad Crossing		LF	400	$ -
	12-inch Railroad Crossing		LF	450	$ -
	15-inch Railroad Crossing		EA	500	$ -
	18-inch Railroad Crossing		EA	550	$ -
	24-inch Railroad Crossing		EA	600	$ -
	Master Meter Vault		EA	15,000	$ -
	0.15 MGD Wastewater Treatment Plant		EA	2,500,000	$ -
	0.3 MGD Wastewater Treatment Plant		EA	3,500,000	$ -
	0.5 MGD Wastewater Treatment Plant		EA	4,500,000	$ -
	2.0 MGD Wastewater Treatment Plant		EA	12,000,000	$ -
	5.0 MGD Wastewater Treatment Plant		GAL	20,000,000	$ -
	Flow Equalization Facilities		GAL	1.75	$ -
	Lift Pump Stations (<500 gpm)		EA	250,000	$ -
	Lift Pump Stations (500-1500 gpm)		EA	400,000	$ -
	Lift Pump Stations (1500-3000 gpm)		EA	600,000	$ -
Subtotal (Construction Costs)					$ 6,436,000
Related Costs		30%	Construction Costs	$ 6,436,000	$ 1,930,800
TOTAL Estimated Project Cost					$ 8,366,800
Operation and Maintenance Costs					$ -
	Labor		HRS	35	$ -
	Electrical Power Unit		KWHRS	0.15	$ -
	Electrical Power Wastewater Treatment		MGD	100,000	$ -
	Line System Maintenance	73,600	LF	0.10	$ 7,360
	Sewer Service from Lynchburg		THOU GAL	1.50	$ -
	Wastewater Treatment Chemicals		MGD	15,000	$ -
TOTAL Estimated Annual Operation and Maintenance Costs					$ 7,360
Present Value Operation and Maintenance Costs					$ 84,419
Total Estimated Present Value					$ 8,451,219

Proposed Wastewater Projects | Preliminary Cost Estimate | Bedford County

Region: Jefferson Planning Area

Service Area: Judith Creek

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	8-inch Sewer	26,900	LF	70	$	1,883,000
	10-inch Sewer		LF	75	$	-
	12-inch Sewer		LF	85	$	-
	15-inch Sewer		LF	100	$	-
	18-inch Sewer		LF	120	$	-
	24-inch Sewer		LF	140	$	-
	4-inch Force Main		LF	45	$	-
	6-inch Force Main		LF	55	$	-
	8-inch Force Main		LF	60	$	-
	10-inch Force Main		LF	65	$	-
	12-inch Force Main		LF	75	$	-
	14-inch Force Main		LF	83	$	-
	15-inch Force Main		LF	90	$	-
	18-inch Force Main		LF	105	$	-
	4- or 6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing	20	LF	200	$	4,000
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	14-inch Road or Stream Crossing		LF	325	$	-
	15-inch Road or Stream Crossing		LF	350	$	-
	18-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	15-inch Railroad Crossing		EA	500	$	-
	18-inch Railroad Crossing		EA	550	$	-
	24-inch Railroad Crossing		EA	600	$	-
	Master Meter Vault		EA	15,000	$	-
	0.15 MGD Wastewater Treatment Plant		EA	2,500,000	$	-
	0.3 MGD Wastewater Treatment Plant		EA	3,500,000	$	-
	0.5 MGD Wastewater Treatment Plant		EA	4,500,000	$	-
	2.0 MGD Wastewater Treatment Plant		EA	12,000,000	$	-
	5.0 MGD Wastewater Treatment Plant		GAL	20,000,000	$	-
	Flow Equalization Facilities		GAL	1.75	$	-
	Lift Pump Stations (<500 gpm)		EA	250,000	$	-
	Lift Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Lift Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	1,887,000
Related Costs		30%	Construction Costs	$ 1,887,000	$	566,100
TOTAL Estimated Project Cost					$	2,453,100
Operation and Maintenance Costs					$	-
	Labor		HRS	35	$	-
	Electrical Power Unit		KWHRS	0.15	$	-
	Electrical Power Wastewater Treatment		MGD	100,000	$	-
	Line System Maintenance	26,900	LF	0.10	$	2,690
	Sewer Service from Lynchburg		THOU GAL	1.50	$	-
	Wastewater Treatment Chemicals		MGD	15,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	2,690
Present Value Operation and Maintenance Costs					$	30,854
Total Estimated Present Value					$	2,483,954

Proposed Wastewater Projects — Preliminary Cost Estimate — Bedford County

Region: Lakes Planning Area

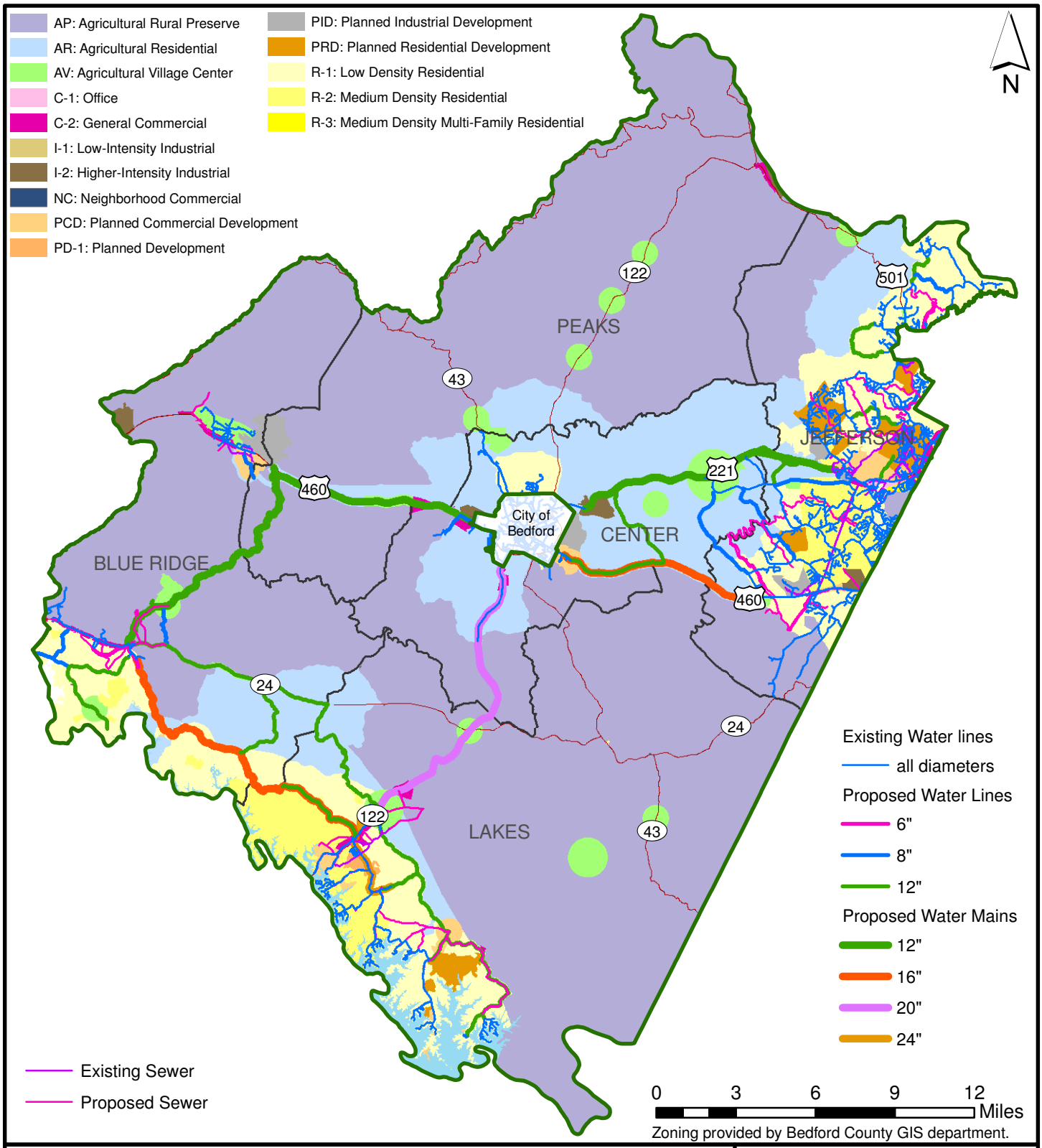
Service Area: Smith Mountain Lake Sewer Project Phases 1-6

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	8-inch Sewer	19,500	LF	70	$	1,365,000
	10-inch Sewer	11,000	LF	75	$	825,000
	12-inch Sewer		LF	85	$	-
	15-inch Sewer	3,000	LF	100	$	300,000
	18-inch Sewer		LF	120	$	-
	24-inch Sewer		LF	140	$	-
	4-inch Force Main		LF	45	$	-
	6-inch Force Main		LF	55	$	-
	8-inch Force Main	15,700	LF	60	$	942,000
	10-inch Force Main	4,200	LF	65	$	273,000
	12-inch Force Main	18,700	LF	75	$	1,402,500
	14-inch Force Main	27,600	LF	83	$	2,290,800
	15-inch Force Main	3,500	LF	90	$	315,000
	18-inch Force Main	12,700	LF	105	$	1,333,500
	4- or 6-inch Road or Stream Crossing		LF	150	$	-
	8-inch Road or Stream Crossing	160	LF	200	$	32,000
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	14-inch Road or Stream Crossing	9	LF	325	$	2,925
	15-inch Road or Stream Crossing		LF	350	$	-
	18-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing	50	LF	350	$	17,500
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	15-inch Railroad Crossing		EA	500	$	-
	18-inch Railroad Crossing		EA	550	$	-
	24-inch Railroad Crossing		EA	600	$	-
	Master Meter Vault		EA	15,000	$	-
	0.15 MGD Wastewater Treatment Plant		EA	2,500,000	$	-
	0.3 MGD Wastewater Treatment Plant		EA	3,500,000	$	-
	0.5 MGD Wastewater Treatment Plant		EA	4,500,000	$	-
	2.0 MGD Wastewater Treatment Plant		EA	12,000,000	$	-
	5.0 MGD Wastewater Treatment Plant		GAL	20,000,000	$	-
	Flow Equalization Facilities		GAL	1.75	$	-
	Lift Pump Stations (<500 gpm)		EA	250,000	$	-
	Lift Pump Stations (500-1500 gpm)	2	EA	400,000	$	800,000
	Lift Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	9,899,225
Related Costs		30%	Construction Costs	$ 9,899,225	$	2,969,768
TOTAL Estimated Project Cost					$	12,868,993
Operation and Maintenance Costs					$	-
	Labor	5,000	HRS	35	$	175,000
	Electrical Power Unit	150,000	KWHRS	0.15	$	22,500
	Electrical Power Wastewater Treatment		MGD	100,000	$	-
	Line System Maintenance	115,900	LF	0.10	$	11,590
	Sewer Service from Lynchburg		THOU GAL	1.50	$	-
	Wastewater Treatment Chemicals		MGD	15,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	209,090
Present Value Operation and Maintenance Costs					$	2,398,246
Total Estimated Present Value					$	15,267,238

Proposed Wastewater Projects — Preliminary Cost Estimate — Bedford County
Region: Lakes Planning Area
Service Area: Collectors

	Item	Quantity	Units	Unit Price		Cost
Capital Costs						
	8-inch Sewer		LF	70	$	-
	10-inch Sewer		LF	75	$	-
	12-inch Sewer		LF	85	$	-
	15-inch Sewer		LF	100	$	-
	18-inch Sewer		LF	120	$	-
	24-inch Sewer		LF	140	$	-
	4-inch Force Main	5,200	LF	45	$	234,000
	6-inch Force Main	9,200	LF	55	$	506,000
	8-inch Force Main	62,500	LF	60	$	3,750,000
	10-inch Force Main		LF	65	$	-
	12-inch Force Main		LF	75	$	-
	14-inch Force Main		LF	83	$	-
	15-inch Force Main		LF	90	$	-
	18-inch Force Main		LF	105	$	-
	4- or 6-inch Road or Stream Crossing	160	LF	150	$	24,000
	8-inch Road or Stream Crossing	640	LF	200	$	128,000
	10-inch Road or Stream Crossing		LF	250	$	-
	12-inch Road or Stream Crossing		LF	300	$	-
	14-inch Road or Stream Crossing		LF	325	$	-
	15-inch Road or Stream Crossing		LF	350	$	-
	18-inch Road or Stream Crossing		LF	400	$	-
	24-inch Road or Stream Crossing		LF	450	$	-
	6-inch Railroad Crossing		LF	300	$	-
	8-inch Railroad Crossing		LF	350	$	-
	10-inch Railroad Crossing		LF	400	$	-
	12-inch Railroad Crossing		LF	450	$	-
	15-inch Railroad Crossing		EA	500	$	-
	18-inch Railroad Crossing		EA	550	$	-
	24-inch Railroad Crossing		EA	600	$	-
	Master Meter Vault		EA	15,000	$	-
	0.15 MGD Wastewater Treatment Plant		EA	2,500,000	$	-
	0.3 MGD Wastewater Treatment Plant		EA	3,500,000	$	-
	0.5 MGD Wastewater Treatment Plant		EA	4,500,000	$	-
	2.0 MGD Wastewater Treatment Plant		EA	12,000,000	$	-
	5.0 MGD Wastewater Treatment Plant		GAL	20,000,000	$	-
	Flow Equalization Facilities		GAL	1.75	$	-
	Lift Pump Stations (<500 gpm)	7	EA	250,000	$	1,750,000
	Lift Pump Stations (500-1500 gpm)		EA	400,000	$	-
	Lift Pump Stations (1500-3000 gpm)		EA	600,000	$	-
Subtotal (Construction Costs)					$	6,392,000
Related Costs		30%	Construction Costs	$ 6,392,000	$	1,917,600
TOTAL Estimated Project Cost					$	8,309,600
Operation and Maintenance Costs					$	-
	Labor	3,500	HRS	35	$	122,500
	Electrical Power Unit	100,000	KWHRS	0.15	$	15,000
	Electrical Power Wastewater Treatment		MGD	100,000	$	-
	Line System Maintenance	76,900	LF	0.10	$	7,690
	Sewer Service from Lynchburg		THOU GAL	1.50	$	-
	Wastewater Treatment Chemicals		MGD	15,000	$	-
TOTAL Estimated Annual Operation and Maintenance Costs					$	145,190
Present Value Operation and Maintenance Costs					$	1,665,318
Total Estimated Present Value					$	9,974,918

APPENDIX C



Zoning

Bedford County PSA
Comprehensive Water and Wastewater Study Update
Bedford County, Virginia

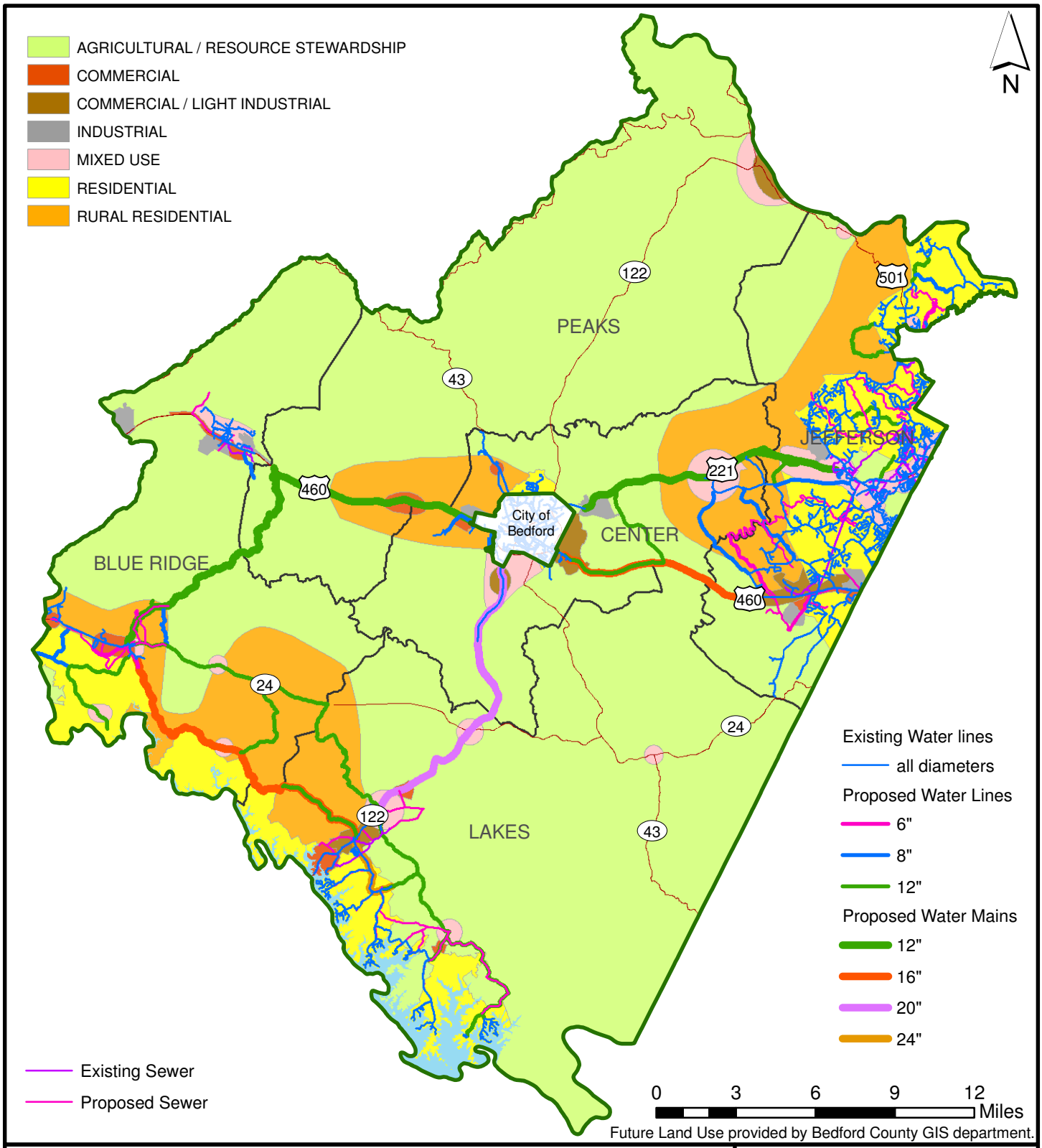
SCALE: to fit

PLAN NO. B05123-06

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services
2206 South Main Street
Blacksburg, VA 24060
540-552-0444 Fax: 540-552-0291
Richmond, VA
Charlottesville, VA
Hampton Roads, VA

DESIGNED GRM
DRAWN SMF
CHECKED GRM
DATE 12-26-08

Appendix
C



Future Land Use

Bedford County PSA
Comprehensive Water and Wastewater Study Update
Bedford County, Virginia

SCALE: to fit

PLAN NO. B05123-06

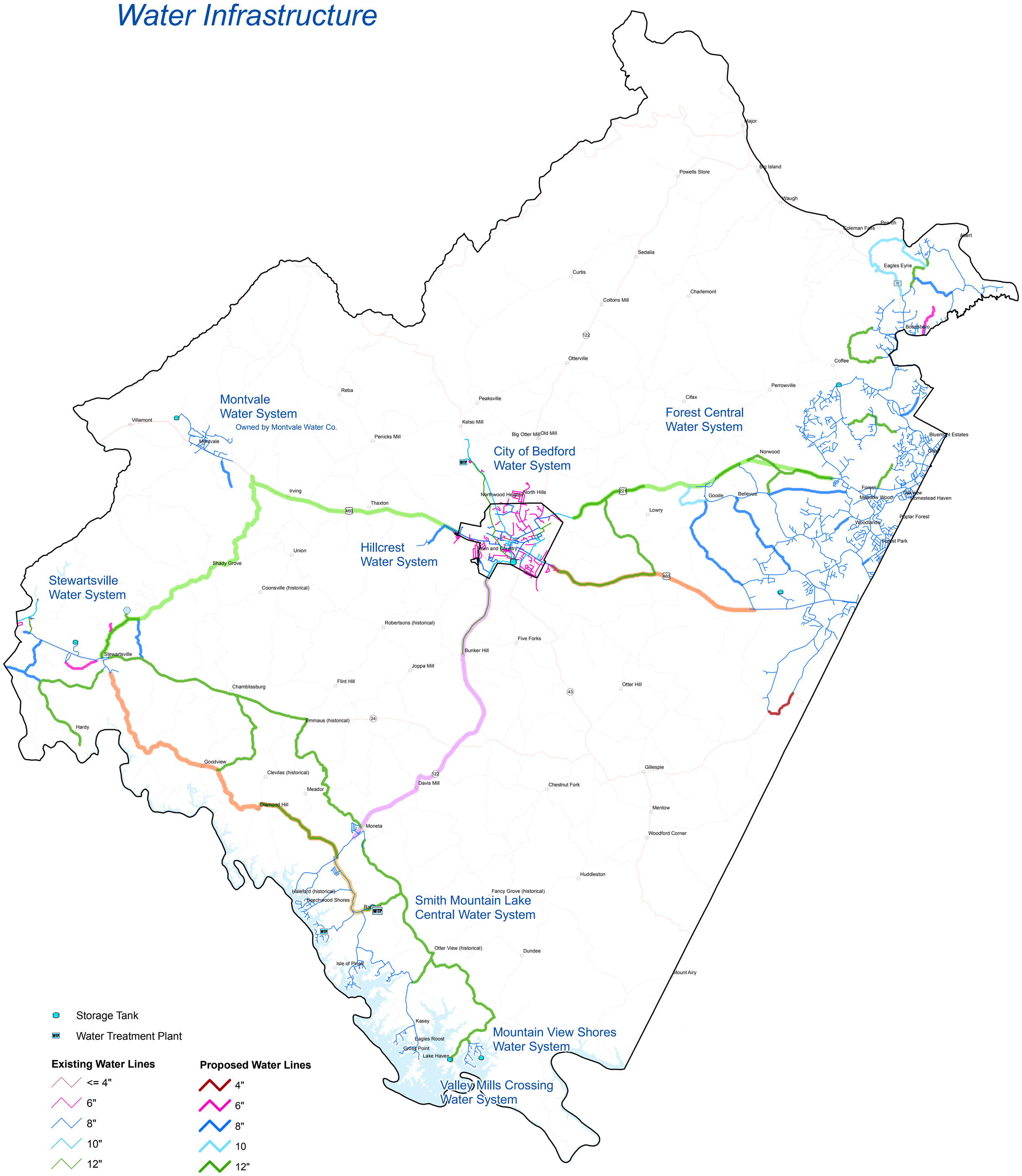
Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services
2206 South Main Street
Blacksburg, VA 24060
540-552-0444 Fax: 540-552-0291
Richmond, VA
Charlottesville, VA
Hampton Roads, VA

DESIGNED GRM
DRAWN SMF
CHECKED GRM
DATE 12-26-08

Appendix
C

APPENDIX D

Existing and Proposed Water Infrastructure



Appendix D

PROJECT NUMBER: B05123-06

DATE: 12-26-08

SCALE: to fit

CHECKED BY: GRM

DRAWN BY: SMF

DESIGNED BY: GRM

REVISIONS

Existing and Proposed Water Service

Bedford County PSA - Comprehensive
Water and Wastewater Study Update

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services
2206 South Main Street
Blacksburg, VA 24060
540-552-0444 Fax: 540-552-0291
Richmond, VA
Charlottesville, VA
Hampton Roads, VA

BEDFORD COUNTY PUBLIC SERVICE AUTHORITY
Quality On Tap!
Our Commitment Our Profession

APPENDIX E

Existing and Proposed Sewer Infrastructure

N

Montvale
Sewer System

Montvale 50,000
GPD WWTP

Stewartsville
Sewer System

City of Bedford
Sewer System

Forest Central
Sewer System

Moneta
Sewer System

Moneta 0.5 MGD WWTP

Major
Big Island
Powells Store
Waugh
Coleman Falls
Pearch
Albert
Sedalia
Curtis
Eagles Eyrie
Charlemont
Coltons Mill
Boonsboro
Otterville
Coffee
Perrowville
Cifax
Reba
Peaksville
Villamont
Kelso Mill
Penicks Mill
Big Otter Mill
Old Mill
Centerville
Norwood
Bluemont Estates
Clay
Irving
Northwood Heights
North Hills
Thaxton
Goode
Bellevue
Lowry
Forest
Meadow Wood
Oakview
Homestead Haven
Poplar Forest
Woodlands
Forest Park
Union
Shady Grove
Coonsville (historical)
Robertsons (historical)
Five Forks
Bunker Hill
Joppa Mill
Flint Hill
Chamblissburg
Otter Hill
Stewartsville
Hardy
Emmaus (historical)
Goodview
Clevilas (historical)
Meador
Davis Mill
Chestnut Fork
Gillespie
Mentow
Woodford Corner
Huddleston
Fancy Grove (historical)
Haleford (historical)
Beechwood Shores
Radford
Otter View (historical)
Dundee
Isle of Pines
Mount Airy
Kasey
Eagles Roost
Gross Point
Lake Haven

Existing

Gravity	Force
4"	1.5"
6"	2"
8"	3"
10"	4"
12"	6"
15"	10"
16"	12"
18"	unknown
24"	Pump Station
unknown	

Proposed

- Force
- Gravity
- Pump Station

0 2 4 6 8 Miles

Utility layers provided by Bedford County Public Service Authority

Appendix E

PROJECT NUMBER: B05123-06

DATE: 12-26-08

SCALE: to fit

CHECKED BY: GRM

DRAWN BY: SMF

DESIGNED BY: GRM

REVISIONS

Existing and Proposed Sewer Service

Bedford County PSA - Comprehensive
Water and Wastewater Study Update

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services
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Richmond, VA
Charlottesville, VA
Hampton Roads, VA

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