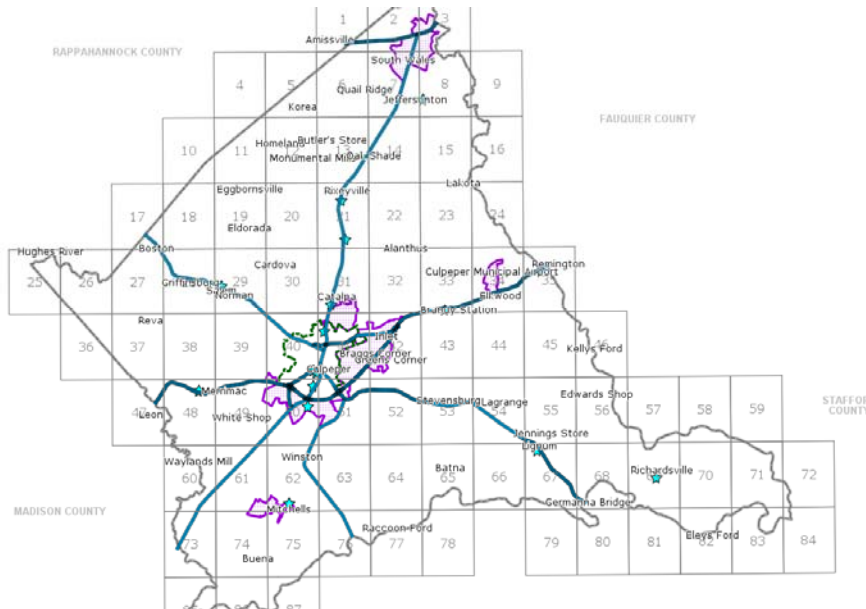




WATER & SEWER MASTER PLAN UPDATE FOR CULPEPER COUNTY, VIRGINIA



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1.0 Executive Summary

The service areas listed below were all evaluated for future water and sewer facilities. They correspond to areas identified in the 2015 Culpeper County Comprehensive Plan. The Town Environs, Clevenger's Corner, and Brandy Station/Elwood are listed as village centers, whereas, Boston and Mitchells are designated convenience centers.

- Boston
- Brandy Station / Elkwood
- Clevenger's Corner
- Town of Culpeper Environs
- Mitchells
- Cherry Hill

The Master Water and Sewer Plan is a macro scale guide for developing water and sewer distribution facilities to support anticipated growth described in the County Comprehensive Plan. Each service area is intended to support growth and provide the necessary services for its specific rural service area.

The proposed facilities will accommodate the projected demands for buildout of the future land use plan included in the 2015 County Comprehensive Plan and presented in Figure No. 2-2, in accordance with the *Sewage Collection and Treatment Regulations*, which state: "In general, sewer systems should be designed for the estimated ultimate tributary population with an upper limit consisting of the 50-year population growth projection, except when considering parts of the systems that can be readily increased in capacity".

Note that the ultimate location of lines and pump stations will be determined by more detailed engineering and design, topography, hydraulic modeling, and the timing, location, and type of development. The purpose of the maps provided in this Master Plan is to demonstrate the general nature and extent of potential future utilities for the service area.



1.0 Executive Summary

1.1 Boston

Boston is located approximately 7.0 miles northwest of the Town of Culpeper along State Route 522 (Sperryville Pike). The service area includes the Boston Post Office, Longlea planned unit development, the American Security Council, and a commercial mailing facility known as Communications of America (CCA) to the south. Formerly categorized as a village center, it is now categorized in the 2015 Comprehensive Plan as a convenience center. Other significant new residential components are not anticipated. The Longlea property is zoned as a planned unit development (PUD) that could accommodate expanded commercial facilities and substantial residential development, large scale development of the property is limited by infrastructure requirements and is no longer encouraged.

Boston is supplied by neither a public water nor public sewer system. Because of the unsuitability of the soils to accommodate on-site sewage disposal systems, a public sewer system would be required. A public groundwater supply system would also be required to serve the Longlea development as currently proposed.

Based on current information, the public water system would include one or more wells supplying 475 gpm, a 0.5 MG elevated water tank and distribution lines. The public sewer system would include a new wastewater treatment facility, gravity sewer, pump stations and force mains. Alternatively, a low-pressure sewer system could provide cost-effective service for the Longlea development.

1.2 Brandy Station / Elkwood

The Brandy Station / Elkwood Utility Service Area is generally located along the U.S. Route 15/29 corridor, approximately four miles east of the town of Culpeper, and stretches nearly to the Rappahannock River, the eastern border of the County. Brandy Station is primarily a residential area with some minor commercial and industrial properties. Elkwood has a small residential area, but is primarily zoned for industry including the Culpeper Regional Airport and Culpeper County Industrial Airpark.



1.0 Executive Summary

An area east of the Airpark (Willow Run) is protected by conservation easement. The area west of, and adjacent to, the airport is the battlefield, protected by the Civil War Preservation Trust and the Association for the Preservation of Civil War Sites. The County has water rights to wells on the Willow Run property east of the Airpark.

The two primary foci for development, in order of probability of development, are listed, and shown generally on Figure No. 4-1:

1. Beverly Ford Road, south of the Culpeper Regional Airport;
2. South of US 15/29, southwest of area #2 above, in the Flat Run drainage area.

1.3 Clevenger's Corner

Clevenger's Corner Village Center is one of the two Village Centers identified in the Culpeper County 2015 Comprehensive Plan. The Village Center is located south of the intersection of Route 211 and Route 229 in the northern portion of the County, approximately 13 miles north of the Town of Culpeper. The Clevenger's Corner Village Center includes the existing South Wales subdivision, the proposed Pulte Homes residential and commercial development which is known as Clevenger's Village, parcels known as the Epstein Property and River Ridge subdivision, Clevenger Oaks Estates. No additional development or expansion of the service area to support the water and sewer infrastructure is anticipated.

The existing waterworks in the Clevenger's Corner Village Center is owned and operated by Culpeper County and currently serves the South Wales development. The water supply consists of four new and two existing groundwater wells with a combined safe yield of 945 gallons per minute (gpm), and combined pumping capacity of 785 gpm. Water is treated, and stored in a 350,000 ground storage tank and a 750,000 gallon elevated storage tank.

The wastewater system in the Clevenger's Village area is owned and operated by Culpeper County, and currently serves the South Wales development. The plant was designed to serve the new Pulte Homes development at Clevenger's Village, the existing South Wales



1.0 Executive Summary

subdivision, the Epstein Subdivision, River Ridge Subdivision, and some small surrounding areas.

The future wastewater collection system will consist of gravity sewers, pump stations and force mains, to convey the wastewater to the wastewater treatment plant.

1.4 Culpeper Town Environs

The January 30, 2012, Voluntary Settlement Agreement between the Town and County, details the water and sewer service relationship for the 30-year term of the Agreement. The essence of the Agreement is discussed further in Section 6.1.1.

The Town's sources of supply include surface water from Lake Pelham and Mountain Run Lake, and groundwater from five wells. The total capacity of the surface water and ground water sources is 6.818 MGD.

Three water storage tanks serve the Town and Environs. Two are ground storage tanks and one is elevated. The collective storage capacity is 2 MG. Existing storage is sufficient to serve the existing demand.

The Town's wastewater treatment plant is located in the McDevitt Drive Area. Its permitted capacity is 6.0 MGD.

The future water system in the Environs will include two new groundwater wells with treatment, 0.5 MG (Southwest Area) and 0.75 MG (Culpeper North Area) storage tanks, and distribution mains.

1.5 Cherry Hill

The Cherry Hill is located approximately 2.3 miles northwest of the Town of Culpeper along State Route 522 (Sperryville Pike). It includes the former County Landfill and surrounding residences.



1.0 Executive Summary

The Cherry Hill area is not supplied by public water or wastewater systems. The residents have individual wells and on-site septic systems to serve their water and wastewater needs, respectively.

Future water facilities for the Cherry Hill area will include supply, treatment, storage, and distribution to serve up to 25 homes. The water system is likely to be constructed in phases, with the first phase serving the area east of the landfill.

Emery & Garrett Groundwater, Inc. assessed groundwater in the area, and located a groundwater well capable of yielding 90 gallons per minute (gpm) or 129,600 gallons per day (gpd). The first phase of the distribution system will include 6-inch and 8-inch water lines on Cherry Hill Road, Scantlin Mountain road and Hickory Mountain Lane.

1.6 Mitchells

The Mitchells utility service area is defined by the community of Mitchells, located north of the Coffeewood Correctional Facility. The Mitchells area is located approximately 5.5 miles south of the Town of Culpeper at the intersection of State Route 615 (Rapidan Road) and State Route 652 (Mitchell Road). The area has been classified as a convenience center in the 2015 County Comprehensive Plan. Poor soils and existing industrial uses, however, limits additional residential growth in this area.

County residents' water and wastewater needs are met in this area by onsite wells, septic systems, and a low-pressure sewer system. The wastewater generated by the low-pressure sewer system is treated at the Coffeewood wastewater treatment plant.

Culpeper County is contemplating construction of a new jail on property owned by the Commonwealth of Virginia Department of Corrections adjacent to the Coffeewood Facility. As part of this expansion the Department of Corrections is contemplating closing down its wells and reverse osmosis treatment facility and purchasing water from Culpeper County. Finished water will be supplied by the Town of Culpeper water system, extended from the Town Environs, via a 12-inch and 8-inch transmission main.



1.0 Executive Summary

Wastewater service has been made available to the community through excess capacity at the Coffeewood Correctional Facility's wastewater treatment plant to alleviate problems with failing drainfields. No new construction will be allowed to connect to the sewer. However, all existing structures are eligible for connection.



2.0 Introduction

Culpeper County, with a land area of 389 square miles, lies in the upper Piedmont Plateau where the land is rolling and hilly. The Blue Ridge Mountains, to the west, are visible in the distance from much of the County. Elevations vary from an average low of about 250 feet above sea level to about 600-650 feet, although there are specific points that are lower and higher. The entire County lies within the Rappahannock River Basin and is bordered on the northeast by this river for approximately 38 miles. A primary tributary of the Rappahannock River, the Rapidan River also borders the southern part of the County for approximately 38 miles. Other primary tributaries of the Rappahannock River, within Culpeper County, are Mountain Run and Hazel River. Mountain Run, with a drainage area of 124.65 square miles lies exclusively within Culpeper County, while the Hazel River, with a drainage area of 351.43 square miles, drains the northern third of the County.

Temperatures vary from an average monthly of approximately 34 degrees F in January to 76 degrees F in July. Average annual rainfall is approximately 41 inches per year. Precipitation is well distributed throughout the year with the maximum in July and August and the minimum in February. Stream flow gages on the Hazel River at Rixeyville and Mountain Run near Culpeper indicate an average annual runoff of 14-15 inches per year from these drainage areas.

Mountain Run Lake and Lake Pelham, located within the upper reaches of the Mountain Run drainage area, are used by the Town of Culpeper for its water supply. The entire land area that feeds these two reservoirs is referred to as the Lake Pelham Watershed. The combined storage available for water supply from these two reservoirs is approximately 499,000,000 gallons. Currently, the Town of Culpeper has 4,000,000 gallons per day of water treatment plant capacity. The relationship between the Town and County for the provision of water and sewer services is discussed in Section 8.

Culpeper County is currently experiencing some growth, although the growth is slower than it was during the period prior to the recession. The County is still basically rural. Some of the growth pressure is due to the proximity of the County to the Washington, D.C./northern Virginia area, which is approximately 75 miles to the northeast.



2.0 Introduction

2.1 Service Areas

In the period prior to the recession, the County of Culpeper had an estimated population of 42,530 residents and a 5.9% annual growth rate. County leaders recognized the need to identify potential growth areas and provide public facilities to support growth in those areas. Construction of water and sewer facilities in coordination with zoning amendments and comprehensive planning is a means of promoting and centralizing development to certain areas of the County while retaining the rural character of the remainder. The County's water and sewer service areas discussed in this plan support the Village Centers and Convenience Centers identified in the 2015 County Comprehensive Plan. The water and sewer service areas included in this master plan are:

- Boston
- Brandy Station/Elkwood
- Clevenger's Corner
- Town of Culpeper Environs
- Mitchells
- Cherry Hill

Additional information regarding each of these service areas will be given in subsequent chapters. This study develops a conceptual master plan for the provision of water and sewer facilities within these service areas. The Master Water and Sewer Plan is a macro scale guide for developing water and sewer distribution facilities to support anticipated growth described in the County Comprehensive Plan. Each service area is intended to support growth and provide the necessary services for its specific rural service area.

The report's objective is to identify these facilities and the resources required to meet the population demands through the year 2040 and beyond. The Village Centers and Convenience Centers listed above are presented in Figure No. 2-1. Facilities will be constructed in accordance with the Culpeper County construction standards, which include the use of ductile iron pipe for water and sewer lines. Note that the ultimate location of lines and pump stations will be determined by more detailed engineering and design,



2.0 Introduction

topography, hydraulic modeling, and the timing, location, and type of development. The purpose of the maps provided in this Master Plan is to demonstrate the general nature and extent of potential future utilities for the service area.

According to the 2015 County Comprehensive Plan, a Village Center is intended to serve the needs of the population residing within a five-mile radius of it. It is also intended to be the primary focus for rural commercial services including neighborhood retail, general business, and offices conducive to rural community development. A Convenience Center is intended to provide services concentrated at the crossroads, rather than being spread out along highways or isolated as home occupations. It is also intended for these areas to provide opportunities for limited local convenience services to serve rural residents and supplement neighborhood and community areas. The future land use plan contained in the 2015 County Comprehensive Plan is shown in Figure No. 2-2.

2.2 Population and Demands

Population projections were developed and are presented in the 2015 Culpeper County Comprehensive Plan. Those data were used as a basis for projecting future growth in service areas, when buildout information was not available.

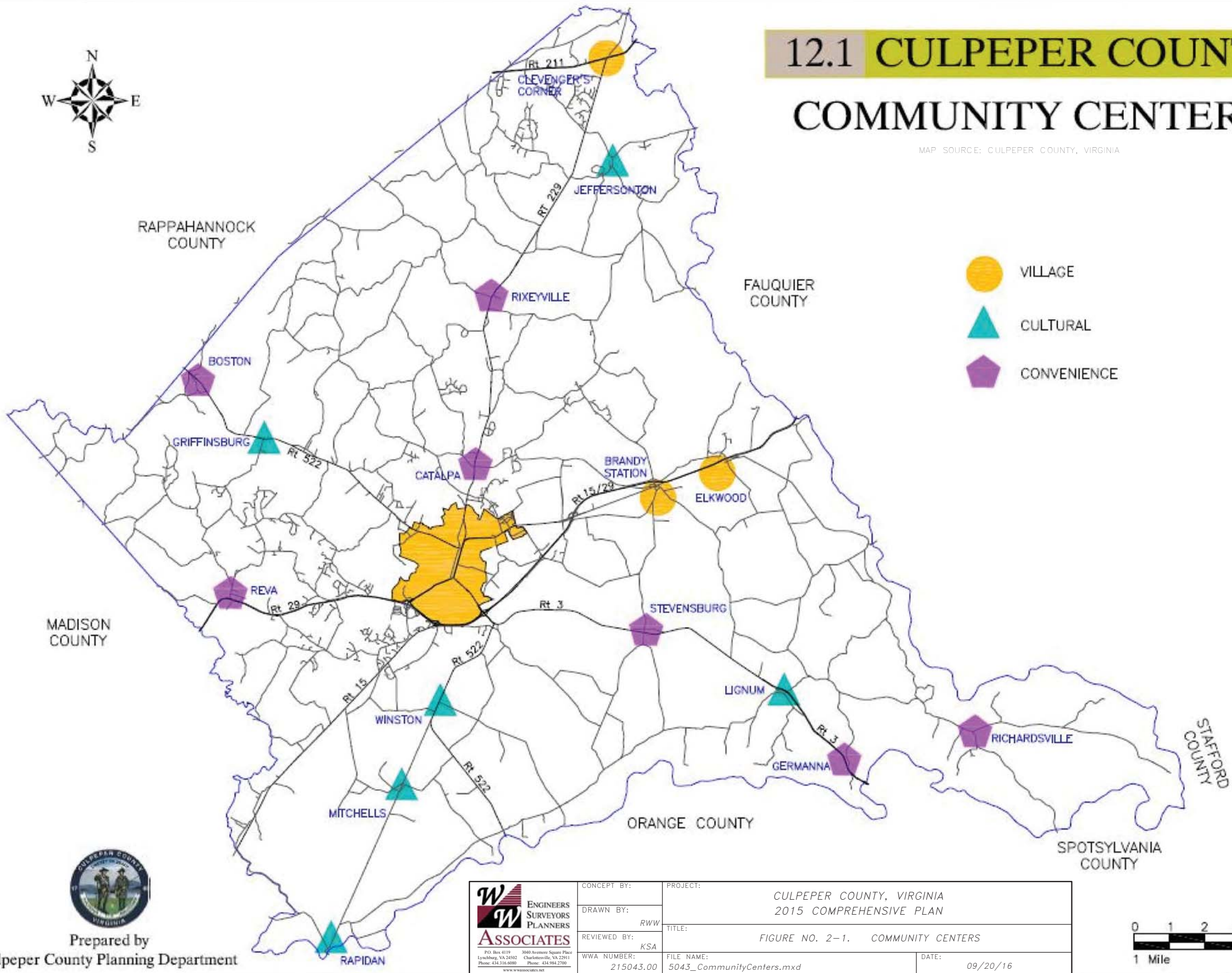
Wastewater flows and water demand calculations have been produced, taking into account the mixed uses. Generally, estimated flows were based on build-out.

The 2010 Census data indicate an occupancy rate of approximately 2.77 persons per household. It is assumed that the occupancy rate will not increase significantly over time. The Virginia Department of Environmental Quality and Department of Drinking Water recommend an allowance of 100 gpd/individual for use in sizing water and wastewater facilities. Rounding up to an average occupancy of 3 persons per household and an average water consumption rate of 100 gpd/individual, the equivalent residential connection (ERC) used will be 300 gpd/connection. Water use rates for commercial and industrial areas were obtained using the Department of Environmental Quality's *Sewage Collection and Treatment Regulations*, and are based on square footage.

12.1 CULPEPER COUNTY

COMMUNITY CENTERS

MAP SOURCE: CULPEPER COUNTY, VIRGINIA



-  VILLAGE
-  CULTURAL
-  CONVENIENCE

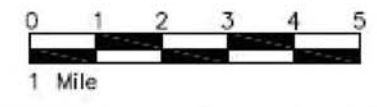


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CONCEPT BY:	PROJECT:	CULPEPER COUNTY, VIRGINIA 2015 COMPREHENSIVE PLAN	
DRAWN BY:	RWW	TITLE:	FIGURE NO. 2-1. COMMUNITY CENTERS
REVIEWED BY:	KSA	FILE NAME:	5043_CommunityCenters.mxd
WVA NUMBER:	215043.00	DATE:	09/20/16

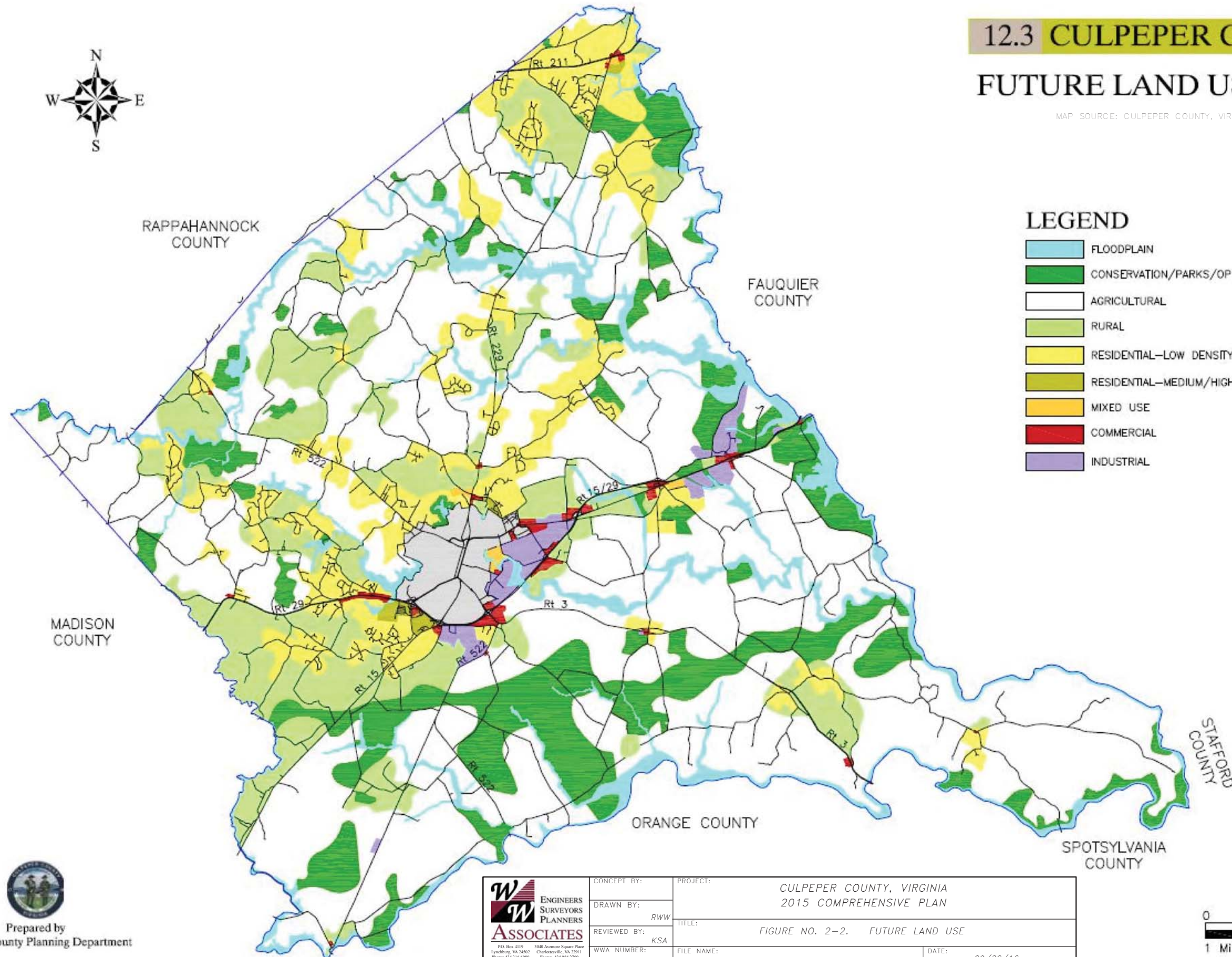


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12.3 CULPEPER COUNTY

FUTURE LAND USE PLAN

MAP SOURCE: CULPEPER COUNTY, VIRGINIA



LEGEND

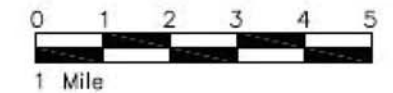
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- CONSERVATION/PARKS/OPEN SPACE
- AGRICULTURAL
- RURAL
- RESIDENTIAL-LOW DENSITY
- RESIDENTIAL-MEDIUM/HIGH DENSITY
- MIXED USE
- COMMERCIAL
- INDUSTRIAL



Prepared by
Culpeper County Planning Department



CONCEPT BY:	PROJECT:	CULPEPER COUNTY, VIRGINIA 2015 COMPREHENSIVE PLAN	
DRAWN BY:	RWW	TITLE:	FIGURE NO. 2-2. FUTURE LAND USE
REVIEWED BY:	KSA	FILE NAME:	5043_FutureLandUse.mxd
WWA NUMBER:	215043.00	DATE:	09/20/16



2.0 Introduction



The proposed facilities will accommodate the projected demands for buildout of the future land use plan included in the 2015 County Comprehensive Plan and presented in Figure No. 2-2, in accordance with the *Sewage Collection and Treatment Regulations*, which state: “In general, sewer systems should be designed for the estimated ultimate tributary population with an upper limit consisting of the 50-year population growth projection, except when considering parts of the systems that can be readily increased in capacity”. A summary of the demands is presented in Table No. 2-1.

Table No. 2-1
Summary of Projected Flows

Service Area	Projected ERCs	Projected Flow (gpd)
Clevenger’s Corner	1,758	527,400
Town Environs		
Southwest	2,765	829,500
Lovers Lane	250	75,000
McDevitt Drive	84	25,200
Inlet	549	164,700
Culpeper North	1,387	416,100
Brandy Station / Elkwood	600	180,000
Boston	838	251,400
Mitchells	520	156,000
Cherry Hill	25	7,500



3.0 Boston

3.1 Introduction

Boston is located approximately 7.0 miles northwest of the Town of Culpeper along State Route 522 (Sperryville Pike). The service area includes the Boston Post Office, Longlea planned unit development, the American Security Council, and a commercial mailing facility known as Communications of America (CCA) to the south. It is categorized in the 2015 Comprehensive Plan as a convenience center, intended to reinforce past farm patterns and act as a focal point for future community activities. Other significant new residential components are not anticipated.

Although Boston was formerly categorized as a village center, and the Longlea property is zoned as a planned unit development (PUD) that could accommodate expanded commercial facilities and substantial residential development, large scale development of the property is limited by infrastructure requirements and is no longer encouraged.

The area is only slightly developed and a large portion remains wooded and undisturbed. Steep slopes are prevalent in portions of the service area and will severely limit development.

3.2 Existing Water Facilities

The Boston area is not supplied by a public water system. The residents and commercial establishments have individual wells to supply their daily water usage. The planned unit development will require additional groundwater supplies and a water distribution system. The installation of a publicly-owned system is discussed in detail in Section 3.4.

3.3 Existing Wastewater Facilities

The Boston area does not have a public wastewater system. However, Communication Corporation of America and the American Security Council have a private wastewater treatment facility near their operations that treats their wastewater effluent. The plant is regulated under the Virginia Pollutant Discharge Elimination System permit VA0065358,



3.0 Boston

held by the Boston Water and Sewer Company. It is permitted for a discharge of approximately 15,000 gallons per day. All existing residential development is served by onsite drainfields. The development density expected with Longlea would not permit septic tank/drainfield systems. The soil conditions in most of the area are not considered adequate for the proper operation of septic tank/drainfield systems. This is due to expansive clay soils three to four feet deep overlying bedrock. A public sewer system will be required and is discussed in Section 3.5.

3.4 Future Water Facilities

Water facilities for the Boston Service area will include supply, treatment, storage, and distribution improvements. The following includes a discussion of each system component and the recommended facilities. The proposed development plan for Longlea will comprise the bulk of Boston's growth, and is included in Figure No. 3-1. Figure No. 3-2 presents a conceptual layout of the future water supply system.

Water and wastewater demands are often expressed in terms of Equivalent Residential Connections (ERCs), which represent 300 gallons per day (gpd). The estimated number of ERCs in the proposed plan is 838, representing 251,400 gpd of average daily water usage.

3.4.1 Water Demands

The water demand projection is based on current zoning, the Planned Unit Development shown in Figure No. 3-1, the source capacity as determined by the Emery & Garrett Groundwater, Inc. assessment, and the planning period. Each residential connection was allocated 300 gpd. The commercial spaces were allocated 0.2 gal./ft², based on the Sewage Collection and Treatment Regulations. The plan shows 711 residential units (ERCs), 140,000 ft² of commercial space, and 168 conference spaces. The conference spaces were allocated the same demand as the commercial spaces because no other information was available.



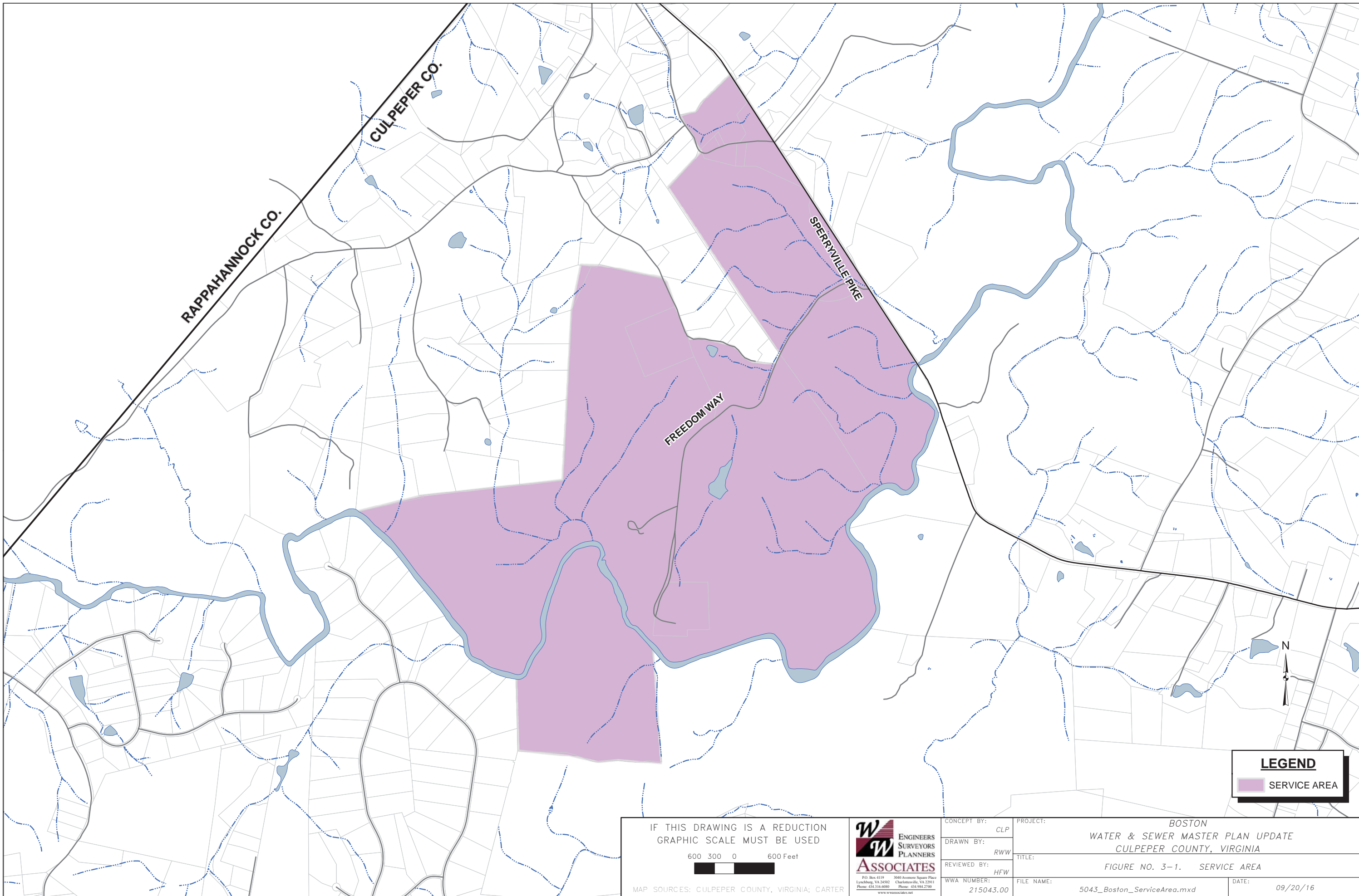
3.0 Boston

The fire flow volume used for planning purposes is based on a 2,000 gpm flow for 2 hours, or 240,000 gallons.


Based on the County's Design Standards, the water system capacity for 838 ERCs including fire demand must be 400 gpd per ERC, which equals 335,200 gpd.

Alternatively, the VDH Working Memo #784 method estimates the maximum daily demand to be 1.8 times the average daily demand. It calculates as follows: $251,300 \text{ gpd} \times 1.8 = 452,340 \text{ gpd}$, and is more stringent than the County's method.

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LEGEND

 SERVICE AREA

IF THIS DRAWING IS A REDUCTION
GRAPHIC SCALE MUST BE USED

600 300 0 600 Feet

MAP SOURCES: CULPEPER COUNTY, VIRGINIA; CARTER

W
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CONCEPT BY:	CLP	PROJECT:	BOSTON WATER & SEWER MASTER PLAN UPDATE CULPEPER COUNTY, VIRGINIA
DRAWN BY:	RWW	TITLE:	FIGURE NO. 3-1. SERVICE AREA
REVIEWED BY:	HFW	FILE NAME:	5043_Boston_ServiceArea.mxd
WWA NUMBER:	215043.00	DATE:	09/20/16

**FUTURE WATER LINES 8",
UNLESS NOTED**

LONGLEA WATER TANK
OVERFLOW ELEVATION = 750'
VOLUME = .35 MG

NOTES:

1. THE MASTER WATER AND SEWER PLAN IS A MACRO SCALE GUIDE FOR DEVELOPING WATER AND SEWER DISTRIBUTION FACILITIES TO SUPPORT ANTICIPATED GROWTH DESCRIBED IN THE COUNTY COMPREHENSIVE PLAN.
2. THE ULTIMATE LOCATION OF LINES AND PUMP STATIONS WILL BE DETERMINED BY MORE DETAILED ENGINEERING AND DESIGN, TOPOGRAPHY, HYDRAULIC MODELING, AND THE TIMING, LOCATION, AND TYPE OF DEVELOPMENT.
3. THE PURPOSE OF THIS MAP IS TO DEMONSTRATE THE GENERAL NATURE AND EXTENT OF POTENTIAL FUTURE UTILITIES FOR THE SERVICE AREA.

RAPPAHANNOCK CO.

CULPEPER CO.

SPERRYVILLE PIKE

FREEDOM WAY



LEGEND

- EXISTING WELL
- FUTURE WATER LINES
- FUTURE TANK
- FUTURE MINOR ROADS
- SERVICE AREA

IF THIS DRAWING IS A REDUCTION
GRAPHIC SCALE MUST BE USED

600 300 0 600 Feet

MAP SOURCES: CULPEPER COUNTY, VIRGINIA; CARTER

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REVIEWED BY:	HFW
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TITLE:	FIGURE NO. 3-2. FUTURE WATER IMPROVEMENTS		
FILE NAME:	5043_Boston_FutureWater.mxd	DATE:	09/20/16

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3.0 Boston

3.4.2 Supply

Water for the Longlea development will be supplied by groundwater wells. A groundwater availability assessment was performed by Emery & Garrett Groundwater, Inc. to determine the safe yield of groundwater in the Boston area. The result of that assessment is the location of three groundwater wells capable of yielding a total of 365 gallons per minute (gpm) or 525,600 gallons per day (gpd). The Virginia Health Department (VDH) classifies a water system source capacity as the lower of the well yield and pumping capacity, calculated for each well in service. The combined capacities equal the system source capacity. Based on the information above, the supply is capable of supporting 1,752 ERCs, at 300 gpd/ERC.

The Culpeper County standards state that a source water supply utilizing only groundwater must have a safe yield of 1.0 gpm per connection (ERC). Using this more stringent standard, the existing wells could serve (365 gpm / 1.0 gpm/ERC) or 365 ERCs.

Therefore, to reach the buildout provided in the latest development plan, additional well supplies providing 475 gpm must be developed. However, since the extent of development is not actually known at this time, additional wells may or may not be needed to meet future demand. If additional wells are needed, construction could be phased to meet demand. Prior to acceptance of any development plan, the ability to provide an adequate water supply should be demonstrated. According to the VDH Memo #784, any water system serving >49 residential units must include an additional well with a capacity of $\geq 20\%$ of the daily demand. (It is noted that the memo also contains a reference to the proposed *Waterworks Regulations* amendments, which specify $\geq 30\%$ as the criterion).

3.4.2 Treatment

The treatment system for this area will be based on results of sampling performed for each well. Samples for the three wells discussed above were analyzed and found to meet all EPA Primary Drinking Water Standards. Treatment for contaminants exceeding recommended



3.0 Boston

secondary drinking water parameters is optional. Additional water chemistry testing prior to final acceptance by the Virginia Department of Health is recommended. Design of water treatment processes will be based on specific concentrations of contaminants. The current Longlea plan indicates using small package facilities at each well head. However, a single treatment facility may be more beneficial if a higher level of treatment is chosen to remove the secondary contaminants.

3.4.3 Storage

County standards specify a storage capacity of 400 gallons per equivalent residential connection or the minimum storage capacity required by the *Waterworks Regulations*, whichever is higher. The minimum storage capacity based on the *Waterworks Regulations* and Working Memo #784, which is half of the maximum daily demand plus fire flow volume, is 466,200 gallons. The County standards would require 335,200 gallons for 838 connections. Using the more stringent VDH method, a 500,000 gallon tank should be sited at the Longlea development at a ground elevation of approximately 680 feet MSL. To provide the minimum pressure requirement of 30 psi, the tank minimum water level would be approximately 70 feet above the base, or at 750 feet MSL. The storage capacity is based on an assumed development plan and should be adjusted once the plan is finalized. The final planned storage must meet the *Waterworks Regulations* and Culpeper County Water and Sewer Authority minimum requirements.

3.4.4 Distribution

The distribution system for this area will be primarily confined to the Longlea development. A series of 8-inch and 12-inch distribution lines will be installed to serve the residential development and provide fire flow capacity.

3.5 Future Wastewater Facilities

Wastewater generation in the Boston Service Area will occur primarily in the Longlea planned development. The development will be served by gravity sewers, pump stations,



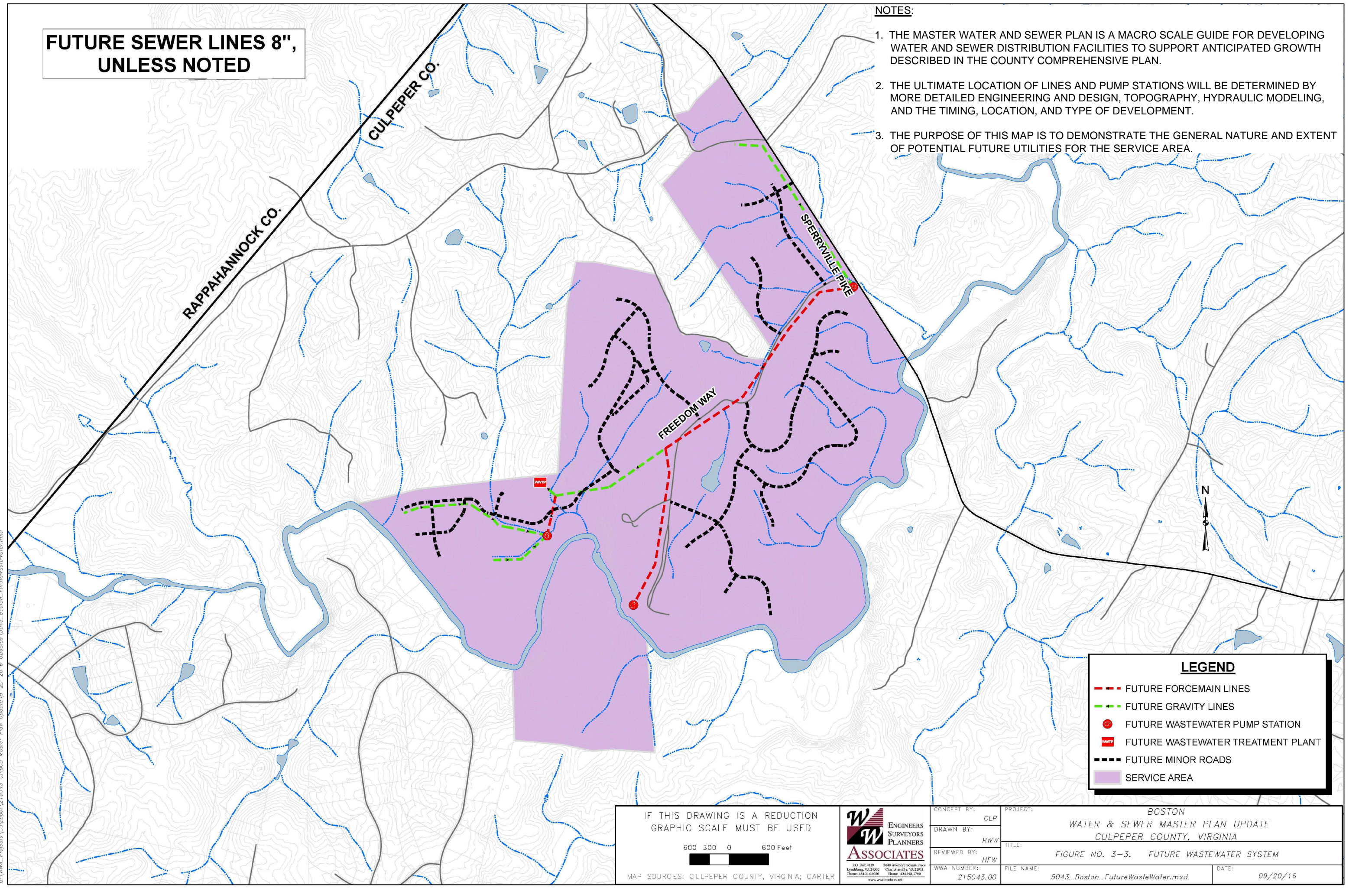
3.0 Boston

and force mains to convey the wastewater flow to a new wastewater treatment facility within Longlea. Alternatively, a low-pressure sewer system could be constructed. Conventional pump stations, force mains, interceptors, and treatment facility location are presented in Figure No. 3-3. The following is general description of the necessary collection and conveyance lines and the required treatment facilities.

**FUTURE SEWER LINES 8",
UNLESS NOTED**

NOTES:

1. THE MASTER WATER AND SEWER PLAN IS A MACRO SCALE GUIDE FOR DEVELOPING WATER AND SEWER DISTRIBUTION FACILITIES TO SUPPORT ANTICIPATED GROWTH DESCRIBED IN THE COUNTY COMPREHENSIVE PLAN.
2. THE ULTIMATE LOCATION OF LINES AND PUMP STATIONS WILL BE DETERMINED BY MORE DETAILED ENGINEERING AND DESIGN, TOPOGRAPHY, HYDRAULIC MODELING, AND THE TIMING, LOCATION, AND TYPE OF DEVELOPMENT.
3. THE PURPOSE OF THIS MAP IS TO DEMONSTRATE THE GENERAL NATURE AND EXTENT OF POTENTIAL FUTURE UTILITIES FOR THE SERVICE AREA.



LEGEND

- FUTURE FORCEMAIN LINES
- FUTURE GRAVITY LINES
- FUTURE WASTEWATER PUMP STATION
- FUTURE WASTEWATER TREATMENT PLANT
- FUTURE MINOR ROADS
- SERVICE AREA

IF THIS DRAWING IS A REDUCTION
GRAPHIC SCALE MUST BE USED

600 300 0 600 Feet

MAP SOURCES: CULPEPER COUNTY, VIRGINIA; CARTER

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CONCEPT BY:	CLP	PROJECT:	BOSTON WATER & SEWER MASTER PLAN UPDATE CULPEPER COUNTY, VIRGINIA	
DRAWN BY:	RWW	TITLE:	FIGURE NO. 3-3. FUTURE WASTEWATER SYSTEM	
REVIEWED BY:	HFV	FILE NAME:	5043_Boston_FutureWasteWater.mxd	DATE:
WWA NUMBER:	215043.00			09/20/16

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3.0 Boston

3.5.1 Collection and Conveyance

As previously discussed, the final development plans have not been established for the Longlea property. The conceptual layout of wastewater facilities in Figure No. 3-3 is based on the latest development submittal. Upon approval of the final development plan, facilities shall be sized in accordance with the Culpeper County Water and Sewer Authority Design and Construction Standards. All onsite facilities would be financed by the land developer.

3.5.2 Treatment

The Longlea wastewater treatment plant will discharge directly to Hazel River, a tributary of the Rappahannock River. Therefore, it will be subject to the requirements of the Chesapeake Bay Tributary Strategy. The Hazel River is included in the Commonwealth's 2012 303(d) Total Maximum Daily Load Priority List of impaired waters, based on coliform bacteria. The Virginia Pollutant Discharge Elimination System discharge permit (VA0088749) associated with a 250,000 gallon per day proposed wastewater treatment plant would contain limits to protect the river.

4.0 Brandy Station / Elkwood



4.1 Introduction

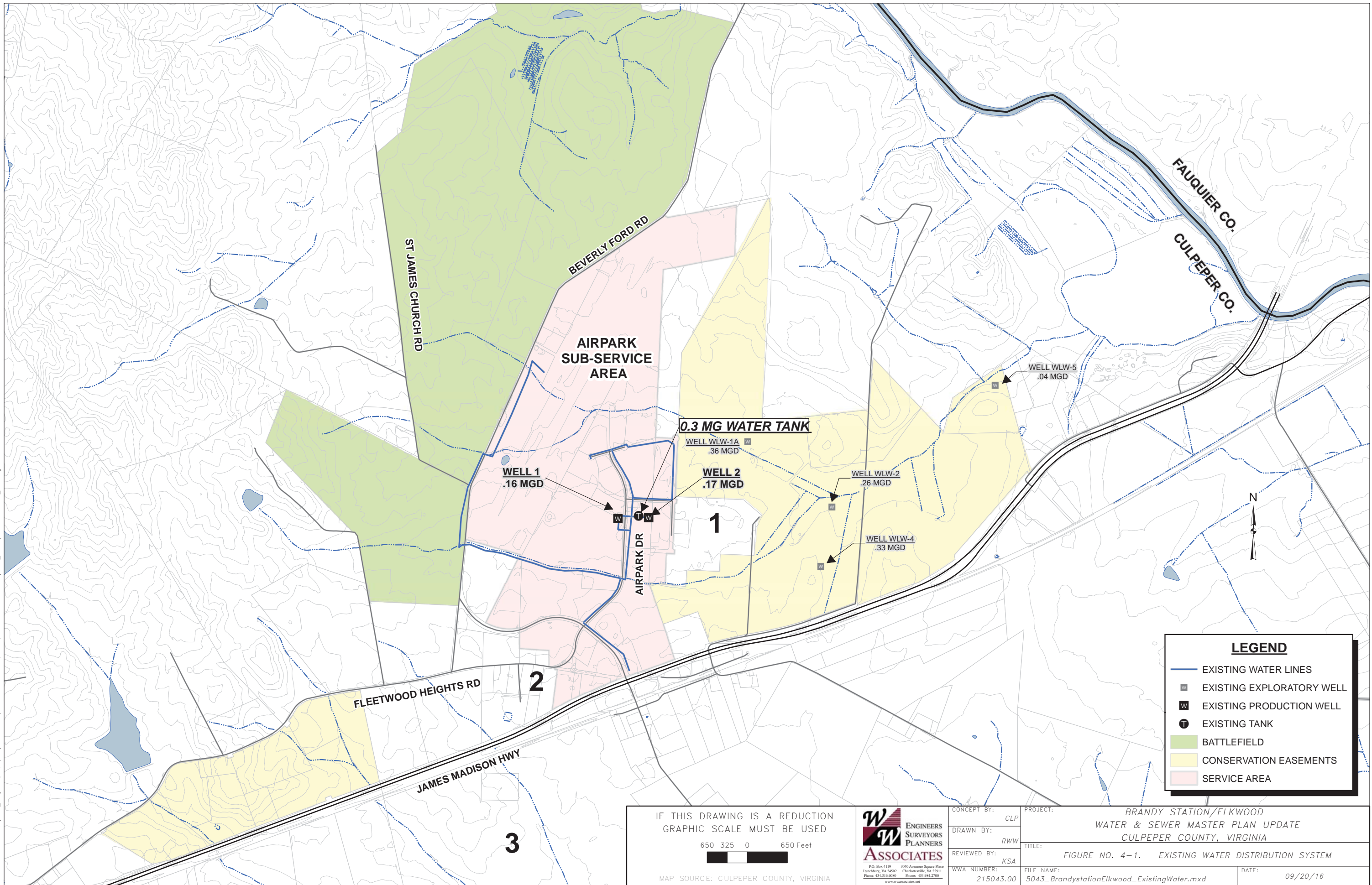
The Brandy Station / Elkwood Utility Service Area is generally located along the U.S. Route 15/29 corridor, approximately four miles east of the town of Culpeper, and stretches nearly to the Rappahannock River, the eastern border of the County. The service area corresponds with the village center identified in the 2015 County Comprehensive Plan. It contains portions of the Jonas Run, Flat Run and Hubbard Run drainage basins. It encompasses 3,200 acres and includes the two communities of Brandy Station and Elkwood and the surrounding areas. Brandy Station is primarily a residential area with some minor commercial and industrial properties. Elkwood has a small residential area, but is primarily zoned for industry including the Culpeper Regional Airport and Culpeper County Industrial Airpark.

The 2015 Comprehensive Plan projects a village center population of 1,500 persons at buildout, with 218 acres of commercial property and 1,183 acres of industrial property. The development plans for the area include mixed uses that include industrial areas to the eastern and western ends of the service area, a residential area adjacent to and south of Brandy Station, and commercial areas located at Elkwood and at the intersection of State Route 762 (Brandy Road) and U.S. Route 15/29. The Future Land Use Plan included in the Comprehensive Plan, is shown in Section 2, Figure No. 2-2. With large developments anticipated, Elkwood would likely be an employment and commercial center in Culpeper County.

The three primary foci for development, in order of probability of development, are listed below, and shown generally on Figure No. 4-1:

1. Northeast of the wastewater treatment plant at Airpark Drive;
2. Beverly Ford Road, south of the Culpeper Regional Airport;
3. South of US 15/29, southwest of area #2 above, in the Flat Run drainage area.

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4.0 Brandy Station / Elkwood

The Airpark water system is limited to the area directly adjacent to the Culpeper Regional Airport. There is no central water and sewer network south of U.S. Route 29. Individual parcels in the Brandy Station area are served by on-site wells; however, groundwater contamination is a concern. Failing drainfields have left the shallow ground water bacteriologically unsafe. The Culpeper County Department of Health requires any new private wells to penetrate a deeper groundwater aquifer approximately 250 feet deep. In addition, new wells must be grouted to the ground surface to avoid contamination.

It should be noted throughout the planning and development process that the Brandy Station area has significant Civil War era historical value. It was the site of the largest cavalry battle fought on the North American continent, with the entire county seeing more troop movements than anywhere else in the nation. The Comprehensive Plan states that the village center includes some significant historic resources that should be respected and preserved.

An area east of the Airpark (Willow Run) is protected by conservation easement. The area west of, and adjacent to, the airport is the battlefield, protected by the Civil War Preservation Trust and the Association for the Preservation of Civil War Sites.

4.2 Existing Water Facilities

The only location in the Mountain Run service area with existing county water service is the Industrial Airpark near Elkwood. The Airpark system provides water to the Culpeper Regional Airport and adjacent industrial parcels. This non-transient non-community water system consists of two groundwater wells, a water storage tank, a hydropneumatic tank, fire pumps, and distribution lines.

A fire pump with a rated flow capacity of 1,500 gallons per minute at 139 feet of TDH is included in the system to meet fire flow requirements.

Normal daily water demand is supplied by a 5,000 gallon hydropneumatic tank. The water distribution system is a network of 8-inch, 10-inch and 12-inch diameter mains.



4.0 Brandy Station / Elkwood

The waterworks permitted design capacity is 299,520 gpd, as discussed further below. The 12-month average daily demand on the system is 5,445 gpd, or 18 Equivalent Residential Units (ERCs) at 300 gpd/ERC.

4.2.1 Supply

Based on the VDH Engineering Description Sheet, the two groundwater wells have effective capacities of 114 gallons per minute and 120 gallons per minute. They are drilled to depths of 220 feet and 295 feet, respectively.

The Virginia Department of Health (VDH) water description sheets for these wells indicate that both wells exceed secondary contaminant levels for iron and manganese set forth by the *Virginia Waterworks Regulations*. Since reduction of these contaminants is not mandated by VDH, treatment is not included at the wells or point of collection. Additional information regarding treatment for secondary contaminant levels and future regulatory requirements is included in this Chapter under the Section labeled “Future Water Facilities”.

The *Virginia Waterworks Regulations* require that, for systems with groundwater sources as the sole source of supply, the second well capacity must be rated for at least 20% of the waterworks capacity. VDH Working Memo #784 clarifies and provides the method for determining the system capacity. The safe yield and pumping capacity for each well is determined, and the more stringent result is the source capacity for that well. For systems with more than one well, the method is applied to each source, and the results for each well are combined for the total system capacity.

Using the *Waterworks Regulations* and Working Memo #784 as discussed above, the capacity of the existing well sources is 234 gpm (336,960 gpd), which must be adequate to serve the maximum daily demand. A peaking factor can be used to estimate the maximum daily demand, and 1.8 is cited in that Memo. The resulting estimated maximum daily demand, based on 5,445 gpd and a 1.8 peaking factor, is 9,800 gpd.



4.0 Brandy Station / Elkwood

The Culpeper County Water and Sewer Authority Design Standards state that a source water supply utilizing only groundwater must have a safe yield of 1.0 gpm per connection. Using these standards, the existing wells could serve 234 connections.

By either standard, the existing water supply is sufficient to serve the existing water needs for the utility service area.

4.2.2 Storage

The system contains a 300,000-gallon ground storage tank to supply required fire flows and additional peak water demands. A fire pump with a rated flow rate of 1,500 gallons per minute is included in the system to meet the fire flow requirements. Normal daily water demand is supplied by a 5,000-gallon hydropneumatic tank.

The maximum daily demand for the purposes of this evaluation is estimated to be 9,800 gpd. Half of this volume is 4,900 gpd. The required fire flow is 180,000 gallons for a two-hour fire; therefore the total storage needed is 184,900 gallons. The current storage is adequate for the existing demand.

4.2.3 Distribution

The water distribution system is a network of 8-inch, 10-inch, and 12-inch diameter mains, as shown in Figure No. 4-2. Two 15 HP centrifugal pumps each rated at 208 gallons per minute at 124 feet TDH (one is standby) withdraw water from the 300,000 gallon atmospheric tank and pump into the 5,000 gallon hydropneumatic storage tank or into the distribution system directly. The combined capacity of these pumps is 328 gallons per minute at 132 feet of TDH.

4.3 Existing Wastewater Facilities

The Culpeper County Industrial Airpark contains office space and light industrial development. This development is served by a County wastewater collection and



4.0 Brandy Station / Elkwood

treatment system. Wastewater flow is light and intermittent, originating from light industry, primarily warehouses.

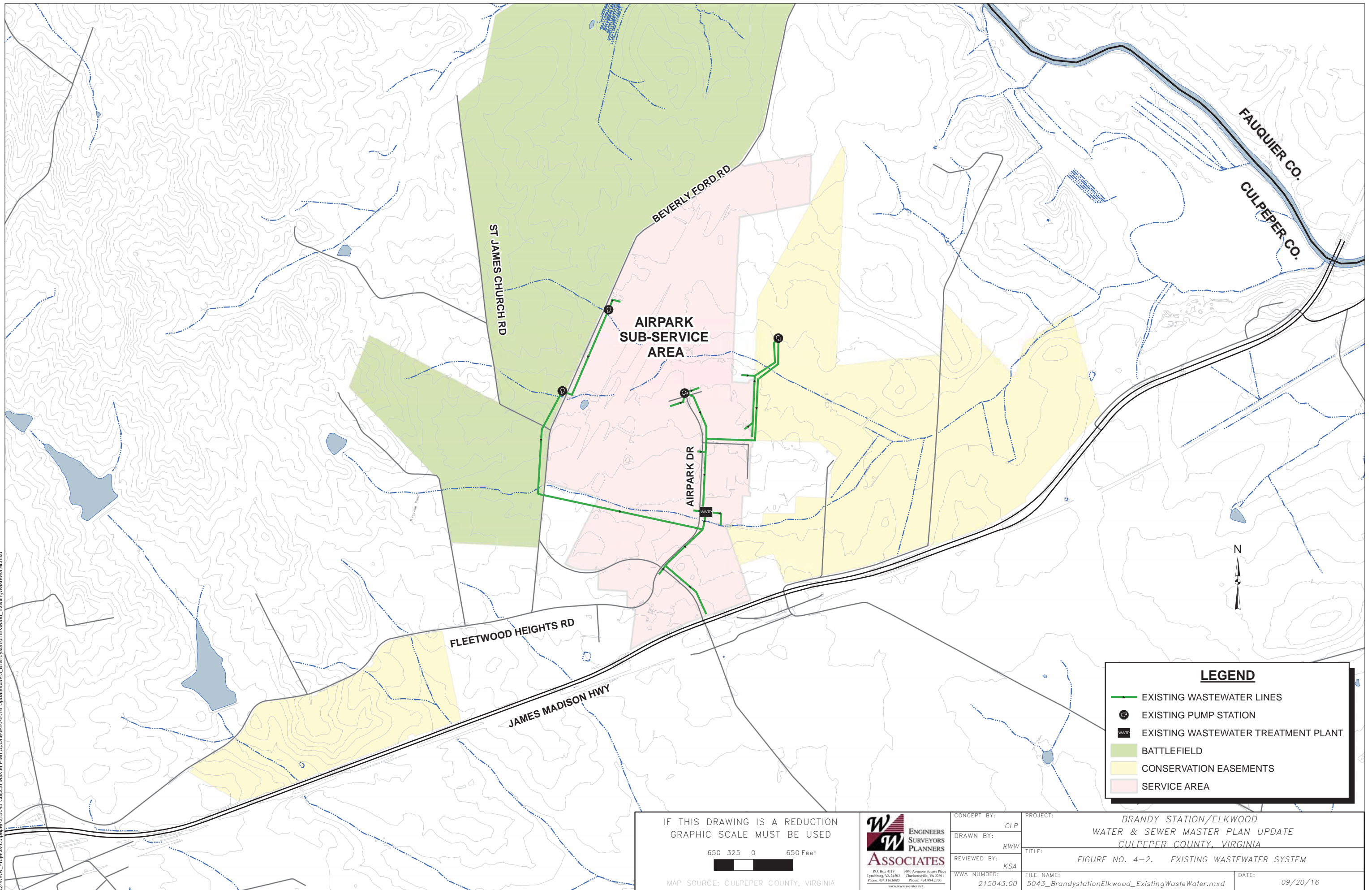
4.3.1 Collection/Conveyance

The County Airpark, which includes 106 acres, has been divided into 14 industrial sites with roads, potential runway access, and utility infrastructure. The collection and conveyance system consists of 8-inch and 12-inch diameter gravity sewer lines, three wastewater pump stations, and force mains. The existing system is presented in Figure No. 4-2. The wastewater is pumped to the treatment facility located on and discharging to Hubbard Run, a tributary of the Rappahannock River.







4.3.2 Treatment

The plant discharge is authorized and regulated according to VPDES Permit No. VA0068586. The facility is owned by Culpeper County. The design capacity of the current plant is 25,000 gpd. At the time of this plan update, the plant is being replaced with the Greens Corner Wastewater Treatment Plant (also referred to as the “High School Interim” Wastewater Treatment Plant), which has a hydraulic capacity of 100,000 gpd. The VPDES permit is written to allow up to 300,000 gpd without having to reissue the permit. The hydraulic upgrade request was based on previously projected growth.

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LEGEND

-  EXISTING WASTEWATER LINES
-  EXISTING PUMP STATION
-  EXISTING WASTEWATER TREATMENT PLANT
-  BATTLEFIELD
-  CONSERVATION EASEMENTS
-  SERVICE AREA

IF THIS DRAWING IS A REDUCTION
GRAPHIC SCALE MUST BE USED



MAP SOURCE: CULPEPER COUNTY, VIRGINIA

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CONCEPT BY: CLP
DRAWN BY: RWW
REVIEWED BY: KSA
WWA NUMBER: 215043.00

PROJECT: BRANDY STATION/ELKWOOD
WATER & SEWER MASTER PLAN UPDATE
CULPEPER COUNTY, VIRGINIA
TITLE: FIGURE NO. 4-2. EXISTING WASTEWATER SYSTEM
FILE NAME: 5043_BrandystationElkwood_ExistingWasteWater.mxd
DATE: 09/20/16

4.0 Brandy Station / Elkwood



4.4 Future Water Facilities

Water facilities for the utility service area will include supply, treatment distribution, and storage, as determined by growth. The following includes a discussion of each system component and the recommended facilities. The future water facilities are presented in Figure No. 4-3.

The future water demand growth figures have been revised following the recession, and are based on the equivalent of 1,500 persons (542 ERCs) at buildout. The 2015 Comprehensive Plan states that the Brandy Station/Elkwood area is envisioned as a significant growth area. The Elkwood area is projected to be a major commerce center. The Brandy Station area lends itself more to residential development complementing the employment area at Elkwood.

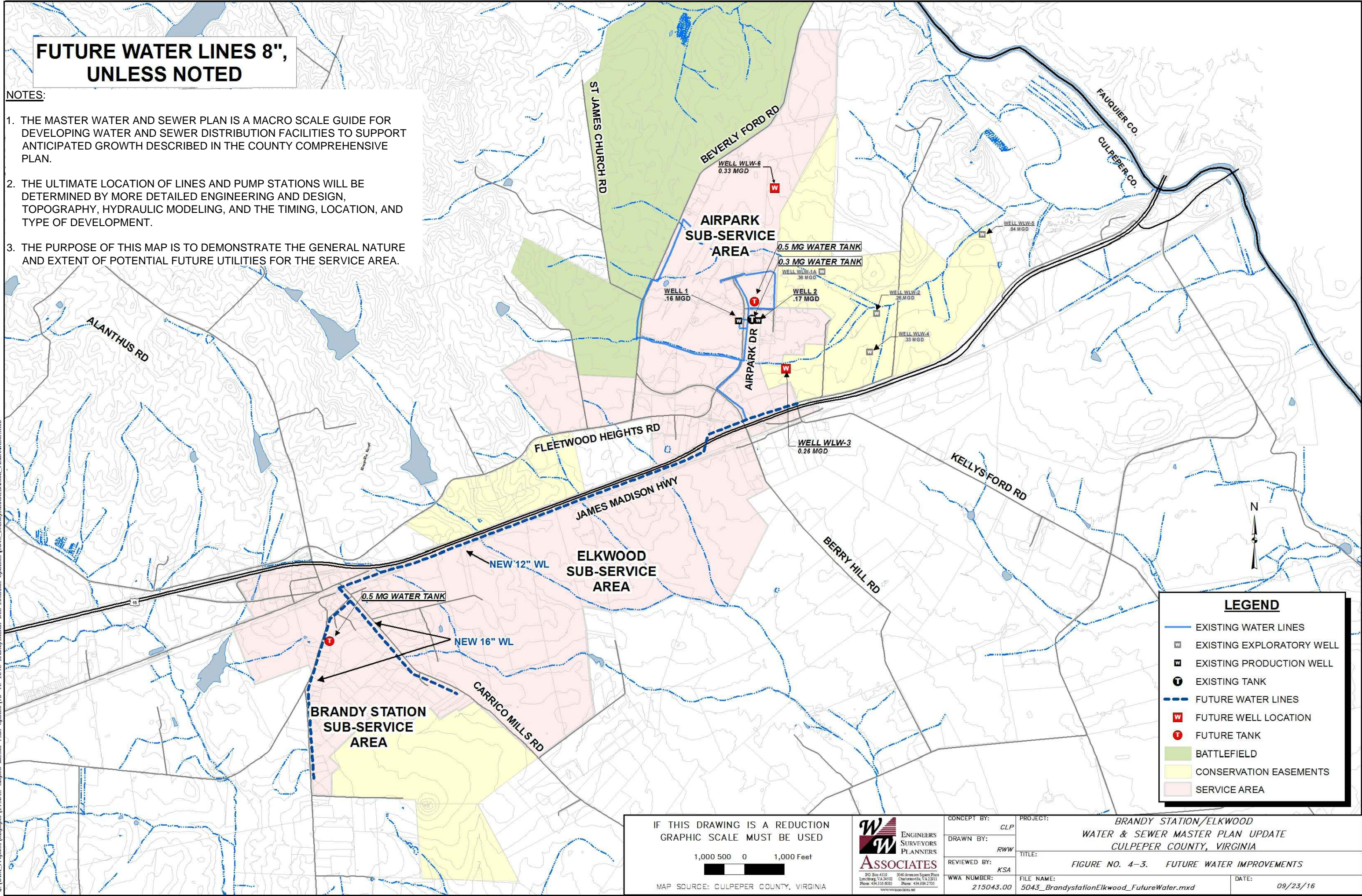
4.4.1 Supply

As discussed in Section 4.2.1, the existing wells are sufficient to supply 234 connections, at 1.0 gpm/connection, based on the County's Design Standards. Given the projected population at buildout, the existing wells can supply the needs for approximately half of the projected growth. Monitoring of development trends should be performed to determine the phasing of new groundwater sources.

FUTURE WATER LINES 8", UNLESS NOTED

NOTES:

1. THE MASTER WATER AND SEWER PLAN IS A MACRO SCALE GUIDE FOR DEVELOPING WATER AND SEWER DISTRIBUTION FACILITIES TO SUPPORT ANTICIPATED GROWTH DESCRIBED IN THE COUNTY COMPREHENSIVE PLAN.
2. THE ULTIMATE LOCATION OF LINES AND PUMP STATIONS WILL BE DETERMINED BY MORE DETAILED ENGINEERING AND DESIGN, TOPOGRAPHY, HYDRAULIC MODELING, AND THE TIMING, LOCATION, AND TYPE OF DEVELOPMENT.
3. THE PURPOSE OF THIS MAP IS TO DEMONSTRATE THE GENERAL NATURE AND EXTENT OF POTENTIAL FUTURE UTILITIES FOR THE SERVICE AREA.



LEGEND

- EXISTING WATER LINES
- W EXISTING EXPLORATORY WELL
- W EXISTING PRODUCTION WELL
- T EXISTING TANK
- - - FUTURE WATER LINES
- W FUTURE WELL LOCATION
- T FUTURE TANK
- BATTLEFIELD
- CONSERVATION EASEMENTS
- SERVICE AREA

IF THIS DRAWING IS A REDUCTION
GRAPHIC SCALE MUST BE USED

1,000 500 0 1,000 Feet

MAP SOURCE: CULPEPER COUNTY, VIRGINIA

W
W
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CONCEPT BY:	CLP	PROJECT:	BRANDY STATION/ELKWOOD WATER & SEWER MASTER PLAN UPDATE CULPEPER COUNTY, VIRGINIA	
DRAWN BY:	RWW	TITLE:	FIGURE NO. 4-3. FUTURE WATER IMPROVEMENTS	
REVIEWED BY:	KSA	FILE NAME:	5043_BrandystationElkwood_FutureWater.mxd	DATE:
WWA NUMBER:	215043.00			09/23/16

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4.0 Brandy Station / Elkwood



A groundwater well system in lieu of developing a surface water supply system is recommended to provide water for the Brandy Station / Elkwood Village Center. This recommendation is based on the following considerations:

- A surface water supply would consist of a water reservoir and water treatment plant. The associated capital and operating cost for this type of water supply is much higher than for groundwater systems.
- Groundwater with adequate water quality and quantity is available for this area.
- The development of groundwater sources can be staged incrementally with the phasing of land development projects. This reduces the initial capital required to develop the water Supply System.
- The County has water rights by Deed of Transfer of Water Rights with Reservations dated June 3, 2010, to wells located on the Willow Run property east of the Airpark. According to the Deed, four (4) wells exist at present, although six (6) wells appear to exist as exploratory wells. The Deed is provided in Appendix A for reference.
- The Brandy Station/Elkwood Village Center is in an environmentally-sensitive area. The development of a surface water reservoir would require significant regulatory review such as Section 401 and 404 reviews. It is also likely that the reservoir would impact wetlands and, therefore, require mitigation.

A groundwater availability assessment was performed by Emery and Garrett Groundwater, Inc. to determine the quantity and availability of water in the service area. The investigation showed six primary groundwater development zones in or within close proximity to the utility service area.

A second Emery and Garrett Groundwater, Inc. study, performed in September, 2007, on the Willow Run property, identified six exploratory wells and four additional well



4.0 Brandy Station / Elkwood

locations. These wells are the subject of the Water Rights deed referenced above. The preliminary airlift yields range from 28 gpm to 250 gpm, and the water quality varies significantly. The report and associated map are presented in Appendix B. Additional effort must be made to determine the sustainable yields and water treatment requirements.

To meet the supply need for the 20-year planning period at the projected growth rate shown above, one or more wells collectively providing at least 300 gpm would be required to meet County standards. Exploratory Wells WLW-3 and WLW-6 have airlift yields of 0.26 MGD (184 gpm) and 0.33 MGD (230 gpm), respectively, with treatable water quality.

4.4.2 Treatment

The required treatment system will be based on results of sampling performed as new groundwater wells are developed. Design of water treatment processes will be based on concentrations of contaminants including, but not limited to, radon, arsenic, iron, manganese and radium. Adjustment of the treated water pH may also be needed to prevent corrosion of the distribution system piping and to avoid violations of the Lead and Copper rule.

In addition, it is recommended that all new groundwater supplies be provided with a disinfection system. Disinfection of the groundwater sources is recommended to satisfy VDH regulations and prevent re-growth of bacteria within the distribution network.

The groundwater contaminants most often observed in the Culpeper County region are iron, manganese and total dissolved solids. These contaminants are considered secondary contaminants by the *Virginia Waterworks Regulations*. By definition, secondary contaminants are substances that affect water quality aesthetically, such as color, staining, taste and odor. Treatment for removal of excess secondary contaminant concentrations is recommended to ensure that aesthetic considerations are satisfied, thereby minimizing

4.0 Brandy Station / Elkwood



customer complaints. Secondary maximum contaminant levels (MCLs) for iron, manganese and total dissolved solids are presented in Table No. 4-1.

Table No. 4-1
Secondary Drinking Water Contaminant Standards

Contaminant	MCL	Units*
Iron	0.3	mg/L
Manganese	0.05	mg/L
Total Dissolved Solids	500	mg/L

*mg/L = milligrams per liter

The 1996 Safe Drinking Water Act (SDWA) amendments direct the Environmental Protection Agency to issue regulations requiring disinfection as necessary for groundwater systems. The Groundwater Rule (GWR) has been developed in response to this regulatory requirement. The regulatory goal of the GWR will be to prevent infective fecal contamination from reaching the consumer. EPA published the Ground Water Rule in the Federal Register on November 08, 2006, with a correction to the table on Analytical Methods for Source Water Monitoring published November 21, 2006. The published regulation promotes a risk-based strategy including periodic evaluation to determine risks, monitoring if risks are found, corrective action if deficiencies are found, and compliance monitoring to ensure virus removal. Disinfection of the groundwater sources may be required to satisfy this regulation and prevent re-growth within the distribution network.

Treatment systems would be installed at each groundwater well location to treat effectively the contaminants present at each well. Alternatively, if several wells are within close proximity to each other, they could be piped to a central treatment location. Once well locations, yields, and water quality are determined, a more detailed plan of treatment can be established.



4.0 Brandy Station / Elkwood

4.4.3 Storage

The Virginia *Waterworks Regulations* specify that a water system must have enough storage for half of a maximum day demand, plus fire flow. Fire flow requirements are dependent on zoning, land use, and building construction. The Culpeper County Water and Sewer Authority Design Standards specify the storage requirement for domestic and fire flow usage as 400 gallons per equivalent residential connection. These two standards produce different volume requirements as discussed below; therefore the larger volume was specified when selecting the tank size.

The estimated future average daily demand is approximately 160,800 gpd. The maximum daily demand is 289,400 gpd, per Working Memo #784. Half of the maximum daily demand plus fire flow volume (180,000 gallons) is approximately 324,700 gallons. The existing storage is insufficient. The recommended volume for a *full* day storage plus fire demand is 469,400 gallons.

Culpeper County's methods attributed 400 gpd to each ERC for the daily domestic plus fire demands. At 400 gpd/ERC, the necessary volume for 536 ERCs would be 214,400 gallons. The larger volume from the two methods will be used.

Fire flow needs in commercial and industrial areas are often higher than for residential areas. To be conservative, a fire flow of 1,500 gpm was used for this evaluation. Storage infrastructure design must be sensitive to the historical nature of the area; therefore, the tank height selection should balance fire flow capacity and visibility. Elevated composite tanks provide more reliable fire protection than a fire pump, and would be less expensive to maintain than legged steel tanks. The base of a composite tank can be used for almost any purpose, including a water treatment facility, pumping equipment, meeting rooms and storage.

Although not ideal, the existing fire pump could provide fire protection to parts of Brandy Station through a 16-inch transmission main, under good circumstances, such as



4.0 Brandy Station / Elkwood

starting with a full ground storage tank. However, a thorough evaluation would be needed.

Two Tank Scenario

The following discussion assumes two elevated tanks will be constructed to serve the Brandy Station/Elkwood service area to optimize service and minimize the tank heights. Having storage tanks at both ends of the water system improves fire flow by reducing friction losses. Second, two tanks provide flexibility in operations, allowing for parts of the water distribution system to be isolated for maintenance without loss of service to customers. A second tank also allows the County to take one tank offline for maintenance.

The assumptions are that a 0.5 MG elevated tank, overflow elevation approximately 142 feet above the ground, is located on the parcel on which the existing 300,000 tank is located, and a new 0.5 MG elevated tank is located north of 15007 Stevensburg Road in Brandy Station. If the Brandy Station tank and 16-inch transmission main are constructed first, the existing 300,000 gallon tank and pump station can be demolished, and a water tank constructed on that parcel.

A 0.5 MG elevated tank with a minimum water surface elevation of 419 feet MSL can provide the minimum 30 psi pressure to the highest buildings in the service area. The overflow elevation for the Airpark tank would be approximately 142 feet above the ground (452 feet MSL).

A second 0.5 MG elevated tank located in the Brandy Station area would benefit the overall future water system. If this tank can be located at a ground surface elevation of 344 ft MSL, the tank would be 108 feet tall, with the same overflow elevation as the Airpark tank.



4.0 Brandy Station / Elkwood

Single Tank Scenario

If the Brandy Station tank is not constructed, the existing ground storage tank and fire pump can be kept in service to supply the water needs when the Airpark elevated tank is out of service for routine maintenance, provided the water in the ground storage tank is kept fresh. In this scenario, the elevated tank must be constructed next to the ground storage tank.

At the overflow elevation assumed, the Airpark tank could provide fire protection to Brandy Station only if it is maintained close to full. However, operating at near full condition reduces its effective storage. The Brandy Station tank is necessary to provide reliable fire protection to Brandy Station structures. When it is offline for maintenance, the temporary operation of the Airpark elevated tank at near-full is an acceptable practice. One alternative is to install a larger diameter transmission pipe to reduce friction losses during fire events. Another is to construct the tank with an overflow elevation of approximately 166 feet above ground (477 feet MSL).

Because Brandy Station is approximately 30 feet higher than the Airpark, supplying fire protection to the Airpark from Brandy Station is not an issue.

4.4.4 Distribution

Distribution piping will include a 16-inch waterline from the Airpark to Brandy Station, as shown on Figure No. 4-3. It will provide 1,500 gpm of fire flow for the commercial areas without excessive friction losses.

4.5 Future Wastewater Facilities

The future Brandy Station/Elkwood utility service area wastewater system will be comprised of gravity sewers, pump stations, and force mains to convey wastewater flow to the Airpark Wastewater Treatment Plant (WWTP). Low-pressure sewer systems can also provide economical service for populated areas. A future conventional wastewater



4.0 Brandy Station / Elkwood

system and service area are presented in Figure No. 4-4. Although not shown in the figure, a low-pressure system in Brandy Station would pump all wastewater into the pump station near US 29/15, for conveyance to the Airpark WWTP.

The service area is situated in three drainage basins: Hubbard Run, Flat Run and Jonas Run. The Hubbard Run drainage basin includes the lands of Culpeper Regional Airport, Culpeper Industrial Airpark and additional lands north and east of the Airpark. It drains directly into the Rappahannock River just north of U.S. Route 15/29. The future land use plan calls for industrial/commercial zoning in the entire Hubbard Run drainage basin within the defined service area. The Flat Run basin drains to Mountain Run, a tributary of the Rappahannock River. This basin includes much of the Brandy Station community, as well as large undeveloped tracts along Flat Run. The future land use plan maintains much of the current land use pattern. Brandy Station will remain a residential center with light industrial and commercial support services located along U.S. Route 15/29. The Elkwood area north of Route 15/29 will be incorporated into the Airpark industrial center with commercial services south of Route 15/29.

The wastewater generated within these drainage basins would be collected either in a network of gravity sewers, or by low-pressure collection system. The wastewater will be pumped to the Airpark wastewater treatment plant. The general systems shown in Figure No. 4-4 can be phased as needed in response to growth patterns.

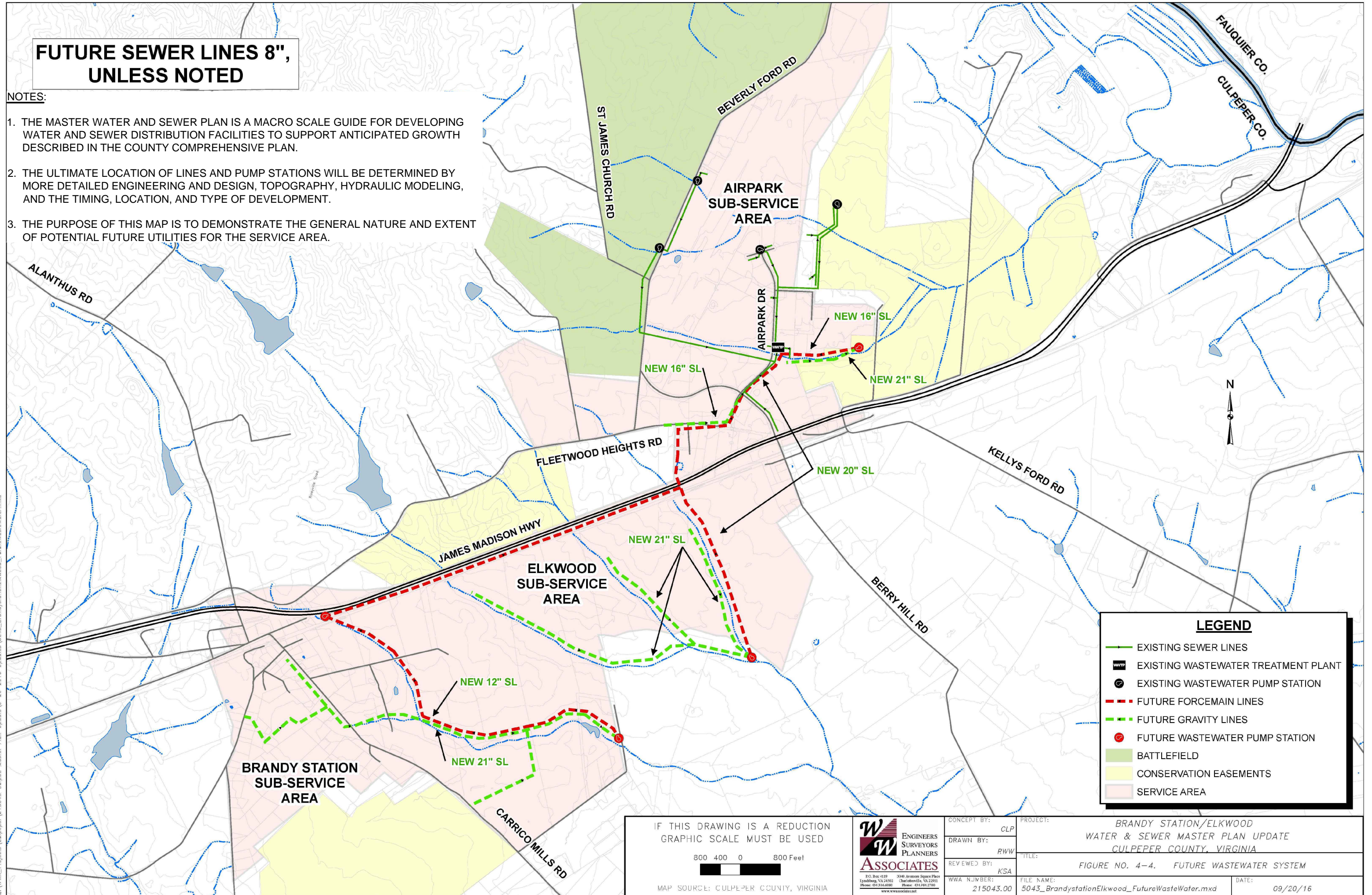
4.5.2 Treatment

The relocated Greens Corner WWTP replaces the existing WWTP, discharging into Hubbard Run. The wastewater treatment plant has a hydraulic design capacity of 0.10 MGD, and can be upgraded to 0.30 MGD. The Greens Corner WWTP is a membrane bioreactor plant, with influent flow equalization, a sludge holding tank, ultraviolet disinfection and final effluent aeration. The sludge is hauled by independent contractor to the Remington Wastewater Treatment Facility in Fauquier County.

FUTURE SEWER LINES 8", UNLESS NOTED

NOTES:

1. THE MASTER WATER AND SEWER PLAN IS A MACRO SCALE GUIDE FOR DEVELOPING WATER AND SEWER DISTRIBUTION FACILITIES TO SUPPORT ANTICIPATED GROWTH DESCRIBED IN THE COUNTY COMPREHENSIVE PLAN.
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3. THE PURPOSE OF THIS MAP IS TO DEMONSTRATE THE GENERAL NATURE AND EXTENT OF POTENTIAL FUTURE UTILITIES FOR THE SERVICE AREA.



LEGEND

- EXISTING SEWER LINES
- EXISTING WASTEWATER TREATMENT PLANT
- EXISTING WASTEWATER PUMP STATION
- - - FUTURE FORCEMAIN LINES
- - - FUTURE GRAVITY LINES
- FUTURE WASTEWATER PUMP STATION
- BATTLEFIELD
- CONSERVATION EASEMENTS
- SERVICE AREA

IF THIS DRAWING IS A REDUCTION GRAPHIC SCALE MUST BE USED

800 400 0 800 Feet

MAP SOURCE: CULPEPER COUNTY, VIRGINIA

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REVIEWED BY: KSA
WVA NUMBER: 215043.00

PROJECT: BRANDY STATION/ELKWOOD WATER & SEWER MASTER PLAN UPDATE CULPEPER COUNTY, VIRGINIA

TITLE: FIGURE NO. 4-4. FUTURE WASTEWATER SYSTEM

FILE NAME: 5043_BrandystationElkwood_FutureWasteWater.mxd
DATE: 09/20/16

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4.0 Brandy Station / Elkwood

The plant discharge is regulated through a Virginia Pollutant Discharge Elimination System permit (VA0068586). Because Hubbard Run is a tributary of the Chesapeake Bay, the discharge is subject to the requirements of the Chesapeake Bay Tributary Strategy, and is also regulated through coverage under the VPDES Watershed General Permit for Nutrient Discharges to the Chesapeake Bay (VAN020138). Information related to the permit is on file with the County.



5.0 Clevenger's Corner

5.1 Introduction

Clevenger's Corner Village Center is one of the two Village Centers identified in the Culpeper County 2015 Comprehensive Plan. The Village Center is located south of the intersection of Route 211 and Route 229 in the northern portion of the County, approximately 13 miles north of the Town of Culpeper. The Clevenger's Corner Village Center includes the existing South Wales subdivision, the proposed Pulte Homes residential and commercial development which is known as Clevenger's Village, parcels known as the Epstein Property and River Ridge subdivision, Clevenger Oaks Estates. The purpose of this Master Plan is to identify the water and sewer facilities that serve the Clevenger's Corner Village Center through buildout, and does not anticipate or require any additional development or expansion of the service area to support the water and sewer infrastructure. The service area is presented in Figure No. 5-1.

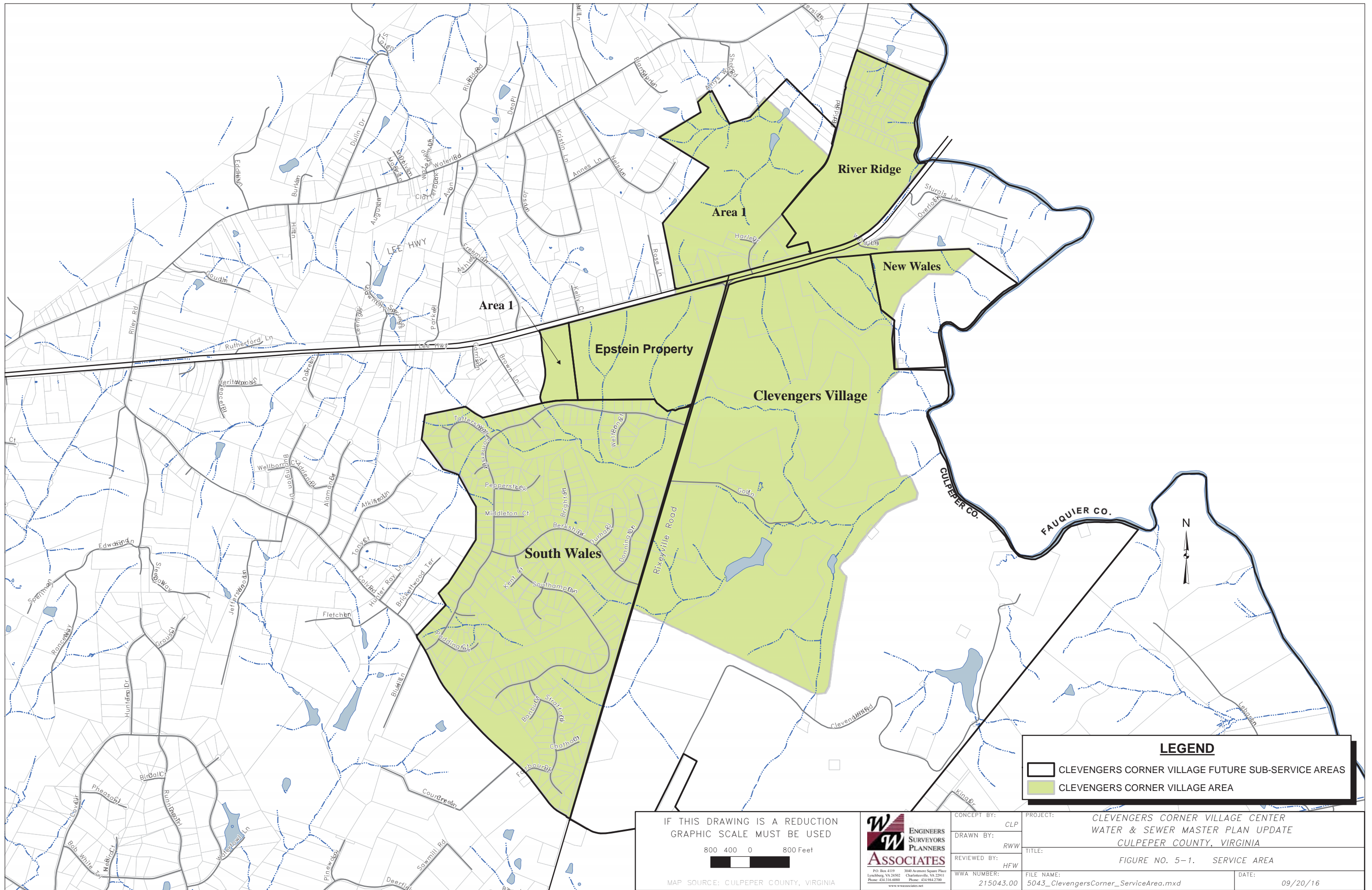
Present and future water consumption and wastewater flows are based on zoning, which allows for up to 774 residential units and 398,000 square feet of commercial space. The growth estimates are based on the proffer dated July 29, 2004 (as amended). Existing water and wastewater facilities were constructed as described below. Water distribution and wastewater collection and conveyance infrastructure will be completed as growth occurs.

The estimated average daily water demand for the residential development is 232,200 gpd, and 39,900 gpd for the commercial development at buildout. These estimates are based on 300 gpd/home and 0.2 gpd/ft² for the commercial development, in accordance with the Sewage Collection and Treatment Regulations. Consequently, the total average daily demand for Clevenger's Village is 272,100 gpd.

The water and wastewater facilities serve the South Wales area, which contains 348 ERCs. At 300 gpd/ERC, the South Wales area estimated water demand is 104,400 gpd.

The combined development average daily demand is 376,500 gpd at buildout.

The estimated maximum daily demand is 677,700 gpd, based on the VDH Working Memo #784.



LEGEND

- CLEVENGERS CORNER VILLAGE FUTURE SUB-SERVICE AREAS
- CLEVENGERS CORNER VILLAGE AREA

IF THIS DRAWING IS A REDUCTION
GRAPHIC SCALE MUST BE USED

800 400 0 800 Feet

MAP SOURCE: CULPEPER COUNTY, VIRGINIA

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CONCEPT BY: CLP
DRAWN BY: RWW
REVIEWED BY: HFW
WWA NUMBER: 215043.00

PROJECT:	CLEVENGERS CORNER VILLAGE CENTER WATER & SEWER MASTER PLAN UPDATE CULPEPER COUNTY, VIRGINIA
TITLE:	FIGURE NO. 5-1. SERVICE AREA
FILE NAME:	5043_ClevengersCorner_ServiceArea.mxd
DATE:	09/20/16



5.0 Clevenger’s Corner

5.2 Existing Water Facilities

The existing waterworks in the Clevenger’s Corner Village Center is owned and operated by Culpeper County and currently serves the South Wales development. The Virginia Department of Health (VDH) permit (6047035) was last amended March 31, 2014. The Clevenger’s Village water system is presented in Figure No. 5-2.

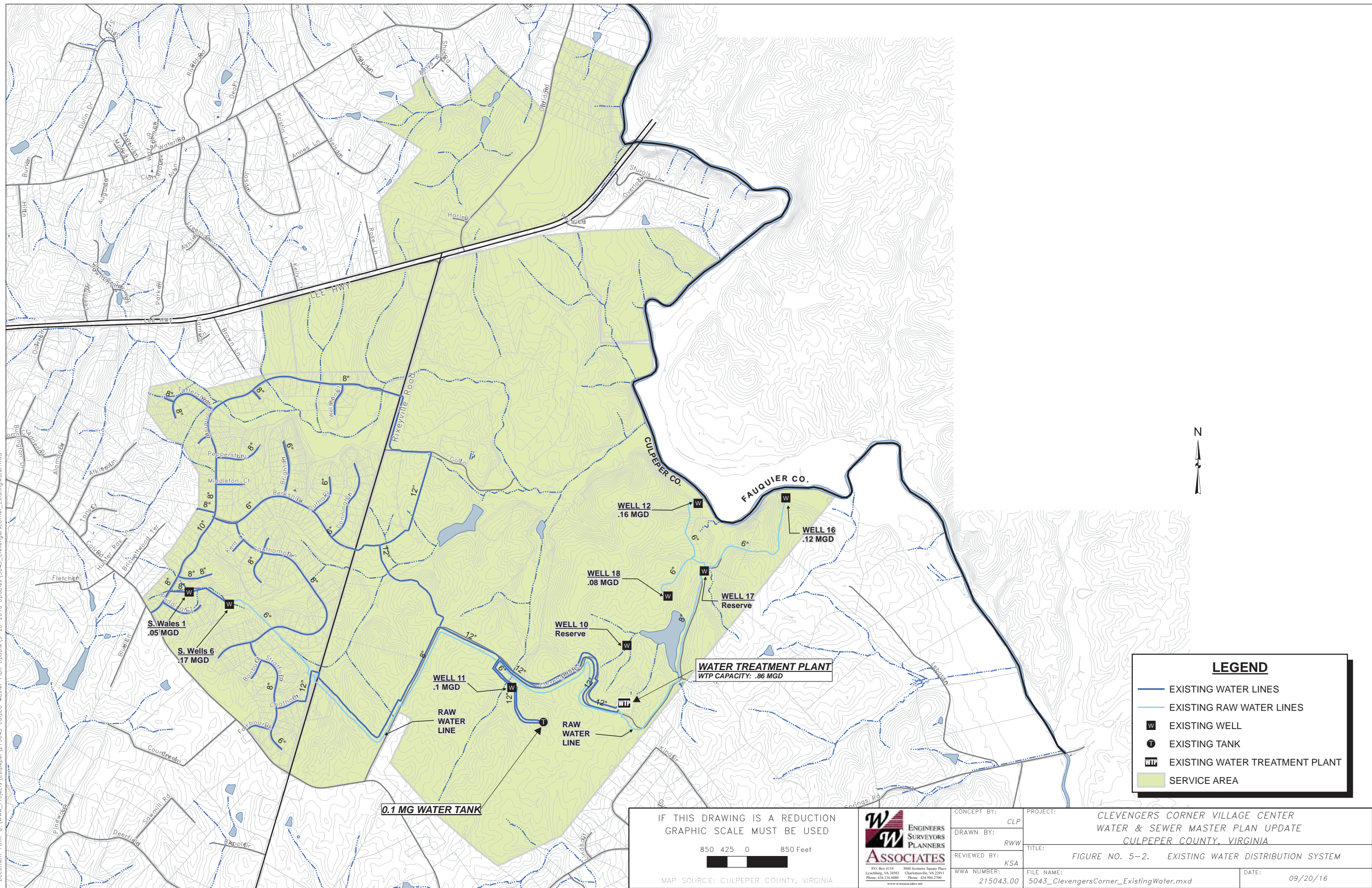
5.2.1 Supply

The water supply consists of four new and two existing groundwater wells with a combined safe yield of 945 gallons per minute (gpm), and combined pumping capacity of 785 gpm. Well capacities are summarized in Table No. 5-1. The well capacities are limited by the lower of the well yield or pumping capacity. The permitted waterworks capacity is 701,600 gpd, or 2,338 Equivalent Residential Connections (ERCs), at 300 gpd/ERC.

**Table No. 5-1
Summary of Source Capacity**

Well No.	Well Yield (gpd)	Pumping Capacity (gpd)	Limiting Capacity (gpd)
11	108,000	194,400	108,000
12	160,000	288,000	160,000
16	120,000	216,000	120,000
18	92,000	165,600	92,000
South Wales 1	56,000	100,800	56,000
South Wales 6	220,000	165,600	165,600
Total			701,600

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LEGEND

- EXISTING WATER LINES
- - - EXISTING RAW WATER LINES
- W EXISTING WELL
- T EXISTING TANK
- WTP EXISTING WATER TREATMENT PLANT
- SERVICE AREA

0.1 MG WATER TANK

WELL 12
.16 MGD

WELL 16
.12 MGD

WELL 18
.08 MGD

WELL 17
Reserve

WELL 10
Reserve

WELL 11
.1 MGD

WELL 6
.17 MGD

WELL 1
.05 MGD

WATER TREATMENT PLANT
WTP CAPACITY: .86 MGD

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MAP SOURCE: CULPEPER COUNTY, VIRGINIA

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WWA NUMBER: 215043.00

PROJECT: CLEVENGERS CORNER VILLAGE CENTER
WATER & SEWER MASTER PLAN UPDATE
CULPEPER COUNTY, VIRGINIA

TITLE: FIGURE NO. 5-2. EXISTING WATER DISTRIBUTION SYSTEM

FILE NAME: 5043_ClevengersCorner_ExistingWater.mxd

DATE: 09/20/16



5.0 Clevenger's Corner

5.2.2 Treatment

The water treatment system consists of a 100,000 gallon raw water ground storage tank, raw water booster pump station, aeration, filters and chemical treatment. The filter backwash wastewater is treated at the Clevenger's corner wastewater treatment plant. The VDH Engineering Description Sheet specifies the treatment plant capacity is 864,000 gpd.

5.2.3 Storage

Finished water storage consists of a 350,000 gallon ground storage tank and a 750,000 gallon elevated storage tank that is filled by a water booster pump station.

The VDH Engineering Description Sheet specifies the total effective storage as 1,094,400 gallons, which is sufficient to provide a full day storage for a maximum daily demand of 1,094,400 gpd. Since the minimum storage required by VDH is half of the maximum daily demand, storage capacity is adequate for the water system.

5.2.4 Distribution

The distribution system consists of 12-inch, 8-inch and 6-inch diameter water lines. The distribution system connects the Clevenger's Village and the South Wales water systems.

5.3 Existing Wastewater Facilities

The wastewater system in the Clevenger's Village area is owned and operated by Culpeper County, and currently serves the South Wales development. The plant was designed to serve the new Pulte Homes development at Clevenger's Village, the existing South Wales subdivision, the Epstein Subdivision, River Ridge Subdivision, and some small surrounding areas for a total of 1,595 ERCs. The County increased the capacity of the plant to 900,000 gpd to provide additional treatment capacity and to preserve the County's wasteload allocation.

Since the plant discharges to the Rappahannock River, it is subject to the requirements of the Chesapeake Bay Tributary Strategy. The Virginia Department of Environmental Quality (VDEQ) enacted regulations that establish a cap on wasteload allocations and concentration



5.0 Clevenger's Corner

limits on the nutrients that are discharged from wastewater treatment plants that are classified as “significant dischargers” to waters that are in the Chesapeake Bay Watershed. The plant uses a suspended growth, single-sludge system, known as a five-stage Bardenpho process that removed nutrients.

The VPDES permit contains seasonal effluent limits for the following parameters:

BOD	(December-May)	25 mg/L
CBOD	(June-November)	3 mg/l
TSS	(December-May)	25 mg/l
TSS	(June-November)	5 mg/L
TKN	(June-November)	5 mg/L

The permit contains the following monthly average concentration limits that comply with the wasteload allocations, based on the plant capacity:

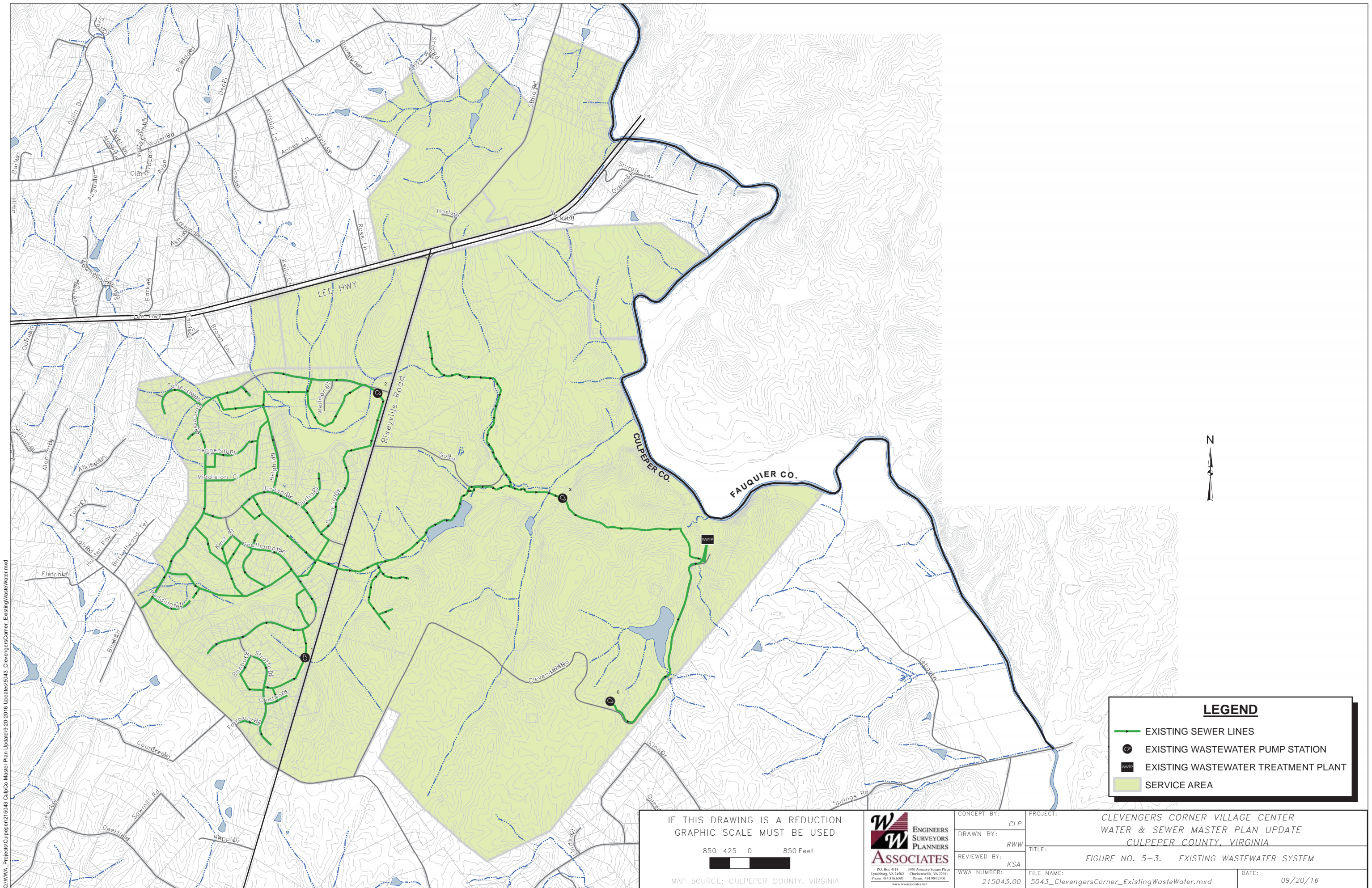
Total Nitrogen	4 mg/l
Total Phosphorus	0.3 mg/l

The Clevenger's Corner wastewater collection and treatment system is presented in Figure No. 5-3.

5.4 Future Water Facilities

Existing water facilities were designed for future growth, the rate for which is specified generally in the Proffer Statement last revised January 18, 2004. The limiting component is supply. Because growth slowed during and after the recession, the projected growth is spread over more years. Average daily demands should be monitored, and additional groundwater well sources should be developed as needed.

The water facilities for the Clevenger's Corner Village Center service area will include completion of the construction of the water mains to connect the South Wales subdivision and Clevenger's Oaks development to the Clevenger's Village water system. The future water facilities are presented in Figure No. 5-4.



LEGEND

- EXISTING SEWER LINES
- EXISTING WASTEWATER PUMP STATION
- EXISTING WASTEWATER TREATMENT PLANT
- SERVICE AREA

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850 425 0 850 Feet

MAP SOURCE: CULPEPER COUNTY, VIRGINIA



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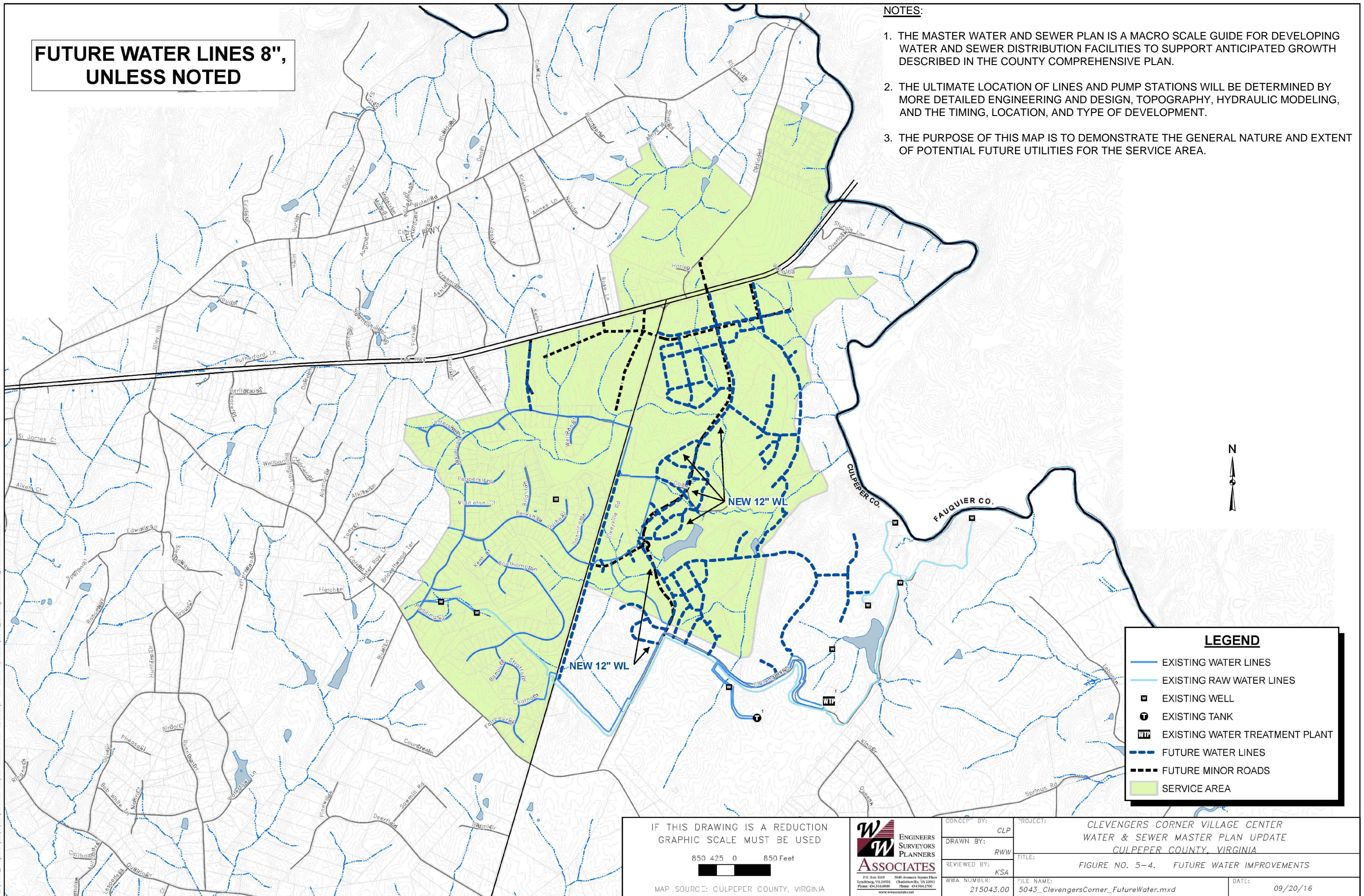
PROJECT: CLEVENGERS CORNER VILLAGE CENTER WATER & SEWER MASTER PLAN UPDATE CULPEPER COUNTY, VIRGINIA
 TITLE: FIGURE NO. 5-3. EXISTING WASTEWATER SYSTEM
 FILE NAME: 5043_ClevengersCorner_ExistingWasteWater.mxd
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**FUTURE WATER LINES 8",
UNLESS NOTED**

NOTES:

1. THE MASTER WATER AND SEWER PLAN IS A MACRO SCALE GUIDE FOR DEVELOPING WATER AND SEWER DISTRIBUTION FACILITIES TO SUPPORT ANTICIPATED GROWTH DESCRIBED IN THE COUNTY COMPREHENSIVE PLAN.
2. THE ULTIMATE LOCATION OF LINES AND PUMP STATIONS WILL BE DETERMINED BY MORE DETAILED ENGINEERING AND DESIGN, TOPOGRAPHY, HYDRAULIC MODELING, AND THE TIMING, LOCATION, AND TYPE OF DEVELOPMENT.
3. THE PURPOSE OF THIS MAP IS TO DEMONSTRATE THE GENERAL NATURE AND EXTENT OF POTENTIAL FUTURE UTILITIES FOR THE SERVICE AREA.



LEGEND

- EXISTING WATER LINES
- EXISTING RAW WATER LINES
- W EXISTING WELL
- T EXISTING TANK
- WTP EXISTING WATER TREATMENT PLANT
- - - FUTURE WATER LINES
- - - FUTURE MINOR ROADS
- SERVICE AREA

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850 425 0 850 Feet

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WWA NUMBER: 215043.00

PROJECT: CLEVENGERS CORNER VILLAGE CENTER
WATER & SEWER MASTER PLAN UPDATE
CULPEPER COUNTY, VIRGINIA

TITLE: FIGURE NO. 5-4. FUTURE WATER IMPROVEMENTS

FILE NAME: 5043_ClevengersCorner_FutureWater.mxd
DATE: 09/20/16

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5.0 Clevenger's Corner

5.5 Future Wastewater Facilities

The wastewater facilities for the Clevenger's Village Service Area were sized for future growth and are adequate for the planning period. Remaining wastewater facilities consists of collection and conveyance lines that will be designed and constructed as needed for growth.

5.5.1 Collection/Conveyance

The Clevenger's Village wastewater collection system will be designed with capacity for the wastewater generated throughout the Service Area. It will convey the wastewater via pump stations to the wastewater treatment plant and meet the requirements of the Culpeper County Water and Sewer Authority Design Standards.

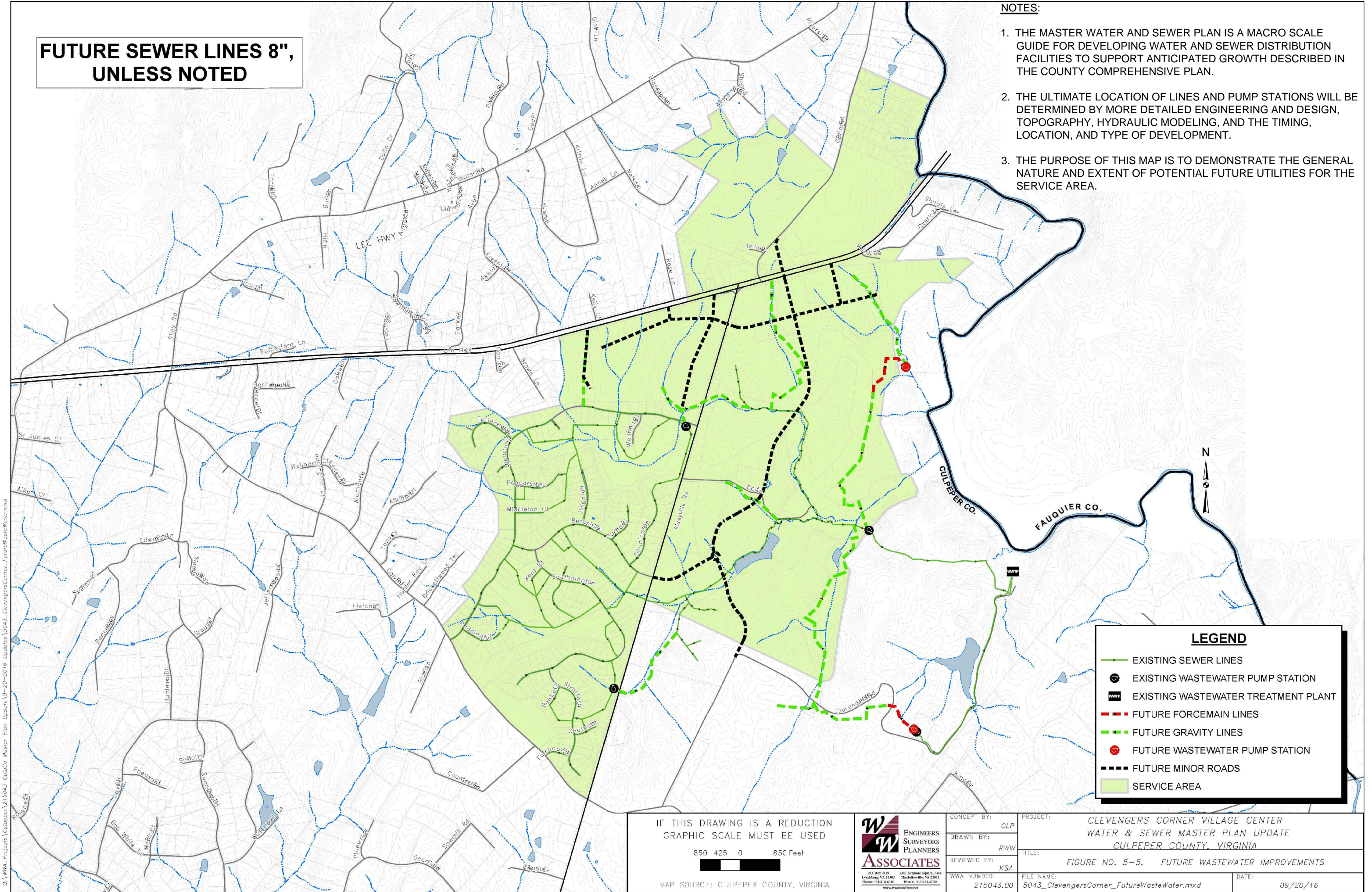
The collection for the Clevenger's Village system will require a small pump station to serve the northeast portion of the Clevenger's Village commercial area. The New Wales property will also be served by this pump station in the future. The only other pump station that would be required is one to serve the northern portion of River Ridge Subdivision.

The future wastewater system for the Service Area is presented in Figure No. 5-5.

**FUTURE SEWER LINES 8",
UNLESS NOTED**

NOTES:

1. THE MASTER WATER AND SEWER PLAN IS A MACRO SCALE GUIDE FOR DEVELOPING WATER AND SEWER DISTRIBUTION FACILITIES TO SUPPORT ANTICIPATED GROWTH DESCRIBED IN THE COUNTY COMPREHENSIVE PLAN.
2. THE ULTIMATE LOCATION OF LINES AND PUMP STATIONS WILL BE DETERMINED BY MORE DETAILED ENGINEERING AND DESIGN, TOPOGRAPHY, HYDRAULIC MODELING, AND THE TIMING, LOCATION, AND TYPE OF DEVELOPMENT.
3. THE PURPOSE OF THIS MAP IS TO DEMONSTRATE THE GENERAL NATURE AND EXTENT OF POTENTIAL FUTURE UTILITIES FOR THE SERVICE AREA.



LEGEND

- EXISTING SEWER LINES
- ⊙ EXISTING WASTEWATER PUMP STATION
- WWTP EXISTING WASTEWATER TREATMENT PLANT
- - - FUTURE FORCEMAIN LINES
- - - FUTURE GRAVITY LINES
- ⊙ FUTURE WASTEWATER PUMP STATION
- - - FUTURE MINOR ROADS
- SERVICE AREA

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850 425 0 850 Feet

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PROJECT:	CLEVENGERS CORNER VILLAGE CENTER WATER & SEWER MASTER PLAN UPDATE CULPEPER COUNTY, VIRGINIA
TITLE:	FIGURE NO. 5-5. FUTURE WASTEWATER IMPROVEMENTS
FILE NAME:	5043_ClevengersCorner_FutureWasteWater.mxd
DATE:	09/20/16

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6.0 Culpeper Town Environs

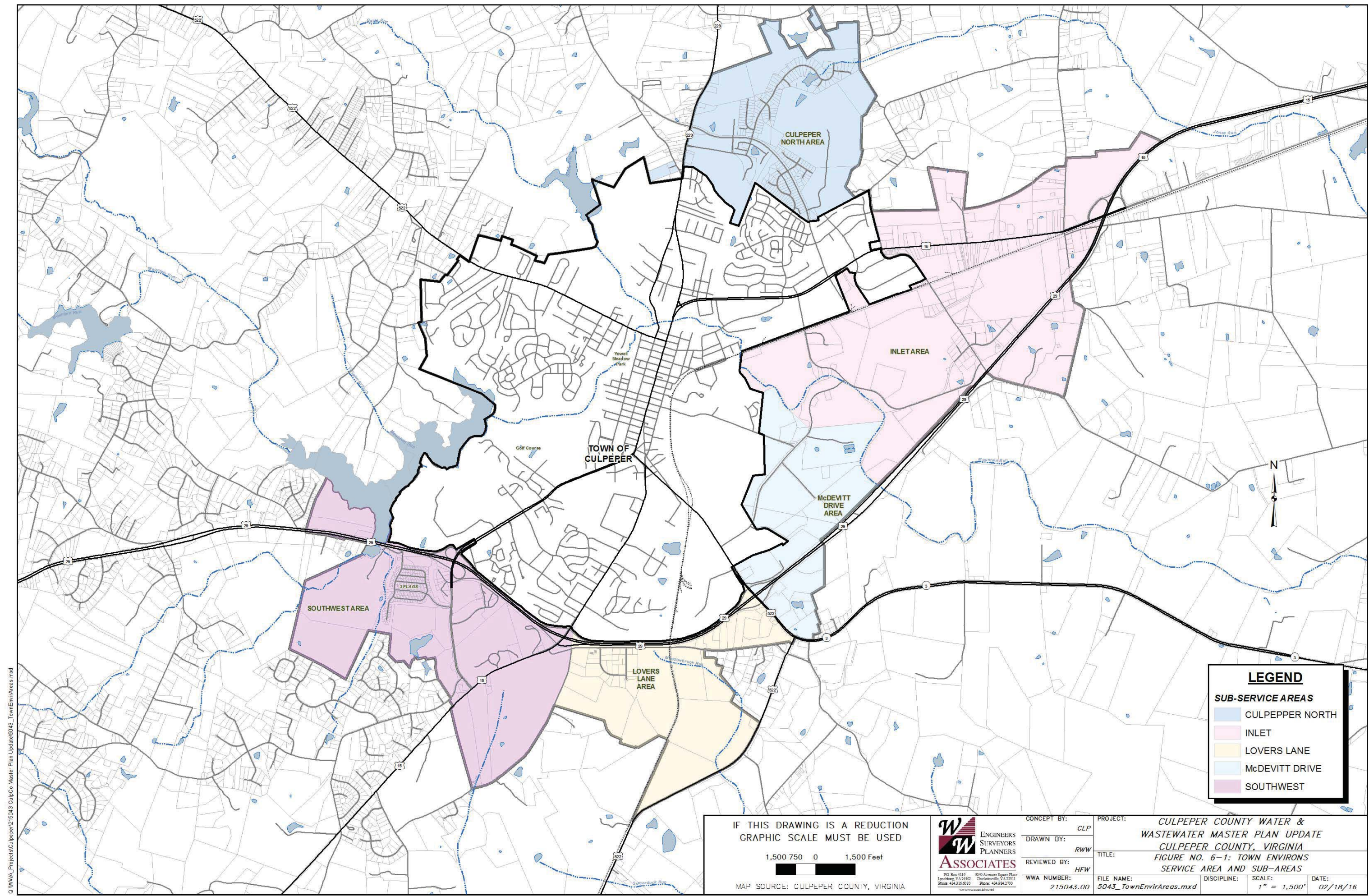
6.1 Introduction

The Culpeper County service areas served by the Town of Culpeper are presented in Figure No. 6-1. The Environs area contains a mix of residential, commercial and industrial land uses. The areas south and east of the Town have been identified for industrial and commercial development. This plan addresses future water and wastewater infrastructure that supports the County's Comprehensive Plan.

Comprised of 6,650 acres, the Environs areas are located along Route 29 South, Route 15/29 Business to the east, Route 229 North, and to a lesser extent Route 522. Within these areas, developments are primarily concentrated along the existing road corridors. Residential growth continues in the areas south of U.S. Route 29 and east of S.R. 229.

Growth is anticipated to occur within the Environs. The Future Land Use Plan shows low and medium/high density residential areas. Using this Plan and the demographic information presented in the 2015 Comprehensive Plan, the estimated population growth for the area is approximately 1,388 people, for a new population of 5,035. Growth related to employment is estimated to be 1.36% annually, primarily in service-related industries.

It is also noted that, based on the U.S. Census, the Town of Culpeper 2015 population is estimated to be 17,672 people.



LEGEND

SUB-SERVICE AREAS

- CULPEPPER NORTH
- INLET
- LOVERS LANE
- McDEVITT DRIVE
- SOUTHWEST

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1,500 750 0 1,500 Feet

MAP SOURCE: CULPEPER COUNTY, VIRGINIA

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CONCEPT BY: <i>CLP</i>	PROJECT: <i>CULPEPER COUNTY WATER & WASTEWATER MASTER PLAN UPDATE</i>
DRAWN BY: <i>RWW</i>	TITLE: <i>CULPEPER COUNTY, VIRGINIA</i>
REVIEWED BY: <i>HFV</i>	<i>FIGURE NO. 6-1: TOWN ENVIRONS SERVICE AREA AND SUB-AREAS</i>
WVA NUMBER: <i>215043.00</i>	FILE NAME: <i>5043_TownEnvirAreas.mxd</i>
DISCIPLINE:	SCALE: <i>1" = 1,500'</i>
DATE: <i>02/18/16</i>	

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6.0 Culpeper Town Environs



The anticipated types of development for each Environs sub-area are presented in Table No. 6-1.

Table No. 6-1
Environs Sub-Areas and Anticipated Development

Sub-area	Future Development
Lover's Lane	Industrial/Commercial/Residential
McDevitt Drive	Industrial/Commercial
Inlet Area	Industrial/Commercial/Rural Residential
Culpeper North Area	Low Density residential
Southwest Area	Commercial/Medium Density Residential

6.1.1 Voluntary Settlement Agreement – Water and Sewer Services

This 30-year January 30, 2012, agreement defines, *inter alia*, the relationship between the Town of Culpeper and the County, in the Town environs, as it pertains to the provision of water and sewer services. The agreement is provided in Appendix C. Although somewhat complex in the details, the essence of the agreement is as follows:

- Town provides retail water and sewer services to Town and County residents within the Water and Sewer Service Area (WSSA) and County areas pursuant to criteria and procedures specified in the agreement.
- Town's water and sewer rates, fees and charges are the same for all of its customers, regardless of whether they are located in the Town or County.
- Town and County agreed to work together to plan and implement upgrades to water and sewage treatment plant capacities.



6.0 Culpeper Town Environs

- Town agreed to provide 1.5 MGD of water and sewer capacity, pursuant to the criteria and procedures specified in the agreement. Capacity is based on “Maximum Allowable Gallons” for each customer, based on meter size.
- Within the WSSA, line extensions shall be paid for by developers or individual property owners; Town or County may choose to participate in funding extensions.
- Within the WSSA, Town-funded extensions are owned and operated by the Town; County- or Developer-funded extensions are owned by the County and operated by the Town, except as specified in the agreement.
- Water and sewer designs must comply with the jointly approved design standards.
- Town-served customers in the County were transferred to the Town.
- The Town constructed a sewer line to the Eastern View High School.
- DEQ transferred 1.5 MGD of the County’s nutrient allocation to the Town’s wastewater treatment plant, preserving its allocation for the community.

6.2 Existing Water Facilities

The County currently has limited utility services available within the Environs service area, and cannot purchase services for retail sale, per the agreement discussed in Section 6.2.1. The properties directly adjacent to the Town of Culpeper are currently served by the Town’s water system as presented in Figure No. 6-2.

6.2.1 Supply

The Town’s sources of supply include surface water from Lake Pelham and Mountain Run Lake, and groundwater from five wells. The total capacity of the surface water and ground water sources is 6.818 MGD.

6.0 Culpeper Town Environs



6.2.1.1 Surface Water

The Town's water treatment plant is located on the west side of Town, east of Lake Pelham. It has the capacity to treat 4 MGD. Three finished water pumps are capable of pumping 1,520 gpm each. One of the three pumps is held in reserve for standby use.

6.2.1.2 Groundwater

The Town's existing production well safe yields are summarized in Table No. 6-2, and presented on the map in Figure No. 6-2. Madison Street Well, C-1, C-3 and C-6 are clustered in the area between Nalle Place and East Chandler Street, west of Keyser Road. East Yowell Meadow Park well is located west of South Blue Ridge Avenue. Three wells currently being brought into service are TOC-X3A, TOC-X1B and TOC-X1C.

The total capacity of the ground water sources is 2.818 million gallons per day (MGD).

Table No. 6-2
Summary of Existing Well Safe Yields

Well No.	Yield (MGD)
Madison St.	0.763
C-1	0.24
C-3	0.2
C-6	0.24
E-Yowell Meadow Park	0.045
TOC-X3A Alt	0.36
TOC-X1B	0.54
TOC-X1C	0.43
Total	2.818



6.0 Culpeper Town Environs

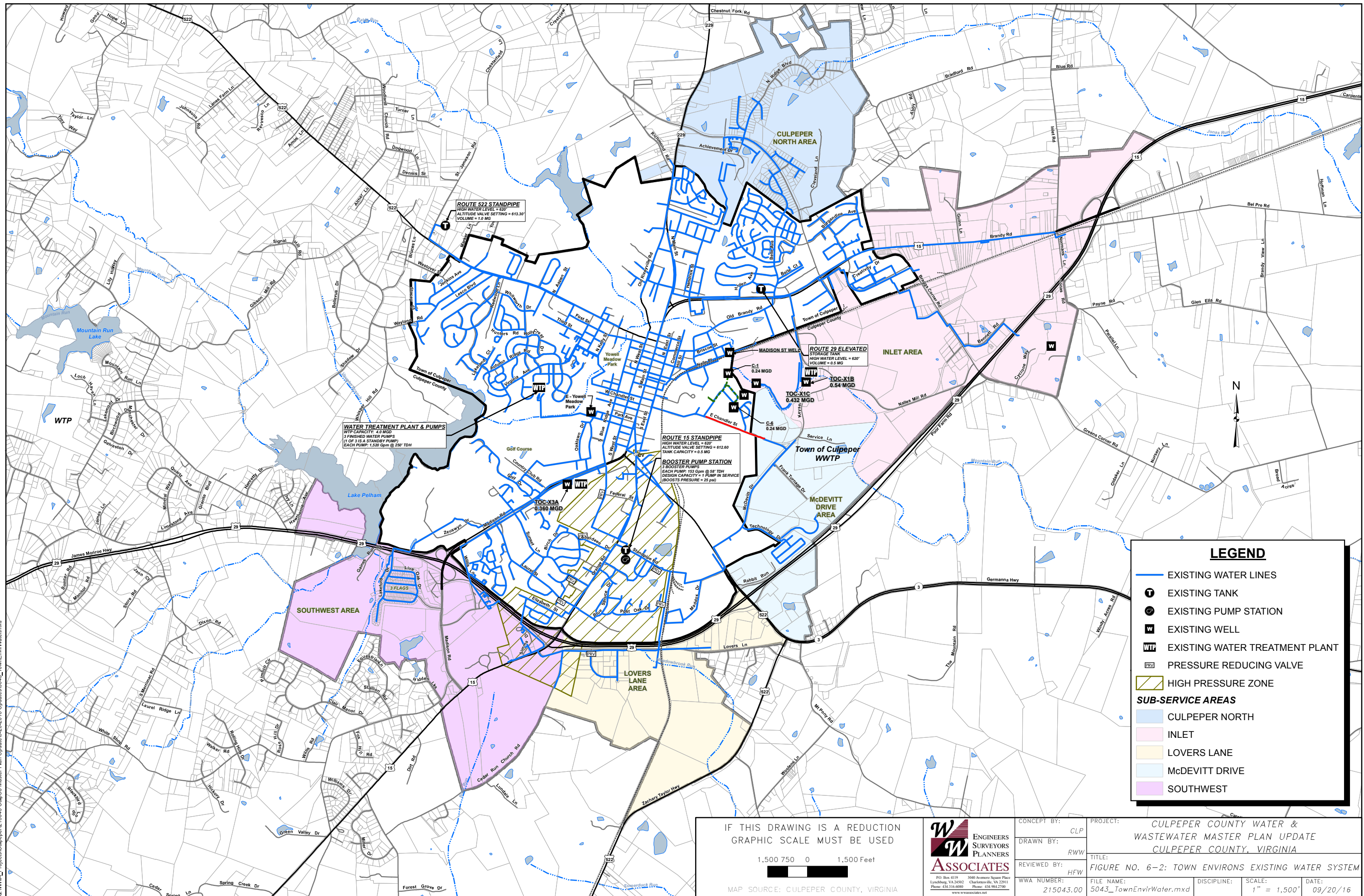
6.2.1.3 Town Service

The waterline extensions from the Town into the County include service to the 3 Flags development southwest of the Town, The Friendship Way, Culpeper Baptist Retirement Community, the G. Richardson Elementary School and the Pearl Sample School, as shown in Figure No. 6-2.

6.2.2 Storage

Three water storage tanks serve the Town and Environs. Two are ground storage tanks and one is elevated. A pump station located next to the water tank on Standpipe Road provides a high pressure zone, shown on Figure No. 6-2. The collective storage capacity is 2 MG. Existing storage is sufficient to serve the existing demand.

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LEGEND

- EXISTING WATER LINES
- EXISTING TANK
- EXISTING PUMP STATION
- EXISTING WELL
- EXISTING WATER TREATMENT PLANT
- PRESSURE REDUCING VALVE
- HIGH PRESSURE ZONE
- SUB-SERVICE AREAS**
- CULPEPER NORTH
- INLET
- LOVERS LANE
- McDEVITT DRIVE
- SOUTHWEST

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1,500 750 0 1,500 Feet

MAP SOURCE: CULPEPER COUNTY, VIRGINIA



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DRAWN BY:	RWW	TITLE:	FIGURE NO. 6-2: TOWN ENVIRONS EXISTING WATER SYSTEM		
REVIEWED BY:	HFW	FILE NAME:	5043_TownEnvrWater.mxd	DISCIPLINE:	
WVA NUMBER:	215043.00	SCALE:	1" = 1,500'	DATE:	09/20/16



6.0 Culpeper Town Environs

6.4 Existing Wastewater Facilities

Much of the Environs is served by on-site drainfields or some other form of on-site treatment. A small portion of the lands directly adjacent to the Town of Culpeper is served by the Town's system. Wastewater generated in these areas is subject to the Voluntary Service Agreement discussed in Section 6.1.1.

6.4.1 Collection and Conveyance

The existing wastewater collection and conveyance system is presented in Figure No. 6-3. A pump station located at the Eastern View High School at Braggs Corner serves part of the Jonas Run sewershed. It pumps wastewater to another pump station located at the Town's wastewater treatment plant.

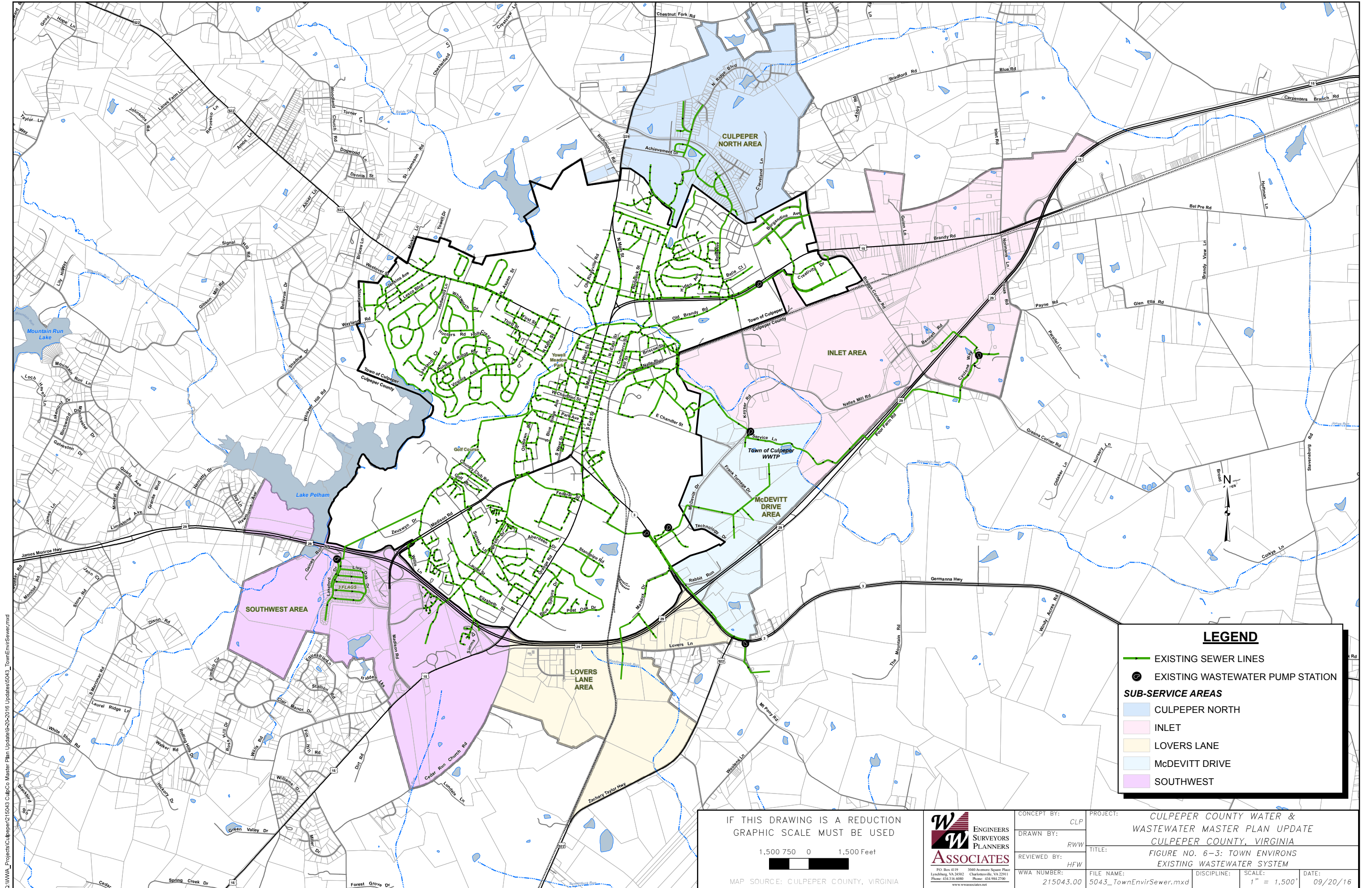
Another pump station is located close to State Route 3, pumping wastewater into Town pump stations for conveyance to the wastewater treatment plant. This pump station can serve the southern McDevitt Drive and Lovers Lane areas.

A third wastewater pump station serves the 3 Flags development in the Southwest Area.

6.4.2 Treatment

The Town's wastewater treatment plant is located in the McDevitt Drive Area. Its permitted capacity is 6.0 MGD.

The County's "High School Interim" wastewater treatment plant (also referred to as "Greens Corner Wastewater Treatment Plant"), was located south of Greens Corner Road, east of Route 29. Because the new force main discussed above now conveys the wastewater to the Town's wastewater treatment plant, the Greens Corner wastewater treatment plant is being relocated to the Culpeper Industrial Airpark.



LEGEND

- EXISTING SEWER LINES
- EXISTING WASTEWATER PUMP STATION

SUB-SERVICE AREAS

- CULPEPER NORTH
- INLET
- LOVERS LANE
- McDEVITT DRIVE
- SOUTHWEST

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1,500 750 0 1,500 Feet

MAP SOURCE: CULPEPER COUNTY, VIRGINIA

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DRAWN BY: RWW	TITLE: FIGURE NO. 6-3: TOWN ENVIRONS EXISTING WASTEWATER SYSTEM
REVIEWED BY: HFW	DISCIPLINE: SCALE: DATE:
WWA NUMBER: 215043.00	FILE NAME: 5043_TownEnvirSewer.mxd
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6.0 Culpeper Town Environs



6.5 Future Water Facilities

Water facilities for the Town Environs utility service area will include supply, treatment, distribution, and storage. The following includes a discussion of each system component and the recommended facilities to serve the County's current customers and future growth. Figures No. 6-4 through 6-10 present conceptual layouts of the future water supply system overall and for each service area.

6.5.1 Supply

Water for the Town Environs utility service area will be supplied as needed by two new groundwater wells, drilled based on the groundwater assessment by Emery & Garrett Groundwater, Inc., dated June 6, 2014. A summary of the well yields is presented in Table No. 6-3 below. The safe yield of these new wells is 0.71 MGD. However, the permitted capacity for each will be the safe yield or the pumping capacity, whichever is less.

Table No. 6-3

Summary of Future Well Safe Yields

Well No.	Yield (MGD)
TOC-X2A	0.21
TOC-X4B	0.5
Total	0.71

6.0 Culpeper Town Environs



The total capacity of the Town's water system is summarized in Table No. 6-4.

Table No. 6-4

Water Source Capacity Summary

Source	Capacity (MGD)
Surface Water	4.0
Existing Wells	2.818
2 Remaining Wells	0.71
Total	7.528

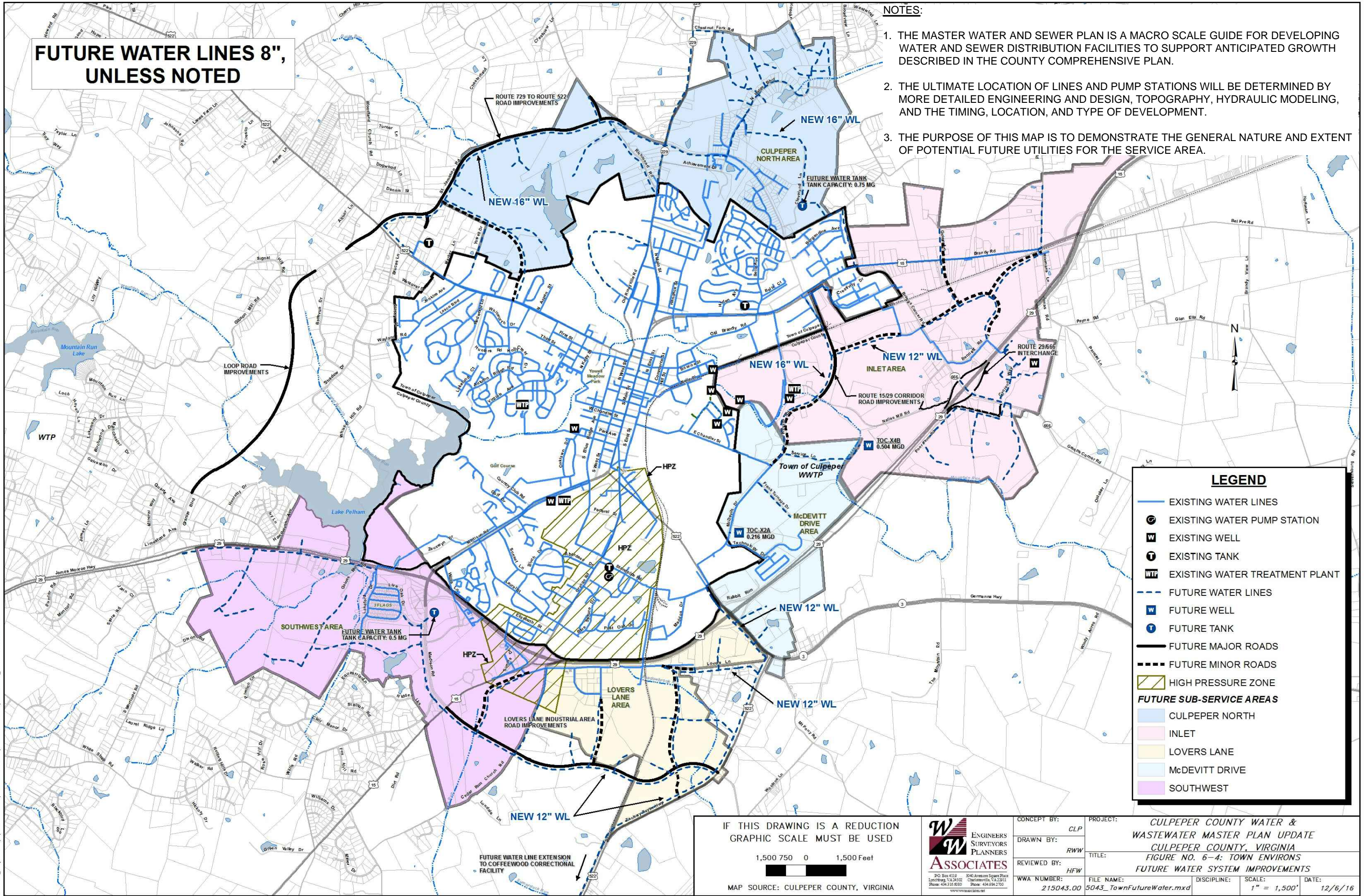
A common unit for utilities with residential and commercial customers is the “Equivalent Residential Connection” (ERC). An ERC is defined in Culpeper County as 300 gallons per day per connection. The total future source capacity is sufficient to serve 25,090 ERCs, with all sources listed above in production.

The County's growth projections are discussed in Chapter 2 of the draft 2015 Comprehensive Plan. Using the projected annual growth rates of 2% and 1.5%, and the Future Land Use Plan, the estimated new growth in the Environs Area is estimated to be 1,388 people in 20 years. The growth estimate is based on residential population, but commercial/industrial growth will occur in the Environs area also, primarily in the service industry. Barring the connection of a very large water user, sufficient source capacity exists for the planning period.

FUTURE WATER LINES 8", UNLESS NOTED

NOTES:

1. THE MASTER WATER AND SEWER PLAN IS A MACRO SCALE GUIDE FOR DEVELOPING WATER AND SEWER DISTRIBUTION FACILITIES TO SUPPORT ANTICIPATED GROWTH DESCRIBED IN THE COUNTY COMPREHENSIVE PLAN.
2. THE ULTIMATE LOCATION OF LINES AND PUMP STATIONS WILL BE DETERMINED BY MORE DETAILED ENGINEERING AND DESIGN, TOPOGRAPHY, HYDRAULIC MODELING, AND THE TIMING, LOCATION, AND TYPE OF DEVELOPMENT.
3. THE PURPOSE OF THIS MAP IS TO DEMONSTRATE THE GENERAL NATURE AND EXTENT OF POTENTIAL FUTURE UTILITIES FOR THE SERVICE AREA.



LEGEND

- EXISTING WATER LINES
- EXISTING WATER PUMP STATION
- EXISTING WELL
- EXISTING TANK
- EXISTING WATER TREATMENT PLANT
- FUTURE WATER LINES
- FUTURE WELL
- FUTURE TANK
- FUTURE MAJOR ROADS
- FUTURE MINOR ROADS
- HIGH PRESSURE ZONE
- FUTURE SUB-SERVICE AREAS
 - CULPEPER NORTH
 - INLET
 - LOVERS LANE
 - McDEVITT DRIVE
 - SOUTHWEST

IF THIS DRAWING IS A REDUCTION
GRAPHIC SCALE MUST BE USED

1,500 750 0 1,500 Feet

MAP SOURCE: CULPEPER COUNTY, VIRGINIA



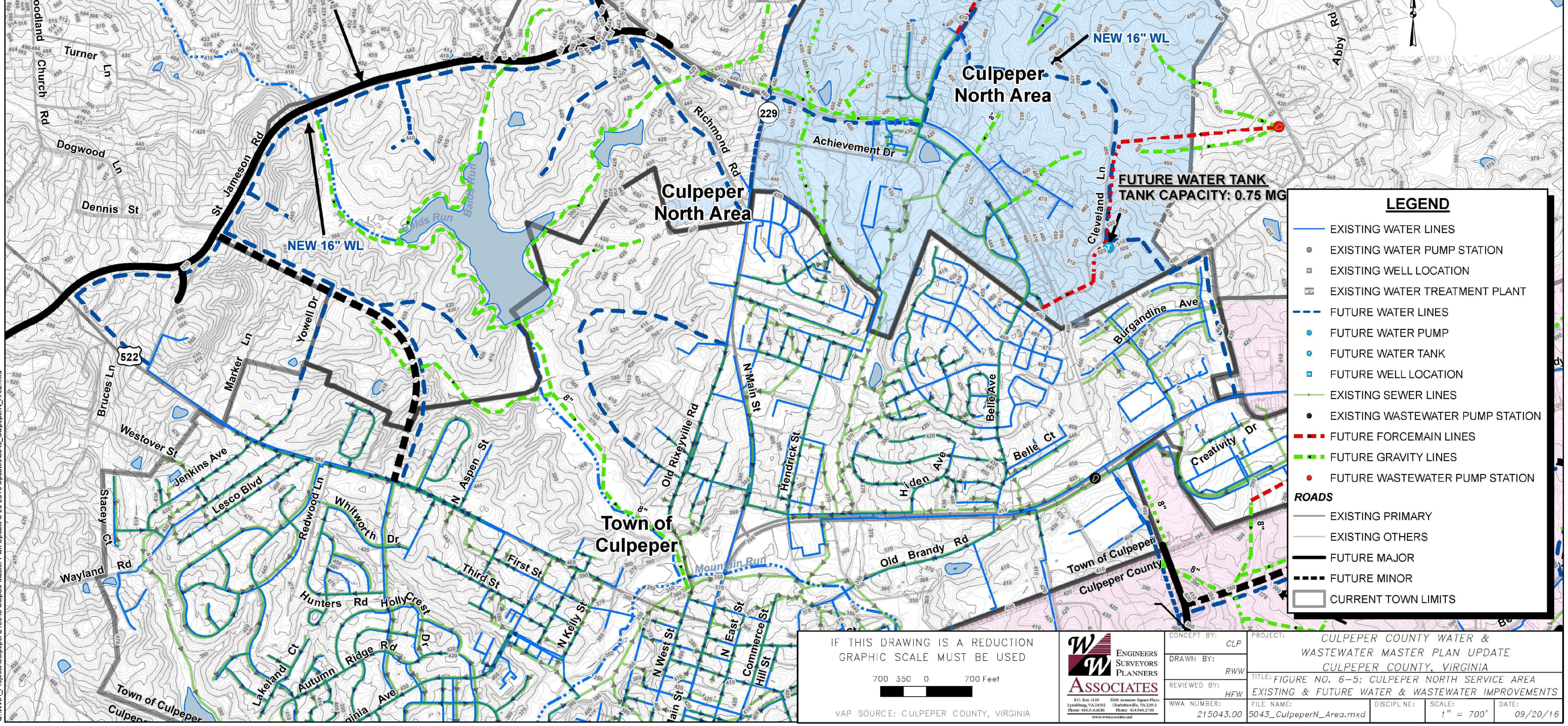
CONCEPT BY:	CLP	PROJECT:	CULPEPER COUNTY WATER & WASTEWATER MASTER PLAN UPDATE		
DRAWN BY:	RWW	TITLE:	CULPEPER COUNTY, VIRGINIA		
REVIEWED BY:	HFV	TITLE:	FIGURE NO. 6-4: TOWN ENVIRONS		
WVA NUMBER:	215043.00	TITLE:	FUTURE WATER SYSTEM IMPROVEMENTS		
FILE NAME:	5043_TownFutureWater.mxd	DISCIPLINE:		SCALE:	1" = 1,500'
		DATE:			12/6/16

FUTURE WATER & SEWER LINES 8", UNLESS NOTED

NOTES:

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ROUTE 729 TO ROUTE 522 ROAD IMPROVEMENTS



LEGEND

- EXISTING WATER LINES
- EXISTING WATER PUMP STATION
- EXISTING WELL LOCATION
- ▭ EXISTING WATER TREATMENT PLANT
- - - FUTURE WATER LINES
- FUTURE WATER PUMP
- FUTURE WELL LOCATION
- EXISTING SEWER LINES
- - - FUTURE FORCEMAIN LINES
- · - · - FUTURE GRAVITY LINES
- FUTURE WASTEWATER PUMP STATION

ROADS

- EXISTING PRIMARY
- EXISTING OTHERS
- FUTURE MAJOR
- - - FUTURE MINOR
- CURRENT TOWN LIMITS

IF THIS DRAWING IS A REDUCTION GRAPHIC SCALE MUST BE USED



VAP SOURCE: CULPEPER COUNTY, VIRGINIA

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CONCEPT BY:	CLP
DRAWN BY:	RWW
REVIEWED BY:	HFV
WVA NUMBER:	215043.00

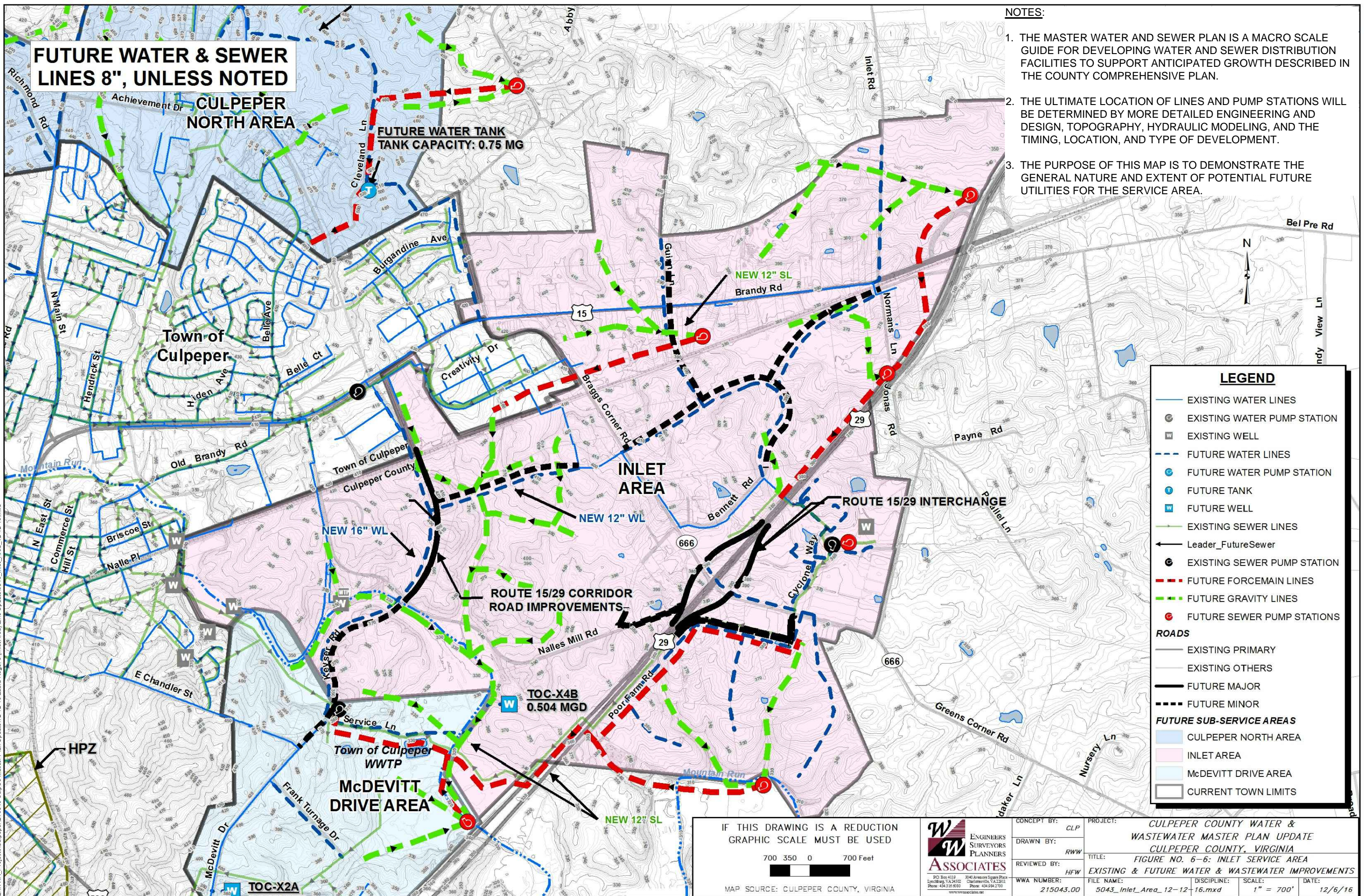
PROJECT:	CULPEPER COUNTY WATER & WASTEWATER MASTER PLAN UPDATE CULPEPER COUNTY, VIRGINIA		
TITLE:	FIGURE NO. 6-5: CULPEPER NORTH SERVICE AREA EXISTING & FUTURE WATER & WASTEWATER IMPROVEMENTS		
FILE NAME:	5043_CulpeperN_Area.mxd	DISCIPLINE:	
SCALE:	1" = 700'	DATE:	09/20/16

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FUTURE WATER & SEWER LINES 8", UNLESS NOTED

NOTES:

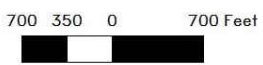
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LEGEND

- EXISTING WATER LINES
 - ⊙ EXISTING WATER PUMP STATION
 - ⊞ EXISTING WELL
 - - - FUTURE WATER LINES
 - ⊙ FUTURE WATER PUMP STATION
 - ⊞ FUTURE WELL
 - EXISTING SEWER LINES
 - ← Leader_FutureSewer
 - ⊙ EXISTING SEWER PUMP STATION
 - - - FUTURE FORCEMAIN LINES
 - - - FUTURE GRAVITY LINES
 - ⊙ FUTURE SEWER PUMP STATIONS
- ROADS**
- EXISTING PRIMARY
 - EXISTING OTHERS
 - FUTURE MAJOR
 - - - FUTURE MINOR
- FUTURE SUB-SERVICE AREAS**
- CULPEPER NORTH AREA
 - INLET AREA
 - McDEVITT DRIVE AREA
 - CURRENT TOWN LIMITS

IF THIS DRAWING IS A REDUCTION GRAPHIC SCALE MUST BE USED

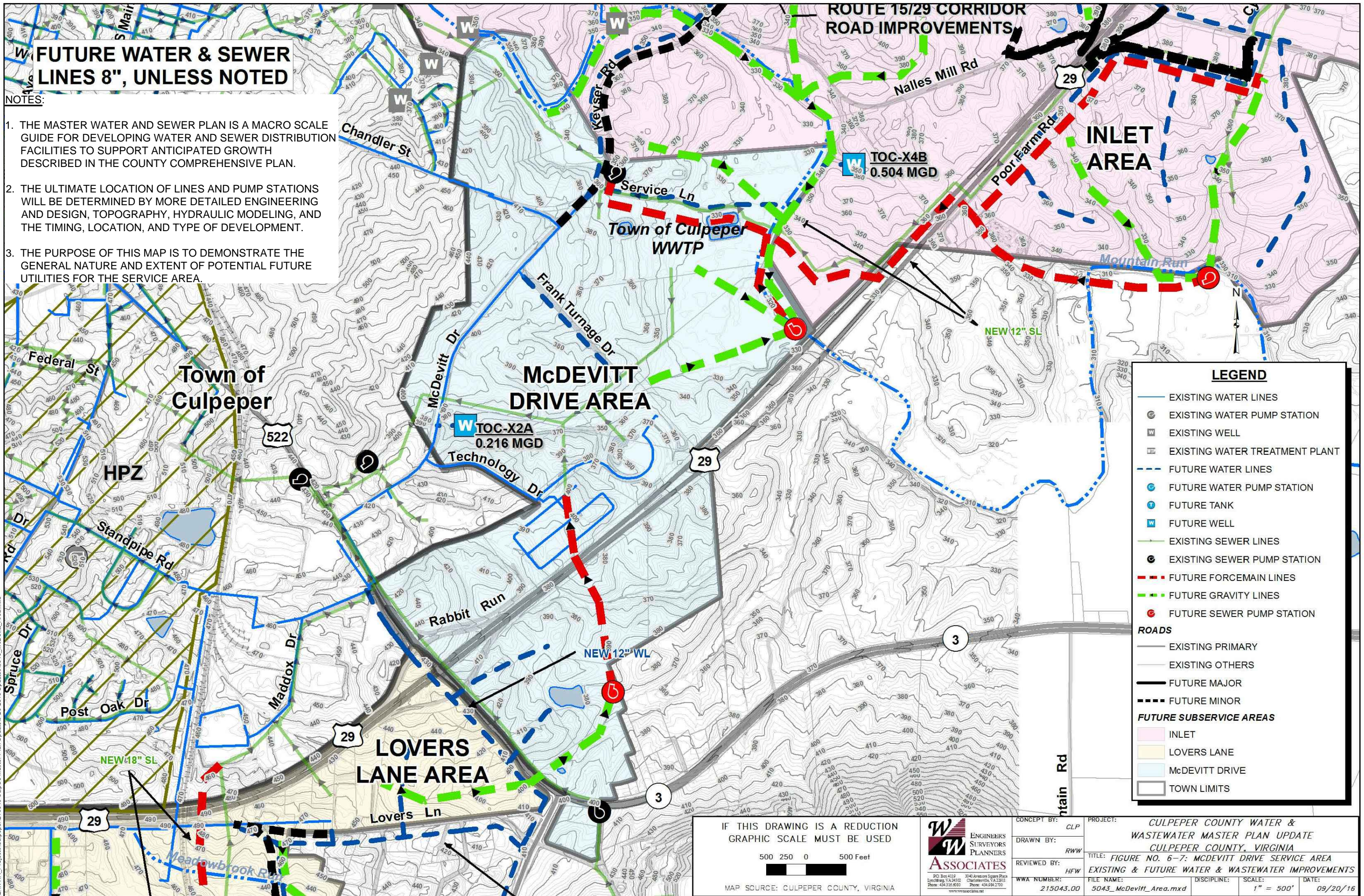


MAP SOURCE: CULPEPER COUNTY, VIRGINIA



CONCEPT BY:	CLP	PROJECT:	CULPEPER COUNTY WATER & WASTEWATER MASTER PLAN UPDATE		
DRAWN BY:	RWW	TITLE:	CULPEPER COUNTY, VIRGINIA		
REVIEWED BY:	HFV	TITLE:	FIGURE NO. 6-6: INLET SERVICE AREA		
WVA NUMBER:	215043.00	TITLE:	EXISTING & FUTURE WATER & WASTEWATER IMPROVEMENTS		
		FILE NAME:	5043_Inlet_Area_12-12-16.mxd	DISCIPLINE:	
		SCALE:	1" = 700'	DATE:	12/6/16

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FUTURE WATER & SEWER LINES 8", UNLESS NOTED

- NOTES:**
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LEGEND

- EXISTING WATER LINES
- EXISTING WATER PUMP STATION
- EXISTING WELL
- EXISTING WATER TREATMENT PLANT
- FUTURE WATER LINES
- FUTURE WATER PUMP STATION
- FUTURE TANK
- FUTURE WELL
- EXISTING SEWER LINES
- EXISTING SEWER PUMP STATION
- FUTURE FORCEMAIN LINES
- FUTURE GRAVITY LINES
- FUTURE SEWER PUMP STATION

ROADS

- EXISTING PRIMARY
- EXISTING OTHERS
- FUTURE MAJOR
- FUTURE MINOR

FUTURE SUBSERVICE AREAS

- INLET
- LOVERS LANE
- MCDEVITT DRIVE
- TOWN LIMITS

IF THIS DRAWING IS A REDUCTION GRAPHIC SCALE MUST BE USED

500 250 0 500 Feet

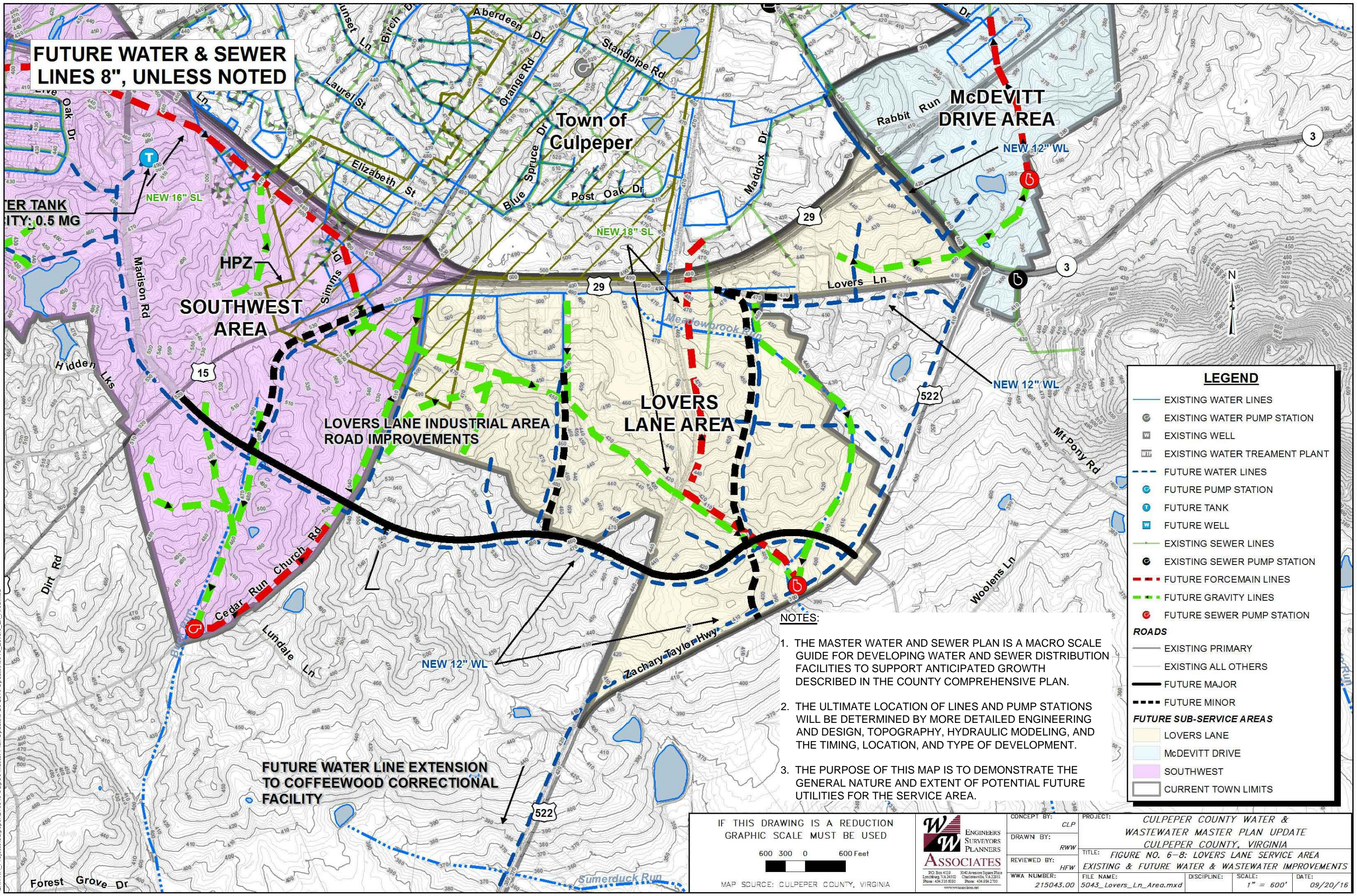
MAP SOURCE: CULPEPER COUNTY, VIRGINIA

W ASSOCIATES
 ENGINEERS SURVEYORS PLANNERS
 3040 Aronson Square Plaza
 Charlottesville, VA 22911
 Phone: 434.516.6500
 www.wassociates.com

CONCEPT BY: CLP	PROJECT: CULPEPER COUNTY WATER & WASTEWATER MASTER PLAN UPDATE CULPEPER COUNTY, VIRGINIA
DRAWN BY: RWW	TITLE: FIGURE NO. 6-7: MCDEVITT DRIVE SERVICE AREA EXISTING & FUTURE WATER & WASTEWATER IMPROVEMENTS
REVIEWED BY: HFW	FILE NAME: 5043_McDevitt_Area.mxd
WVA NUMBER: 215043.00	DISCIPLINE: SCALE: DATE: 1" = 500' 09/20/16

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FUTURE WATER & SEWER LINES 8", UNLESS NOTED



WATER TANK
CAPACITY: 0.5 MG

HPZ
SOUTHWEST AREA

LOVERS LANE INDUSTRIAL AREA ROAD IMPROVEMENTS

LOVERS LANE AREA

MCDEVITT DRIVE AREA

FUTURE WATER LINE EXTENSION TO COFFEWOOD CORRECTIONAL FACILITY

NOTES:

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LEGEND

- EXISTING WATER LINES
- EXISTING WATER PUMP STATION
- EXISTING WELL
- EXISTING WATER TREATMENT PLANT
- FUTURE WATER LINES
- FUTURE PUMP STATION
- FUTURE TANK
- FUTURE WELL
- EXISTING SEWER LINES
- EXISTING SEWER PUMP STATION
- FUTURE FORCEMAIN LINES
- FUTURE GRAVITY LINES
- FUTURE SEWER PUMP STATION

ROADS

- EXISTING PRIMARY
- EXISTING ALL OTHERS
- FUTURE MAJOR
- FUTURE MINOR

FUTURE SUB-SERVICE AREAS

- LOVERS LANE
- MCDEVITT DRIVE
- SOUTHWEST
- CURRENT TOWN LIMITS

IF THIS DRAWING IS A REDUCTION GRAPHIC SCALE MUST BE USED

600 300 0 600 Feet

MAP SOURCE: CULPEPER COUNTY, VIRGINIA

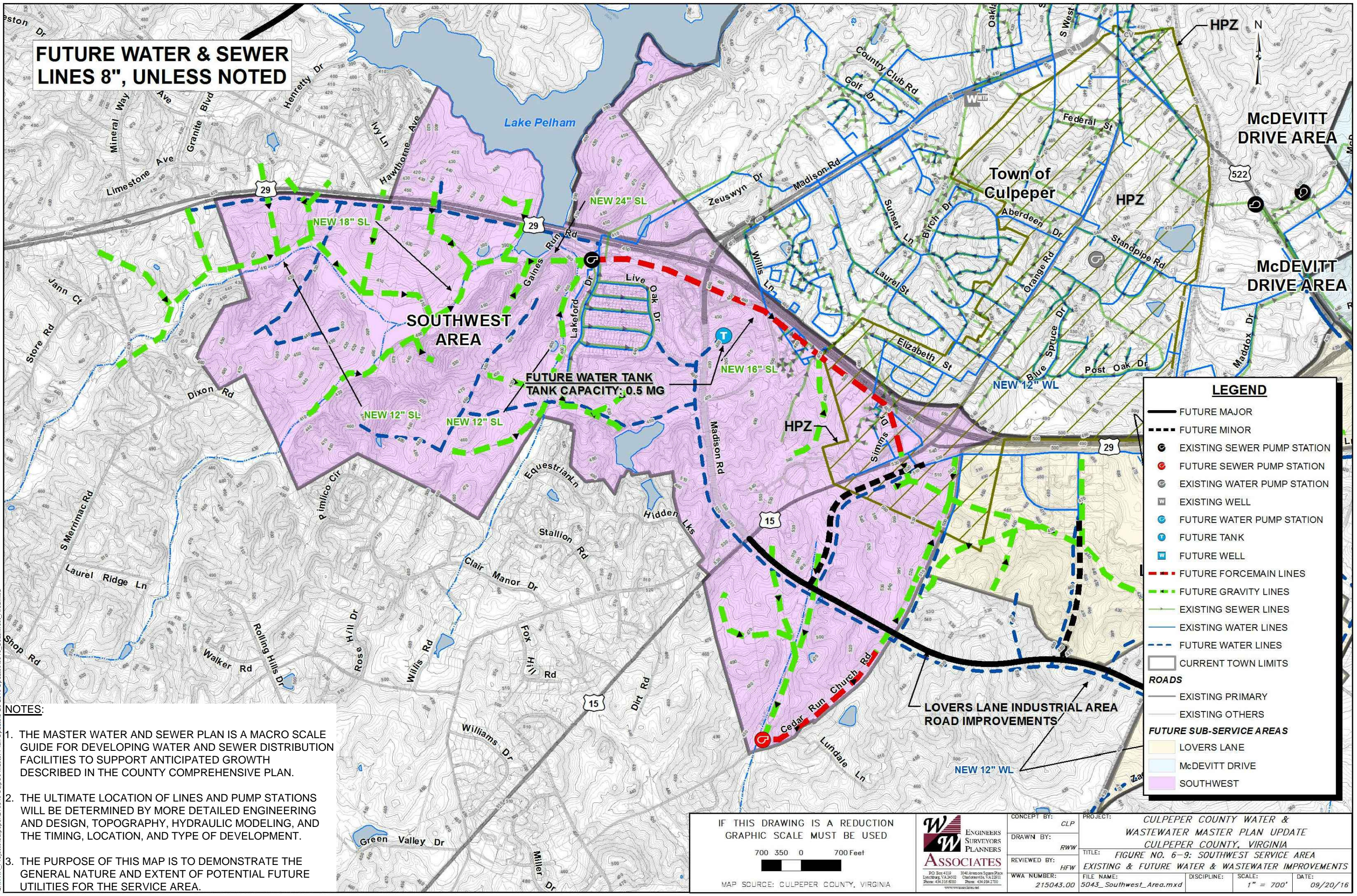
W ASSOCIATES
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PO Box 4110 3940 Aronson Square Plaza
Lynchburg, VA 24502 Charlottesville, VA 22911
Phone: 434.235.6500 Phone: 434.994.2700
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CONCEPT BY:	CLP	PROJECT:	CULPEPER COUNTY WATER & WASTEWATER MASTER PLAN UPDATE CULPEPER COUNTY, VIRGINIA		
DRAWN BY:	RWW	TITLE:	FIGURE NO. 6-8: LOVERS LANE SERVICE AREA EXISTING & FUTURE WATER & WASTEWATER IMPROVEMENTS		
REVIEWED BY:	HFV	FILE NAME:	5043_Lovers_Ln_Area.mxd	DISCIPLINE:	SCALE:
WVA NUMBER:	215043.00	DATE:	09/20/16	1" = 600'	

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FUTURE WATER & SEWER LINES 8", UNLESS NOTED



LEGEND

- FUTURE MAJOR
- - - FUTURE MINOR
- ⊙ EXISTING SEWER PUMP STATION
- ⊙ FUTURE SEWER PUMP STATION
- ⊙ EXISTING WATER PUMP STATION
- ⊙ EXISTING WELL
- ⊙ FUTURE WATER PUMP STATION
- ⊙ FUTURE TANK
- ⊙ FUTURE WELL
- - - FUTURE FORCEMAIN LINES
- - - FUTURE GRAVITY LINES
- EXISTING SEWER LINES
- EXISTING WATER LINES
- - - FUTURE WATER LINES
- CURRENT TOWN LIMITS

ROADS

- EXISTING PRIMARY
- EXISTING OTHERS

FUTURE SUB-SERVICE AREAS

- LOVERS LANE
- McDEVITT DRIVE
- SOUTHWEST

- NOTES:**
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IF THIS DRAWING IS A REDUCTION GRAPHIC SCALE MUST BE USED

700 350 0 700 Feet

MAP SOURCE: CULPEPER COUNTY, VIRGINIA



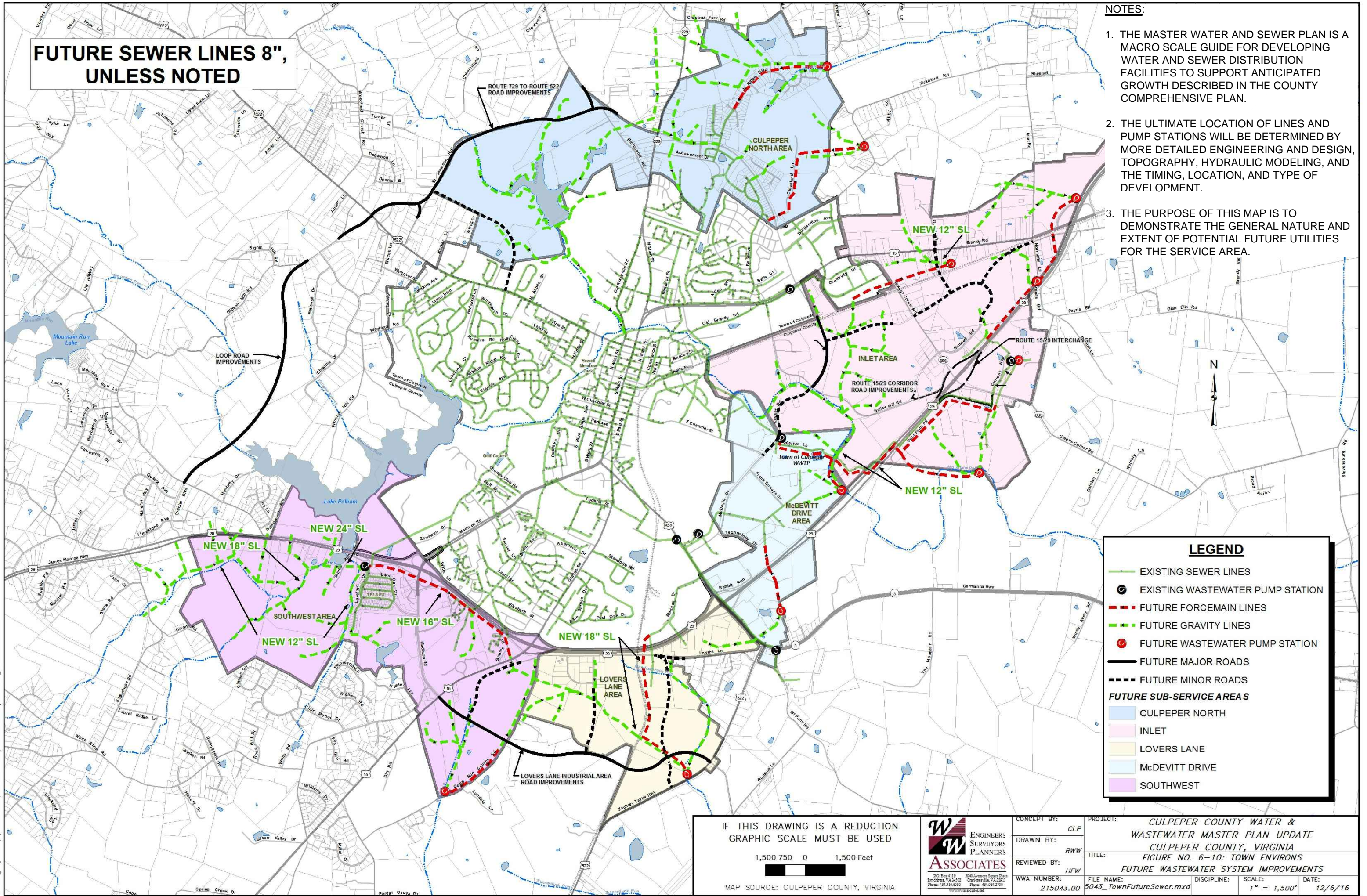
CONCEPT BY:	CLP	PROJECT:	CULPEPER COUNTY WATER & WASTEWATER MASTER PLAN UPDATE CULPEPER COUNTY, VIRGINIA		
DRAWN BY:	RWW	TITLE:	FIGURE NO. 6-9: SOUTHWEST SERVICE AREA EXISTING & FUTURE WATER & WASTEWATER IMPROVEMENTS		
REVIEWED BY:	HFV	FILE NAME:	5043_Southwest_Area.mxd	DISCIPLINE:	
WVA NUMBER:	215043.00	SCALE:	1" = 700'	DATE:	09/20/16

G:\WVA - Projects\Culpeper\215043 Cupco Master Plan Update\9-20-2016 Updates\6043 Southwest Area.mxd

**FUTURE SEWER LINES 8",
UNLESS NOTED**

NOTES:

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LEGEND

- EXISTING SEWER LINES
- ⊙ EXISTING WASTEWATER PUMP STATION
- - - FUTURE FORCEMAIN LINES
- · - · FUTURE GRAVITY LINES
- ⊙ FUTURE WASTEWATER PUMP STATION
- FUTURE MAJOR ROADS
- - - FUTURE MINOR ROADS

FUTURE SUB-SERVICE AREAS

- CULPEPER NORTH
- INLET
- LOVERS LANE
- McDEVITT DRIVE
- SOUTHWEST

IF THIS DRAWING IS A REDUCTION
GRAPHIC SCALE MUST BE USED

1,500 750 0 1,500 Feet

MAP SOURCE: CULPEPER COUNTY, VIRGINIA

W ASSOCIATES
ENGINEERS
SURVEYORS
PLANNERS

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Leak Springs, VA 22602 Charlottesville, VA 22911
Phone: 434.316.0000 Phone: 434.994.2700
www.wassociates.net

CONCEPT BY:	CLP	PROJECT:	CULPEPER COUNTY WATER & WASTEWATER MASTER PLAN UPDATE			
DRAWN BY:	RWW	TITLE:	CULPEPER COUNTY, VIRGINIA			
REVIEWED BY:	HFV	TITLE:	FIGURE NO. 6-10: TOWN ENVIRONS			
WVA NUMBER:	215043.00	TITLE:	FUTURE WASTEWATER SYSTEM IMPROVEMENTS			
FILE NAME:	5043_TownFutureSewer.mxd	DISCIPLINE:	SCALE:	DATE:		
			1" = 1,500'	12/6/16		

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6.0 Culpeper Town Environs

6.5.2 Treatment

New treatment systems in the Town Environs utility service area resulted from sampling performed as new groundwater wells were developed. Treatment currently being installed on new wells includes chlorination, fluoridation, and pH control. The pH of the treated water will be adjusted to prevent corrosion of the distribution system piping and to avoid violations of the Lead and Copper Rule.

6.5.3 Town Service

Future water distribution lines in the Town-served areas (Water and Sewer Service Areas) are presented in Figures No. 6-4 through 6-10.

The waterlines shown in the figures range from 8-inch to 16-inch, and will provide adequate fire flow to residential and commercial/industrial areas during periods of peak water usage.

The Culpeper North Area functionally extends to the intersection of Route 229 and Chestnut Fork Road. Although outside of the Urban services boundary, commercial developments have been approved with onsite wells. Properties in this area could be served by public water. The North Area is presented in Figure No. 6-5.

The proposed improvements to the Environs include a 12-inch main extension into the Southwest service area through residential developments and along U.S. Route 15/29. Future water and sewer services will extend across Route 29 to serve properties zoned “Commercial”. These properties have existing businesses including car dealerships, which have onsite wells. Waterlines parallel Route 29, as shown on Figure No. 6-9.

A 12-inch loop around Lover’s Lane through industrial properties and along U.S. Route 15/29 will also be constructed. Additionally, a 12-inch and 8-inch transmission main will be installed along State Routes 522 and 615 to serve the Coffeewood Correctional Facility and the Mitchells area. New 12-inch mains through the McDevitt Drive area will connect the south and southwestern areas of the Environs to the remaining system



6.0 Culpeper Town Environs

including Inlet and Culpeper North. A network of 8-inch and 12-inch lines will serve the Inlet area of the Environs, and a new main along State Route 694 (Ira Hoffman Lane) will serve the Culpeper North area.

6.5.4 Storage

The Virginia Department of Health's Waterworks Regulations and Working Memo #784 specify that a water system must have sufficient storage for a minimum of one half day demand, based on the maximum daily demand, plus fire flow.

The Culpeper County Water and Sewer Authority Design Standards specify the storage requirement for domestic and fire flow usage as 400 gallons per day per equivalent residential connection. This volume provides one half of the maximum daily demand plus fire flow volume.

At 400 gpd/connection for the projected total ERCs, the minimum required storage volume based on the County's Design Standards is 0.719 MG.

The VDH method to calculate the storage volume needed to serve the projected populations results in 0.725 MG, for a half-day storage, and is the more conservative method of the two. However, a half-day storage is the minimum volume. A full day storage is recommended.

To satisfy the storage requirements discussed above and provide service reliability, two elevated water storage tanks are proposed. The conceptual locations of these tanks are shown on Figure No. 6-4 and include a 750,000 gallon tank in the Culpeper North Area and a 500,000 gallon tank in the Southwest Area.

This allows for storage in different areas of the distribution system and a safety factor relative to one-half day storage. With overflows at an elevation of 620 feet, the tanks will provide the minimum 30 psi pressure requirement specified by the Culpeper County



6.0 Culpeper Town Environs

Water and Sewer Authority Design Standards. By monitoring the average and maximum daily demands, the Authority can construct the Southwest and North tanks as needed.

6.6 Future Wastewater Facilities

The conceptual layouts of wastewater facilities are presented in Figures No. 6-5 through 6-10 overall and for each service area. The following is description of the recommended collection and conveyance lines and the required treatment facilities.

6.6.1 Collection and Conveyance

In the Southwest area, gravity sewers ranging from 8-inch to 24-inch will be extended from the existing wastewater pump station on Lakeford Drive westward to serve properties north and south of Route 29. The same pump station will convey wastewater from the 8-inch gravity sewer on Lakeford Drive that will be extended eastward across Madison Road. Properties on the north side of Route 29 are zoned “Commercial”. Car dealerships and other businesses are located there, currently served by onsite septic systems.

New 8-inch to 16-inch gravity mains will be constructed in the Lovers Lane Industrial Area. A wastewater pump station located on Zachary Taylor Highway (Route 522) will pump the wastewater northward, discharging into a new gravity main near Route 3 (Germanna Highway). This 8-inch and 24-inch gravity main will convey the sewage to a wastewater pump station on Mountain Run, east of Route 29 and the Town’s wastewater treatment plant.

The wastewater pump station on Mountain Run will collect wastewater from proposed 8-inch and 12-inch gravity mains that will serve the southern part of the Inlet Area. It will convey the wastewater through an 18-inch force main to the Town’s wastewater treatment plant.



6.0 Culpeper Town Environs

The northern Inlet Area will be served by 8-inch to 15-inch gravity sewers that will discharge into two wastewater pump stations, located on Jonas Road and the Route 15/Brandy Road interchange, as shown on Figure No. 6-5. The discharge from those two pump stations will be conveyed by a future wastewater pump station to the Town's wastewater treatment plant via a 12-inch force main installed parallel to the existing 6-inch force main.

The North Area extends to the intersection of Route 229 and Chestnut Fork Road. A large portion of the property is owned by the County, and recently commercial developments were approved. These developments will be served by onsite septic, but could be served by public sewer.

6.6.2 Treatment

Wastewater from these County areas adjacent to the Town will be treated by the Town's 6.0 MGD wastewater treatment plant.



7.0 Cherry Hill

7.1 Introduction

The Cherry Hill is located approximately 2.3 miles northwest of the Town of Culpeper along State Route 522 (Sperryville Pike). It includes the former County Landfill and surrounding residences. In 2014, the County awarded a contract to develop a public water supply system to serve these residences. The Preliminary Engineering Report presented the recommended water system, which is discussed further below.

7.2 Existing Water Facilities

The Cherry Hill area is not supplied by a public water system. The residents have individual wells to supply their daily water needs.

7.3 Existing Wastewater Facilities

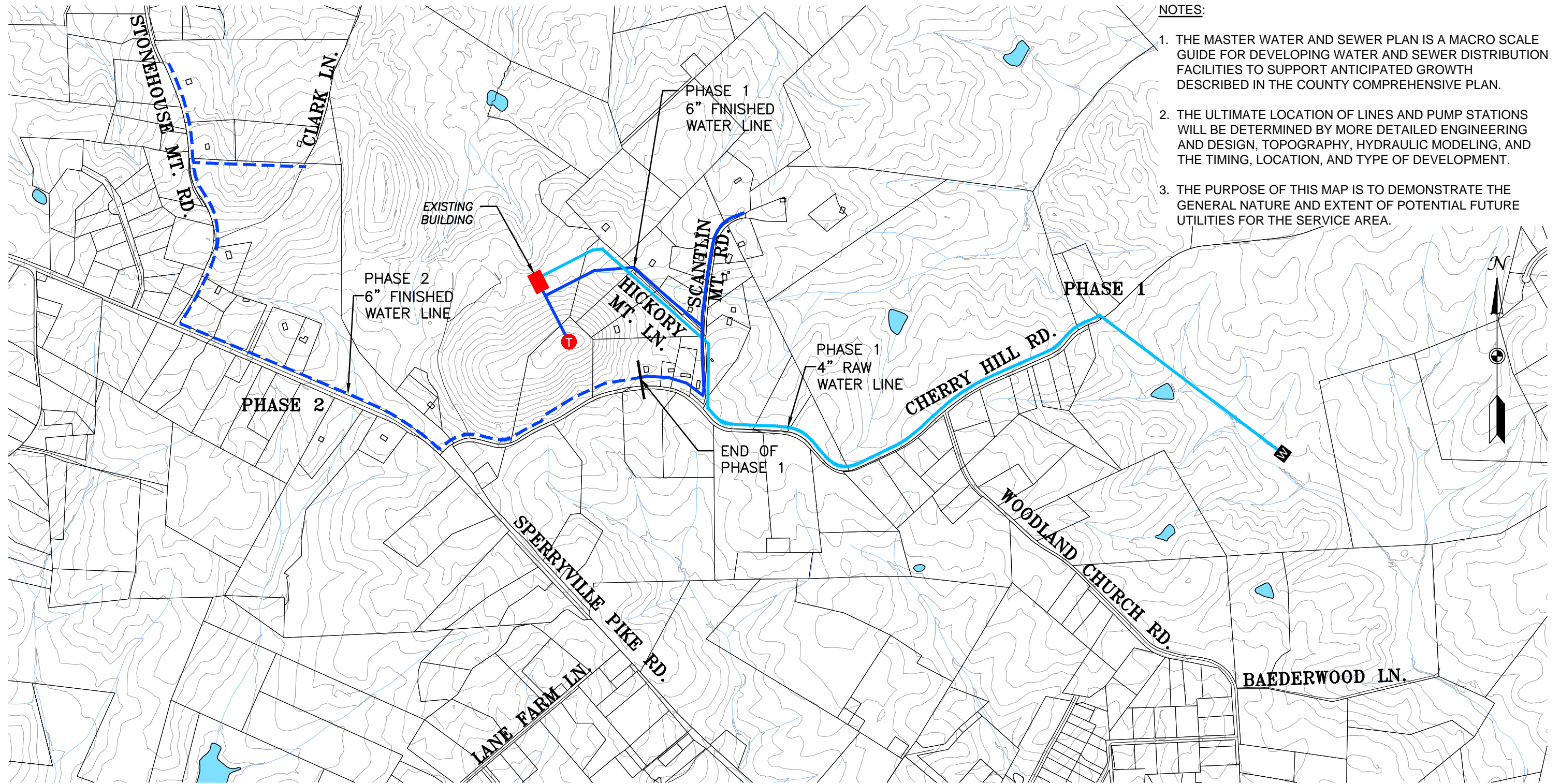
The Cherry Hill area does not have a public wastewater system. All residences are served by onsite drainfields.

7.4 Future Water Facilities

Water facilities for the Cherry Hill area will include supply, treatment, storage, and distribution. The following includes a discussion of each system component and the recommended facilities. Figure No. 7-1 presents a conceptual layout of the future water system. The facilities will be capable of serving 25 homes. The water system is likely to be constructed in phases, with the first phase serving the area east of the landfill.

7.4.1 Supply

A groundwater availability assessment was performed by Emery & Garrett Groundwater, Inc. to determine the safe yield of groundwater in the Cherry Hill area. The result of that assessment is the location of a groundwater well capable of yielding 90 gallons per minute (gpm) or 129,600 gallons per day (gpd).









NOTES:

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LEGEND

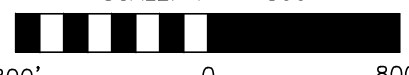
-  EXISTING WELL
-  RAW WATER LINE
-  PHASE 1 FINISHED WATER LINE
-  PHASE 2 FINISHED WATER LINE
-  WATER TANK
-  WATER TREATMENT FACILITY

NOTE:

THE SOURCE OF INFORMATION FOR ALL ROADWAYS, CONTOURS, PROPERTY LINES AND WATERWAYS COMES FROM THE CULPEPER COUNTY GIS DATABASE. CONTOURS ARE SHOWN AT 10 FOOT INTERVALS.

IF THIS DRAWING IS A REDUCTION GRAPHIC SCALE MUST BE USED

SCALE: 1" = 800'




ASSOCIATES
ENGINEERS
SURVEYORS
PLANNERS

100 Bank 2110 Lynchburg, VA 24502 Phone: 434.316.0080
2040 Arundell Square #2100 Charlottesville, VA 22911 Phone: 434.964.2700
www.wswassociates.com

DESIGNED BY:	PROJECT:	CHERRY HILL WATER SYSTEM CULPEPER COUNTY, VIRGINIA	
DRAWN BY:	TITLE:	FIGURE NO. 7.1 - SELECTED ALTERNATIVE TREATMENT WITH STORAGE TANK	
REVIEWED BY:	FILE NAME:	SCALE:	DATE:
WSW	JAC	H: AS NOTED V: N/A	9/20/16
216038.02	CHERRY_HILL.dwg		



7.0 Cherry Hill

Consideration will be given to adding a secondary backup well, with the goal of serving 25 homes in the vicinity of the former landfill.

The Culpeper County design standards state that a source water supply utilizing only groundwater must have a safe yield of 1.0 gpm per connection. The existing well could serve (90 gpm / 1.0 gpm/connection) or 90 Equivalent Residential Connections (ERCs). The average daily demand, at 300 gpd/ERC, would be 27,000 gpd. The average daily demand for 25 homes would be 7,500 gpd.

7.4.2 Treatment

A 4-inch raw water line will be constructed from the well to the treatment system to be located at the former animal shelter on County property near the landfill. The proposed treatment system for this area is based on results of sampling performed for the well. Recommended treatment will consist of hydrated manganese oxide addition, greensand filtration and disinfection. The water treatment plant will be located adjacent to the water tank.

7.4.3 Storage

In the first phase of the water system development, a water tank will provide adequate pressures and one full day of domestic water usage for 25 homes. The 5,000 gallon storage tank will be located on the hill east of the landfill, not far from the communications tower. It will be sited such that the daily usage volume will be completely usable and maintain 30 psi at every service connection at all times.

7.4.4 Distribution

The distribution system for this area will be comprised of approximately 3 miles of waterlines. Six-inch and 8-inch water lines will provide finished water on Cherry Hill Road, Scantlin Mountain Road, Hickory Mountain Lane, Stonehouse Mountain Road and Sperryville Pike.



7.0 Cherry Hill

The first phase of construction will consist of the 4-inch waterline from the well to the water treatment plant, the storage tank, and finished water distribution mains and services for customers on Cherry Hill Road, Hickory Mountain Lane and Scantlin Mountain Road.

7.5 Future Wastewater Facilities

No public wastewater facilities are proposed.



8.0 Mitchells

8.1 Introduction

The Mitchells utility service area is defined by the community of Mitchells, located north of the correctional facility. The area drains almost entirely to Cedar Run, a tributary of the Rapidan River. The Mitchells area is located approximately 5.5 miles south of the Town of Culpeper at the intersection of State Route 615 (Rapidan Road) and State Route 652 (Mitchell Road). It began as a rail stop for the Orange Alexandria Railroad in 1854.

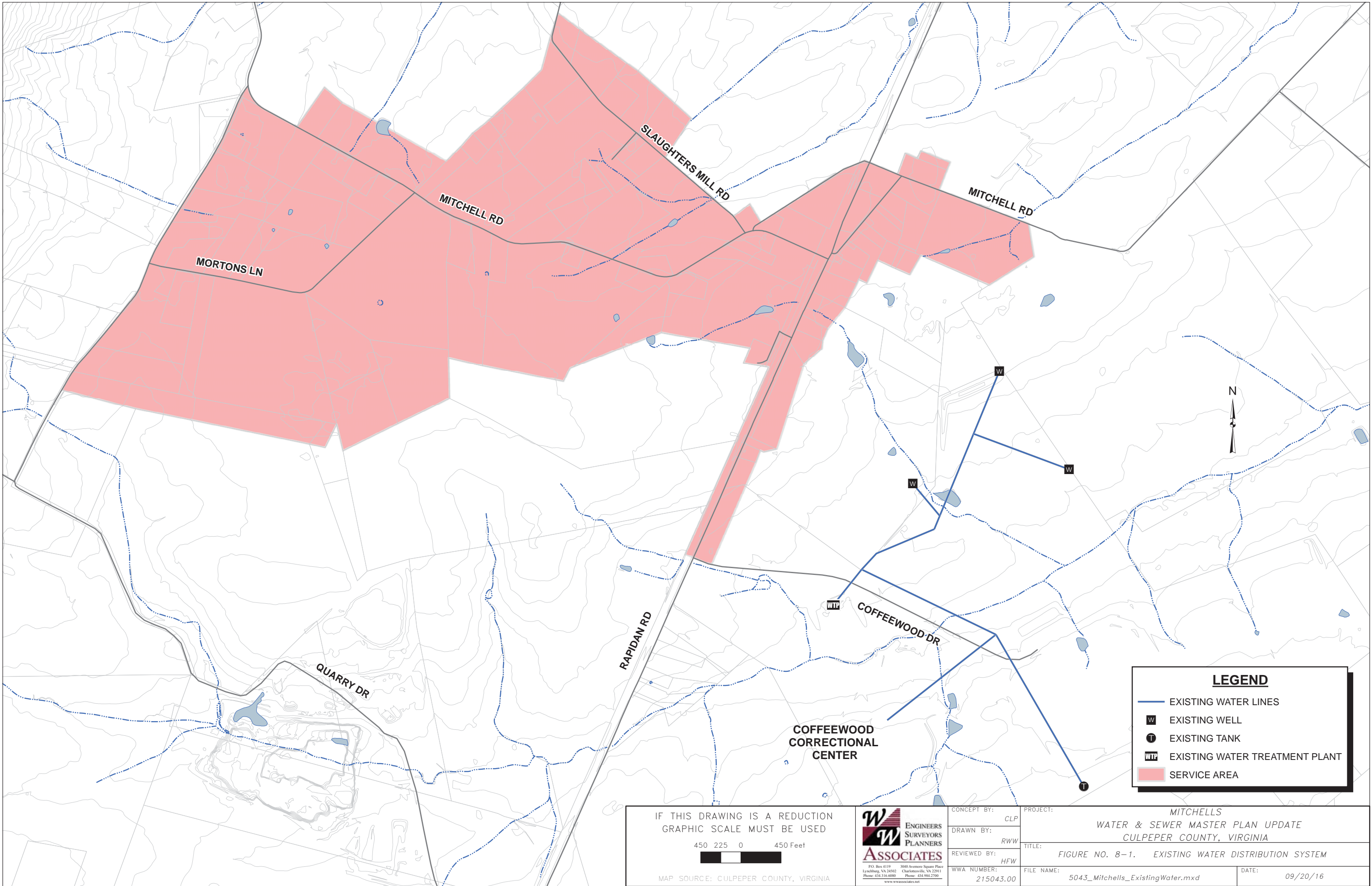
The area has been classified as a convenience center in the 2015 County Comprehensive Plan. The convenience center classification allows for limited local convenience services for rural residents, neighborhood, and community areas. The Coffeewood Correctional Facility located $\frac{3}{4}$ miles south of the Mitchells community is a large employer in the area, with nearly 300 employees. Additional convenience services may be added to the Mitchells community to serve this employee base as well as the neighboring areas. Poor soils and existing industrial uses, however, will likely eliminate additional residential growth in this area.

Water and wastewater needs are met in this area by onsite wells, septic systems, and a low-pressure sewer system, except as discussed below.

8.2 Existing Water Facilities

The existing water system serves *only* the Coffeewood Correctional Facility. The water system consists of three wells, a water treatment facility, an elevated water storage tank, and distribution system. This system is capable of supplying the Correctional Facility's average daily demand of 156,000 gallons per day. Figure No. 8-1 presents the layout of the existing system.

Document Path: C:\WVA_Projects\Culpeper\215043_Culpeper_Master_Plan_Update\9-20-2016_Updates\5043_Mitchells_ExistingWater.mxd



LEGEND

- EXISTING WATER LINES
- EXISTING WELL
- EXISTING TANK
- EXISTING WATER TREATMENT PLANT
- SERVICE AREA

IF THIS DRAWING IS A REDUCTION
GRAPHIC SCALE MUST BE USED

450 225 0 450 Feet

MAP SOURCE: CULPEPER COUNTY, VIRGINIA

WVA ASSOCIATES
ENGINEERS
SURVEYORS
PLANNERS

PO Box 4119 5000 Avenue Square Place
Lyndburg, VA 22602 Charlottesville, VA 22911
Phone: 434.316.6880 Phone: 434.984.2700
www.wvaassociates.net

CONCEPT BY: CLP
DRAWN BY: RWW
REVIEWED BY: HFW
WVA NUMBER: 215043.00

PROJECT:	MITCHELLS WATER & SEWER MASTER PLAN UPDATE CULPEPER COUNTY, VIRGINIA	
TITLE:	FIGURE NO. 8-1. EXISTING WATER DISTRIBUTION SYSTEM	
FILE NAME:	5043_Mitchells_ExistingWater.mxd	DATE: 09/20/16



8.0 Mitchells

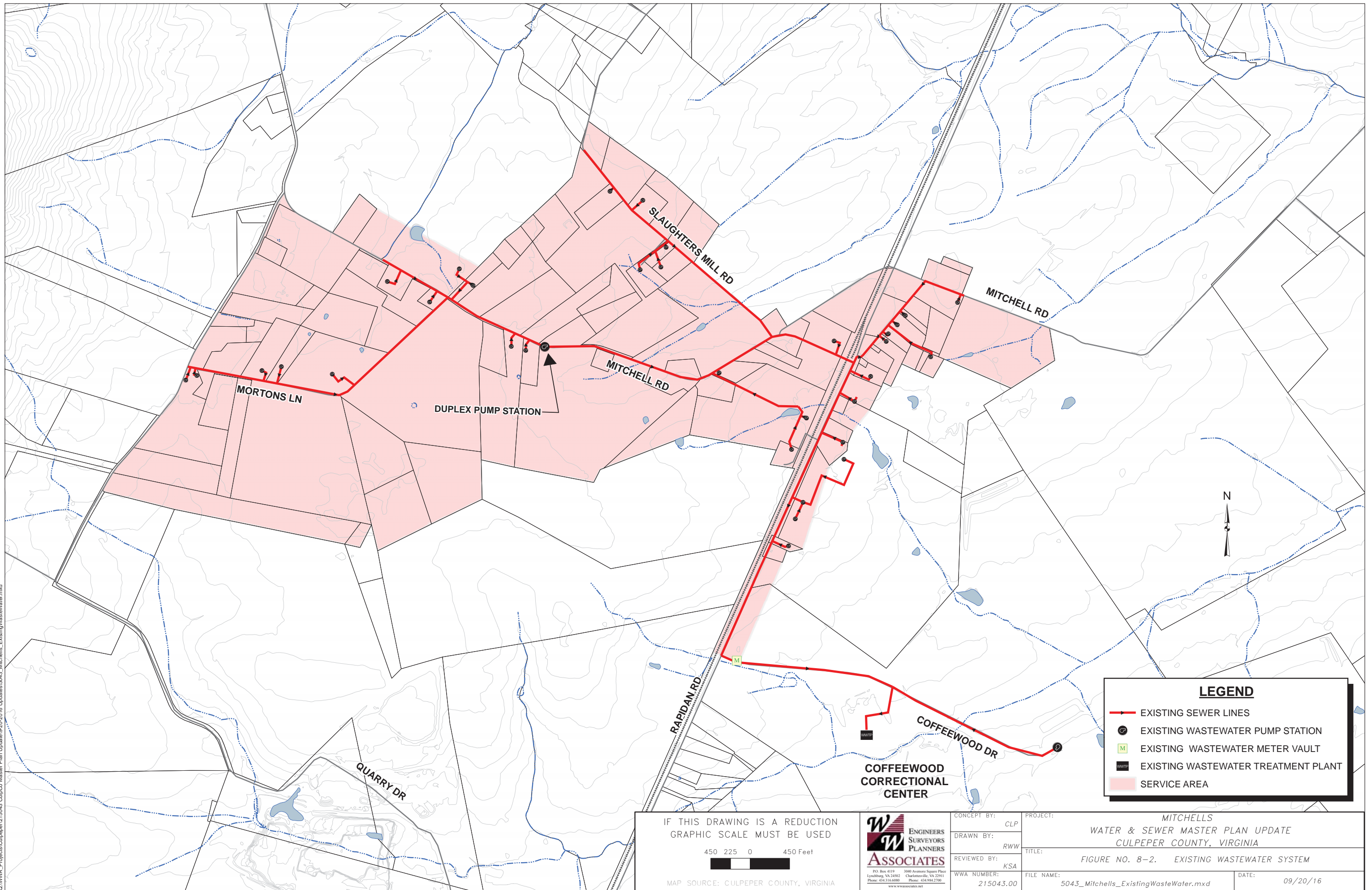
Culpeper County is contemplating construction of a new jail on property owned by the Commonwealth of Virginia Department of Corrections adjacent to the Coffeewood Facility. As part of this expansion the Department of Corrections is contemplating closing down its wells and reverse osmosis treatment facility and purchasing water from Culpeper County. The Department of Corrections has had difficulty meeting VPDES discharge limits associated with its discharge from the reverse osmosis facility.

8.3 Existing Wastewater Facilities






The Mitchells service area has limited public wastewater treatment availability. Wastewater service has been made available to the community through excess capacity at the Coffeewood Correctional Facility's wastewater treatment plant to alleviate problems with failing drainfields. No new construction will be allowed to connect to the sewer. However, all existing structures are eligible for connection. This policy encourages restoration of existing buildings.

The existing wastewater system in Mitchells consists of a low-pressure system of pump stations and force mains. After the wastewater from each connected structure is collected, it is pumped through a force main along Rapidan Road to the correctional facility wastewater treatment plant. A map of the existing wastewater system is presented in Figure No. 8-2.

C:\WWA_P\Projects\Culpeper\215043_CulCo_Master Plan Update\19-20-2016_Updates\5043_Mitchells_ExistingWasteWater.mxd




LEGEND

-  EXISTING SEWER LINES
-  EXISTING WASTEWATER PUMP STATION
-  EXISTING WASTEWATER METER VAULT
-  EXISTING WASTEWATER TREATMENT PLANT
-  SERVICE AREA

IF THIS DRAWING IS A REDUCTION
GRAPHIC SCALE MUST BE USED

450 225 0 450 Feet



MAP SOURCE: CULPEPER COUNTY, VIRGINIA



**ENGINEERS
SURVEYORS
PLANNERS**

ASSOCIATES

P.O. Box 4119 3860 Avonmore Square Place
Lynchburg, VA 24502 Charlottesville, VA 22911
Phone: 434.316.6080 Phone: 434.984.2700
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CONCEPT BY: CLP
DRAWN BY: RWW
REVIEWED BY: KSA
WWA NUMBER: 215043.00

PROJECT: MITCHELLS
WATER & SEWER MASTER PLAN UPDATE
CULPEPER COUNTY, VIRGINIA

TITLE: FIGURE NO. 8-2. EXISTING WASTEWATER SYSTEM

FILE NAME: 5043_Mitchells_ExistingWasteWater.mxd DATE: 09/20/16



8.0 Mitchells

8.4 Future Water Facilities

Water facilities for the Mitchells Service area will only include improvements to the distribution system. Finished water will be supplied by the Town of Culpeper water system, extended from the Town Environs, via a 12-inch and 8-inch transmission main. Therefore, supply sources and treatment will not be developed for this service area. The necessary storage capacity will be provided by the Department of Corrections' elevated tank and the Town system. No additional water storage will be required. Figure No. 8-3 presents a conceptual layout of the future water improvements.

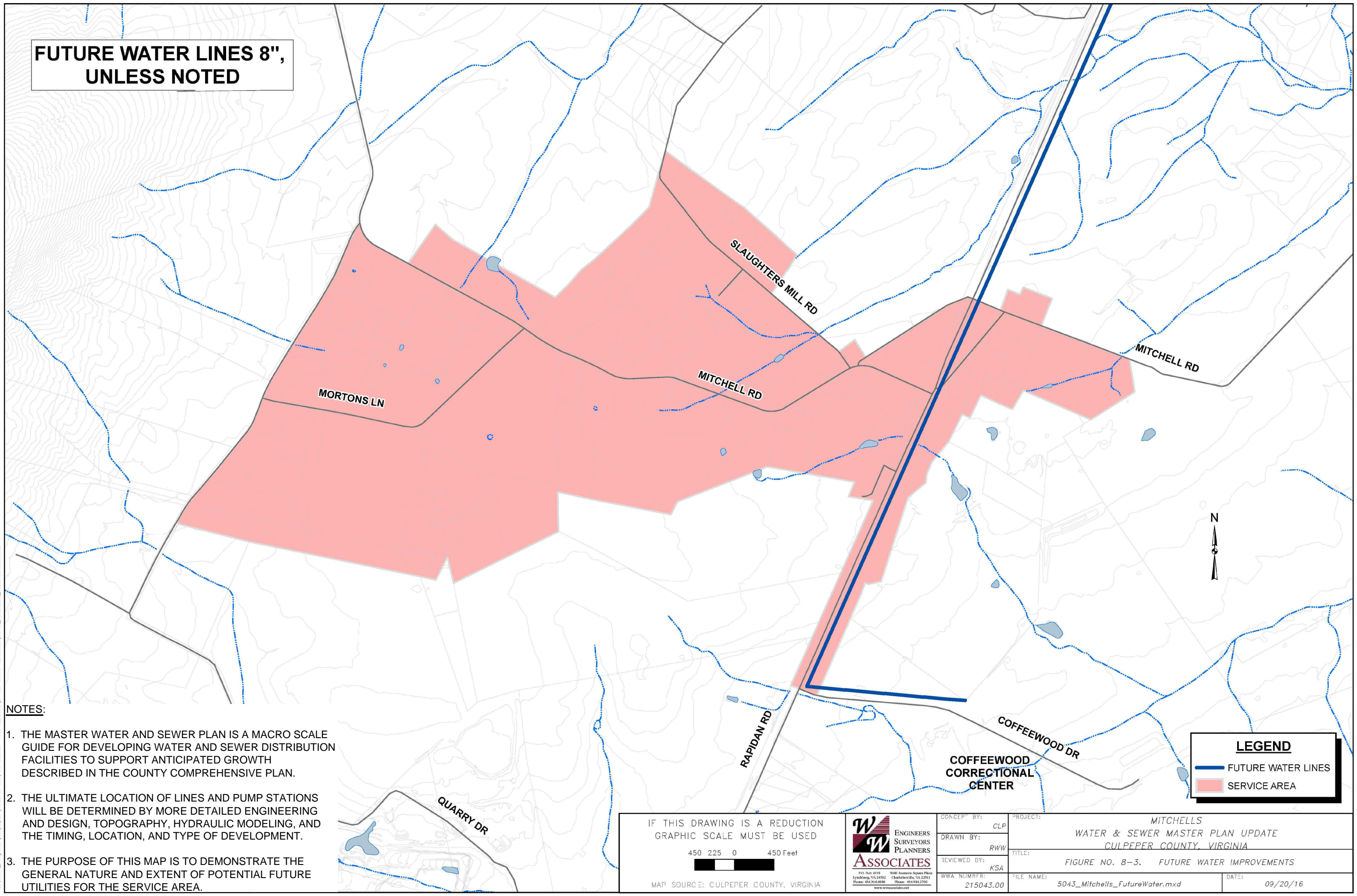
8.4.1 Distribution

A 12-inch water main will connect to the existing Town of Culpeper water line located on State Route 686 (Lovers Lane), or to the proposed 12-inch waterline that would be installed with the Lovers Lane Industrial Area Road Improvements. The main may transition to 8-inch at the intersection of Browning Road and US 522, where US 522 is close to the railroad.

8.5 Future Wastewater Facilities

No additional wastewater facilities are planned for the Mitchells service area. The current pump stations and force mains will serve the existing structures.

**FUTURE WATER LINES 8",
UNLESS NOTED**



- NOTES:**
1. THE MASTER WATER AND SEWER PLAN IS A MACRO SCALE GUIDE FOR DEVELOPING WATER AND SEWER DISTRIBUTION FACILITIES TO SUPPORT ANTICIPATED GROWTH DESCRIBED IN THE COUNTY COMPREHENSIVE PLAN.
 2. THE ULTIMATE LOCATION OF LINES AND PUMP STATIONS WILL BE DETERMINED BY MORE DETAILED ENGINEERING AND DESIGN, TOPOGRAPHY, HYDRAULIC MODELING, AND THE TIMING, LOCATION, AND TYPE OF DEVELOPMENT.
 3. THE PURPOSE OF THIS MAP IS TO DEMONSTRATE THE GENERAL NATURE AND EXTENT OF POTENTIAL FUTURE UTILITIES FOR THE SERVICE AREA.

LEGEND

- FUTURE WATER LINES
- SERVICE AREA

IF THIS DRAWING IS A REDUCTION
GRAPHIC SCALE MUST BE USED

450 225 0 450 Feet

MAP SOURCE: CULPEPER COUNTY, VIRGINIA

W ASSOCIATES
ENGINEERS
SURVEYORS
PLANNERS

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Ipswich, VA 24642
Phone: 541.316.6888

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Charlottesville, VA 22911
Phone: 434.984.2700
www.wassociates.com

CONCEPT BY:	CLP	PROJECT:	MITCHELLS WATER & SEWER MASTER PLAN UPDATE CULPEPER COUNTY, VIRGINIA	
DRAWN BY:	RWW	TITLE:	FIGURE NO. 8-3. FUTURE WATER IMPROVEMENTS	
REVIEWED BY:	KSA	FILE NAME:	5043_Mitchells_FutureWater.mxd	DATE:
WWA NUMBER:	215043.00			09/20/16

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9.0 General Construction Costs

Construction costs are volatile and market-driven. However, estimating them is necessary for long-term planning of water and wastewater systems. This section provides 2015 construction cost unit pricing for some basic components of water and wastewater systems. It is not intended to include all of the costs related to the installation of a water and wastewater system.

The County's design standards require the use of ductile iron pipe for water systems, with push-on joints or mechanical joints. Pipe must be Pressure Class 350 for pipe ≤ 12 inches in diameter, and at least Class 250 for pipe >12 inches in diameter. Fire hydrants must be Mueller Centurion, Kennedy K81-A, or approved equal. The costs listed in Table 9-1 are based on these criteria. The estimated costs include trench excavation (excluding rock), shoring, or use of trench box, installation, warning tape, locating wire, pumping, backfilling, compaction, testing of failed trenches, disposal of excess material, pressure testing, chlorinating, proper disposal of chlorinated water and the contractor's overhead and profit. Payment for mechanical joint pipe also includes accessory kits.

The County's design standards for sanitary sewers allow the use of lined ductile iron and polyvinyl chloride (PVC, SDR 35) pipe. Manholes must have a 48-inch inside diameter. The costs include trench excavation (excluding rock) to standard 4-foot depth, warning tape, tracing wire (as applicable per specifications), shoring or use of trench box, installation, pumping, backfilling, compaction, testing of failed trenches, disposal of excess material, pressure testing and the contractor's overhead and profit.

Some construction includes road or railroad crossings, low-pressure sewers, pump stations, elevated water storage tanks, paving, stormwater controls and traffic controls. More accurate cost estimates should be obtained during preliminary engineering of specific projects.

9.0 General Construction Costs



**Table No. 9-1
Water and Sewer Construction Costs**

Type	Component	Size	Unit Price	Unit
Water				
	Ductile Iron Pipe (Push-on Joint)	8"	\$39	LF
	Ductile Iron Pipe (Push-on Joint)	12"	\$50	LF
	Ductile Iron Pipe (Push-on Joint)	16"	\$68	LF
	Ductile Iron Pipe (Mechanical Joint)	8"	\$47	LF
	Ductile Iron Pipe (Mechanical Joint)	12"	\$71	LF
	Ductile Iron Pipe (Mechanical Joint)	16"	\$113	LF
	Fire Hydrant		\$2,790	EA
Sewer				
	PVC Pipe	8"	\$40	LF
	PVC Pipe	12"	\$50	LF
	Ductile Iron Pipe	8"	\$49	LF
	Ductile Iron Pipe	12"	\$64	LF
	Ductile Iron Pipe	18"	\$103	LF
	Ductile Iron Pipe	24"	\$127	LF
	Reinforced Concrete Pipe	24"	\$78	LF
	Manhole	48"	\$348.00	VF
General Construction				
	Asphalt Cut & Removal		\$19	SY

APPENDIX



	<i>Section</i>
Deed of Transfer of Water Rights with Reservations	A
Emery and Garrett Groundwater Report – Willow Run	B
Voluntary Settlement Agreement	C
Wiley & Wilson Culpeper County Reservoir Study, March 2001	D



APPENDIX A

DEED OF TRANSFER OF
WATER RIGHTS WITH RESERVATIONS

TAX MAP REFERENCE NO.: 34-3B, 34-64, 34-65, 34-66, 34-66A

TAX EXEMPT: VA Code Section 58.1-811(c)(4)

NO TITLE WORK PERFORMED BY PREPARER

NO TITLE COMPANY INVOLVED

Prepared by: Fray, Hudson, Clark & Walker, L.L.P.

P.O. Box 850, Culpeper, Virginia 22701

Telephone: (540) 825-0701 Facsimile: (540) 825-2355

FRAY, HUDSON, CLARK & WALKER, L.L.P. ATTORNEYS AT LAW 115 S. WEST STREET CULPEPER, VIRGINIA 22701

THIS DEED OF TRANSFER OF WATER RIGHTS WITH RESERVATIONS is made this 3rd day of June, 2010, by and between CHARLES K. GYORY and MARY SCOTT MITCHELL GYORY, husband and wife, and PETER G. GYORY and LINDA LUANN GYORY, husband and wife (all of whom shall be referred to hereinafter as "The Gyorys") and WILLOW RUN COMPANY, INC., a Virginia corporation, (hereinafter "Willow Run"), Grantors herein, and the BOARD OF SUPERVISORS OF CULPEPER COUNTY, VIRGINIA, a body politic, Grantor and Grantee herein, and provides as follows:

WITNESSETH:

WHEREAS, by Deed Gift of Easement dated November 13, 2009 recorded in the Clerk's Office of Culpeper County, Virginia, as Instrument Number 090006720 ("the Easement Agreement") the Gyorys and Willow Run granted to the Commonwealth of Virginia, Board of Historic Resources, historical and other easements on certain portions of the lands of the Gyorys and Willow Run, located at Elkwood in the Stevensburg District of Culpeper County, Virginia, as more fully described therein, and

WHEREAS, under Section Fifteen of the Easement Agreement, entitled "Groundwater Production", the Gyorys and Willow Run reserved the right to undertake groundwater production and purification on the lands within the granted easement, subject to certain terms, conditions and obligations as are more fully set forth in the Easement Agreement and primarily within Section Fifteen of the Easement Agreement, and

FRAY, HUDSON, CLARK & WALKER, L.L.P. ATTORNEYS AT LAW 115 S. WEST STREET CULPEPER, VIRGINIA 22701

WHEREAS, under the terms of Section Fifteen of the Easement Agreement, the Gyorys and Willow Run expressly reserved the authority to transfer or assign their rights and obligations as set out therein to the County of Culpeper, and

WHEREAS, the County of Culpeper desires to accept transfer of such rights and is willing in return to assume the obligations set out in Section Fifteen of the Easement Agreement,

NOW, THEREFORE, for and in consideration of the above, the Gyorys and Willow Run hereby grant, give, transfer and convey to the Board of Supervisors of Culpeper County, Virginia, subject to the terms of the Easement Agreement and primarily Section Fifteen of the Easement Agreement and subject to the reservations set out below, their rights in and to groundwater production within the boundaries of lands described on the attached Exhibit A, being the same lands described in the Deed Gift of Easement dated November 13, 2009, as herein above described,

PROVIDED HOWEVER, the Gyorys and Willow Run reserve unto themselves and for their successors in title in perpetuity, the continued rights to place, maintain and operate such wells on the lands described herein as may be reasonably required to provide water for permitted buildings and structures on the lands described in Exhibit A of the Deed of Gift of Easement as defined in the Easement Agreement including but not limited to those uses set out in paragraphs 3. and 4. of the Deed of Gift of Easement and water for all permitted activities as defined within the Easement Agreement including but not limited to those uses set out in paragraph 5. of such document. Moreover, the Gyorys and Willow Run expressly retain unto themselves and their successors in title in perpetuity all rights, without limitations, to ground- water production and use on all and every portion of their remaining adjoining lands not lying within the bounds of the easements

as described on Exhibit A, herein.

In return for, and in partial consideration of the above, the County agrees to abide by the terms of the Easement Agreement, especially such terms are set out in Section Fifteen of such agreement and shall, at its sole expense, comply with all obligations and limitations set out in such agreement insofar as they may relate to the County's activities on the properties described in the attached Exhibit A. Provided however that the Gyorys, Willow Run and their successors in title shall be solely responsible to comply with such conditions and obligations in relation to any groundwater production rights they have retained herein as the same now exist or as they may be expanded or altered in the future.

The parties hereto further recognize that at the time of the making of this agreement and transfer, four existing wells are located on the lands described in Exhibit A which are as of the date of the execution of this document not yet in production. The County shall have the right at any time to elect to place such wells or any one or more of them into production provided, however, should they do so and should the Gyorys, Willow Run or their successors ever have need for use of a portion of the waters obtained from such well or wells for permitted buildings and structures on the lands described in Exhibit A of the Deed of Gift of Easement as defined in the Easement Agreement including but not limited to those set out in paragraphs 3. and 4. of such document and/or need for use of water for permitted activities as defined in the Easement Agreement including but not limited to those uses set out in paragraph 5. of said document, the County shall provide from such well or wells the water needed by the Gyorys, Willow Run or their successors who shall pay the County for the same at a rate equal to the cost of production incurred by the County for the raw water as it is

FRAY, HUDSON, CLARK & WALKER, L.L.P. ATTORNEYS AT LAW 115 S. WEST STREET CULPEPER, VIRGINIA 22701

FRAY, HUDSON, CLARK & WALKER, L.L.P. ATTORNEYS AT LAW 115 S. WEST STREET CULPEPER, VIRGINIA 22701

drawn from the well. Moreover, should the Gyorys, Willow Run or their successors ever elect to place one or more of such wells in production, they shall first notify the County in writing of such intention in which case the County shall have sixty (60) days following receipt of such notice to decide whether it desires to place such well into production. If the County elects not to place such well into production, or having elected to do so fails to have such well commissioned within one hundred and twenty (120) days following notice of its intention to do so given to the Gyorys, Willow Run or their successors the party having given the County such notice may thereafter commission the well themselves and having done so shall enjoy exclusive use of such well provided such use shall be limited to use for permitted buildings and structures on the lands described in Exhibit A of the Deed of Gift of Easement as permitted under the Easement Agreement including but not limited to the uses set out in paragraphs 3 and 4 of such document and such other activities as are permitted by the Easement Agreement including but not limited to those permitted activities as defined in paragraph 5 of such document.

In order to permit the operation and use of any wells commissioned by the County or hereinafter installed by the County within the Easement Area, the Gyorys and Willow Run agree for themselves and for their successors in title that if at any future time the County requests protective easements around their wells sites and/or easements to permit the installation of water lines, power lines and similar utility lines as may be required to operate such wells and to transport the water obtained from such well to its point of use, they shall grant such easements provided that the protective easements shall at no time be larger than the minimum size required to comply with all laws and regulations regarding the same; that all such easements shall fully conform to all terms and

requirements of the Easement Agreement and provided that all such easements shall be placed so as to not unreasonably interfere with any improvements then existing on the properties and so as to minimize to the extent reasonably practical any interference with the then owner's daily operations upon such property. These obligations shall run with the land and be an obligation of all future owners thereof.

In witness whereof the undersigned have set their signatures and seals:

Charles K. Gyory (SEAL)
CHARLES K. GYORY

Mary Scott Mitchell Gyory (SEAL)
MARY SCOTT MITCHELL GYORY

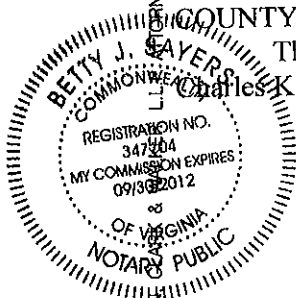
Peter G. Gyory (SEAL)
PETER G. GYORY

Linda Luann Gyory (SEAL)
LINDA LUANN GYORY

ATTORNEYS AT LAW 115 S. WEST STREET CULPEPER, VIRGINIA 22701
FRAY, HUDSON & GORNEY

STATE OF VIRGINIA
COUNTY OF CULPEPER, to-wit:

The foregoing instrument was acknowledged before me this 3rd day of June, 2010, by Charles K. Gyory and Mary Scott Mitchell Gyory.



Betty J. Sayer
NOTARY PUBLIC

My Commission expires: 09-30-2012
Registration No: 347704

STATE OF VIRGINIA
COUNTY OF CULPEPER, to-wit:

The foregoing instrument was acknowledged before me this 3rd day of June, 2010, by Peter G. Gyory and Linda Luann Gyory.

Mary C. McPhillips
NOTARY PUBLIC

My Commission expires: 09-30-2011
Registration No: 116820



FRAY, HUDSON, CLARK & WALKER, L.L.P. ATTORNEYS AT LAW 115 S. WEST STREET CULPEPER, VIRGINIA 22701

BY: Charles K. Gyory (SEAL)
PRESIDENT

STATE OF VIRGINIA
COUNTY OF CULPEPER, to-wit:

The foregoing instrument was acknowledged before me this 7th day of June, 2010, by Charles K. Gyory, President of Willow Run Company, Inc.



Betty J. Sayers
NOTARY PUBLIC

My Commission expires: 09-30-2012
Registration No: 347704

THE BOARD OF SUPERVISORS OF CULPEPER
COUNTY, VIRGINIA

BY: Larry W. Aylor (SEAL)
LARRY W. AYLOR, VICE CHAIRMAN

ATTEST:

Frank B. Bossio
Frank B. Bossio, CLERK

FORM APPROVED FOR CULPEPER COUNTY

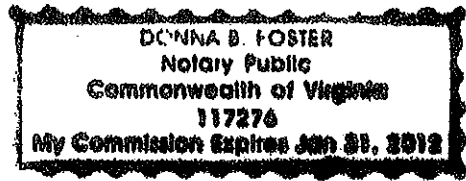
Roy B. Thorpe, Jr.
Roy B. Thorpe, Jr., County Attorney

STATE OF VIRGINIA
COUNTY OF CULPEPER, to-wit:

The foregoing instrument was acknowledged before me this 9th day of June, 2010, by Larry W. Aylor, Vice Chairman of the Board of Supervisors of Culpeper County, Virginia.

Donna B. Foster
NOTARY PUBLIC

My Commission expires: 1/31/2012
Registration No: 117276





APPENDIX B

EMERY AND GARRETT

GROUNDWATER REPORT – WILLOW RUN

Emery & Garrett Groundwater, Inc.

***56 Main Street • P.O. Box 1578
Meredith, New Hampshire 03253***

(603) 279-4425

www.eggi.com

Fax (603) 279-8717

September 14, 2007

Mr. Robert Lee
Chief Operating Officer
USA Development Services, Inc.
10089 Lee Highway
Fairfax, VA 22030

**Re: Preliminary Status of Groundwater Supply Development for Willow Run
Subdivision**

Dear Mr. Lee,

This letter serves as a brief summary of the preliminary status of the groundwater exploration program currently being conducted at the Willow Run Project Site. To date, a total of six exploratory test wells have been drilled. The cumulative airlift yield¹ for these six wells is slightly over 1,100 gallons per minute (gpm) (see Table I). These wells are six inches in diameter and range in yield between 28 and 250 gpm. Water chemistry is highly variable, with hardness, sulfate, and total dissolved solids being significantly elevated in Test Wells WLW-1A, WLW-2, and WLW-4 (Table I). If these specific wells are to be used in the future, they will require significant water treatment.

It should be noted that the preliminary airlift yields do not reflect the long-term sustainable yield of these wells, as this must be determined on the basis of extended groundwater withdrawal tests. These tests will be focused on assessing the overall interference between each on-site well and existing off-site domestic/commercial wells. These detailed pumping tests will also evaluate the volume of recharge available to this bedrock aquifer by monitoring how quickly the aquifer recovers after pumping is terminated.

At the present time, the results of this preliminary exploratory drilling program appear favorable. However, we recommend that additional exploratory wells be drilled at those locations where groundwater quality may be more favorable. The four additional sites are marked as WLW-13 through WLW-16 (Figure 1). If these meet with your approval, they will be permitted and arrangements made to have them drilled.

¹ Airlift tests involve using the drill rig to remove water from a well using an air compressor in order that a preliminary measurement of the rate of water produced from a well can be made.

Ultimately, when the exploratory drilling program is complete, we will then choose the highest yielding wells that produce the best quality water for conversion into larger diameter production wells. We are encouraged by the results of this groundwater exploration program to date and will keep you posted as additional information is obtained.

Best regards,



Ken C. Hardcastle, Ph.D., PG
Senior Geologist

Table I. Exploratory Test Wells Drilled at Willow Run

Well_Id	Permit #	Date Drilled	Total Depth (feet)	Airlift Yield* (gpm)	Depth to Bedrock (feet)	Casing Length (feet)				
WLW-1A	SD-07-192	8/27/2007	440	250	8	18				
WLW-2	SD-07-194	8/28/2007	340	184	15	18				
WLW-3	SD-07-195	8/27/2007	350	184	5	18				
WLW-4	SD-07-196	8/28/2007	395	230	10	18				
WLW-5	SD-07-197	8/29/2007	600	28	10	18				
WLW-6	SD-07-198	8/28/2007	360	230	10	18				

	Iron (mg/l)	Manganese (mg/l)	PH	Alkalinity	Chloride	Hardness	TDS	Sulfate	Nitrate
WLW-1A	0.2	0.13	7.7	140	14	920	1800	1200	0
WLW-2	0.092	0.13	7.8	200	10	560	1100	690	0
WLW-3	0	0.017	7.8	220	8	220	280	40	0
WLW-4	0	0.09	7.8	250	12	460	870	450	0
WLW-5	0	0.019	7.8	110	0	240	230	68	0
WLW-6	0	0.014	7.9	300	6	290	300	9	0

***NOTE:** Airlift tests involve using the drill rig to remove water from a well using an air compressor in order that a preliminary measurement of the rate of water produced from a well can be made. Long-term sustainable yields of these wells must be determined on the basis of extended groundwater withdrawal tests.

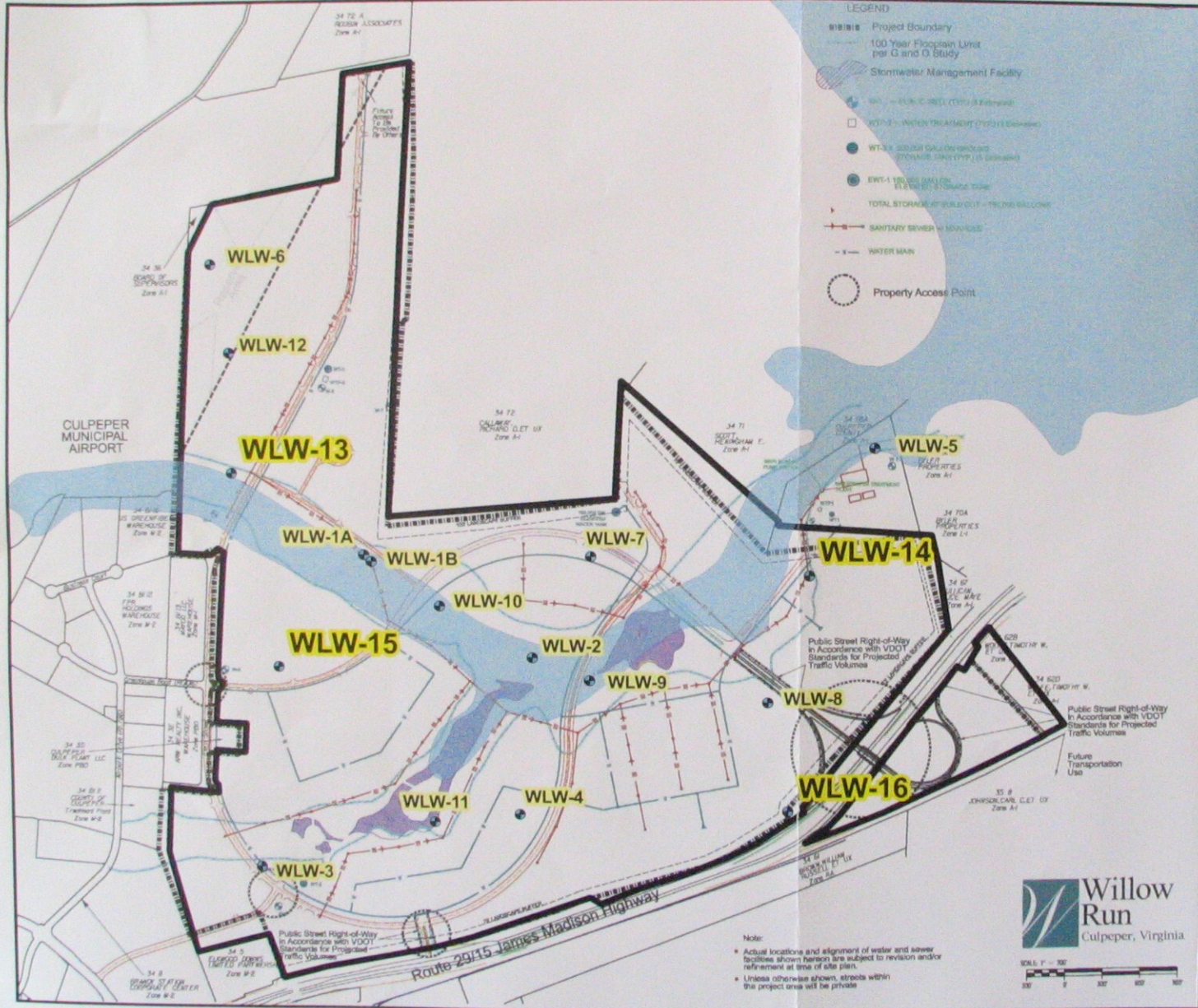


FIGURE 1

Setting of the Proposed Exploratory Test Well Sites at the WILLOW RUN Project Site, Culpeper County, Virginia

- **WLW-13** ADDITIONAL Proposed Exploratory Test Well Site
- **WLW-1A** Proposed Exploratory Test Well Site

(FEMA) 100-year Floodplain

Willow Run Project Site

Site plan provided by W. Ben Burton of Greenhome & O'Mara, Inc. (received May 24, 2007) - alignment is approximate only -

Scale is 1:9,000
1 inch equals 750 feet

0 137.5 275 550

Meters

0 405 810 1,620

Feet

FIGURE 1

Emery & Garrett Groundwater, Inc.



APPENDIX C

VOLUNTARY SETTLEMENT AGREEMENT

**REPORT ON THE
TOWN OF CULPEPER – COUNTY OF CULPEPER
VOLUNTARY SETTLEMENT AGREEMENT**



**Commission on Local Government
Commonwealth of Virginia**

November 2011

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REPORT ON THE TOWN OF CULPEPER – COUNTY OF CULPEPER VOLUNTARY SETTLEMENT AGREEMENT

PROCEEDINGS OF THE COMMISSION

On July 11, 2011, the Town of Culpeper and the County of Culpeper submitted to the Commission on Local Government for review a proposed voluntary settlement agreement negotiated by the two jurisdictions under the authority of Section 15.2-3400 of the Code of Virginia.¹ Consistent with the regulations promulgated by the Commission, the submission was accompanied by data and materials supporting the proposed agreement. Further, and in accordance with the Commission’s regulation 1VAC 50-20-230(C), the Town and County gave notice of the proposed agreement to 12 other political subdivisions with which they are contiguous or with which they share functions, revenues, or tax sources.² The proposed agreement contains provisions for (1) an immediate boundary adjustment by which specified territory will be incorporated into the Town; (2) optional boundary adjustments in the future if certain criteria are met; (3) a waiver of the Town’s annexation and city status rights during the term of the agreement, which will be a minimum of 30 years; (4) the provision of water and wastewater services by the Town within a County-designated service area adjacent to the Town’s boundaries; (5) the construction by the Town of a sewer line to serve a County high school; (6) the resolution of related utility issues between the Town and the County; (7) a reduction in the Town’s business, professional, and occupational license tax rates; and (8) the creation of a joint advisory planning body.³

In conjunction with its review of the proposed settlement agreement, on September 12, 2011, the Commission toured relevant sections of the Town of Culpeper and Culpeper County and met in the Town to receive oral testimony from the two jurisdictions in support of the agreement. That evening, the Commission held a public hearing, advertised in accordance with Section 15.2-2907(B) of the Code of Virginia, for the purpose of receiving citizen comment. The public hearing was attended by approximately 30 persons and four individuals testified. In order to permit receipt of additional public comment, the Commission agreed to keep its record open for written submissions through September 27, 2011. The Commission did not receive any additional submissions or comments from the public.

¹ Town of Culpeper and Culpeper County, Notice by the Town of Culpeper and the County of Culpeper of a Voluntary Settlement Agreement (hereinafter cited as the “Joint Notice”), July 11, 2011, which contains the Settlement Agreement and supporting materials.

² Ibid., Tab, “Local Governments Notified.”

³ Voluntary Settlement of Annexation and Utility Issues Between the Town of Culpeper and the County of Culpeper (hereinafter cited as the “Settlement Agreement,” “Agreement” or “proposed agreement”). See Appendix A for the complete text of the Settlement Agreement.

SCOPE OF REVIEW

The Commission on Local Government is directed by law to review proposed annexations and other local boundary change and transition issues, as well as negotiated agreements settling such matters, prior to their presentation to the courts for ultimate disposition. Upon receipt of notice of such a proposed action or agreement, the Commission is directed to “hold hearings, make investigations, analyze local needs” and to submit a report containing findings of fact and recommendations regarding the issue to the affected local governments.⁴ With respect to a proposed agreement negotiated under the authority of Section 15.2-3400 of the Code of Virginia, the Commission is required to determine in its review “whether the proposed settlement is in the best interest of the Commonwealth.”

As we have noted in previous reports, it is evident that the General Assembly encourages local governments to attempt to negotiate settlements of their interlocal concerns. One of the statutory responsibilities of this Commission is to assist local governments in such efforts. In view of this legislative intent, the Commission believes that proposed interlocal agreements, such as that negotiated by the Town of Culpeper and Culpeper County, should be approached with respect and presumption of their compatibility with applicable statutory standards. The Commission notes, however, that the General Assembly has decreed that interlocal agreements negotiated under the authority of Section 15.2-3400 of the Code of Virginia shall be reviewed by this body prior to their final adoption by the local governing bodies. We are obliged to conclude, therefore, that while interlocal agreements are due respect and should be approached with a presumption of their consistency with statutory standards, such respect and presumption cannot be permitted to render our review a *pro forma* endorsement of any proposed settlement. Our responsibility to the Commonwealth and to the affected localities requires more.

GENERAL CHARACTERISTICS OF THE TOWN, THE COUNTY, AND THE AFFECTED AREAS

Town of Culpeper

The Town of Culpeper was established in 1759 by the Virginia House of Burgesses as the Town of Fairfax. In 1870, the General Assembly changed the name to Culpeper.⁵ The Town is served by rail and four U.S. Highway routes and is the center of commerce and government in Culpeper County.⁶ The Town of Culpeper’s population increased from 9,664 to 16,379 persons, or by 69.48%, between 2000 and 2010. Based on its land area of 6.719 square miles and the 2010 population, the Town has a population density of 2,437.71 persons per square mile.

⁴ Section 15.2-2907(A), *Code of Virginia*.

⁵ “Historical Timeline,” Museum of Culpeper History, accessed October 24, 2011, www.culpepermuseum.com/timeline.htm.

⁶ Town of Culpeper, *Town of Culpeper Comprehensive Plan* (hereinafter cited as *Town Comprehensive Plan*), September 14, 2010, p. 91.

The population of the Town is younger and less wealthy than the State as a whole. As of 2010, the median age of Town residents was 31.9 years, compared with 37.5 for Virginia as a whole, and the percentage of the population that was age 65 or older was 10.0%, compared to 12.2% for Virginia.⁷ With regard to income, the Census estimated that, in 2009, the Town's per capita income was \$24,999, which is 79.1% of the statistic for the Commonwealth as a whole (\$31,606).⁸ In addition, unemployment in the Town increased from 7.4% in FY2009 to 8.0% at the end of FY2010,⁹ which is higher than the statewide average of 7.0%.¹⁰

In terms of the Town's physical development, recent land use data indicate that 30.21% of the land area is devoted to residential uses, 12.77% to commercial enterprise, 6.40% to industrial activity, 17.18% to public or semi-public uses and 10.28% to public rights-of-way. This leaves about 23.16% (1,008 acres) of the Town as undeveloped agricultural land or open space. Of this undeveloped land, 104.45 acres are inhibited by floodplains or steep slopes. Exclusive of this land affected by major environmental constraints, the jurisdiction retains approximately 903.55 acres, or 20.76% of its total land area, in parcels that are vacant and suitable for development.¹¹

County of Culpeper

Culpeper County was established in 1749 from territory that was previously part of Orange County.¹² Between 2000 and 2010, the County's population increased from 34,262 to 46,689, or by 36.27%. On the basis of the 2010 population and an area of 379.23 square miles, the locality has a population density of 123.12 persons per square mile.

With respect to the characteristics of its population, Culpeper County is demographically older and less affluent than the State as a whole, but, when compared to the Town, the County's residents are older and more affluent. The 2010 median age of County residents was 38.2 years, slightly more than the statewide median age (37.5). Moreover, the percentage of its populace age 65 and over was 12.2, which was exactly the same as the rate for the State overall.¹³ Regarding income, the 2009 estimated per capita income was \$26,707, or 84.50% of the comparable figure for the entire State (\$31,606).¹⁴ In addition, unemployment in the County decreased from 8.3% in FY2009 to 8.0% in FY2010, which is comparable to the Town's unemployment rate but higher than the state average of 7.0%.¹⁵

With regard to the nature of its economy, employment data indicate that, between 2000 and 2010, the number of nonagricultural wage and salary employment positions in the County increased from 13,008 to 14,504, or by 11.50%, significantly lower than the 36.27% increase in population experienced in the

⁷ U.S. Department of Commerce, Bureau of the Census, Census 2000, Summary File 1; Census 2010, Summary File 1.

⁸ U.S. Department of Commerce, Bureau of the Census, 2005-2009 American Community Survey.

⁹ Town of Culpeper, Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2010, p. 61.

¹⁰ Bureau of Labor Statistics, June 2010 Local Area Unemployment Statistics, Virginia, Statewide.

¹¹ Joint Notice, Tab, "Best Interests of the Parties," pp. 48-50.

¹² Salmon, Emily J. and Edward D.C. Campbell Jr., The Hornbook of Virginia History, 4th ed. (Richmond: Library of Virginia, 1994), p. 163.

¹³ U.S. Department of Commerce, Bureau of the Census, Census 2000, Summary File 1; Census 2010, Summary File 1.

¹⁴ U.S. Department of Commerce, Bureau of the Census, 2005-2009 American Community Survey.

¹⁵ County of Culpeper, Culpeper Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2010, p. 120.

same period.¹⁶ This disparity indicates that a considerable number of new residents commute outside of the County for employment.

Between 2002 and 2007, the market value of agricultural products produced in the jurisdiction decreased from \$36.7 million to \$27.1 million, a decline of 26%. Despite the population growth and losses in agricultural activity, as of 2007, almost half (45.89%) of the county's land remained occupied by farms.¹⁷

Areas Proposed for Annexation

First Boundary Adjustment

The proposed agreement would incorporate three areas into the Town of Culpeper, referred to as the First Boundary Adjustment Areas (FBAAs), at midnight on June 30 following the entry of the order by the Special Court. These areas consist of a total of 302.2 acres and, as of 2010, contained an estimated population of 239 persons. In addition, based on 2010 assessed values, these areas included \$95.1 million in total assessed real estate and tangible personal property values. The FBAAs contain 0.12% of the County's total land area, 0.51% of its population, and 1.61% of its total 2010 assessed real estate and tangible personal property values. Based on the total area and the 2010 population estimate, the FBAAs have a population density of 506 persons per square mile, or slightly greater than four times that of Culpeper County overall (123.12 persons per square mile).¹⁸

With respect to current development, the FBAAs contain two residential concentrations and a significant commercial area.¹⁹ According to the most recent land use data, approximately 23.5% of the FBAAs are devoted to residential development, 28.7% to commercial and industrial activity, 1.2% to public and semi-public uses and 8.6% to public rights-of-way, leaving 38.0% (114.98 acres) remaining vacant or engaged in agricultural production.²⁰ Similar to vacant property within the current Town limits, some of the undeveloped land in the area proposed for immediate annexation has environmental constraints (e.g., location within the 100-year flood plain, water supply protection areas or steep slopes) which reduce their development potential.²¹ In sum, although the area proposed for immediate annexation contains some vacant land, it also contains established focal points of development with some growth potential.

Future Boundary Adjustments

The proposed agreement would also allow the Town of Culpeper to annex by ordinance additional territory in Culpeper County, within areas designated by the agreement as Future Boundary Adjustment

¹⁶ Virginia Employment Commission, Quarterly Census of Employment and Wages; 2000 and 2010 (Online database), <https://www.vawc.virginia.gov>.

¹⁷ Culpeper County, Culpeper County Comprehensive Plan 2010 (hereinafter cited as County Comprehensive Plan), p. 5-5.

¹⁸ Joint Notice, Tab "Best Interests of the Parties," pp. 15-16.

¹⁹ Ibid., p. 4.

²⁰ Joint Notice, Tab "Best Interests of the Parties," pp. 51-52.

²¹ Carter Glass, IV, Counsel for the Town of Culpeper, email to Commission on Local Government staff, dated September 23, 2011. County staff estimates that only about 14 to 19 acres of the vacant land in the FBAAs are affected by environmental constraints.

Areas (hereinafter referred to as “Future Areas”), subject to certain criteria specified in the agreement.²² Those areas, situated to the north, east and south of the Town’s current corporate limits, contain approximately 4,913 acres of territory and have a 2010 estimated population of 1,651. According to the most recent land use data, 6.26% of the Future Areas are devoted to residential development, 11.10% to commercial enterprise, 11.09% to public, semi-public or miscellaneous uses and 9.15% to public rights-of-way, with 62.4% of the area (3,066 acres) remaining vacant or engaged in agricultural production. According to County staff, minimal areas of the vacant or agricultural property contain environmental constraints to development such as floodplains or steep slopes.²³ Though the Future Areas are largely vacant or agricultural at present, there is some residential and commercial development scattered throughout the areas.

PUBLIC FINANCE PROFILES

Town of Culpeper

Short-Term Financing and Capital Structure

Short-Term Financing. Two methods by which to analyze a locality’s short-term financial health are its current ratio and cash ratio. In FY2010, the Town’s current ratio²⁴ was 4.04, which means they have \$4.04 in short-term assets – such as cash, receivables and inventory – for every \$1.00 in short-term liabilities – such as payables and payroll costs. The Town’s cash ratio²⁵ was 88.5% in FY2010, which indicates a very liquid position because cash and cash equivalents comprise a majority of short-term assets. These two indicators illustrate that the Town can easily meet its short-term obligations.

Unreserved fund balance is an indicator of a locality’s ability to meet unforeseen short-term needs. According to the Town’s fund balance policy, the benchmark for its minimum level of unreserved fund balance is 15% of expenditures, and the optimal level is 40%.²⁶ According to the Town’s FY2010 Comprehensive Annual Financial Report, the unreserved fund balance in the general fund was 34.2% of expenditures.²⁷ While this is short of the optimal level, it still shows that the Town has the funds on hand to meet its short-term obligations.

The Town’s policy also states that the minimum level of unreserved fund balance in the enterprise fund is 100% of operating expenses, with the optimal level at 200%.²⁸ Total unrestricted funds in the Town’s

²² Settlement Agreement, Articles III and IV. The Future Areas are the portions of the County-designated Water and Sewer Service Area (WSSA) that are not within the Technology Zone and were not included in the FBAAs. The WSSA boundaries can be adjusted unilaterally by the County, subject to certain criteria and specific parcels in the Technology Zone can be annexed if not used for technology or industrial uses or if the County takes official action agreeing to such. To be eligible for incorporation as a Future Boundary Adjustment, the property must meet certain density and dimensional requirements set forth in the agreement.

²³ Joint Notice, Tab “Best Interests of the Parties,” pp. 14, 15 and 53 and Glass, email to Commission staff, dated September 23, 2011.

²⁴ The current ratio is computed as current assets divided by current liabilities. It is a measure of short-term liquidity. See Appendix B, Town of Culpeper Supplemental Table 6.

²⁵ The cash ratio is computed as cash and cash equivalents divided by current assets. It shows the percentage of “near-cash” assets among all short-term assets. See Appendix B, Town of Culpeper Supplemental Table 6.

²⁶ Town Response, Fund Balance Policy.

²⁷ Town of Culpeper, Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2010, p. 14,16. See Appendix B, Town of Culpeper Supplemental Tables 1-6 for complete analysis.

²⁸ Ibid.

enterprise fund equal 169.4%²⁹ of operating expenses. While this is in line with Town benchmarks, it should be noted that the electric fund portion of enterprise funds maintains an unrestricted fund balance of just 25.8%,³⁰ which is well short of the minimum. It is also important to highlight that, after dropping to a low of 107.3%³¹ in FY2008, the percentage returned to 166.6%³² in FY2009.

A review of the statements of activities of governmental and enterprise funds paint a slightly different picture. General fund revenues have been exceeded by expenditures in each of the last five fiscal years. These net losses illustrate the Town's need for additional revenues. In addition, operating income of the enterprise fund was negative from FY2006-FY2009 before reversing in FY2010. After recent \$27 million in expenditures out of the wastewater fund, the Town anticipates that costs will be covered by revenues within the next 5 years.³³

Capital Structure. Capital structure illustrates how much debt a locality is using to accumulate its assets. The Town has been using long-term debt as a means of financing the bulk of its major expenditures. Debt has been used to finance the construction of a new police building, purchase of vehicles and equipment, water and wastewater capital projects, public works improvements, light and power improvements, road improvements, and park projects.³⁴ In FY2010, total debt represented 39.2% of total assets; however, long-term debt represented 31.3% of total assets.³⁵ Since 2006, the Town's capital structure has become more leveraged. In FY2006, total debt made up just 22.1% of total assets, but it has increased in every year since.³⁶ While the Town's debt level has increased over the last five years, it still maintains a favorable credit rating.

County of Culpeper

Short-Term Financing and Capital Structure

Short-Term Financing. As stated earlier, the current ratio and cash ratio can help to analyze a locality's short-term financial position. The County's current ratio for FY2010 was 3.22.³⁷ This was a large increase over its FY2009 current ratio, which was 1.67.³⁸ The increase in the current ratio was due to a decrease in the current portion of the County's long-term debt. Meanwhile, their cash ratio in FY2010 was 73.0%.³⁹ These ratios indicate that the County is increasing its ability to meet its short-term obligations.

²⁹ See Appendix B, Town of Culpeper Supplemental Table 6.

³⁰ Town of Culpeper, Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2010, p. 18-19. This figure was computed by dividing the unrestricted net asset amount from the Electric Fund (\$2,198,646) by the operating expenses of the Electric Fund (\$8,507,692).

³¹ See Appendix B, Town of Culpeper Supplemental Table 6.

³² Ibid.

³³ Chris Hively, Director of Environmental Services for the Town of Culpeper, email to Commission staff dated September 19, 2011.

³⁴ Town Response, p 5-6.

³⁵ See Appendix B, Town of Culpeper Supplemental Table 1.

³⁶ Ibid.

³⁷ County of Culpeper, Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2010, p. 15. See Appendix C, County of Culpeper Supplemental Tables 7 and 12 for complete analysis.

³⁸ County of Culpeper, Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2009, p. 15. See Appendix C, County of Culpeper Supplemental Tables 7 and 12 for complete analysis.

³⁹ See Appendix C, County of Culpeper Supplemental Table 12.

The County's undesignated fund balance in FY2010 in the general fund represents 29.1% of the fund's expenses.⁴⁰ This is a decrease from FY2006 when the percentage was 50.6%.⁴¹ The decrease is mainly due to increased educational expenses, which began in FY2008.⁴² Meanwhile, the enterprise fund has experienced operating losses in each of the past five fiscal years.⁴³

Capital Structure. In FY2006, the County's debt-to-assets ratio was 90.3%.⁴⁴ The main reason for this was a negative unrestricted net asset balance, which was due to the issuance of \$61.7 million of school board debt. While nominal debt levels have remained mostly steady since then, increases in net assets decreased the County's debt-to-assets ratio to 48.9% in FY2010.⁴⁵ The increases in net assets are a combination of increased investments in capital assets – mainly in FY2007 and FY2008 – and increases in their unrestricted net assets. As a result, the County's capital structure over the last five years has become significantly less leveraged.

STANDARD FOR REVIEW

As a previous section of this report has noted, the Commission on Local Government is charged with reviewing proposed interlocal settlements negotiated under the authority of Section 15.2-3400 of the Code of Virginia to determine whether such settlements are “in the best interest of the Commonwealth.” In our judgment, the State's interest in this and other proposed interlocal agreements is fundamentally the preservation and promotion of the general viability of the affected localities. In this instance, the Commission is required to review an interlocal agreement which provides for: (1) an immediate boundary adjustment by which specified territory will be incorporated into the Town; (2) optional boundary adjustments in the future if certain criteria are met; (3) a waiver of the Town's annexation and city status rights during the term of the agreement, which will be a minimum of 30 years; (4) the provision of water and wastewater services by the Town within a County-designated service area adjacent to the Town's boundaries; (5) the construction by the Town of a sewer line to serve a County high school; (6) the resolution of related utility issues between the Town and the County; (7) a reduction in the Town's business, professional, and occupational license tax rates; and (8) the creation of a joint advisory planning body. A proper analysis of the proposed Town of Culpeper-Culpeper County settlement agreement, as mandated by statute, requires consideration of the ramifications of these provisions with respect to the current and future viability of the two jurisdictions.

Interests of the Town of Culpeper

Land for Development

As indicated previously, the Town of Culpeper currently has within its boundaries approximately 1,008 acres of undeveloped land, which constitutes 23.16% of the Towns' total land area. Excluding property

⁴⁰ See Appendix C, County of Culpeper Supplemental Table 12.

⁴¹ *Ibid.*

⁴² See Appendix C, County of Culpeper Supplemental Table 9.

⁴³ See Appendix C, County of Culpeper Supplemental Table 11.

⁴⁴ See Appendix C, County of Culpeper Supplemental Tables 7 and 12.

⁴⁵ *Ibid.*

situated within the 100-year floodplain and wetlands, the Town has 903.55 acres, or 20.76%, of its total land area vacant and generally amenable to development.⁴⁶

The Town experienced rapid growth during the last decade, consuming large amounts of vacant property. Between 2000 and 2010, the amount of vacant or agricultural land decreased by approximately 938 acres. In other words, 48.20% of the Town's 2000 vacant land inventory was consumed in the ensuing ten years.⁴⁷ During that same period, the population of the Town increased from 9,664 to 16,379, or by 69.48%.

While the incorporation of the FBAs would immediately bring within the Town an additional 114.98 acres of vacant land for possible future development, the provisions within the agreement for future boundary adjustments provide opportunities for the incorporation of additional territory. As stated earlier, there are 3,066 acres of vacant or agricultural land in the Future Areas, which is over three times greater than the amount that is situated within the existing Town's limits. As the agreement is structured, each part of the Future Areas should be developed to a certain density prior to annexation.⁴⁸ While this provision will not substantially increase the amount of available vacant land in the Town, it will secure the Town's ability to extend its boundaries into these areas after significant development occurs. Additionally, the agreement provides for a "Joint Planning Advisory Body," with County and Town representation, which will be responsible for considering planning issues that are referred to it by either jurisdiction and for making advisory recommendations to the governing bodies. While the specific responsibilities of this body have not yet been determined, the planning body could exert influence on how land develops prior to annexation of Future Areas and should benefit other cross-jurisdictional planning efforts and overall intergovernmental relations.⁴⁹ In our judgment, the proposed agreement will provide the Town of Culpeper access to additional land, both developed and undeveloped, and provide better opportunities to coordinate planning for such land's orderly development.

Fiscal Assets and Public Service Liabilities

Fiscal Assets. The Town of Culpeper, which is the major service and employment center in Culpeper County, has experienced growth in its property values comparable to Culpeper County as a whole. Based upon assessment at 100% of fair market value, real property values (exclusive of those of public service corporations) increased in the Town from \$817.7 million in FY2006 to \$1,287.5 million in FY2010, or by 57.46%.⁵⁰ During the same span of years, such values in Culpeper County overall grew from \$3,289.0 million to \$5,169.8 million, or by 57.19%.⁵¹

⁴⁶ Joint Notice, Tab, "Best Interests of the Parties," pp. 48-50. While such factors are not absolute barriers to development, they do constitute major impediments to development.

⁴⁷ Ibid., p.48 and Town of Culpeper, Town Comprehensive Plan, March 12, 2002, p. VIII-5.

⁴⁸ Settlement Agreement, Section 3.4.

⁴⁹ Ibid., Article XIII.

⁵⁰ Town of Culpeper, Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2010, p. 55.

⁵¹ County of Culpeper, Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2010, p. 112.

While the Town's real estate values increased on par with those of the County, a recent fiscal concern has been the development of new commercial uses beyond the Town's corporate limits to the northeast along U.S. Route 29.⁵² The proposed agreement will permit the Town to immediately annex this newly developed area as well as two other generally vacant tracts that are intended for commercial use.⁵³

The total FY2010 fair market value of real estate in the three areas proposed for immediate annexation was \$85.9 million, which, upon annexation, will increase the Town's total of such values by 6.67%. At the current rate of \$0.13 (per \$100 of value) levied by the Town on real estate, the FBAs will generate an additional \$111,625 in real estate taxes each year. In addition, the FBAs contain tangible personal property valued at \$9.2 million and machinery and tools valued at \$827,334 in FY2010.⁵⁴ At the Town's current rates of \$1.00 (per \$100 of value) for tangible personal property and \$0.80 (per \$100 of value) for machinery and tools,⁵⁵ the FBAs will generate an additional, \$92,487 in personal property taxes and \$6,619 in machinery and tools taxes annually.

In addition, several restaurants are situated in the Montanus area of the FBAs. These establishments are not currently subject to a local meals tax as part of the unincorporated portion of the County; however, upon annexation, they will be subject to the Town's 5% food and beverage tax, which is estimated to generate \$600,000 each year. The Town also charges a 5% occupancy tax; however, at present, there are no hotels located in the FBAs. Further, to encourage business development, the Town has agreed to reduce its business, professional and occupational license (BPOL) tax rate by 20% during the first year of the agreement, resulting in an estimated loss of \$200,000 in revenues.

In sum, based on FY2010 data and taking into consideration the aforementioned BPOL tax rate reduction, the Town of Culpeper estimates that the incorporation of the FBAs will increase the Town's local-source revenue and state aid by \$1.1 million annually, or by 9.71%.⁵⁶ While it can be assumed that the Town would add to its taxable base if it were to annex additional territory within the Future Areas, an estimate of the net revenues that would be generated cannot be computed at this time.

Public Service Liabilities. While the incorporation of the immediate annexation areas into the Town of Culpeper will provide the Town with additional revenue and the potential for future economic growth, it will concurrently present the municipality with increased public service responsibilities. The proposed agreement will require the Town to extend its general governmental services to the citizens in the areas annexed at the same level as currently provided to those within the municipality. In terms of these additional public service responsibilities, the Town estimates, based on FY2010 figures, that it will be required to expend an additional \$631,395 annually from its general fund. As noted previously, the Town of Culpeper estimates that the incorporation of the FBAs will increase the Town's local-source

⁵² Joint Notice, Tab, "Best Interests of the Parties," p. 45.

⁵³ County Comprehensive Plan, "Future Land Use," Map 11.3 and Joint Notice, Exhibit 1.

⁵⁴ Joint Notice, Tab "Best Interests of the Parties," p. 16.

⁵⁵ Ibid., p. 17.

⁵⁶ Settlement Agreement, Article XII; Joint Notice, p. 58, "Estimated Revenues & Expenditures for First Boundary Adjustment Areas, General Fund," revised September 6, 2011; and Comparative Report of Local Government Revenues and Expenditures for the Fiscal Year Ended June 30, 2010, Commonwealth of Virginia, Auditor of Public Accounts, Exhibit A. According to the State Auditor's report, in FY2010, local source revenue and state aid to the town totaled \$11,461,603.

revenue and state aid by \$1.1 million annually. When projected expenses are subtracted from projected revenues, the Town estimates a net increase in annual revenues of \$481,568.⁵⁷

With respect to the impact of the proposed annexation on the Town's enterprise fund, several points merit note. First, if the County makes a request pursuant to the agreement, the Town is obligated to construct a sewer line extension to Eastern View High School, which is currently serviced by a package sewer treatment plant operated by the County. The Town estimates that the construction of the new line will cost \$2 million.⁵⁸ As a point of reference, in FY2010, the Town's total capital project expenses equaled \$2,675,162.⁵⁹

Also, the Town would be obligated to provide long-term system improvements to increase water and sewer capacity to specified levels.⁶⁰ In order to assist with these improvements, the County requested that the Virginia Department of Environmental Quality transfer 1.5 million gallons per day (MGD) of the County's nutrient allocation to the Town's wastewater treatment facility, clearing an administrative hurdle to expansion of the sewage treatment plant.⁶¹ In addition, the County has agreed to assist the Town in developing new raw water sources as may be necessary to ensure that 1.5 MGD of water capacity is available for the County-designated Water and Sewer Service Area (WSSA).⁶²

Following the effective date of the agreement, all out-of-town water and sewer customers will be relieved of paying the higher rates and fees imposed by the Town on nonresidents. As a consequence, the Town estimates that the initial annexation will reduce the Town's enterprise fund's annual revenues by approximately \$351,250. In anticipation of the approval of the proposed agreement, the Town increased its utility rates and fees by 5% effective July 1, 2011 in order to offset this loss of revenue.⁶³ Finally, the agreement guarantees the Town exclusive rights to provide water and wastewater services within the WSSA for at least 30 years. As the area develops, revenues should increase for the utility system, which, along with existing reserves, should be sufficient to finance the provision of water and sewer services as required by the agreement.⁶⁴

Interests of the Areas Proposed for Annexation

Community of Interest

One of the factors appropriate for consideration in the analysis of proposed voluntary settlement agreements is the strength of the community of interest that joins the area proposed for annexation to the adjacent municipality. In this instance, the evidence suggests that there exists a significant degree of interdependence between the areas subject to immediate and future annexation to the adjacent municipality.

⁵⁷ Joint Notice, p. 58, "Estimated Revenues & Expenditures for First Boundary Adjustment Areas, General Fund," revised September 6, 2011.

⁵⁸ Settlement Agreement, Section 10.3 and Joint Notice, p.61.

⁵⁹ Town of Culpeper, Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2010, p. 16.

⁶⁰ Settlement Agreement, Section 10.1.

⁶¹ Ibid., Section 15.2 and Glass, letter to Commission on Local Government staff (hereinafter cited as "Town Response"), September 1, 2011, p. 8.

⁶² Settlement Agreement, Section 10.2.

⁶³ Joint Notice, Tab "Best Interests of the Parties," p. 60

⁶⁴ Ibid., p. 58 and Settlement Agreement, Sections 7.2 and 11.1.

First, the Town is the source of public water and sewer services to much of the area, and the County has designated the FBAs and Future Areas as appropriate areas to be served by the Town's water and sewer systems.⁶⁵ Other entities serving the areas proposed for annexation that also serve the existing Town include the volunteer fire department, the County Library and Culpeper County Public Schools. In addition, the Town's police department currently provides assistance to the area through a mutual aid agreement.⁶⁶

Further, the Town of Culpeper is a major focal point of commercial activity serving the area proposed for annexation as well as the overall vicinity. In 2007, 58.45% of the business establishments located within Culpeper County were located within the town limits.⁶⁷

Finally, the immediate annexation area has an urban character and service needs which more closely parallel those of the Town than those of the outlying portions of the County. To some degree this has been intentional through long-range planning efforts by the County to direct growth toward areas where urban services are readily available.⁶⁸ As a result of this planned growth, the development that has occurred in the immediate annexation areas is an extension of development patterns that originate within the Town.

For the reasons cited above, the Commission finds that the area proposed for annexation has a strong relationship with the existing Town of Culpeper, comprising a noteworthy community of interest.

Need For Urban Services

The 0.472 square miles of territory which are immediately subject to annexation by the Town of Culpeper under the terms of the agreement are estimated to contain a population of 239 persons, giving the area, as noted previously, a population density of about 506 persons per square mile. While approximately 38% of the FBAs remain vacant or in agricultural use, the areas also include significant residential and commercial development. With respect to its prospective future development, the current Culpeper County comprehensive plan, which was based upon an in-depth analysis of the County's needs and projected growth, calls for development to occur within the areas proposed for immediate and future annexation.⁶⁹ Thus, as the areas subject to potential incorporation into the Town are anticipated to experience development, they will increasingly need the urban services provided by the Town.

Water and Sewer Service. The Town of Culpeper's water treatment plant, which uses Lake Pelham as its raw water source, can receive and treat 4.0 MGD. In 2010, the water system consumed an average of 2.0 MGD, or about half of its capacity. With respect to its storage facilities, the Town has five storage

⁶⁵ County Comprehensive Plan, p. 11-15 and Joint Notice, Tab "Best Interests of the Parties," pp. 33-37.

⁶⁶ Ibid., p. 63.

⁶⁷ U.S. Department of Commerce, Bureau of the Census, 2007 Economic Census. The Census revealed that, of the 657 business establishments situated in the County as of 2007, 384 were located within the Town limits.

⁶⁸ County Comprehensive Plan, p. 11-15, Maps 11.3 and 11.4. The County's Future Land Use Plan designates much of the County as appropriate for lower density uses, whereas most of the areas intended for more intense uses are adjacent to the Town.

⁶⁹ Ibid.

tanks which collectively hold 2.54 million gallons of treated water. The distribution system serves 6,490 connections, with 103 of those located within the FBAs and 419 in the Future Areas.⁷⁰

The Town also owns and operates a sewage collection system that serves 6,476 customers, 102 of which are located within the FBAs and 419 of which are situated in the Future Areas.⁷¹ Sewage collected by the Town's system is treated at the Town's wastewater treatment plant, which has a rated capacity of 6.0 MGD. The plant currently treats an average daily flow of 2.8 MGD, or just under half of its capacity.⁷²

Currently, water and sewer service arrangements in the WSSA are complex, with some out-of-town customers served directly by the Town and some served by the County through a wholesale contract with the Town. In addition, the County operates a small sewage treatment plant that provides service to Eastern View High School. Many of the developments outside of the Town are served under contractual agreements that would reserve the option for the County to assume ownership of transmission mains and begin providing retail sewer service.⁷³ This disjointed arrangement of service delivery has made planning for growth and future utility system needs more difficult. The agreement contains several provisions that would improve the delivery of water and sewer services in the areas proposed for annexation.

First, the agreement eliminates the previously described array of fragmented service delivery arrangements by making the Town the exclusive provider of water and sewer service in the WSSA for the duration of the agreement.⁷⁴ Also, the County would retain ownership of its water mains and sewer collectors until such time as that portion of the WSSA is annexed, when ownership of the affected utility lines would transfer to the Town.

Second, the agreement provides for a unified rate and fee structure for both in-Town and out-of-Town water and sewer customers so that out-of-Town customers will no longer pay 50% more than in-Town customers. As a result, the Town estimates that it will initially lose approximately \$310,000 in enterprise revenues.⁷⁵ New tap fees will recover some of these costs; however, the Town could still experience losses to the enterprise fund over time. As mentioned previously, in anticipation of the approval of the proposed agreement, the Town recently increased its utility rates and fees in order to address this potential shortfall.⁷⁶

⁷⁰ Joint Notice, Tab "Best Interests of the Parties," pp. 22, 33 and 34. In addition to the water distribution customers noted, the County provides water to five customers in the proposed annexation areas. Also, the town provides water service to two customers within the Technology Zone, which is not eligible for incorporation unless certain criteria are met.

⁷¹ Ibid., p. 37. The County's wastewater system also serves about four customers located within the FBAs or Future Areas. In addition, the Town's sewer system has two customers located within the Technology Zone.

⁷² Ibid., p. 35.

⁷³ Ibid., p. 7-8.

⁷⁴ Settlement Agreement, Section 6.4. County sewer customers served by the Greens Corner Wastewater Treatment Plant will not become Town customers until such time as the Town connects those customers to the Town's sewer system via the sewer line extension discussed in Section 10.3 of the Agreement.

⁷⁵ Joint Notice, Tab "Best Interests of the Parties," p. 59. The Town estimates losses in the water fund of \$150,000 and losses of \$160,000 in the wastewater fund.

⁷⁶ Joint Notice, Tab "Best Interests of the Parties," p. 60

Third, the agreement obligates the Town to permit connections to its water and sewer system within the entire WSSA, up to theoretical service capacities of 1.5 MGD for water 1.5 MGD for wastewater.⁷⁷ Though this commitment will require some expansion of the Town's water supply and treatment capacities, it will also ensure that the Future Areas will have sufficient utility service for anticipated growth.

Solid Waste Collection and Disposal. The Town of Culpeper provides weekly solid waste collection services to its residents and small businesses, free of charge. In addition, seasonal collection of leaves and Christmas trees is provided in residential areas. The Town disposes of its refuse at Culpeper County's transfer station, from where it is then hauled to a landfill outside of the County.⁷⁸

Culpeper County does not provide any solid waste collection services to its residents and businesses. County residents can dispose of their household waste at County-operated trash collection sites or contract with a private entity for garbage collection.⁷⁹

Upon annexation, the Town will extend its solid waste collection and disposal services to the annexed area. Residents as well as small businesses in those areas should benefit from the Town's solid waste collection service. The extension of the Town's solid waste collection services to newly-annexed areas will reduce costs for those who currently pay for garbage collection by a private contractor and provide a convenience for residents who currently haul their solid waste to the County's collection sites. The general availability of publicly financed solid waste collection services promotes the use of that service, reduces the incidence of illegal disposal and has a beneficial effect on a community.

Planning, Zoning, and Subdivision Regulation. The Town of Culpeper conducts its public planning efforts with the assistance of a planning commission and guided by a comprehensive plan that was adopted in 2010. With respect to development controls, the Town has zoning and subdivision ordinances to assist in the management of its physical development. Further, the Town's current zoning ordinance was recently updated to provide higher development standards relative to landscaping and signage.⁸⁰ Within the core historic area of the Town, an architectural review board supplements the development standards with historic preservation measures.⁸¹ Subdivision requirements in the Town mandate the installation of curbs and gutters, sidewalks and streetlights in most situations.⁸² The zoning ordinance also contains provisions authorizing the use of conditional zoning, which enables the locality to mitigate the impact of development on public resources and concerns. Voluntary cash proffers are also accepted as part of the conditional zoning process to help offset needs that have been identified in the Town's adopted capital improvements program, which was last updated in 2011.⁸³ At present, the

⁷⁷ *Ibid.*, Sections 6.1 and 6.2.

⁷⁸ *Joint Notice*, Tab "Best Interests of the Parties," p. 41.

⁷⁹ *County Comprehensive Plan*, p. 6B-11.

⁸⁰ *Joint Notice*, Tab "Best Interests of the Parties," p. 40.

⁸¹ Town of Culpeper, *Code of the Town of Culpeper*, Chapter 27, Zoning, Article V, Historic District.

⁸² *Joint Notice*, p. 42.

⁸³ Town of Culpeper, *Code of the Town of Culpeper*, Section 27-381 and Town of Culpeper, *Capital Improvements Plan*, June 8, 2010.

Town has a staff of five persons to assist in the administration and management of its planning and land development control efforts.⁸⁴

The County also utilizes a planning commission and a comprehensive plan to help guide its development.⁸⁵ The County's current comprehensive plan, adopted in 2010, is supplemented by a five-year capital improvements plan that was updated in 2011.⁸⁶ In addition, the County also utilizes zoning and subdivision ordinances and has authorized conditional zoning.⁸⁷ With respect to development standards, the County has established an architectural review board that is tasked with protecting the aesthetic character of major corridors that lead into the Town.⁸⁸ Within new subdivisions, the county does not have specific requirements for the installation of amenities such as curbs and gutters, sidewalks and streetlights but instead follows the guidelines set forth by the Virginia Department of Transportation.⁸⁹ Though the County does not have a formal policy regarding the acceptance of cash proffers, it has historically accepted such payments.⁹⁰ The County maintains a staff of six persons for the management and implementation of its various planning and development control activities.⁹¹

Following the effective date of an annexation, the Town will extend its comprehensive planning and its other regulatory instruments to the areas annexed. The Town Code contains provisions for transitional zoning categories for newly annexed areas, and the Town has indicated that it has already begun considering appropriate classifications for the immediate annexation area.⁹² Although both the Town and County have made commitments for the planning and control of development within their respective borders, in our judgment, the Town has a more effective set of tools for guiding urban development. The area proposed for annexation will benefit from the application of the Town's development control policies.

Crime Prevention and Detection. Since the law enforcement activities of Virginia's towns supplement those provided by a county Sheriff's office, the proposed annexation by the Town of Culpeper will have the effect of providing additional and more intense law enforcement services in the areas annexed. The Town presently has 41 full-time sworn law enforcement personnel, 25 of whom are assigned patrol responsibility. This staffing level is sufficient to give the Town one patrol officer per 655 residents. In terms of patrol activity, the Town maintains officers on its streets 24-hours per day, with a minimum of three patrol officers on duty at all times. This staffing arrangement provides the Town with patrol coverage of at least one officer for each 2.24 square miles of territory.⁹³ Another measure of the intensity and adequacy of patrol service in a locality is the number of calls for service borne by each law

⁸⁴ Town Response, p. 1.

⁸⁵ Ibid., p. 1-2.

⁸⁶ County of Culpeper, Capital Improvements Program, Fiscal Years 2012-2016, May 3, 2011.

⁸⁷ County of Culpeper, Code of the County of Culpeper, Appendix A, Zoning Ordinance, Article 29, Conditional Zoning and Appendix B, Subdivision Ordinance.

⁸⁸ Ibid., Appendix A, Zoning Ordinance, Article 30, Entrance Corridor Overlay District and Article 30A, Architectural Review Board.

⁸⁹ Roy Thorpe, Culpeper County Attorney, email to Commission on Local Government staff, dated October 19, 2011.

⁹⁰ Culpeper County's Responses to August 5, 2011 Letter from Commission on Local Government (hereinafter cited as the "County Response"), p. 1 and Commission on Local Government, Report on Proffered Cash Payments and Expenditures By Virginia's Counties, Cities and Towns, FY2001-FY2011.

⁹¹ County Response, p. 2.

⁹² Town of Culpeper, Code of the Town of Culpeper, Section 27-30 and Joint Notice, Tab "Best Interest of the Parties," p. 41.

⁹³ Glass, email to Commission on Local Government staff, dated October 19, 2011.

enforcement position. The data indicate that, during calendar year 2010, each patrol officer in the Town was responsible for an average of 603 calls for service. The average patrol staffing level in the Town and the incidence of activity requiring police response permitted the police department to respond to calls for service in an average of 8.4 minutes.⁹⁴ As mentioned previously, the County and Town law enforcement agencies cooperate with a mutual aid agreement, whereby each agency provides support to the other upon request.

The Culpeper County Sheriff's Office, which is headquartered in the Town, has primary law enforcement responsibility for areas outside of the Town limits.⁹⁵ The Office has 49 full-time employees assigned to law-enforcement, 22 of whom are dedicated to patrol responsibility. Therefore, the County (including the Town) has one patrol deputy for every 2,122 residents, or one for every 17.2 square miles. From August 1, 2010 to July 31, 2011, the Office responded to 39,430 calls for service, or 1,792 per patrol deputy.

The Commission has no knowledge of any law enforcement problems within the annexation area; however, given the concentration of commercial activity within the FBAs, a significant demand for service in this area is likely. In fact, in 2010, the Town responded to 252 calls for service within the FBAs.⁹⁶ Therefore, in order to extend its law enforcement services to the areas proposed for immediate annexation, the Town proposes to add one officer and one civilian position.⁹⁷ In our judgment, the extension of the Town's law enforcement services into this area will benefit its residents and businesses and also provide some relief to the County Sheriff's Office.

Public Works. The proposed annexation will result in the application of the Town's policies and procedures for the construction and maintenance of various public works in the annexed areas. The Town of Culpeper's policies and procedures are, in our view, properly designed to meet the needs of urbanizing areas and should be increasingly beneficial to the residents and businesses incorporated into the Town.

First, the Town of Culpeper will assume responsibility for the construction and maintenance of roads in the annexed area, which includes snow removal, street cleaning and grass mowing and right-of-way maintenance. The ability of the Town to schedule and administer the maintenance of its public thoroughfares, as well as an apparent willingness to appropriate and expend local funds for that purpose, will benefit the area. With respect to the latter point, the data indicate that between FY2008 and FY2010, the Town of Culpeper expended approximately \$1.9 million in local funds to improve and maintain approximately 124.26 lane-miles of public roadway within its corporate boundaries.⁹⁸ The proposed immediate annexation will bring into the Town approximately 9.26 lane-miles of roadway

⁹⁴ Town Response, p 11. During 2010, the Town's police department received 15,064 calls for service.

⁹⁵ Joint Notice, Tab "Best Interest of the Parties," p. 38.

⁹⁶ County Response, p. 8.

⁹⁷ Joint Notice, Tab "Best Interest of the Parties," p. 39.

⁹⁸ "Weldon Cooper Public Highway Survey," Virginia Department of Transportation, Local Assistance Division, accessed October 28, 2011, <http://www.virginiadot.org/business/local-assistance-programs.asp>. Between FY2008 and FY2010, the Town reported \$5,877,128 in expenditures for the upkeep of its streets and highways, and, during the same period, \$3,975,506 in maintenance payments were received from the Commonwealth.

eligible for State maintenance payments, and the Town has estimated the cost for such maintenance at \$113,230.⁹⁹

Second, as previously mentioned, the Town currently requires the installation of curbs, gutters and sidewalks in most new developments, whereas the County does not. For existing residential areas without these amenities, the Town has a program whereby it will install curb, gutter and sidewalks subject to certain conditions, including a requirement that property owners bear 50% of the cost.¹⁰⁰ While the proposed agreement does not commit the Town to install these facilities as a consequence of annexation, the Town's policies regarding curb, gutter and sidewalks will be beneficial to the area proposed for annexation.

Finally, the Town of Culpeper funds the installation and operation of streetlights at public expense when it is deemed that the lighting is appropriate and necessary. At present, there are approximately 1,416 publicly funded streetlights within the Town's boundaries. The FBAs currently do not have public streetlights; however, the Town has indicated that it will install additional lighting within this area upon annexation.¹⁰¹ Further, the Town requires streetlights to be installed in all new subdivisions, whereas the County does not have a similar policy.¹⁰² In our judgment, the areas proposed for annexation will benefit from the application of the Town's policies and practices regarding the installation and operation of these facilities.

Fire Protection. The Town and adjacent territory – including the areas proposed for immediate and future annexation – are currently served by the Culpeper County Volunteer Fire Department, which is jointly supported by the Town and County.¹⁰³ Based upon the fire suppression capabilities of the department, along with the specifications of the Town's water system, properties located in the existing Town as well as the areas proposed for immediate annexation are classified "5" by the Insurance Services Office (ISO) in terms of their exposure to fire loss.¹⁰⁴

Since water service is generally available to the developed portions of the immediate annexation areas, existing residents will not experience any change in the level of fire protection as a result of annexation; however, areas that are currently undeveloped should benefit from water line extensions as growth occurs, which will improve the fire suppression capabilities as additional fire hydrants are installed.

Summary of Service Needs

In the preceding sections of this report, the Commission has endeavored to examine the existing and prospective urban service needs of the area proposed for annexation and the ability of the Town of Culpeper to meet those needs. On the basis of the data cited above, the Commission finds that the

⁹⁹ Town Response, p.10.

¹⁰⁰ Joint Notice, Tab "Best Interest of the Parties," p. 42.

¹⁰¹ Ibid.

¹⁰² Town of Culpeper, Facilities Standards Manual, Section 6.710 and Thorpe, email to Commission on Local Government staff, dated October 19, 2011.

¹⁰³ Joint Notice, Tab "Best Interest of the Parties," p. 39.

¹⁰⁴ Thorpe, email to Commission on Local Government staff, dated October 20, 2011.

areas proposed for immediate and future annexation will benefit from the extension of Town services and policies as well as the provisions of the agreement. Further, the Town is capable, in our judgment, of meeting the future needs of those areas as they develop.

Interests of the County of Culpeper

The immediate annexation of the FBAs by the Town will have minimal adverse fiscal impact on Culpeper County. Although the annexation of that area will not affect the County's receipts from any of its property taxes, it will reduce its collections from some of its secondary revenue sources.

Local sales and use taxes are distributed among towns and counties based upon school-age population. As a result of the annexation, the County stands to lose a small share of sales and use tax revenues to the Town. The current estimate of school-age children residing within the FBAs is 45,¹⁰⁵ and the County's estimated loss of local sales tax revenue is \$15,000.¹⁰⁶ In addition, the County will lose approximately \$22,000 in bank franchise tax revenue and another \$1,250 in motor vehicle license tax revenue.¹⁰⁷ In total, the County estimates an annual loss in revenue of about \$38,250, which constitutes an amount equal to only 0.07% of the County's budgeted local source general fund revenue collections in FY2012.¹⁰⁸

Moreover, following annexation, the Town will assume responsibility for providing certain municipal services to the annexed area, most notably water and wastewater services but also law enforcement, street maintenance, planning and development control, which should reduce to some degree the demand on the County's staff and resources. In addition, the proposed immediate annexation and future opportunities for annexation will permit the Town to increase its fiscal potential by expanding its tax base, will assure the municipality of land for future development and will, accordingly, expand the Town's ability to serve the general area. In brief, the enhanced fiscal viability of the Town will be a positive factor in strengthening the economy of the general area, with economic benefits accruing to the citizens of Culpeper County generally.

The agreement contains a provision by which the Town waives its right to initiate any annexation proceedings during the term of the agreement, which will be for a minimum of thirty years and may be extended under certain conditions. In addition, the Town waives its right to initiate any proceedings to make a transition from town to city status while the agreement is in effect.¹⁰⁹ This provision assures the County that the Town will remain a constituent element of that jurisdiction for an extended period of time should the General Assembly allow the current moratorium on town-to-city transition to expire.

Under the terms of the agreement, the Town would be the exclusive provider of water and sewer services in the WSSA. The County would be absolved from the responsibilities of operating water and

¹⁰⁵ County Response, p. 5.

¹⁰⁶ Joint Notice, Tab "Best Interests of the Parties," p. 61.

¹⁰⁷ Ibid.

¹⁰⁸ Joint Notice, Tab "Best Interest of the Parties," p. 61 and County of Culpeper, Adopted Annual Fiscal Plan: July 1, 2011-June 30, 2012, p. 28. Local source general fund revenue for FY2012 was projected to be \$54,743,985.

¹⁰⁹ Settlement Agreement, Sections 5.1 and 11.1.

sewer services in the area as well as providing related capital improvements, except that the County has agreed to assist the Town in developing new raw water sources as may be necessary to ensure that 1.5 MGD of water capacity is available for the WSSA.¹¹⁰

The Department of Environmental Quality, at the County's request, has already transferred a portion of the County's nutrient allocation to the Town, which will assist with future wastewater capacity needs.¹¹¹ The agreement would also allow the County to cease operation of a small wastewater treatment facility that serves a limited number of customers and Eastern View High School because, upon the County's request, the agreement provides that the Town will extend its sewer lines to serve that area, saving the County an estimated \$90,000 in annual operational expenses.¹¹² Finally, the County would retain ownership of all of its utility lines until annexation occurs, which would be beneficial in the event that the County decides to again provide retail service after the completion of the agreement.¹¹³ In our view, these provisions are in the best interest of Culpeper County, as they will ensure that utilities are made available to the County's high growth areas in the most efficient manner by using the Town's established utility resources.

The proposed agreement retains the County's ability to adjust the WSSA's boundaries, subject to certain conditions, allowing the County to continue to plan for appropriate growth at the Town's periphery in addition to influencing the direction in which the Town is able to grow.¹¹⁴ The proposed agreement will restrict the Town from annexing any of the Future Areas until adequate development has occurred, which should prevent the Town from incorporating large rural areas that do not yet need urban services.¹¹⁵ Finally, with respect to economic development interests, the agreement requires the Town to reduce its business, professional, and occupational license taxes and excludes the "Technology Zone," which is intended for high-tech industrial development, from annexation by the Town unless specified criteria are met.¹¹⁶ For these reasons, along with creation of the previously described "Joint Planning Advisory Body," we believe that the agreement will protect the County's land use and economic development concerns.

In sum, the various provisions in the proposed agreement, coupled with the long-term positive impact of the proposed annexation for the general area, are features of the settlement which are, in our judgment, in the best interests of Culpeper County.

Interests of the Commonwealth

The Commission notes that the proposed Town of Culpeper – County of Culpeper agreement is the product of negotiations conducted under a State-established process that encourages the negotiated settlement of interlocal issues. By the establishment of this negotiation process, the State has

¹¹⁰ *Ibid.*, Sections 6.3, 10.1 and 10.2.

¹¹¹ *Town Response*, p. 8.

¹¹² *Settlement Agreement*, Section 10.3 and *Joint Notice*, Tab "Best Interest of the Parties," p. 62.

¹¹³ *Settlement Agreement*, Section 6.5.

¹¹⁴ *Ibid.*, Article IX.

¹¹⁵ *Ibid.*, Sections 3.4, 3.5 and 3.6.

¹¹⁶ *Ibid.*, Article XII and Section 3.2.3.

expressed its desire for local governments to affect a resolution of their interlocal concerns within parameters established by law. This agreement, which constitutes a locally effected reconciliation of the needs and interests of the Town and County, is consistent with the interest of the Commonwealth in the promotion of negotiated settlements.

The principal interest of the State in the resolution of this and all interlocal issues subject to the Commission's review is the preservation and promotion of the viability of the affected local governments. As previous sections of this report have indicated, the provisions in the proposed settlement agreement will afford the Town of Culpeper with an opportunity to extend its boundaries and provide municipal services in areas with high-growth potential, while simultaneously protecting the County's interests. In addition, the agreement provides both jurisdictions with a long term solution to planning and utility needs as the area grows. In sum, the Commission finds that the proposed agreement, negotiated by the governing bodies of the Town and County, is consistent with the interest of the Commonwealth in the promotion and preservation of the viability of Virginia's local governments.

FINDINGS AND RECOMMENDATIONS

In the preceding sections of this report, the Commission has reviewed a proposed voluntary settlement agreement negotiated by the Town of Culpeper and Culpeper County addressing the interests of the two jurisdictions. Based upon that review, we find that the agreement promotes the viability of both local governments and is consistent with the best interests of the Commonwealth. Accordingly, we recommend the court's approval of the agreement. While finding the agreement to be in the best interest of the two jurisdictions and the State, there is a related issue which we are obliged to address.

MINIMUM 30-YEAR ANNEXATION MORATORIUM

The Commission has historically approached provisions for lengthy bans on annexation with reservation. In this instance, the agreement provides for a waiver of annexation and city status rights by the Town during the term of the agreement, which will be for a minimum period of 30 years. The Commission carefully considered the length and indefinite nature of the moratorium on annexation in the context of a complicated, heavily negotiated agreement, which clearly reflects significant compromise by both parties. In resolving its concern, the Commission evaluated, among other factors, the need for the Town to expand its tax base as well as the benefit of replacing the current fragmented provision of utility services with an efficient operation in which the Town acts as the exclusive service provider in the County's Water and Sewer Service Areas. The Commission concludes that, on balance, the lengthy and indefinite moratorium is acceptable under these specific circumstances because the agreement settles major issues facing both jurisdictions and should work to enhance cooperation between them.

CONCLUDING COMMENT

The Commission on Local Government acknowledges the considerable effort devoted by officials of the Town of Culpeper and Culpeper County to negotiate the agreement before us. The agreement reflects a notable commitment by the leadership of both jurisdictions to address in a collaborative fashion the concerns of their localities and the needs of their residents. We commend the officials of the two jurisdictions for their public leadership and for the interlocal agreement which they have negotiated.

Respectfully submitted,

Cole Hendrix, Vice Chairman

Kathleen K. Seefeldt

John G. Kines, Jr.

APPENDIX A:
Voluntary Settlement Agreement

**VOLUNTARY SETTLEMENT OF ANNEXATION AND
UTILITY ISSUES**

Between

TOWN OF CULPEPER, VIRGINIA

And

COUNTY OF CULPEPER, VIRGINIA

Dated as of May 4, 2011

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2. Metes and Bounds Descriptions of First Boundary Adjustment Areas
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4. Metes and Bounds Description of the Tech Zone
5. Hypothetical Examples of Future Boundary Adjustment (single area & two non-contiguous areas)
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8. Method of Calculating Minimum Width of Future Boundary Adjustment Areas
9. Agreements Obligating the Town to Provide Water and/or Sewer Services within the Water & Sewer Service Area
10. List of Customers Served Pursuant to 2003 Agreement, as Amended, and 2011 Interim Agreement
11. Town's Tap Privilege Fee Assessment Policy

**VOLUNTARY SETTLEMENT OF ANNEXATION AND UTILITY ISSUES
BETWEEN
THE TOWN OF CULPEPER AND THE COUNTY OF CULPEPER**

This Agreement is made and entered into this 4th day of May, 2011, by and between the **TOWN OF CULPEPER, VIRGINIA**, a municipal corporation of the Commonwealth of Virginia (the "Town"), and the **COUNTY OF CULPEPER, VIRGINIA**, a political subdivision of the Commonwealth of Virginia (the "County") (together, the "Parties"), pursuant to Title 15.2, Chapter 34 (§ 15.2-3400 et seq.) of the Code of Virginia (1950), as amended (the "Code").

RECITALS

R-1. For many years, the Town and the County have discussed and studied proposals for (i) the joint use of Town water and wastewater treatment plants to provide water and sewer services in an efficient manner to those developing areas surrounding the Town and (ii) the expansion of the Town's boundaries to incorporate certain urban or urbanizing areas in the unincorporated portions of the County.

R-2. On June 3, 2003, the Town and the County entered into a water and sewer agreement (the "2003 Agreement"), by which the Town agreed to sell to the County and the County agreed to purchase from the Town, pursuant to various terms and conditions, water and sewer capacity in the Town's public water and wastewater systems, if the County determined that it desired to acquire such capacity. In 2007, the County paid the Town \$3,300,000 for the purchase of certain capacity, thereby giving the County the right to receive a certain quantity of potable water from the Town's water distribution system for the use of water customers of the County and to deliver a certain quantity of wastewater to the Town's wastewater collection and treatment system that the County collected from wastewater customers of the County.

R-3. On June 18, 2009, the Town and the County entered into an Amendment to the 2003 Agreement, which provided, among other things, for the temporary provision of water and wastewater services by the Town to the County; for good faith negotiations for the creation of a joint water and sewer authority; for adjustment of the Town's boundaries; and for the termination of water and sewer agreements between the Town and the County in the event the negotiations were unsuccessful.

R-4. On May __, 2011, the Town and the County entered into an Interim Agreement ("2011 Interim Agreement"), which provided for the temporary provision of water and wastewater services by the Town to the County during the negotiation and approval process of the Agreement.

R-5. Following extended negotiations, the Parties have determined that it will be in the best interests of the residents of the Town and the County to avoid a duplication of

water and sewer facilities serving the Town and the surrounding urban and urbanizing areas of the County and, instead, to utilize existing water and wastewater treatment facilities to meet the need of all such areas for such utility services.

R-6. To provide for the efficient provision of utility services, the County, by a separate Nutrient Allocation Consolidation Agreement (the "Nutrient Agreement"), has agreed to transfer to the Town its Mountain Run Plant nutrient allocations of 18,273 pounds per year of the nutrient total nitrogen and 1,371 pounds per year of the nutrient total phosphorus, subject to the approval of the Department of Environmental Quality.

R-7. In exchange for the transfer of the nutrient allocation, the Town will make available 1.5 million gallons per day ("MGD") of water capacity and 1.5 MGD of wastewater capacity to the urban and urbanizing areas surrounding the current boundaries of the Town on the basis of rates and terms and conditions that will be the same for all users of the Town's water and sewer systems.

R-8 The Parties have further determined that it is in the best interests of the residents of the Town and the County to provide for an orderly method for the periodic incorporation of additional areas into the Town of those urban and urbanizing areas that will require public water and sewer facilities and other urban services that can best be provided by the Town.

R-9. The Parties are now prepared to enter into a comprehensive settlement that will provide (i) a long-term method of meeting the need for public water and sewer services in the urban and urbanizing areas surrounding the Town and (ii) a simplified procedure for incorporating portions of such areas into the Town to meet its need for an expansion of its tax base.

R-10. The Town and the County have reached this Agreement, pursuant to Title 15.2, Chapter 34 of the Virginia Code, which authorizes agreements providing for boundary line adjustments, waivers of utility rights, and other terms as the parties deem to be in their business.

NOW, THEREFORE, in consideration of the mutual covenants and agreements herein contained, the parties agree as follows:

ARTICLE I **DEFINITIONS**

The following words, terms and abbreviations as used in this Agreement shall have the defined meanings listed below, unless the context clearly indicates otherwise:

Section 1.1 Town. "Town" shall mean the Town of Culpeper, Virginia.

Section 1.2 Code. "Code" shall mean the Code of Virginia of 1950, as amended.

Section 1.3 Commission. "Commission" shall mean the Commission on Local Government.

Section 1.4 County. "County" shall mean the County of Culpeper, Virginia.

Section 1.5 Special Court. "Special Court" shall mean the special three-judge court appointed by the Supreme Court of Virginia pursuant to Title 15.2, Chapter 30, § 15.2-3000 of the Code.

Section 1.6 Dwelling. "Dwelling" shall mean a building or portion thereof used exclusively for residential purposes, including one-family, two-family and multiple-family dwellings, but not including hotels, motels, boardinghouses, dormitories, tourist cabins, or automobile trailers.

Section 1.7 Dwelling Unit. "Dwelling unit" shall mean one or more rooms in a dwelling designed for independent housekeeping by one family with separate toilets and cooking facilities.

Section 1.8 Section. "Section" refers to parts of this Agreement unless the context indicates that the reference is to parts of the Code.

Section 1.9 Floor Area. "Floor area" shall mean the sum of the total horizontal areas of the several floors of all buildings on a lot, including accessory buildings, measured from the exterior faces of exterior walls or the centerline of walls separating buildings, which dimension is commonly referred to as a building "footprint." It shall include, for example, basements; elevator shafts; stairwells at each story; stairs, closets, thickness of interior walls, columns, or similar features, floor space used for mechanical equipment; finished attic space; interior balconies; and mezzanines. Floor area shall not include parking structures below or above ground, unfinished attic space, open rooftops, or all other areas outside of the exterior walls of the buildings on a lot.

Section 1.10 Parcel of Land. "Parcel of land" or "parcel" shall mean a separate lot, tract, or area of land established by a recorded subdivision plat, a deed, or a condemnation proceeding, or as otherwise permitted by law, to be owned, used, developed, or built upon.

ARTICLE II
FIRST BOUNDARY ADJUSTMENT

Section 2.1 First Boundary Adjustment Areas. The existing boundary line of the Town shall be adjusted (the "First Boundary Adjustment") by incorporating three areas within the unincorporated portions of the County (the "First Boundary Adjustment Areas"), which are depicted in green on the map dated July 27, 2010, attached as Exhibit 1, and which are described by metes and bounds on the attached Exhibit 2. They include the Montanus area with approximately 198 acres lying generally to the northeast of the Town, the S.W.I.F.T. property area with approximately 11.2 acres lying generally to the southeast of the Town, and the Lake Pelham/Clore Farm area with approximately 93 acres lying generally to the southwest of the Town. The First Boundary Adjustment Areas are a portion of the territory that has been designated by the County for public water and wastewater services, as depicted on the map attached as Exhibit 1, and hereafter referred to as the "Water & Sewer Service Area."

Section 2.2 Effective Date of First Boundary Adjustment. The incorporation of the First Boundary Adjustment Areas, as provided in section 2.1, shall be authorized by the Special Court in its final order approving this Agreement and shall not require the initiation of any other legal proceeding. Unless otherwise agreed to by the Parties and ordered by the Special Court, the First Boundary Adjustment Areas shall be effective as of midnight on June 30 following entry of the final order of the Special Court.

Section 2.3 Survey of First Boundary Adjustment Areas. The Town shall prepare a survey plat depicting the First Boundary Adjustment Areas. Following review and approval by the County, the Town shall submit the survey to the Special Court for inclusion in its final order.

Section 2.4 Extension of Municipal Services. Following the effective date of the First Boundary Adjustment provided by Section 2.1 of this Agreement, the Town shall extend its then-existing governmental services to the First Boundary Adjustment Areas on the basis of the same policies and at the same level as such services are then, or may thereafter be, provided to areas within the Town's current corporate limits where like conditions exist. The Town shall also undertake the construction of such capital improvements as the Town Council determines, in its discretion, are needed to serve the First Boundary Adjustment Areas in accordance with then existing policies and at such times as the Town Council deems appropriate.

ARTICLE III
FUTURE BOUNDARY ADJUSTMENTS

Section 3.1 Future Boundary Adjustments. Following the incorporation into the Town of the First Boundary Adjustment Areas, the Town may incorporate additional territory currently lying within the unincorporated portions of the County (“future boundary adjustments”) in accordance with the procedures set forth in Article IV of this Agreement, if such areas satisfy certain eligibility criteria. An area shall be eligible for incorporation by the Town if it is located within the territory described in Section 3.2 and if it meets the requirements specified in Section 3.3 and Section 3.4.

Section 3.2 Areas Available for Future Boundary Adjustments.

Section 3.2.1. One or More Portions of Water & Sewer Service Area. The territory available for one or more future boundary adjustments by the Town during the term of this Agreement shall include those portions of the Water & Sewer Service Area depicted in yellow on the map attached as Exhibit 1 (the “Future Boundary Adjustment Areas”). The Future Boundary Adjustment Areas consist of three areas described by metes and bounds in the attached Exhibit 3. One area with approximately 838 acres lies generally to the north of the Town, a second area with approximately 1,994 acres lies generally to the east of the Town, and a third area with approximately 2,081 acres lies generally to the south of the Town. For each periodic boundary adjustment, the Town may elect to include all or portions of any of the three Future Boundary Adjustment Areas, but each separate portion of the Future Boundary Adjustment Areas shall meet the eligibility requirements specified in Section 3.3 and Section 3.4 of this Agreement.

Section 3.2.2. Modifications to Water & Sewer Service Area. Subsequent to the approval of this Agreement by the Special Court, the County shall have the right unilaterally to expand and/or contract the territory contained within the Water & Sewer Service Area in accordance with procedures and limitations set forth in Article IX of this Agreement. If the County modifies the Water & Sewer Service Area, then any areas added shall automatically become part of the Future Boundary Adjustment Areas eligible for incorporation into the Town, and any areas removed shall automatically be eliminated from the Future Boundary Adjustment Areas and no longer will be eligible for incorporation into the Town. However, no such modifications to the Water & Sewer Service Area shall affect the incorporation of the First Boundary Adjustment Areas pursuant to Article II of this Agreement.

Section 3.2.3. Technology Zone. The area in red on the map attached as Exhibit 1, which is identified as the “Tech Zone” within the Water & Sewer Service Area, shall not be eligible in the future for incorporation into the Town by a boundary adjustment, except as provided herein. The Tech Zone consists of one area containing approximately 408 acres and is described by metes and bounds in the attached Exhibit 4.

(a) County Agreement. All or any portion of the Tech Zone may be incorporated into the Town if the County agrees to such a future boundary adjustment by resolution duly adopted by its board of supervisors. In that case, such portions of the Tech Zone shall constitute part of the Future Boundary Adjustment Areas, and the Town may incorporate any territory identified in such resolution in accordance with the eligibility criteria in Sections 3.3 and 3.4.

(b) Exception for Commercial/Residential Uses. Any parcels of land in the Tech Zone that are developed for commercial or residential uses, rather than technology or industrial uses, shall automatically constitute part of the Future Boundary Adjustment Areas and shall be eligible for incorporation by the Town, based on the eligibility criteria in Sections 3.3 and 3.4, without requiring that the County adopt a resolution or take other official action agreeing to a boundary adjustment of such parcels. For purposes of this exception, "commercial uses" shall mean businesses engaged primarily in the retail sales of goods and services of all kinds. However, restaurants, hotels, and buildings used primarily for office uses shall not qualify as "commercial uses" eligible for the exception provided for in this section. "Residential uses" shall mean any structure used primarily for dwellings for human habitation.

Section 3.3 Eligibility Criteria for Areas to be Incorporated by the Town in the Future – Contiguity and Minimum Width.

Section 3.3.1. Contiguity. To be eligible for incorporation into the Town, each separate portion of the Future Boundary Adjustment Areas that the Town proposes to incorporate within its boundaries shall be contiguous to the then-existing Town boundary line.

Section 3.3.2. Minimum Width. To be eligible for incorporation into the Town, that portion of each separate boundary adjustment area that is contiguous to the existing Town boundary line shall follow along the existing boundary line for at least 500 feet and such boundary adjustment area shall have a minimum width of at least 500 feet throughout the entire length of the boundary adjustment area. However, irregularities in the boundary and parcels of land along the outer edge of the boundary adjustment area may have a width of less than 500 feet. The minimum width of each boundary adjustment area shall be calculated in accordance with the method described in Exhibit 8 attached hereto.

Section 3.4 Eligibility Criteria for Areas to be Incorporated by the Town in the Future – Density of Development. The Parties agree that future boundary adjustments by the Town should be limited to areas that have sufficient density to be considered urban or urbanizing in terms of the nature of development. Accordingly, to be

eligible for a boundary adjustment, each separate portion of one or more of the Future Boundary Adjustment Areas that the Town proposes to incorporate into its corporate limits shall satisfy alternative criteria, the FAR Density Requirement or the Residential Density Requirement (combined, the "Density Eligibility Criteria"), as specified below, which are intended to demonstrate the existence of a minimum level of business and other non-residential development or a minimum level of residential development.

Section 3.4.1. Application of Eligibility Criteria to Single Area. Each separate boundary adjustment area shall be deemed to have satisfied the Density Eligibility Criteria if (i) the area as a whole meets the FAR Density Requirement, (ii) if the area as a whole meets the Residential Density Requirement, or (iii) if any one part or a combination of parts of the area meets the FAR Density Requirement and the other part or a combination of parts of the area meets the Residential Density Requirement.

Section 3.4.2. Application of Eligibility Criteria to Separate Areas. If the Town designates two or more non-contiguous areas to be incorporated into its boundaries, the eligibility requirements shall not be met by combining one or more parts of one area with one or more parts of the other non-contiguous area to satisfy the FAR Density Requirement or the Residential Density Requirement. Instead, each non-contiguous portion of the Future Boundary Adjustment Areas designated by the Town for a boundary adjustment must independently satisfy the eligibility requirements.

Section 3.4.3. Examples of Application of Eligibility Criteria to Single and Separate Areas. Examples of an eligible boundary adjustment area, based in part on compliance with the FAR Density Requirement and in part on compliance with the Residential Density Requirement, is attached as Exhibit 5.

Section 3.5 FAR Density Requirement. A boundary adjustment area, or any portion thereof, for which boundary adjustment eligibility is based on the FAR Density Requirement, must have an average Floor Area Ratio ("FAR") of 10% (0.10) or higher, as of the date the Town gives written notice to the County, as provided in Section 4.2(b), of its intention to adopt an ordinance to incorporate one or more eligible portions of the Future Boundary Adjustment Areas. The FAR for a boundary adjustment area, or any portion thereof, shall be calculated in accordance with the following criteria:

Section 3.5.1. Calculation of FAR -- General. The FAR of a boundary adjustment area, or portion thereof, shall be calculated by dividing the total square footage of the floor area, as defined in Section 1.9, of all buildings in the area, or portion thereof, by the total square footage of the same boundary adjustment area, or portion thereof. The result must equal 10% or higher for the designated area to meet the FAR Density Requirement.

Section 3.5.2. Floor Area of Residential Buildings Excluded. In calculating the total square footage of buildings within a boundary adjustment area, or portion thereof, the square footage of all buildings shall be included except for residential buildings. The square footage of buildings used solely for residential purposes shall be excluded from the FAR calculation. However, where a building is a mixed use structure, such as a building with commercial development on the first floor and residential apartments on the second floor, the square footage of the residential portions of the building shall be included in the FAR calculation.

Section 3.5.3. Public Roads & Rights-of-Way and Lakes Excluded. Where a boundary adjustment area, or portion thereof, includes public roads and associated road rights-of-way, the Town may exclude the square footage of public roads and associated road rights-of-way in calculating the total square footage of the boundary adjustment area, or portion thereof, when determining eligibility for incorporation of such area based on the FAR Density Requirement. The Town may not exclude from the FAR calculation any utility rights-of-way located on private property. If the Town includes a public road within a designated boundary adjustment area, it must include the entire paved portion of the road and the entire road right-of-way. If a boundary adjustment area includes all or any portion of Lake Pelham, Mt. Run Lake, Lake Caynor, Lake Catalpa, Bald's Run Lake, Merrimac Lake, or any other lake owned by the Town in the future, the Town may exclude the acres of land occupied by such lakes, or any portion thereof, when determining eligibility for incorporation of such area based on the FAR Density Requirement.

Section 3.5.4. Qualifying Land Uses and Zoning Districts. While the FAR Density Requirement is intended to measure a minimum level of business and other non-residential development, a boundary adjustment area, or portion thereof, shall be eligible for incorporation into the Town if it has a FAR of 10% or more, notwithstanding the inclusion of parcels of land containing residential development or undeveloped parcels. Such a boundary adjustment area, or portion thereof, that otherwise meets the FAR Density Requirement may contain land devoted to any type of use (for example, commercial, industrial, residential, public, mixed use, agricultural, or vacant) and land that is located within any type of County zoning district, except as noted in Section 3.5.5 and Section 3.5.8, below.

Section 3.5.5. Restrictions on Incorporating Land in A-1 and RA Zoning Districts. The County's zoning ordinance currently contains an Agricultural District ("A-1"), which is for rural low-density uses, and a Rural Area District ("RA"), which is for lands primarily rural in character but where there is a transition to residential development. Both districts permit only very limited commercial, industrial, and other business uses that are traditionally associated with rural areas. The Parties agree that the inclusion of such parcels of land within a boundary adjustment area generally is inappropriate, where the incorporation of such land into the Town is based on the FAR

Density Requirement. Therefore, no parcel of land lying within the County's A-1 or RA zoning districts shall be included in that portion of a future boundary adjustment area that is eligible for incorporation into the Town based on satisfying the FAR Density Requirement, except in the following three circumstances:

(a) Common Boundary. If at least 75% of the boundary of such a parcel adjoins the existing Town boundary and/or the designated boundary adjustment area, then the parcel zoned A-1 or RA may be included as part of the boundary adjustment area.

(b) Open Space Proffer. If such a parcel was proffered as open space land in connection with the conditional zoning by the County of adjoining property, then the parcel zoned A-1 or RA may be included as part of the boundary adjustment area.

(c) Boundary Adjustment Necessity. If the contiguity or minimum width requirements in Section 3.3 and the FAR Density Requirement in this Section 3.4 cannot be satisfied without including one or more parcels, or portions of parcels, zoned A-1 or RA, then the Town may include such a parcel or parcels, or portions of parcels, in a designated boundary adjustment area. If one or more parcels of land zoned A-1 or RA are located within a corridor that would most directly connect the designated boundary adjustment area and the existing Town boundary, then the Town shall be obligated to exclude such parcels of land by drawing the boundary adjustment area to go around such parcels to connect to the Town boundary. However, if the use of such a corridor would result in the designated boundary adjustment area failing to meet the FAR Density Requirement, then the Town may include such parcels zoned A-1 or RA to meet the contiguity and minimum width requirements and the FAR Density Requirement. In the event the Town designates a boundary adjustment area that includes parcels zoned A-1 or RA, pursuant to this exception, it shall include the smallest amount of land zoned A-1 and RA, and to minimize the inclusion of such land, it may split existing parcels of land zoned A-1 or RA. For purposes of applying this exception, the limitations on dividing existing parcels of land, set forth below in Section 3.5.9, shall not be applicable.

Section 3.5.6. A-1 or RA Parcels Included in FAR Calculation. If the Town includes one or more parcels of land zoned A-1 or RA as part of the designated boundary adjustment area, pursuant to one of the exceptions in Section 3.5.5, the square footage of all such A-1 and RA parcels shall be included in the FAR calculation to determine if the area designated for a boundary adjustment meets the FAR Density Requirement.

Section 3.5.7. Adoption of Use Value Assessment. If the Town includes one or more parcels of land zoned A-1 or RA as part of the designated boundary adjustment area, pursuant to one of the exceptions in Section 3.6.5, it shall adopt an ordinance providing for use value assessment and taxation for real estate devoted to agricultural uses, pursuant to Virginia Code Section 58.1-3230 et seq., or any successor provisions.

Section 3.5.8. Amendments to A-1 and RA Zoning Districts. In the event the County changes the name or numbering of its A-1 or RA zoning districts but retains the same text, the limitations in the preceding paragraphs shall continue to apply to the successor zoning districts. In the event the County amends the text for its current A-1 or RA zoning districts or the successor districts to such current zoning districts, the limitations in the preceding paragraphs shall continue to apply to such zoning districts if they permit substantially the same commercial, industrial, and other business uses as the current A-1 and RA zoning districts. However, in the event the County amends the text of its current A-1 or RA zoning districts, or the successor districts to its current A-1 or RA zoning districts, and substantially increases the commercial, industrial, or other business uses authorized in either such district, whether such uses are permitted automatically or by issuance of one or more special or conditional use permits or special exceptions, then the limitations in the preceding paragraphs shall not be applicable to such zoning district or districts, and the Town may include in a designated boundary adjustment area, or portion thereof, parcels of land lying within such zoning districts.

Section 3.5.9. Division of Parcels of Land. In designating a future boundary adjustment area, the Town may split a parcel of land and include only a portion of the divided parcel within the area to be incorporated into the Town. The Town may include such a portion of a parcel in the designated boundary adjustment area if the portion excluded from the designated area is larger than the portion included. Only the portion of the parcel included in the designated area shall be used in the FAR calculation. If the Town splits a parcel of land and the portion included within the designated boundary adjustment area contains development of any type, then the Town shall also include parking areas, storm water facilities, and other appurtenances and accessories directly related to the development, whether such appurtenances and accessories are located on the same parcel of land as the development or on a separate parcel of land.

Section 3.5.10. Example of FAR Calculation. An example of the calculation of the FAR for a boundary adjustment area in accordance with these criteria is attached as Exhibit 6.

Section 3.6 Residential Density Requirement. A boundary adjustment area, or any portion thereof, for which boundary adjustment eligibility is based on the Residential Density Requirement, must have an average residential density of one or more dwelling units per acre, based on existing development or, in limited cases, potential development,

as of the date the Town gives written notice to the County of its intention to adopt an ordinance to incorporate one or more eligible portions of the Future Boundary Adjustment Areas, as provided in Section 4.2(b). The residential density for a boundary adjustment area, or any portion thereof, shall be calculated in accordance with the following criteria:

Section 3.6.1. Calculation of Residential Density -- General. The Residential Density of a boundary adjustment area, or portion thereof, shall be calculated by dividing the total number of existing or potential dwelling units, as defined in Section 1.7, by the total number of acres in the boundary adjustment area, or portion thereof, for which boundary adjustment eligibility is based on the Residential Density Requirement. The result must be a density of 1.0 dwelling units per acre or higher.

Section 3.6.2. Public Roads & Rights-of-Way and Lakes Excluded. Where a boundary adjustment area includes public roads and associated rights-of-way, the Town may exclude the acres of land used for public roads and associated rights-of-way in calculating the total acres within the boundary adjustment area, or portion thereof, when determining eligibility for incorporation of such area based on the Residential Density Requirement. The Town may not exclude from the residential density calculation any utility rights-of-way located on private property. If the Town includes a public road within a designated boundary adjustment area, it must include the entire paved portion of the road and the entire road right-of-way. If a boundary adjustment area includes all or any portion of Lake Pelham, Mt. Run Lake, Lake Caynor, Lake Catalpa, Bald's Run Lake, Merrimac Lake, or any other lake owned by the Town in the future, the Town may exclude the acres of land occupied by such lakes, or any portion thereof, when determining eligibility for incorporation of such area based on the Residential Density Requirement.

Section 3.6.3. Qualifying Land Uses and Zoning Districts. A boundary adjustment area, or portion thereof, based on the Residential Density Requirement shall include, except as otherwise stated herein, only (i) parcels of land having one or more existing dwelling units located within any County zoning district and (ii) vacant land lying within any County zoning district that permits one or more residential uses, by right or by special use permit, including A-1 and RA zoning districts.

Section 3.6.4. Effect on Density Calculation of Parcels in A-1 and RA Zoning Districts. If a boundary adjustment area based on the Residential Density Requirement includes parcels lying within A-1 or RA zoning districts, the parcels in such A-1 or RA zoning districts, taken as a whole, must independently meet the requirement of a density of one or more dwelling units per acre, without regard to the density of the rest of the boundary adjustment area, or portion thereof, that is proposed for incorporation on the basis of the Residential Density Requirement. If such parcels in A-1 or RA zoning districts, taken as a whole, separately fail to meet the Residential Density Requirement,

they must be excluded from the boundary adjustment area, except in the following three circumstances:

(a) Common Boundary. If at least 75% of the boundary of such a parcel adjoins the existing Town boundary and/or the designated boundary adjustment area, then the parcel zoned A-1 or RA may be included as part of the boundary adjustment area based the Residential Density Requirement.

(b) Open Space Proffer. If such a parcel was proffered as open space land in connection with the conditional zoning by the County of adjoining property, then the parcel zoned A-1 or RA may be included as part of the boundary adjustment area based the Residential Density Requirement.

(c) Boundary Adjustment Necessity. If the contiguity or minimum width requirements in Section 3.3 and the Residential Density Requirement in this Section 3.6 cannot be satisfied without including one or more parcels zoned A-1 or RA, then the Town may include such a parcel or parcels in a designated boundary adjustment area based on the Residential Density Requirement. If one or more parcels of land zoned A-1 or RA are located within a corridor that would most directly connect the designated boundary adjustment area and the existing Town boundary, then the Town shall be obligated to exclude such parcels of land by drawing the boundary adjustment area to go around such parcels to connect to the Town boundary. However, if the use of such a corridor would result in the designated boundary adjustment area failing to meet the Residential Density Requirement, then the Town may include such parcels zoned A-1 or RA to meet the contiguity and minimum width requirements and the Residential Density Requirement. In the event the Town designates a boundary adjustment area that includes parcels zoned A-1 or RA, pursuant to this exception, it shall include the smallest amount of land zoned A-1 and RA, and to minimize the inclusion of such land, it may split existing parcels of land zoned A-1 or RA. For purposes of applying this exception, the limitations on dividing existing parcels of land, set forth below in Section 3.6.7, shall not be applicable.

If the Town includes one or more parcels of land zoned A-1 or RA as part of the designated boundary adjustment area, pursuant to one of the exceptions in this Section 3.6.4, the square footage of all such A-1 and RA parcels shall be included in the calculation of the density for the entire boundary adjustment area, or portion thereof, based on the Residential Density Requirement.

Section 3.6.5. Adoption of Use Value Assessment. If the Town includes one or more parcels of land zoned A-1 or RA as part of the designated boundary adjustment area, pursuant to one of the exceptions in Section 3.6.4, it shall adopt an ordinance providing for use value assessment and taxation for real estate devoted to

agricultural uses, pursuant to Virginia Code Section 58.1-3230 et seq., or any successor provisions.

Section 3.6.6. Amendments to A-1 and RA Zoning Districts.

(a) Changes in Names or Numbering of Zoning Districts. In the event the County changes the name or numbering of its A-1 or RA zoning districts but retains the same text, the limitations in Section 3.6.4 shall continue to apply to the successor zoning districts.

(b) Changes in Density of Zoning Districts. In the event the County amends the text for its current A-1 or RA zoning districts or any successor districts, the limitations in Section 3.6.4 shall continue to apply to such zoning districts if the amended text does not authorize an increase in the maximum density currently allowed in such zoning districts, which is one dwelling unit per five acres in the County A-1 zoning district (based on a minimum lot size of five acres) and one dwelling unit per three acres in the County RA zoning district (based on a minimum lot size of three acres). However, if the amended text authorizes a greater density, then the limitations in Section 3.6.4 shall not be applicable to such zoning district. For example, if the County RA zoning district is amended to allow a density of one dwelling unit per two acres (based on a minimum lot size of two acres), then any parcels located in such zoning district may be included in a boundary adjustment area without independently meeting the Residential Density Requirement of one or more dwelling units per acre.

(c) Reduction in Minimum Lot Size in Selected Areas But No Change in Overall Density. The limitations in Section 3.6.4 shall continue to apply to the current A-1 or RA zoning districts or any successor districts if (i) the County does not authorize an increase in the maximum density currently allowed in such zoning districts as a whole, (ii) but allows multiple housing units to be located in designated areas on parcels having less than the minimum lot size otherwise applicable within the zoning district, and (iii) requires that such housing units on smaller lots be surrounded by sufficient undeveloped space to create a residential density that is no greater than the maximum density currently permitted in the zoning district as a whole. However, in any such case, the limitations in Section 3.6.4 shall no longer be applicable to those parcels smaller than the minimum lot size otherwise applicable in such zoning districts. For example, if multiple housing units in a designated portion of the County RA zoning district are located on two-acre lots, which are smaller than the current three-acre minimum lot size, then such two-acre lots may be included in a boundary adjustment area without independently meeting the Residential Density Requirement of one or more dwelling units per acre.

Section 3.6.7. Division of Parcels of Land. In designating a future boundary adjustment area, the Town may split a parcel of land and include only a portion

of the divided parcel within the area to be incorporated into the Town. The Town may include such a portion of a parcel in the designated boundary adjustment area if the portion excluded from the designated area is larger than the portion included. Only the portion of the parcel included in the designated area shall be used in the residential density. If the Town splits a parcel of land and the portion included within the designated boundary adjustment area contains development of any type, then the Town shall also include parking areas, storm water facilities, and other appurtenances and accessories directly related to the development, whether such appurtenances and accessories are located on the same parcel of land as the development or on a separate parcel of land.

Section 3.6.8. Determination of Dwelling Units for Density Calculation.

For each parcel of land having existing residential development within an area designated for a boundary adjustment based on the Residential Density Requirement, the number of existing dwelling units on such parcel shall be used in calculating the residential density. For each parcel of land within the designated area that is vacant, such parcel shall be treated as having no dwelling units when calculating the residential density, except in “qualifying subdivision developments,” where vacant parcels shall be treated as having potential dwelling units that shall be included in the calculation of residential density in addition to those parcels having existing dwelling units.

(a) “Qualifying Subdivision Developments” Defined. A

“qualifying subdivision development” shall mean a residential subdivision, or any section or any phase thereof, as shown on a recorded subdivision plat, where (i) dwelling units have been constructed on 25% of the lots and certificates of occupancy have been issued for each such dwelling unit and where (ii) 25% of the roads (measured by distance) have been graded and provided with at least a gravel surface that provides a drivable roadway.

(b) Potential Dwelling Units. In each such qualifying subdivision development, or any section or any phase thereof, each vacant lot within the development, or section or phase thereof, shall be treated as having one potential dwelling unit for purposes of calculating the residential density without regard to the minimum lot size required by the County zoning ordinance. Hence, each vacant lot shall be deemed to have one potential dwelling unit even if the zoning district regulations permit a greater number of dwelling units on such a parcel or the zoning district regulations require a larger parcel of land for a dwelling unit.

Section 3.6.9. Residential Parcels Surrounding Commercial and Other Non-Residential Parcels. A boundary adjustment area, or portion thereof, which is eligible for incorporation based on the Residential Density Requirement, may include a parcel or parcels of land that does not otherwise qualify for inclusion in such a boundary adjustment area, or portion thereof, if such parcel is entirely surrounded by such an area eligible for incorporation into the Town. For this purpose, a non-qualifying parcel is one

that (i) has existing commercial or other non-residential development, but no structure with dwelling units, or (ii) contains vacant land located in a County zoning district that does not permit any residential uses. In that event, even if such a parcel does not qualify for inclusion in a boundary adjustment area based on the Residential Density Requirement and also fails to meet the FAR Density Requirement, the parcel shall nevertheless be eligible for incorporation into the Town to avoid the creation of an island of unincorporated territory. However, if the Town includes such a non-qualifying parcel within its designated boundary adjustment area, the acreage of any such non-qualifying parcel or parcels shall be included in the residential density calculation to determine whether the designated area is eligible for incorporation into the Town based on the Residential Density Requirement.

Section 3.6.10. Example of Residential Density Calculation. An example of the calculation of the residential density for a boundary adjustment area in accordance with these criteria is attached as Exhibit 7.

ARTICLE IV **PROCEDURE FOR FUTURE TOWN BOUNDARY ADJUSTMENTS**

Section 4.1 Implementation of Future Boundary Adjustments. In accordance with the schedule set forth in Section 4.3, the Town may incorporate one or more eligible portions of the Future Boundary Adjustment Areas by adoption of a boundary adjustment ordinance that shall include (i) a designation of one or more eligible portions of the Future Boundary Adjustment Areas to be incorporated, (ii) a survey plat and metes and bounds description of each designated portion of the Future Boundary Adjustment Areas, (iii) a general statement of the services to be provided within such Future Boundary Adjustment Areas, and (iv) the effective date of the boundary adjustment.

Section 4.2 Preconditions to the Adoption by the Town of Future Boundary Adjustment Ordinances. The Town shall not adopt any ordinance to incorporate any portion of the Future Boundary Adjustment Areas unless and until the following actions have been taken:

Section 4.2.1. Public Hearing. The Town shall hold a public hearing on the proposed boundary adjustment ordinance prior to its adoption. A notice of the Town's intention to hold such a public hearing shall be published once a week for two successive weeks in a newspaper having general circulation in the Town and the County. The notice shall include (i) the date, time, and location of the public hearing, (ii) a general description of the areas designated for incorporation into the Town, and (iii) the proposed effective date of the boundary adjustment. A copy of the proposed ordinance shall be made available for inspection at the office of the Town Clerk of the Town.

Section 4.2.2. Town Notice to County. At least 90 days prior to the adoption of the boundary adjustment ordinance, the Town shall deliver to the County (i) a written notice of its intention to adopt such an ordinance, (ii) an explanation of how each such portion of the Future Boundary Adjustment Areas designated for incorporation into the Town meets the eligibility requirements in Section 3.3 and Section 3.4, as of the date of the Town's notice to the County, and (iii) a copy of the proposed ordinance.

Section 4.2.3. County Notice to Town. Within 60 days after receipt of the Town's notice, the County shall deliver a notice to the Town stating whether it has any objection to the proposed boundary adjustment ordinance based on any portion of the designated Future Boundary Adjustment Areas failing to meet the eligibility requirements in Section 3.3 and Section 3.4 and in Article IV of this Agreement. The County may object to the proposed boundary adjustment solely on the basis of such eligibility requirements, and in the absence of such an objection, the boundary adjustment shall take effect in accordance with the procedures in this Article IV without any further action by the County. In the event the County does not deliver such a notice to the Town within 60 days, the County shall be deemed to have no objection to the proposed boundary adjustment ordinance.

Section 4.2.4. County Objection to Boundary Adjustment. In the event the County objects to the boundary adjustment, the County will deliver a written notice to the Town setting forth in detail the reasons for its contention that the areas designated by the Town do not meet the eligibility requirements for a boundary adjustment.

Section 4.2.5. Resolution of Dispute. Upon receipt of such a notice objecting to the proposed boundary adjustment, the Parties shall undertake negotiations in an effort to resolve the dispute. The Parties may elect to use non-binding arbitration, as provided in Section 14.6, in an effort to reach agreement as to whether the eligibility requirements have been met as to the areas designated by the Town. If the Parties are unable to resolve such a dispute, the Town or the County may initiate a declaratory judgment action with the Special Court appointed to affirm, validate and give full force and effect to this Agreement, or a successor Special Court appointed in accordance with Section 15.2-3000 of the Code, to determine if the proposed boundary adjustment is in accordance with this Agreement. Until such dispute between the Town and the County has been resolved by the Parties or by the Special Court, the Town shall not adopt the proposed boundary adjustment ordinance.

Section 4.3 Timing of Future Boundary Adjustments. Following the effective date of the First Boundary Adjustment, the Town may incorporate one or more eligible portions of the Future Boundary Adjustment Areas in accordance with the following schedule:

Section 4.3.1. Second & Third Boundary Adjustments. No sooner than ten years following the effective date of the First Boundary Adjustment, the Town may incorporate one or more eligible portions of the Future Boundary Adjustment Areas (the “Second Boundary Adjustment”). For example, if the First Boundary Adjustment becomes effective on July 1, 2012, the Second Boundary Adjustment shall become effective no sooner than July 1, 2022, but the Town may elect to make the Second Boundary Adjustment effective at a later date. No sooner than ten years following the effective date of the Second Boundary Adjustment, the Town may incorporate other eligible portions of the Future Boundary Adjustment Areas (the “Third Boundary Adjustment”), but the Town may elect to make the Third Boundary Adjustment effective at a later date.

Section 4.3.2. Final Boundary Adjustment. The Town may incorporate other eligible portions of the Future Boundary Adjustment Areas (the “Final Boundary Adjustment”) no sooner than ten years following the effective date of the Third Boundary Adjustment. However, in the event this Agreement terminates, in accordance with Article XI, sooner than ten years following the effective date of the preceding boundary adjustment (which may be either the First Boundary Adjustment, the Second Boundary Adjustment or the Third Boundary Adjustment), then the Town may make the Final Boundary Adjustment effective on the date of the termination of this Agreement, or at the Town’s option, on any date within one year following the termination of this Agreement. For example, if the Third Boundary Adjustment becomes effective on July 1, 2037, and the Agreement terminates on July 1, 2042, the Town may implement the Final Boundary Adjustment that shall become effective on July 1, 2042, even though that date is sooner than ten years following the effective date of the Third Boundary Adjustment. If the Town elects to make the Final Boundary Adjustment effective within one year following the termination of this Agreement, it may adopt its boundary adjustment ordinance and take the other actions specified in Section 4.2 at any time prior to the effective date of the Final Boundary Adjustment.

Section 4.4 Effective Date of Future Boundary Adjustments. The effective date of any future boundary adjustment that occurs pursuant to Article III and Article IV of this Agreement shall be established in the boundary adjustment ordinance, subject to the limitations in Section 4.3, and shall be no sooner than 30 days after the date of adoption of any boundary adjustment ordinance. After the Town has satisfied the preconditions in Section 4.2, each such future boundary adjustment shall become effective in accordance with the boundary adjustment ordinance without requiring further action by the County, the Commission, or any court.

Section 4.5 Extension of Municipal Services. Following the effective date of each any future boundary adjustment pursuant to Article III and Article IV of this Agreement, the Town shall extend its then-existing governmental services to those portions of the Future Boundary Adjustment Areas incorporated into the Town on the

basis of the same policies and at the same level as such services are then, or may thereafter be, provided to areas within the Town's current corporate limits where like conditions exist. The Town shall also undertake the construction of such capital improvements as the Town Council determines, in its discretion, are needed to serve those portions of the Future Boundary Adjustment Areas incorporated into the Town in accordance with then existing policies, and at such times as the Town Council deems appropriate.

Section 4.6 Certified Copies of Boundary Adjustment Ordinances.

Following the adoption of a boundary adjustment ordinance to incorporate portions of the Future Boundary Adjustment Areas, the Town shall file a certified copy of the ordinance with the Circuit Court of Culpeper County, the Secretary of the Commonwealth, the State Corporation Commission, and the Department of Taxation of the Commonwealth of Virginia.

ARTICLE V
TOWN WAIVER OF ANNEXATION & CITY STATUS RIGHTS

Section 5.1 Waiver of Annexation and City Status Rights. During the term of this Agreement, the Town shall waive and relinquish its right to initiate any annexation proceedings, pursuant to Section 15.2-3202 et seq. of the Code of Virginia, or any successor provisions, except that the Town shall retain its right to initiate such an annexation proceeding that proposes to incorporate only land owned by the Town. During the term of this Agreement, the Town shall also waive and relinquish its right to initiate any proceedings to make a transition from town to city status, pursuant to Section 15.2-3800 et seq. of the Code of Virginia, or any successor provisions.

Section 5.2 Voter and Landowner Annexation Rights. The waiver of rights in Section 5.1 will not be applicable to voters or property owners, who shall retain their right to initiate annexation proceedings pursuant to Section 15.2-3203 et seq. of the Code of Virginia, or any successor provisions. The Town shall not, however, promote an annexation proceeding initiated by voters or property owners. Specifically, it will not provide any legal assistance, engineering assistance, or financial aid to such voters or property owners. However, this limitation shall not prevent the Town from (i) providing information or documents requested by such voters or property owners pursuant to the Virginia Freedom of Information Act, including information as to service policies, comprehensive planning, and zoning regulations applicable to land that is incorporated into the Town, (ii) responding to a request by such voters or property owners as to whether the Town will oppose such a request, or (iii) filing a response with the Commission on Local Government or the annexation court stating that the Town does not oppose such a request but will not participate in the proceeding.

ARTICLE VI
WATER AND SEWER SERVICES -- GENERAL

Section 6.1 Provision of 1.5 MGD of Capacity of Water & Wastewater Services. Pursuant to this Agreement, the Town shall make available potable water to retail water customers located within the Water & Sewer Service Area in the amount of 1.5 MGD of capacity, and it will receive, treat, and dispose of wastewater received from retail sewer customers within the Water & Sewer Service Area in the amount of 1.5 MGD of capacity, pursuant to the terms and conditions stated herein.

Section 6.2 Connections to Town System. Within the Water & Sewer Service Area, the Town shall be obligated to permit any and all users seeking water and/or sewer services to connect to the Town's water and sewer systems, subject to the Town's maximum provision of 1.5 MGD of water capacity and the maximum provision of 1.5 MGD of wastewater capacity. Such users located within or outside the Town's boundaries shall comply with the Town's utility connection policies, as they may be revised from time to time. However, the County's mandatory connection ordinance shall determine whether landowners located within the Water & Sewer Service Area and outside the boundaries of the Town must connect to the Town's water and/or sewer systems. At such time as the Town has provided 1.5 MGD of water and wastewater capacity, it shall have no obligation to permit the connection of additional customers or to grant additional connections to existing customers.

Section 6.3 Retail Service Rights. During the term of this Agreement, the Town will have the exclusive right to provide retail water service to all customers within the Water & Sewer Service Area until such time as the Town has provided 1.5 MGD of water capacity. Likewise, during the term of this Agreement, the Town will have the exclusive right to provide retail wastewater service to all customers within the Water & Sewer Service Area until such time as the Town has provided 1.5 MGD of wastewater capacity. In the event the Town has provided 1.5 MGD of water or wastewater capacity but has not provided 1.5 MGD of capacity for both utility services, then its exclusive right to provide retail service shall continue as to the utility service for which it has not furnished 1.5 MGD. However, the Town shall retain the exclusive right to provide retail water and wastewater services beyond the date or dates it has provided 1.5 MGD of capacity for such utility services in accordance with the terms of any agreement the Town and the County may reach in the future, by which the Town shall agree to furnish additional water and/or wastewater capacity to the Water & Sewer Service Area. At such time as the Town no longer has the exclusive right to provide retail utility service to all customers within the Water & Sewer Service Area, it shall continue to have the exclusive right to serve its then-existing retail customers, as provided in Sections 11.2.1 and 11.2.2 of the Agreement.

Section 6.3.1 Town Customers. All such customers of Town water and wastewater services within the Water & Sewer Service Area shall be customers of the Town, not the County, and shall be billed directly by the Town for initial connection fees, monthly service charges, and any other applicable fees or charges.

Section 6.3.2 No Sale of Water for Resale; No Sale of Capacity. By this Agreement, the Town does not agree to furnish water or wastewater services to the County for resale to County customers in the Water & Sewer Service Area or elsewhere, nor does it agree to sell to the County any capacity or interest in the Town's water or wastewater treatment facilities.

Section 6.4 Transfer of Customers to Town. On the effective date of the Agreement, all existing water and sewer customers of the County served by the Town water or wastewater systems and located within the Water & Sewer Service Area shall be transferred to and shall become customers of the Town. In addition, County customers served by the County's Greens Corner Wastewater Treatment Plant on the effective date of the Agreement, including the Eastern View High School, shall become customers of the Town if the County accepts the Town's offer to construct a new sewer line in accordance with Section 10.3 of the Agreement and at such time as the customers are connected to the Town's wastewater system. Following the effective date of the Agreement, the County shall not connect any new customers located within the Water & Sewer Service Area to the Greens Corner Wastewater Treatment Plant. However, the County may temporarily connect additional customers during the planning, design, permitting, and construction of such a sewer line from its Greens Corner wastewater system to the Town system. Upon the completion of such construction, any such additional customers shall also become customers of the Town.

Section 6.5 Operation of County-Owned Lines. On the effective date of the Agreement, all County-owned utility lines and related facilities that are connected to the Town water or wastewater system shall continue to be owned by the County, but shall be operated and maintained exclusively by the Town. In the event of a boundary adjustment of any portion of the Water & Sewer Service Area, as provided above, the County shall convey to the Town, at no cost, title to all County water and sewer lines and related facilities and easements located within such portions of the Water & Sewer Service Area. The transfer of such facilities shall be made "as is" and without warranty.

Section 6.6 Construction of New Lines. Within all portions of the Water & Sewer Service Area, whether located within or outside the Town, the installation of new lines extending from existing lines to the property of new customers, shall be paid by developers or individual property owners in accordance with the Town's utility extension policies, as they may be revised from time to time. For example,

any wastewater line extension would be subject to the Town's requirement that gravity lines be used, where possible, rather than force mains. In addition, all connections of new lines to the Town's existing lines shall comply with the Town's utility connection policies, as they may be revised from time to time. The installation of related water or sewer facilities shall also be paid by the developers or individual property owners in accordance with the Town's utility extension policies. The installation of such related facilities shall include the enlargement or replacement of existing lines, tanks, or pump stations required to accommodate such new customers connected by a line extension. However, either the Town or the County may elect to pay, or contribute to, the expense of installing extensions of, or making improvements to, the existing systems, but neither the Town nor the County shall have an obligation to pay the expense of such line extensions or the enlargement or replacement of existing facilities to accommodate new customers, except as required below in Article X.

Section 6.7 Review of System Extensions or Improvements. The Town shall have the right to review and to approve or reject the design of all such lines and facilities funded by a developer, an individual property owner, or the County. The Town may deny approval only (i) if such lines and related facilities fail to comply with jointly-approved design standards, (ii) if they will fail to function in compliance with acceptable water quality standards and operating reliability standards, or (iii) if they do not comply with the Town's utility extension or connection policies. No such line extensions or improvements to related facilities shall be constructed until the Town and the County have jointly approved design standards for such lines and facilities. The Town may not deny approval for other reasons, such as disagreement with the location of a proposed development. The Town shall further have the right to inspect and approve or reject the construction of (i) such facilities funded by a developer or an individual property owner before they are dedicated to the County and (ii) such facilities funded by the County before they are connected to the Town's utility systems.

Section 6.8 Town-Funded Improvements. Within the Water & Sewer Service Area, all line extensions, improvement, and related equipment and easements funded by the Town shall be owned, operated, and maintained by the Town.

Section 6.9 Developer or County-Funded Improvements. Within the Water & Sewer Service Area, all line extensions, improvements, and related equipment and easements funded by a developer, an individual property owner, or the County shall be owned by the County, unless the area containing such facilities and easements is incorporated into the Town by a boundary adjustment, in which case they shall be conveyed to the Town. However, all such County-owned facilities shall be operated and maintained solely by the Town.

Section 6.10 Operation of Lines Outside of Water & Sewer Areas. During the term of this Agreement, the Town shall have no obligation to operate or maintain any County water or sewer lines and related facilities located outside the Water & Sewer Service Area. However, upon the request of the County, the Town will undertake good faith negotiations as to the operation and maintenance of any such facilities and/or the transfer of ownership of such facilities to the Town.

Section 6.11 Waiver of County Rights under Certain Agreements. Upon the execution of this Agreement, the County shall thereby relinquish and waive, without any further action, all its rights in certain so-called "3-party" and "2-party" agreements (i) to acquire ownership and control of the water and sewer facilities identified in each agreement and (ii) to provide water and sewer services to the customers served by such facilities. A list of all such agreements is attached as Exhibit 9.

ARTICLE VII

TERMS AND CONDITIONS OF SERVICE FOR RETAIL CUSTOMERS

Section 7.1 Terms & Conditions -- General. All Town customers in the Water & Sewer Service Area shall be entitled to receive service on the basis of the same terms and conditions as the Town's customers currently inside its boundaries.

Section 7.2 Equal Rates, Connection Fees, and Surcharges. The Town shall charge the same rates, connection fees, and other charges to all utility customers of the same class, whether located within the Town boundary or within any portion of the Water & Sewer Service Area. If the Town imposes a surcharge on retail customers who benefit directly from utility system improvements, any such surcharge policy shall be applied in the same fashion to customers within the Town boundary and within those portions of the Water & Sewer Service Area located outside the Town boundary.

Section 7.3 Revisions of Rates. The Town shall retain the discretion to establish and revise, without obtaining the County's consent, the rates, fees, and all other terms and conditions applicable to its water and sewer customers, including those located within the Water & Sewer Service Area.

Section 7.4 Reduction or Cessation of Service. Any reduction or cessation in water or sewer service for emergency conditions, or any denial of new water or sewer connections on the ground of insufficient capacity or other utility-based reasons, will be applied on an equal basis to all customers, whether located within the Town or outside the Town.

ARTICLE VIII
MEASUREMENT OF 1.5 MGD OF CAPACITY

Section 8.1 Calculation of 1.5 MGD. The Town shall be obligated to provide 1.5 MGD of water capacity and 1.5 MGD of wastewater capacity to its retail customers located within the Water & Sewer Service Area. However, the 1.5 MGD of water and wastewater capacity to be made available shall be in addition to, and shall not include, capacity made available to all Town and County customers connected to Town or County water or wastewater facilities within the Water & Sewer Service Area at the time the Agreement is given final approval by the parties following the review by the Commission of the Agreement. A list of all County customers served by the Town water or wastewater facilities pursuant to the 2003 Agreement, as amended, or the 2011 Interim Agreement, is attached hereto as Exhibit 10. The list does not include existing Town customers served within those areas. In addition, the 1.5 MGD of capacity shall not include capacity made available to those Town customers connected after the parties give final approval of the Agreement, where the Town is obligated to provide such service pursuant to so-called “three-party” or “two-party” agreements between the Town and the County and/or third parties. A list of all such agreements is attached as Exhibit 9. Other than customers connected pursuant to such agreements, the calculation of the 1.5 MGD of water and wastewater capacity shall include capacity provided to all new customers connected to water or wastewater facilities within the Water & Sewer Service Area after the Agreement has been given final approval by the Parties, or existing customers who require additional capacity following such approval.

Section 8.2 Water Capacity. The 1.5 MGD of water capacity to be provided by the Town shall not be calculated on the basis of the actual quantity of water delivered to each retail water customer on a daily basis. Instead, such capacity shall be calculated by using the maximum allowable gallons of water to be delivered to a water customer on a monthly basis (“Maximum Allowable Gallons”), as specified for the water meter or meters purchased by each retail water customer in the Water & Sewer Service Area, except those customers excluded as provided in Section 8.1. The Town shall have satisfied its obligation to provide 1.5 MGD of water capacity when the sum of the Maximum Allowable Gallons for the water meters purchased by such retail water customers in the Water & Sewer Service Area equals or exceeds 45,625,000 gallons, which is the equivalent of 1.5 MGD.

Section 8.3 Maximum Allowable Gallons based on Meter Size. The Maximum Allowable Gallons of water capacity for each meter shall be based on the size of the meter as shown in the Town’s Tap Privilege Fee Assessment Policy (“Tap Policy”), which specifies the maximum gallons of water to be delivered per month for each water meter size. Meter sizes currently range in size from 5/8 of an inch to 4 inches. A copy of the Tap Policy is attached hereto as Exhibit 11. Therefore, for example, the Town would supply 1.5 MGD of water capacity if it permitted customers in the Water & Sewer Service Area to connect a total of 304 two-inch water meters and 1 one-inch water meter, based on the

meter sizes provided for in the existing Tap Policy.

Section 8.3.1. Water Taps. Under the Town's Tap Policy, a person may purchase a retail water service tap ("water tap"), which is a right to connect to the Town's water system prior to the purchase and installation of a water meter and the commencement of water service. All such water taps for customers located in the Water & Sewer Service Area will count toward the 1.5 MGD of water capacity, even though a water meter has not been installed and service has not commenced. However, under the Tap Policy, the Town may withdraw a water tap purchased after 24 months if it has not been used. If the Town withdraws such a water tap, the Maximum Allowable Gallons for the meter associated with the tap shall be excluded from the 1.5 MGD of water capacity to be provided by the Town to the Water & Sewer Service Area.

Section 8.3.2. Revisions to Tap Policy. The Town may in its discretion revise or modify its Tap Policy during the term of the Agreement, except that it must retain the six current categories of Maximum Allowable Gallons of water to be delivered to a customer, ranging from 10,000 to 300,000 gallons per month. The Town may, however, change the meter size associated with each such category, because improvements in technology in the future may permit the delivery of greater quantities of water with smaller meters. Notwithstanding any future change in meter sizes, an existing customer shall retain the right to receive the Maximum Allowable Gallons of water authorized for the meter size at the time such water service was initially provided to the customer.

Section 8.3.3. County Purchase of Taps. The County may purchase retail water or wastewater service taps for use at County-owned property, but it may not purchase such taps for use at other parcels of property.

Section 8.4 Wastewater Capacity. While the Town shall make available 1.5 MGD of wastewater capacity within the Water & Sewer Service Area, such capacity shall not be based on the measurement of the actual flows of wastewater from its retail customers within the Water & Sewer Service Area. Instead, the amount of wastewater capacity made available shall be deemed to be equal to the quantity of water capacity provided to or used by such retail customers in the Water & Sewer Service Area, as determined in Section 8.2. Hence, the Town will accept, treat, and dispose of the wastewater from those retail water customers in the Water & Sewer Service Area, who receive or use water as part of the 1.5 MGD of water capacity furnished by the Town pursuant to this Agreement.

Section 8.4.1. Sewer Taps. Under the Town's Tap Policy, a person may purchase a retail wastewater service tap ("sewer tap"), which is a right to connect to the Town's wastewater system prior to the purchase and installation of a service connection and the commencement of wastewater service. All such sewer taps for customers located in the Water & Sewer Service Area will count toward the 1.5 MGD of wastewater capacity, even though a service connection has not been installed and wastewater service has not

commenced. However, under the Tap Policy, the Town may withdraw a sewer tap purchased after 24 months if it has not been used. If the Town withdraws such a sewer tap, the Maximum Allowable Gallons for the meter associated with the tap shall be excluded from the 1.5 MGD of wastewater capacity to be provided by the Town to the Water & Sewer Service Area.

Section 8.4.2. Customers with Wastewater Service Only. Each retail customer in the Water & Sewer Service Area who uses only Town wastewater service must purchase a Town water meter to measure the water flow from a well or other private water source. The Maximum Allowable Gallons of water flow for that meter shall be the assumed wastewater capacity for that customer.

Section 8.5 Impact of Boundary Adjustments on Water & Wastewater Capacity. In the event of the incorporation by the Town of the First Boundary Adjustment Areas or any Future Boundary Adjustment Areas, the water and sewer capacity provided by the Town to such areas shall continue to be counted as part of the total 1.5 MGD of water and sewer capacity to be furnished by the Town to the Water & Sewer Service Area, even though such incorporated areas are located within the Town. However, the incorporation of such areas into the Town shall alter the method of calculating the water and wastewater capacity allocated to such areas for purposes of the Town's obligation to supply 1.5 MGD of capacity, as described below.

Section 8.5.1 Modified Method of Calculating Capacity. For all such areas incorporated into the Town (First Boundary Adjustment or any Future Boundary Adjustments), the Maximum Allowable Gallons provided by the Town on the effective date of the boundary adjustment, as calculated in accordance with Sections 8.1 through 8.5, shall be counted toward the 1.5 MGD of capacity to be provided by the Town, based on water meters and water and sewer taps purchased by customers for such parcels of land prior to the effective date of the boundary adjustment. However, any additional capacity provided to such customers (by larger or additional meters or taps) after the effective date of the boundary adjustment shall not be counted toward the 1.5 MGD of capacity. Likewise, any reduction in the capacity furnished to such parcels (by smaller or fewer meters or taps) after the effective date of the boundary adjustment shall not reduce the capacity counted toward the 1.5 MGD of capacity to be furnished by the Town. For each parcel of land for which no capacity had been provided by the Town as of the effective date of the boundary adjustment (First Boundary Adjustment or any Future Boundary Adjustments), the Town's provision of water or sewer capacity to any such parcel following the effective date of the boundary adjustment shall not be counted toward the 1.5 MGD of capacity to be furnished by the Town.

Section 8.5.2 Example of Calculation of Capacity after Boundary Adjustment. The modified method of calculating water and sewer capacity to an area incorporated into the Town by a boundary adjustment implemented pursuant to this

Agreement can be illustrated by this hypothetical example of the calculation of water capacity. Assume that prior to the effective date of the First Boundary Adjustment, the Maximum Allowable Gallons for water meters and water taps for parcels within the boundary adjustment area total 100,000 gallons per month, as determined in accordance with Section 8.1. Such capacity shall be counted toward the 1.5 MGD of water capacity to be furnished by the Town. However, if a particular customer receiving water service on the effective date of the First Boundary Adjustment increases its capacity of 10,000 gallons per month by purchasing after the effective date of the boundary adjustment a larger meter delivering 200,000 gallons per month, such additional capacity of 190,000 gallons per month shall not be counted toward the 1.5 MGD of capacity to be provided by the Town.

Section 8.6 Annual Reports of Water & Wastewater Capacity. On at least an annual basis, the Town shall make available to the County a report of the water and wastewater capacity provided to retail customers within the Water & Sewer Service Area pursuant to the Agreement, including the capacity provided during the preceding year, the cumulative capacity provided since the inception of the Agreement, and the remainder available for the Water & Sewer Service Area of the total 1.5 MGD.

ARTICLE IX

EXPANSION OR CONTRACTION OF WATER & SEWER SERVICE AREAS

Section 9.1 Expansion of Water & Sewer Service Areas. Following the effective date of this Agreement, the County may unilaterally expand the Water & Sewer Service Area, without the Town's consent, to include any adjacent land where it desires to make public water and wastewater services available pursuant to the terms of this Agreement. All rights and obligations of the Parties with respect to the Water & Sewer Service Areas shall apply to such additional territory.

Section 9.2 Contraction of Water & Sewer Service Areas. Following the effective date of this Agreement, the County may unilaterally remove territory from the Water & Sewer Service Areas, without the Town's consent, and thereby remove land that it no longer desires to designate as a public water and sewer service area, except as follow:

Section 9.2.1. **Parcels Already Served.** The County shall not remove from the Water & Sewer Service Area any parcel that is served by the Town, which shall include (i) those parcels connected to the Town water or sewer system and receiving one or both such services and (ii) parcels for which a "tap privilege" has been purchased from the Town, even if a water meter has not been installed. However, this limitation shall not apply to parcels for which such a tap privilege has expired or has been revoked by the Town in accordance with its tap privilege policies.

Section 9.2.2. Parcels Adjacent to Water & Sewer Lines. The County shall not remove from the Water & Sewer Service Area any parcel located within such distance from an existing water line or existing sewer line so as to be subject to the County's mandatory utility connection ordinance as it may be amended from time to time, subject to a minimum distance of 300 feet along each side of existing lines.

Section 9.2.3. Creation of Islands or Non-Contiguous Areas. The County shall not remove from the Water & Sewer Service Area any parcel that (i) would create an island of land that was not part of the Water & Sewer Service Area, but was surrounded entirely by the Water & Sewer Service Area, or that (ii) would result in a portion of the Water & Sewer Service Area no longer being contiguous to the then-existing Town boundary.

Section 9.2.4. Creation of Peninsula. The County shall not remove from the Water & Sewer Service Area any parcels that would create a peninsula of land lying between the Town and any remaining portions of the Water & Sewer Service Area. A peninsula shall mean a narrow strip of land, which is surrounded on three sides by the Water & Sewer Service Area or the existing Town boundary and which is connected to other unincorporated portions of the County not constituting part of the Water & Sewer Service Area. The Parties acknowledge that such a peninsula cannot be defined with precision, but agree that the purpose of this limitation is to ensure that the Town will not be prevented from incorporating an area located within the Water & Sewer Service Area by the County's action removing certain parcels so as to create peninsula of land that would effectively block the outward extension of the Town's boundary to encompass adjoining land that otherwise would qualify as a boundary adjustment area in accordance with this Agreement.

ARTICLE X

PLANT EXPANSION AND OTHER SYSTEM IMPROVEMENTS

Section 10.1 Expansion of Water & Wastewater Treatment Plant. The Town shall be solely responsible for the planning, funding, and development of such expansions or improvements to its water and wastewater treatment plans as may be required in future years to provide the 1.5 MGD of water and wastewater capacity for the Water & Sewer Service Area.

Section 10.2 Expansion of Raw Water Sources. The Town and the County recognize that the development of new raw water sources as may be required to provide 1.5 MGD of water capacity to the Water & Sewer Service Area will require cooperation in the planning, funding, and development of such raw water sources. Therefore, the Town shall have no obligation pursuant to the Agreement to secure such additional raw water sources, if they are needed in the future to ensure that 1.5 MGD of water capacity is available for the Water & Sewer Service Area. However, the Town and

the County resolve to undertake good faith efforts to cooperate in the planning, funding, and development of any such required raw water sources. Failure to develop adequate raw water sources will affect all customers equally, as provided in Article VII of the Agreement.

Section 10.3 Sewer Line to Eastern View High School. The Town shall offer to build a sewer line to the Eastern View High School that currently is served by the Greens Corner Wastewater Treatment Plant. If the County accepts that offer, the Town shall promptly undertake the planning, design, permitting, and construction of such line and related facilities, the capacity of which shall be determined by the Town in its discretion, except that such capacity shall be sufficient to serve the Eastern View High School. The construction shall be undertaken by the Town at no cost to the County other than the incremental effect of such construction expenses on the Town's retail sewer rates, which will be paid by the County as a retail customer of the Town for any County facilities that are connected to and served by the Town's sewer system. The Town shall own the sewer line constructed to serve the Eastern View High School, and the County may move the Greens Corner Wastewater Treatment Plant to any location outside the Water & Sewer Service Area to serve other needs. Until the Eastern View High School is connected to and served by a Town sewer line, the County shall continue to be responsible for the operation and maintenance of its Treatment Plant and related facilities.

ARTICLE XI

TERM OF AGREEMENT AND POST-TERMINATION RIGHTS

Section 11.1 Minimum Term. This Agreement shall be in effect for a minimum term of 30 years. However, if the Town has not provided 1.5 MGD of water capacity and 1.5 MGD of wastewater capacity to the Water & Sewer Service Area, as calculated in accordance with Article VIII above, then it shall automatically be extended until such time as the Town has provided that quantity of capacity to utility customers located within the Water & Sewer Service Area. However, both parties may jointly decide to terminate the Agreement at the end of 30 years or at any mutually agreed upon date after such 30-year period, but prior to the date upon which the Town has provided that quantity of capacity.

Section 11.2 Post-Termination Rights. Upon the expiration of the 30-year term or such longer term as described above, the rights and obligations of the Town and the County pursuant to this Agreement shall terminate except as provided in Sections 11.2.1, 11.2.2, 11.2.3, and 11.2.4, below:

Section 11.2.1. **Service Rights.** The Town's exclusive right to provide retail service to customers within the Water & Sewer Service Area shall terminate, except as to all then-existing customers of the Town, which the Town shall have the exclusive right to serve indefinitely, unless otherwise agreed to by the Town and the

County. In addition, the Town shall have no right, pursuant to any provision of the Agreement, to provide retail service to any additional customers within the Water & Sewer Service Area. However, by this Section of the Agreement, the Town shall not forfeit or waive any rights under the Code of Virginia or its charter to provide retail service to additional customers within the Water & Sewer Service Area.

Section 11.2.2. Operation of Certain County-Owned Lines. Following the termination of the Agreement, the Town shall have the right to continue to operate and maintain in perpetuity any County-owned water or sewer lines and related facilities that were being used to serve Town customers within the Water & Sewer Service Area prior to the termination of the Agreement.

Section 11.2.3. Provision of Additional Utility Service. The Town shall have no obligation to provide utility service to additional customers within the Water & Sewer Service Area following the termination of the Agreement. Instead, the County shall be solely responsible for providing utility services to any new customers within the Water & Sewer Service Area.

Section 11.2.4. Boundary Adjustment & Annexation Rights. The Town's right to exercise its boundary adjustment rights under this Agreement and its waiver of its right to institute a contested annexation proceeding shall terminate. However, the Final Boundary Adjustment may become effective on the date of termination, or at the Town's option, on any date within one year following the termination of this Agreement, as provided in Section 4.3.2 above.

ARTICLE XII

REDUCTION IN BPOL TAXES

Section 12.1 Reduction in BPOL Rates. The Town shall reduce its business, professional, and occupational license ("BPOL") tax rate and any BPOL flat fee by 20% for each category of business subject to such tax within the existing Town boundaries and within the First Boundary Adjustment Areas.

Section 12.2 Period of Reduced Rates. Such reduced rate of taxation shall be effective for at least the one tax year immediately following the effective date of the First Boundary Adjustment.

ARTICLE XIII

JOINT ADVISORY PLANNING BODY

Section 13.1 General. The Town and the County shall create a joint advisory planning body to consider Town and County planning issues.

Section 13.2 Membership of Joint Body. The Town Council shall appoint two members and the County Board of Supervisors shall appoint two members to the body, and those four members shall elect a fifth member.

Section 13.3 Duties of Joint Body. The joint advisory planning body will consider such planning issues as are referred to the body by either the Council or the Board and shall make advisory recommendations to the governing bodies.

ARTICLE XIV **COMMISSION AND SPECIAL COURT APPROVAL**

Section 14.1 Commission Review. The Town and the County agree to initiate the steps necessary and required by Title 15.2, Chapter 34 of the Code (in particular § 15.2-3400, paragraphs 3, 4, 5 and 6) and Title 15.2, Chapter 29 of the Code (§ 15.2-2900 *et seq.*) to obtain a review of this Agreement by the Commission.

Section 14.2 Submission to Special Court: Following the issuance of the report of findings and recommendations by the Commission, the Town and the County agree that they will submit this Agreement in its present form to the Special Court for approval, as required by Title 15.2, Chapter 34 of the Code (in particular § 15.2-3400, paragraphs 3, 4, 5 and 6 of the Code), unless both parties agree to any changes recommended by the Commission.

Section 14.3 Termination if Agreement Modified. The Town and County agree that if this Agreement is not affirmed without modification by the Special Court, this Agreement shall immediately terminate. However, the parties may waive termination by mutually agreeing to any recommended modifications.

Section 14.4 Future Governing Bodies. Upon approval by the Special Court, the Agreement will bind future local governing bodies of the localities, pursuant to express statutory authority.

Section 14.5 Enforcement of Agreement. The obligations in this Agreement shall be enforceable in a proceeding initiated by the Town or the County before the Special Court appointed to affirm, validate and give full force and effect to this Agreement or a successor Special Court appointed in accordance with Section 15.2-3000 of the Code.

Section 14.6 Alternative Dispute Resolution. Either party may ask that a dispute arising under this Agreement be submitted to non-binding arbitration prior to the commencement of an enforcement proceeding before a Special Court. If the other party agrees, then within 30 days thereafter, the Town and County shall each choose one arbitrator. Such persons may not be currently employed by or hold an elected or other

official position with either the Town or the County. Those two persons shall choose a third arbitrator within 30 days after the initial selections. The panel of three arbitrators will hear the matter under such procedures and rules as the arbitrators conclude are appropriate. Within 90 days after the third arbitrator is chosen, the panel shall issue their decision in writing with such explanation or detail as the arbitrators conclude is appropriate. In the event the dispute is not resolved by such non-binding arbitration, the Special Court reviewing the matter shall do so *de novo*, without factual or legal deference to the decision of the arbitrators.

ARTICLE XV

MISCELLANEOUS PROVISIONS

Section 15.1 Termination of 2003 Agreement and 2011 Interim Agreement.

Upon entry of the order of the Special Court affirming the Agreement and giving it full force and effect, all provisions of the 2003 Agreement, as amended, and of the 2011 Interim Agreement shall terminate and be null and void, including those provisions providing for the refund by the Town to the County of the remaining portion of the \$3,300,000 previously paid by the County for water and sewer capacity that had not already been refunded. It is the Parties' intent that, upon such final approval of the Agreement, the Town shall have no obligation to make any further refund or other payment to the County relating to the County's purchase of water and sewer capacity under the 2003 Agreement, as amended, or the 2011 Interim Agreement.

Section 15.2 Precondition to Implementation of Agreement. This Agreement is conditioned upon, and shall not be implemented unless and until the Virginia Department of Environmental Quality has approved the transfer to the Town of the County's Mountain Run Plant nutrient allocations of 18,273 pounds per year of the nutrient total nitrogen and 1,371 pounds per year of the nutrient total phosphorus, as provided in the Nutrient Agreement entered into by the Town and the County. However, the Town and the County may take action waiving this approval requirement in whole or in part.

Section 15.3 Amendments to Agreement. This Agreement may be amended, modified or supplemented, in whole or in part, by mutual consent of the Town and the County, subject to review by the Commission and approval by a Special Court, except as provided in Section 15.4.

Section 15.4 Modifications to Utility Arrangements. The Town and the County shall have the right to make such modifications to the utility arrangements described above as they deem appropriate without further Commission review or court approval.

Section 15.5 Notices. Any and all notices herein provided for or relating to the transactions herein provided for will be in writing and will be deemed to have been sufficiently given if delivered by hand or mailed, postage prepaid, by first class mail, addressed to:

For notices to the County:
County Administrator
Culpeper County
302 N. Main Street
Culpeper VA 22701

For notices to the Town:
Town Manager
Town of Culpeper
400 S. Main Street
Suite 101
Culpeper, VA 22701

Section 15.6 Counterparts. This Amendment may be executed in several counterparts, each of which will be deemed an original, but all of which together will constitute one and the same instrument.

Section 15.7 Effective Date. This Agreement shall be effective upon the date of entry of the order of the Special Court affirming and giving full force and effect to the Agreement. However, in the event the Virginia Department of Environmental Quality has not approved the transfer of nutrient allocations, as provided in Section 15.2, by the date of entry of such Order, this Agreement shall not be effective until and unless (i) the Department of Environmental Quality has granted such approval or (ii) the Town and the County have taken action waiving this requirement.

WITNESS the following signatures and seals.

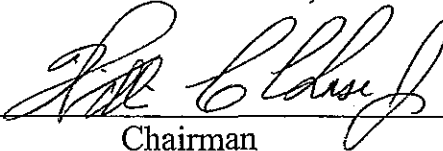
TOWN OF CULPEPER, VIRGINIA

By: 
Mayor

ATTEST:


Clerk

COUNTY OF CULPEPER, VIRGINIA

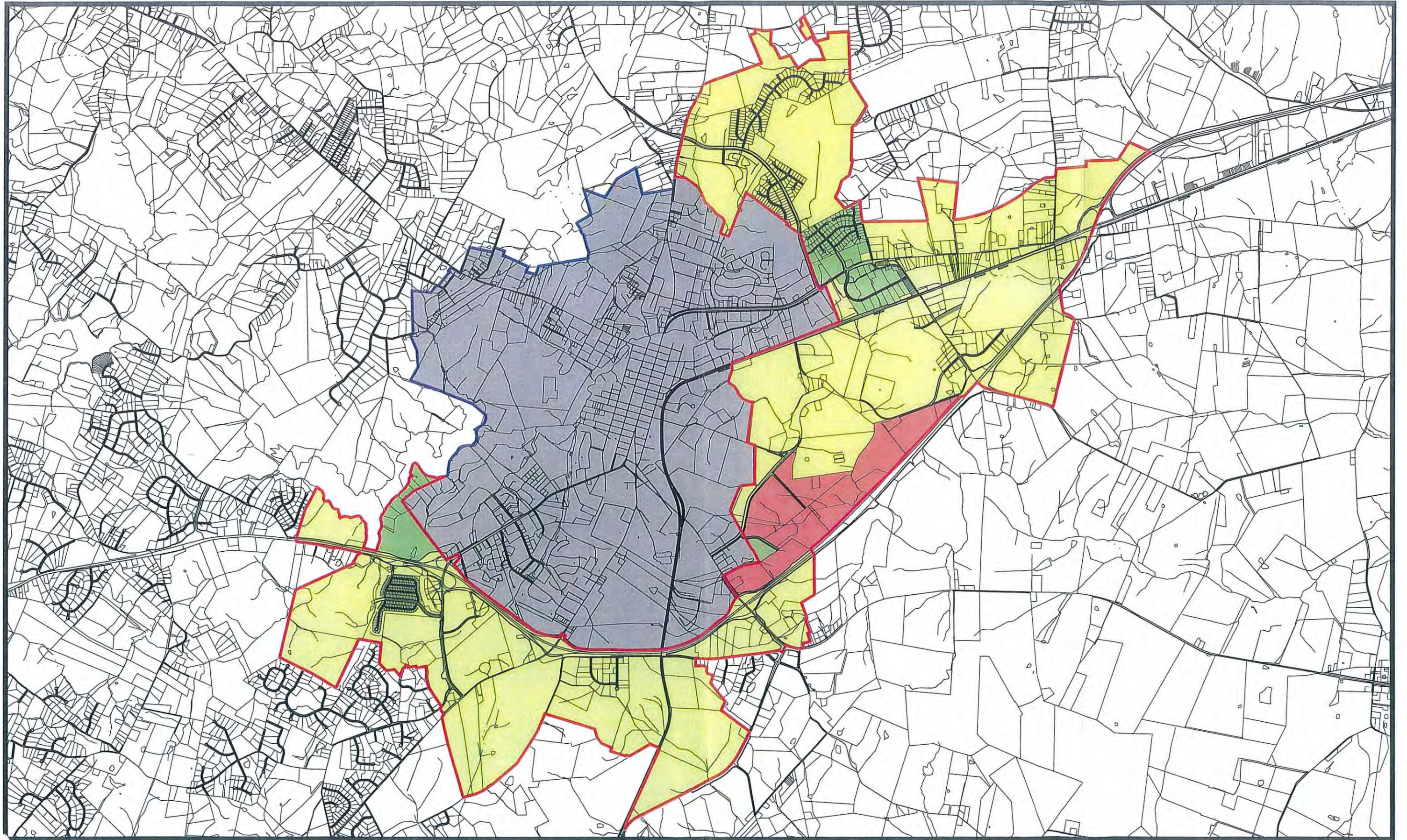
By: 
Chairman

ATTEST:


Clerk

Exhibit 1 to Voluntary Settlement

Map depicting the First Boundary Adjustment Areas and Future Boundary Adjustment Areas, dated July 27, 2010



TOTAL WATER & SEWER SERVICE AREA= 8.79 SQ. MILES

WATER & SEWER SERVICE AREAS

Adopted 10-2-07
Revised & Adopted 12-2-08

MAP DRAFT DATE: 7-27-2010

- TECH ZONE AREA-NOT ELIGIBLE FOR BLA
406 ACRES/0.63 SQ. MILES
- INITIAL BLA
0.48 SQ. MILES
- EXISTING WATER & SEWER SERVICE AREA

Exhibit 2 to Voluntary Settlement

Metes and Bounds Descriptions of the First Boundary Adjustment Areas

(1) Montanus Area

Beginning at the northeast corner of parcel # 41G(1)A, a point on the current Town of Culpeper Corporate limits; thence cutting across Ira Hoffman Lane-Route 694 in a easterly direction to the southwest corner of parcel # 41-70B2; thence in a easterly direction with the southern property line of parcel # 41-70B2 to the southeast corner of parcel # 41-70B2; thence in a northerly direction with the east property line of parcel of parcel # 41-70B2 to the northeast corner of parcel # 41-70B2; thence in a northeasterly direction with the southern property lines of parcel #'s 41-57, 69,68 to the northeast property corner of parcel # 41N(1)24, a point in the west right of way line for Bradford Road – Route 666; thence in a southerly direction with the west right of way line for Bradford Road – Route 666 to the southeast corner of parcel # 41-71B; thence in a westerly direction with the southern property line for parcel # 41-71B to the northwest corner to parcel # 41-73; thence in a southerly direction with the western property line of parcel # 41-73 to the southeast corner of parcel # 41-71D, a point in the northern right of way line for Brandy Road-Business Route 15/29; thence in a easterly direction with the northern right of way line of Brandy Road-Business Route 15/29 to the southeast corner of parcel # 41-73; thence cutting across Brandy Road-Business Route 15/29 in a southerly direction to the northeast corner of parcel # 41C(3)1, a point at the southwest corner of the intersection of Brandy Road-Business Route 15/29 and Braggs Corner Road-Route 666; thence with the right of way line of Braggs Corner Road-Route 666 in a southeasterly direction to the southeast corner of parcel # 41C(1)4; thence in a southwesterly direction with the southern property line for parcel # 41C(1)4 to the southwest corner of parcel # 41C(1)4; thence in a northerly direction with the western property line of parcel # 41C(1)4 to the southeast corner of parcel # 41(3)14; thence in a westerly direction with the southern property line for parcels # 41C(3)14 and 41C(3)15 to the southwest corner to parcel # 41C(3)15, a point in the line of parcel # 41(3)16; thence in a southerly direction with the eastern property line of parcel # 41C(3)16 to the southeast corner to parcel # 41C(3)16, a point in the northern right of way line of Southern Railroad; thence in a westerly direction with the southern property lines of parcels # 41C(3)16, 17 18, 19, 20, 21 to the southwest corner of parcel 41C(3)21; thence in a northerly direction with the western property line of parcel # 41C(3)21 to the southeast corner to parcel # 41-76, a point in the right of way line of Montanus Drive-Route 1023; thence in a northerly direction with the right of Montanus Drive-Route 1023 to the southeast corner of parcel # 41C(3)22; thence with the southern and western property line of parcel # 41C(3)22 in a westerly and northerly direction to the northwest corner of parcel # 41C(3)22, a point in the southern right of way line of Brandy Road-Business Route 15/29; thence in a southwesterly direction with the right of way line of Brandy Road-Business Route 15/29 to point where the right of way intersects with the

Town of Culpeper Corporate limits; thence in a northerly direction with the Town of Culpeper Corporate limits to the point of beginning.

(2) S.W.I.F.T. Property

Beginning at a point where the southern right of way line of Technology Drive-Route 790 intersects with the Town of Culpeper Corporate limits, corner to parcel # 51-83F1; thence in a southeasterly direction with the right of way of Technology Drive-Route 790 to the southeast corner to parcel # 51-83F1; thence in a southwesterly direction with the southern property line for parcel # 51-83F1 to the southwest corner of parcel # 51-83F1 a point on the Town of Culpeper Corporate limits; thence in a northerly direction with the Town of Culpeper Corporate limits to the point of beginning.

(3) Lake Pelham / Clore Farm Area

Beginning at a point where the northern right of way line of James Monroe Highway-Route 29 intersects the Town of Culpeper Corporate limits, a corner to parcel #50-1; thence in a southerly and westerly direction with the property line with parcel # 50-1 to the southwest corner of parcel # 50-1, a point on Lake Pelham owned by the Town of Culpeper; thence in a northerly direction with Lake Pelham and the parcel lines of parcels # 50-1, 1C, 1B, 40-48A, 50D1, 49E2, 49E, 49E3, and 50C to a point where the property line intersects with the Town of Culpeper Corporate limits; thence in southwesterly and then southeasterly direction with the Town of Culpeper Corporate limits to the point of beginning.

Exhibit 3 to Voluntary Settlement

Metes and Bounds Descriptions of the Future Boundary Adjustment Areas

(1) North of Town

Beginning at a point in the east right of way line of Rixeyville Road-Route 229 where it intersects with the Town of Culpeper Corporate limits; thence in a northerly direction with the east right of way line of Rixeyville Road-Route 229 to a point where it intersects with the south right of way line of Ira Hoffman Lane-Route 694; thence cutting across Ira Hoffman Lane-Route 694 in a northerly direction to the northeast corner of the intersection of Rixeyville Road-Route 229 and Ira Hoffman Lane-Route 694; thence in a northerly direction with the east right of way of Rixeyville Road-Route 229 to the northwest property corner of parcel # 31-71C; thence in a northeasterly direction with the northern property lines for parcels # 31-71C, 71, 73A to a corner in the property line of parcel # 31-73A; thence in a northerly direction with the east property line of parcel # 31-73A to the southwest corner of parcel 31-73D; thence with the southern property line of parcel # 73D to the southeast corner of parcel # 31-73D; thence with the east property line of parcel # 31-73D to a point in the southern right of way line of Chestnut Fork Road-Route 685; thence in a easterly direction along the southern right of way line of Chestnut Fork Road-Route 685 to the northeast corner of parcel # 31-73A; thence in a southerly direction with the eastern property line of parcel # 31-73A to the northern property corner of parcel 41M(6)164; thence in a southerly direction with the property of parcel # 41M(6)164 to the northwest property corner of parcel # 41M(6)165; thence in a northerly direction with the northern property line of parcel # 41M(6)165 to a property corner with parcel # 31-73A; thence in a easterly direction with the northern property line of parcel # 31-73A to the southwest property corner of parcel # 31-73M; thence in a northerly direction with the western property line of parcel # 31-73M to a corner in the southern right of way line of Chestnut Fork Road -- Route 685; thence in a northeasterly direction to the corner of parcel # 31-73M; thence in a southerly direction with the property line of parcel # 31-73M to the southwest corner of parcel # 31-73; thence in a easterly and then northerly direction with the property line of parcel # 31-73 to the northeast corner of parcel # 31-73; thence in an easterly direction with the property line of parcel # 31-73R to the southeast corner to parcel # 31-73R; thence in a southerly direction with the property eastern lines of parcels # 31-73M , 31-73A, 41M(6)P, 41M(6)179, 31-105, and 41-57 to the southeast corner of parcel # 41-57; thence in a southwesterly direction with the property line of parcel # 41-57 to the northern corner of parcel # 41-70B2; thence in a southerly direction with the eastern property line of parcel # 41-70B2 to the southeast corner of parcel # 41-70B2; thence in a westerly direction with the southern property line of parcel # 41-70B2 to the southwest corner of parcel # 41-

70B2, a point in the eastern property line of Ira Hoffman Lane – Route 694; thence cutting across Ira Hoffman Lane in a westerly direction to the southern property corner to parcel # 41-70, a point in the Town of Culpeper Corporate limits; thence in a westerly direction with the Town of Culpeper Corporate limits to the point of beginning.

(2) East of Town

Beginning at the northwest corner of parcel # 41-77, a point in the Town of Culpeper Corporate limits and a point in the southern right of way line for Brandy Road – Business Route 15/29; thence in a westerly direction with the right of way line for Brandy Road to the northeast corner of parcel # 41-76; thence with the property line for parcel # 41-76 in a southerly and westerly direction to a point in the right of way line for Montanus Drive – Route 1023; thence in a southerly direction with the right of way line for Montanus Drive to the northeast corner to parcel # 41-76A; thence in a southerly direction to the southeast corner to parcel # 41-76A, a point in the northern right of way line for Southern Railroad; thence with the northern right of way line of Southern Railroad to the southwest corner of parcel # 41C(1)1A; thence in a northerly direction with the western property line of parcel # 41C(1)1A to the northwest corner of parcel # 41C(1)1A; thence in a easterly direction with the northern property of parcel # 41C(1)1A to the northwest corner of parcel # 41C(1)1A; thence in a southerly direction with the eastern property line of parcel # 41C(1)1A to the northwest corner of parcel # 41C(1)3; thence in a easterly direction to the northeast corner of parcel # 41C(1)3 a point in the western right of way line of Braggs Corner Road – Route 666; thence in a northerly direction with the western right of way for Braggs Corner Road to the northeast corner of parcel # 41C(3)1, a point in the southern right of way line of Brandy Road – Business Route 15/29; thence in a northerly direction cutting across Brandy Road to the southeast corner of parcel # 41-73, a point in the northern right of way line of Brandy Road – Business Route 15/29; thence in a westerly direction with the southern property line of parcel # 41-73 to the southwest corner of parcel #41-73; thence in a northerly direction with the western property line of parcel # 41-73 to the northwest corner of parcel # 41-73; thence in a easterly direction with the northern property line of parcel # 41-73 to the northeast corner of parcel # 41-73, a point in the western right of way line of Bradford Road – Route 666; thence in a northerly direction with the western right of way line of Bradford Road to the point of intersection with the right of way for Burgandine Avenue; thence in a easterly direction cutting across the right of way of Bradford Road to a point in the eastern right of way of Bradford Road, a point in the property line of parcel # 41-126; thence in a easterly direction cutting across parcel # 41-126 to a point in western property line of parcel # 42-17, approximately 793 feet north of the southwest property corner; thence with the western property line of parcels # 42-17 and 42-17L in a northerly direction to the

northwest corner of parcel # 42-17L; thence in a easterly direction with the northern property line of parcel # 42-17L to the northeast corner of parcel # 42-17L; thence in a southerly direction with the property lines of parcels # 42-17L and 42-16 to a point in the property line of parcel # 42-16, approximately 155 feet north of the southeast property corner of parcel # 42-16; thence in a northeasterly direction cutting across parcels # 42-15, 42-12, 42-2B and 42-1 to a point in the western right of way line of Inlet Road – Route 665, approximately 2,436 feet north of the intersection with Brandy Road – Business Route 15/29; thence in a easterly direction cutting across the right of way for Inlet Road to the eastern right of way line of Inlet Road; thence in a northerly direction with the eastern right of way line of Inlet Road to the northwest corner of parcel # 42-68; thence in a easterly direction with the northern property line of parcel # 42-68 to a point in the northern right of way line of James Madison Highway – Route 15/29; thence in a southerly direction with the northern right of way line of James Madison Highway to a point where it intersects the right of way line of Brandy Road – Business Route 15/29; thence in a southerly direction cutting across the right of way of Brandy Road to a point in the northern right of way line of James Madison Highway – Route 15/29 and the northeast corner to parcel # 42-59; thence in a southerly direction to the southeast corner to parcel # 42-28C; thence cutting across James Madison Highway in a southeasterly direction to the northeast corner of parcel # 42-28E a point in the western right of way line of Jonas Road – Route 703; thence in a southerly direction with the western right of way line of Jonas Road to a point where it intersects the northern right of way line of Greens Corner Road – Route 666; thence in a westerly direction with the northern right of way line of Greens Corner Road to a point where it intersects the southern right of way line of James Madison Highway – Route 15/29; thence in a southerly direction with the southern right of way line of James Madison Highway to a point in the property line of parcel #42-40A; thence in a northerly direction across the right of way of James Madison Highway to the north property corner of parcel # 41-110; thence in a northerly direction with the eastern property line of parcel # 41-110 to the property corner of parcel # 41-110 a point in the southern right of way line of Nalles Mill Road – Route 667; thence with the southern right of way line of Nalles Mill Road to the property corner between parcels # 41-109 and 41-111; thence in a southerly direction with the western property line of parcel # 41-109 to the northeast property corner of parcel # 41-106; thence in a easterly and northerly direction with the northern property line of parcels 41-106 and 41-106C to a point in the eastern right of way line of McDevitt Drive – Route 799; thence in a southerly direction with the eastern right of way line of McDevitt Drive to where it intersect with the right of way line of Frank Turnage Drive – Route 798; thence cutting across the right of way of Frank Turnage Drive to the northern property corner of parcel # 41-106D, a point in the right of way line of McDevitt Drive – Route 798; thence in a southerly direction with the right of way line for McDevitt Drive to a point where it intersects with the Town of Culpeper Corporate limits;

thence in a northerly direction with the Town of Culpeper Corporate limits to the point of beginning.

(3) South of Town

Beginning at a point in the Town of Culpeper Corporate limits at the northwest corner of the intersection of the right of ways lines for James Madison Highway – Route 15/29 and Germanna Highway – Route 3; thence cutting across the right of way of Germanna Highway to the southwest corner of parcel # 51-83B, a point in the right of way of James Madison Highway – Route 15/29; thence in a northerly direction with the right of way of James Madison Highway to the northeast corner of parcel # 51-83A1; thence in a southerly direction cutting across the right of way for James Madison Highway to the northern property corner of parcel # 51-84M; thence in a southerly direction with the eastern property lines of parcels # 51-84M, 51-84, 51-84P, 51-86 to the southeast property corner of parcel # 51-86, a point in the northern right of way line of Germanna Highway – Route 3; thence in a southerly direction cutting across the right of way of Germanna Highway to a point in the southern right of way line of Germanna Highway – Route 3; thence in a westerly direction with the southern right of way line of Germanna Highway to a point where the right of way intersects with the eastern right of way line of Zachary Taylor Highway – Route 522; thence in a southerly direction along the eastern right of way line of Zachary Taylor Highway for 250 feet; thence cutting across the right of way of Zachary Taylor Highway in a westerly direction to the northeast corner of parcel # 51-18; thence in a westerly direction with the northern property line of parcel # 51-18 to the northwest corner of parcel # 51-18, a point in the northern right of way line of Lovers Lane – Route 686; thence in a westerly direction cutting across the right of way of Lovers Lane – Route 686 to the northwest corner of parcel # 51-19 a point in the southern right of way line of Lovers Lane – Route 686; thence in a westerly direction with the southern right of way line of Lovers Lane to the northeast corner of parcel # 51-21; thence in a southerly direction with the eastern property line of parcel # 51-21 to the southeast corner of parcel # 51-21; thence in a southerly direction with the northern property lines of parcels # 51-23 and 51-23A to the northeast property corner of parcel # 51-23A, a point in the western right of way line of Zachary Taylor Highway – Route 522; thence in a southwesterly direction along the western right of way line of Zachary Taylor Highway to the southwest corner of parcel # 51-24, a point in the eastern right of way line of Southern Railroad; thence in a northerly direction with the western property line of parcel # 51-24 to the northwest corner of parcel # 51-24, a point in the eastern right of way line of Southern Railroad; thence in a westerly direction cutting across the right of way of Southern Railroad to the southeast corner of parcel # 51-22A; thence in a westerly direction with the southern property lines of parcels # 51-22A, 51-22, 50-35D to the southwest corner of parcel # 51-35D, a point in the eastern right of way line of Cedar Run

Church Road – Route 720; thence in a westerly direction cutting across the right of way of Cedar Run Church Road to a point in the western right of way line of Cedar Run Church Road; thence in a southerly direction with the western right of way line of Cedar Run Church Road to the southwest corner of parcel # 50-38E; thence with the western property line in a northerly direction to the northwest corner of parcel # 50-38E, a point in the eastern right of way line of James Madison Highway – Route 15; thence in a northerly direction cutting across the right of way of James Madison Highway to a point in the western right of way line of James Madison Highway; thence in a northerly direction with the western right of way line of James Madison Highway to the southeast property corner to parcel # 50-8A; thence in a northerly direction with the southwestern property line of parcel # 50-8A to the southwest corner of parcel # 50-8A, a point the southern right of way line of Old Orange Road – Route 692; thence in a northerly direction cutting across the right of way of Old Orange Road to a point in the northern right of way line of Old Orange Road – Route 692; thence in a northerly direction to the southwest corner of parcel # 50-8; thence in a northerly direction with the western property line of parcel # 50-8 to the southeast property corner of parcel # 50-7; thence in a westerly and northerly direction with the southern and western property lines of parcel # 50-7 to the southeast corner of parcel # 50W(1)D; thence in a westerly direction with the southern property line of parcel # 50W(1)D to the southeast corner of parcel # 50-4; thence in a westerly direction with the southern property line of parcel # 50-4 to the northeast property corner of parcel # 50-5; thence in a southerly direction with the eastern property line of parcel # 50-5 to the southeast property corner of parcel # 50-5; thence in an easterly direction with the southern property line of parcel # 50-5 to the southwest corner of parcel # 50-5; thence in a northerly direction with the western property lines of parcels # 50-5 and 50-4 to the southern property corner of parcel # 50K(1)1; thence in a northerly direction with the eastern property line of parcel # 50K(1)1 to the northeast corner of parcel # 50K(1)1, a point in the southern right of way line of James Monroe Highway – Route 29; thence in a westerly direction with the southern right of way line of James Monroe Highway to the northwest property corner of parcel # 49-87D1; thence in a northerly direction cutting across the right of way of James Monroe Highway to the southwest corner of parcel # 40-47; thence in a northerly direction with the western property line of parcel # 40-47 to the northwest property corner of parcel # 40-47, a point in the line of Lake Pelham owned by the Town of Culpeper; thence in southeasterly direction with Lake Pelham and the property lines of parcels # 40-47 and 40-47D to the southeast corner of parcel # 40-47D, a point in the northern right of way line of James Monroe Highway – Route 29; thence in a easterly direction with the northern right of way line of James Monroe Highway to a point where it intersects with the Town of Culpeper Corporate limits; thence in a easterly direction with the Town of Culpeper Corporate limits to the point of beginning.

Exhibit 4 to Voluntary Settlement

Metes and Bounds Descriptions of the Tech Zone

Beginning at a point where the southern right of way line of McDevitt Drive-Route 799 intersects with the Town of Culpeper Corporate limits; thence in a northerly direction with the southern right of way line of McDevitt Drive-Route 799 to the northern property corner of parcel # 41-106D; thence cutting across the right of way for Frank Turnage Drive-Route 798 to the southwest property corner of parcel # 41-106; thence in a northerly direction with the right of way of McDevitt Drive-Route 799 to the northwest corner of parcel # 41-106; thence in an easterly direction with the property line of parcel # 41-106 to the property corner of parcel # 41-106; thence in a southerly and easterly direction with the property line of parcel # 41-106 to the northwest corner of parcel # 41-106C; thence in an easterly direction with the northern property line of parcel # 41-106C to the northeast property corner of parcel # 41-106C; thence in an easterly direction with the northern property line for parcel # 41-106 to a point on the property line of parcel # 41-109; thence in a northerly direction with the western property line of parcel # 41-109 to the northwest property corner of parcel # 41-109; thence in an easterly direction along the northern property line of parcel # 41-109 to the northeast corner of parcel # 41-109, a point in the southern right of way line of Nalles Mill Road-Route 667; thence in an easterly direction with the southern right of way line of Nalles Mill Road-Route 667 to the northeast corner of parcel # 41-110; thence in a southerly direction with the east property line of parcel # 41-110 to a corner with the northern right of way of James Madison Highway-Route 15/29; thence in a southwesterly direction with the northern right of way line of James Madison Highway-Route 15/29 and the property line for parcels # 41-110, 109, 107, 106B, 51-83A4, 83A1, 83B to the southwest corner of parcel # 51-83B, a point in the right of way of Germanna Highway-Route 3; thence in a northwesterly direction with the western property line of parcel # 51-83B to the southwest corner of parcel # 51-83; thence in a northwesterly direction with the western property line of parcel # 51-83 to the northwest property corner of parcel # 51-83; thence in a northwesterly direction with the western property line of parcel # 51-83B to the northwest corner of parcel # 51-83B; thence in a northeasterly direction along the Town of Culpeper Corporate limits to the southwest corner of parcel # 51-83A1; thence in a northeasterly direction with the property line of parcel # 51-83A1 to where it meets the southern right of way line of Technology Drive-Route 790; thence in a northwesterly direction with the southern right of way line of Technology Drive-Route 790 to where it intersects the Town of Culpeper Corporate limits; thence in a northerly direction with the Town of Culpeper Corporate limits to the point of beginning.

Exhibit 5 to Voluntary Settlement

Hypothetical Examples of Future Boundary Adjustment (single area and two non-contiguous areas)

Example 1 – Single Area

The Town proposes to incorporate one boundary adjustment area having 100 acres of land, all portions of which are contiguous to one another. The area designated by the Town also shares a common boundary with the existing Town of 500 feet and has a minimum width of 500 feet throughout the length of the proposed boundary adjustment area. Thus, the entire area meets the contiguity and minimum width requirements.

One end of the area (35 acres) is primarily residential, the center of the area (60 acres) is primarily commercial, and the opposite end of the area (5 acres) is residential. The area as a whole does not meet the FAR Density Requirement or the Residential Density Requirement because the amount of commercial floor space in the area as a whole is insufficient, and the number of existing or potential residential dwelling units in the area as a whole is insufficient.

However, within the total designated area, the 35 acres at one end have a density of two dwelling units (existing and potential) per acre, thereby satisfying the Residential Density Requirement. The 60 acres in the center have a FAR of 20%, thereby meeting the FAR Density Requirement. The remaining 5 acre-parcel lying at the other end has a density of only one-half dwelling unit per acre and has a FAR of 0%, thereby failing to meet either density requirement by itself. However, the 5 acres can be combined with the 35 acres, and that combined area meets the Residential Density Requirement. Or, they can be combined with the 60 acres, and that combined area also meets the FAR Density Requirement. Hence, all 100 acres are eligible for a boundary adjustment.

Example 2 – Two Non-Contiguous Areas

The Town proposes to incorporate the same 100 acres of land, except that the 5-acre parcel is located on the opposite side of the Town. The parcel is contiguous to the Town and has a minimum width of 500 feet throughout the length of the boundary adjustment area. Thus, it meets the contiguity and minimum width requirements.

However, the 5-acre parcel is a separate area that is not contiguous to the area with 95 acres. Such a separate area cannot be combined with another boundary adjustment area to meet the Density Eligibility Criteria. Because the 5-acre parcel by itself fails to meet the FAR Density Requirement and the Residential Density Requirement, it is not eligible to be incorporated into the Town as a future boundary adjustment.

Exhibit 6 to Voluntary Settlement

Hypothetical Example of Future Boundary Adjustment (FAR qualifying area)

Ten years after the First Boundary Adjustment, the Town proposes to incorporate a boundary adjustment area having 270,000 square feet of land within the Water & Sewer Service Area, based on meeting the FAR Density Requirement. The designated area contains a mixture of business and residential uses and vacant land that lies within a variety of zoning districts. Specifically, it includes these parcels of property:

- • 80,000 square foot parcel with a multi-story office building (12,000 square feet of floor space, based on the combined floor area for each story of the building),
- • 40,000 square foot parcel with a multi-story County public works building (5,000 square feet of floor space),
- • 10,000 square foot parcel with one single family house (3,000 square feet of floor space),
- • 40,000 square foot parcel with a building containing a restaurant on the first floor and apartments on the upper floors (5,000 total square feet of floor space for the restaurant and apartments),
- • 10,000 square feet of vacant land zoned for apartments,
- • 10,000 square feet of vacant land zoned Rural Area (RA), but totally surrounded by the rest of the designated area,
- • 50,000 square feet of vacant land zoned Rural Area (RA) along the edge of the designated area, and
- 30,000 square feet of public roads and rights-of-way.

Thus, the designated area has a total of 270,000 square feet of land, with a total of 25,000 square feet of floor space.

Qualifying land for FAR Density Requirement. The parcels with commercial buildings, the land with a public use (the public works building), the parcel with one house, and the vacant land zoned for apartments are all eligible as part of a FAR qualifying boundary adjustment. However, land zoned RA can not be part of a boundary adjustment area eligible to be incorporated based on the FAR Density Requirement, unless one of three exceptions exists.

Here, the 10,000 square foot parcel is totally surrounded by the rest of the area, and it falls within an exception because more than 75% of its boundary adjoins the boundary adjustment area. It can be included in the designated area. But, the larger 50,000 square foot parcel (assuming it meets none of the three exceptions) must be completely excluded from the designated area.

The designated area also includes 30,000 square feet of public roads and rights-of-ways, which are excluded from the FAR calculation, although they still can be included as part of the designated area. Thus, the square footage of the boundary adjustment area for FAR calculations is 190,000 square feet: 270,000 minus 50,000 (RA parcel) minus 30,000 (roads), equals 190,000. To meet the minimum 10% FAR Density Requirement, the designated area must have at least 19,000 square feet of floor area in the existing buildings (19,000 divided by 190,000 = 0.10).

Qualifying floor area. While parcels with residential development can be included in the designated area, the floor area must be disregarded, so the 3,000 square feet of floor space on the parcel with a single-family house must be excluded from the total floor area. However, the floor area of residential development in a mixed use structure may be included, so the total 5,000 square feet of floor space in the parcel with the restaurant and apartments may be included. Thus, the eligible floor space totals 22,000 square feet (12,000 sq. ft. in the office building, plus 5,000 sq. ft. in the County public works building, plus 5,000 in the restaurant/apartment building, equals 22,000).

FAR calculation. The FAR is 11.6% (22,000 divided by 190,000 equals 0.116), or stated differently, the building floor space represents 11.6% of the boundary adjustment area. That figure exceeds the minimum FAR, and the area designated by the Town is eligible for incorporation into the Town, except for the excluded parcel in the RA zoning district.

Exhibit 7 to Voluntary Settlement

Hypothetical Example of Future Boundary Adjustment (Residential qualifying area)

The Town proposes to incorporate a boundary adjustment area having 59 acres of land within the Water & Sewer Service Area, based on meeting the Residential Density Requirement. The designated area contains a mixture of residential dwellings and vacant land that lie within a variety of zoning districts, along with a commercial/residential building. Specifically, it includes these parcels of property:

- 18 ½-acre mixed use subdivision (excluding acreage for public roads and rights-of-way) that includes 36 lots of which 9 houses and one 5-unit apartment building have been constructed with the remaining 26 lots being vacant and of the 3000 feet of public roads and rights-of-way, 1000 feet have been roughed in with a gravel surface,
- ½-acre parcel zoned A-1 with 1 house,
- 1-acre parcel with 3 houses in zoning district requiring minimum lot size of 1 acre,
- 1 ½-acre parcel zoned A-1 with 1 house,
- 4 -acre parcel zoned RA with 1 house,
- 10-acre parcel with 1 house in zoning district that permits 5 houses,
- 1-acre parcel with a building containing a restaurant on the first floor and 9 apartments on the upper floors,
- 5-acre parcel with no dwelling units, in zoning district that permits 5 houses,
- ½-acre parcel with no dwelling units, in zoning district that requires minimum lot size of 1 acre,
- 2-acre parcel with no dwelling units, in commercial services (CS) zoning district,
- 10-acre parcel with no dwelling units, in light industrial (LI) zoning district, which is entirely surrounded by the rest of the area,
- 3-acre parcel with no dwelling units, in light industrial (LI) zoning district, at edge of boundary adjustment area, and
- 2-acres of public roads and rights-of-way.

Thus, the boundary adjustment area designated by the Town has a total of 59 acres of land.

Qualifying land. All of the parcels here can be included in a boundary adjustment area that is eligible for incorporation based on the Residential Density Requirement, except two. The 4-acre parcel zoned RA is not eligible since it does not independently meet the density calculation. In contrast, the ½-acre zoned A-1 and the 1 ½-acre zoned A-1 are eligible to be included in the density calculation because, when combined, they

independently meet the density calculation (2 actual dwelling units divided by 2 acres = 1 dwelling units per acre, which satisfies the Residential Density Requirement). There are two vacant parcels lying in the County LI zoning district that does not permit any residential units. In general, a vacant parcel in a zoning district that does not permit any residential units can not be part of a boundary adjustment area based on the Residential Density Requirement. Thus, the 3-acre parcel at the edge of the area must be excluded. However, the 10-acre parcel is completely surrounded by the rest of the boundary adjustment area. It can be incorporated for that reason, but the 10 acres must be included in calculating the residential density. By contrast, the 2-acre vacant parcel in the CS commercial district is eligible because the CS district permits various residential units. And, the 1-acre parcel with a restaurant is eligible because the building also contains residential apartments.

Finally, the designated area also includes 2 acres of public roads and rights-of-ways, which are excluded from the residential density calculation, although they still can be included as part of the designated area. Thus, the size of the area for the residential density calculation is 50 acres: 59 acres minus 4 acres RA property, minus 3 acres LI parcel not surrounded by rest of area, minus 2 acres (roads), equals 50 acres. To meet the minimum 1 unit per acre Residential Density Requirement, the designated area must have at least 50 actual or potential residential units (50 units divided by 50 acres = 1.0 density).

Qualifying residential units. For parcels with one or more existing dwelling units, the actual number of existing units is used for the residential density calculation, regardless of zoning regulations. The 18 ½-acre subdivision meets the criteria of a qualifying subdivision development since there are 9 houses and one 5-unit apartment are constructed on 10 of the 36 lots (10 lots divided by 36 lots = 0.28 or 28% developed, and 1000 feet of developed road divided by 3000 total feet = 0.33 or 33% developed). Therefore, the 18 ½-acre subdivision can be counted as having 40 residential dwelling units (26 potential dwelling units plus 14 existing dwelling units). The 1-acre lot with 3 houses, in a zoning district requiring a 1-acre lot size, is counted as 3 units even though they are non-conforming uses. The 10-acre parcel with 1 house counts as only one dwelling unit, even though the zoning district permits 5 houses. Parcels with no existing dwelling units that are not located within a qualifying subdivision development are each treated as having no potential dwelling unit despite zoning requirements that allow one or more units. Thus, the vacant 5-acre parcel with zoning permitting 5 houses is treated as having no potential dwelling units, as is the vacant ½-acre parcel with zoning requiring a minimum lot size of 1 acre. Thus, the area has 55 existing and potential dwelling units.

Residential Density calculation. The residential density is 1.1 units per acre (55 units divided by 50 acres, equals 1.1). That figure exceeds the minimum residential density of 1 unit per acre, and the area designated by the Town is eligible for incorporation into the Town, except for the excluded 3-acre parcel in the LI zoning district.

Exhibit 8 to Voluntary Settlement

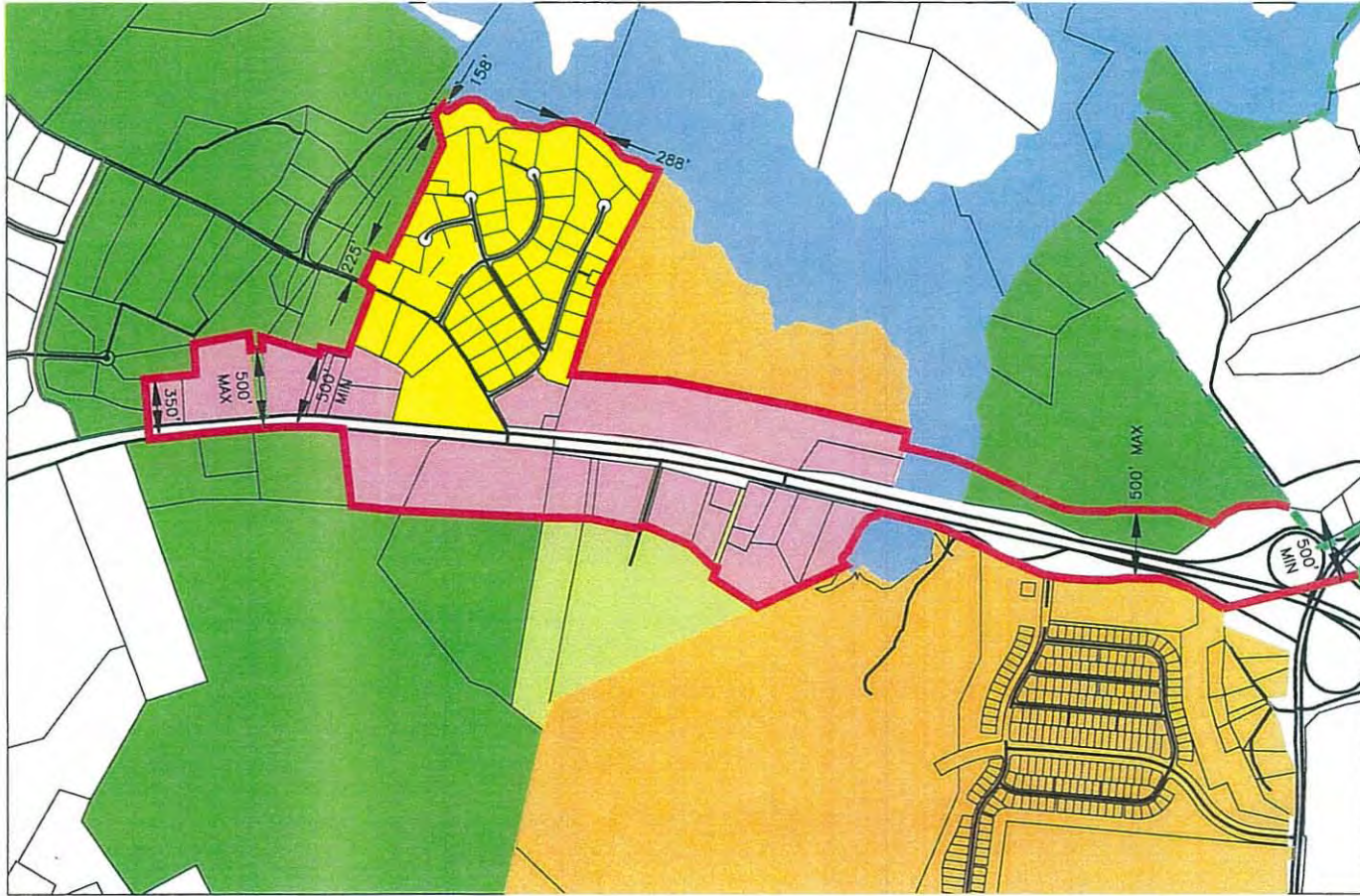
Method of Calculating Minimum Width of Future Boundary Adjustment Areas

To be eligible for incorporation into the Town, that portion of each separate boundary adjustment area that is contiguous to the existing Town boundary line shall follow along the existing boundary line for at least 500 feet, and such boundary adjustment area shall have a minimum width of at least 500 feet throughout the entire length of the boundary adjustment area. The primary intent of this minimum width requirement is to avoid the creation of an extremely narrow corridor running from the existing Town to reach developed areas not immediately adjacent to the Town boundaries.

The width of the designated boundary adjustment area shall be measured at right angles to the length of the designated area.

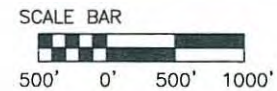
- Because the designated boundary adjustment area may intersect the existing Town boundary at an angle, the width measurement close to the Town boundary can be made from one side of the designated boundary adjustment area to any point within the Town on a line projected from the other side of the boundary adjustment area, as shown on the drawing attached as part of Exhibit 8, which depicts a hypothetical boundary adjustment area that satisfies the 500-foot width requirement in its entirety.
- Because the designated boundary adjustment area may be irregular in shape, the 500-foot minimum width shall not apply to the parcel or parcels along the perimeter of the boundary adjustment area, as shown on the attached drawing. The measurements shown as 350 feet, 225 feet, 158 feet, and 288 feet are all examples of where the 500-foot minimum width would not apply, although there are other points shown on the drawing where the minimum width requirement would not be applicable.
- The attached drawing also shows two measurements designated as "500' MAX." These measurements are shown as maximum widths since the boundary adjustment area would be crossing A-1 zoned property where this Agreement requires that the width of the boundary adjustment area be minimized.
- A 500-foot minimum width measurement is shown on the west side of the drawing to clarify that the width in this area must be at least 500 feet wide as it extends further to the west.

A drawing depicting a sample calculation of the width of a boundary adjustment area is attached.



- LEGEND**
- - - - CORPORATE LIMITS
 - - BLA BOUNDARY
 - ↔ - EXAMPLE DISTANCES
- 500'

- EXP ZONING LEGEND**
- | | |
|--|--|
| ■ - A1 | ■ - R3 |
| ■ - R1 | ■ - CS |
| ■ - R2 | |
- NOTE: EXAMPLE ONLY - DOES NOT REFLECT ACTUAL ZONING



**MINIMUM WIDTH EXAMPLE
TYPICAL BLA CORRIDOR**

DATE: 2/24/11

Exhibit 9 to Voluntary Settlement

**Agreements Obligating the Town to Provide Water and/or Sewer Services within the
Water & Sewer Service Area**

1. Water & Sewer Tap Agreement between the Town of Culpeper and Three Flags Agreement, dated October 10, 2000
2. Water & Sewer Agreement among the County of Culpeper, Virginia, the Town of Culpeper, Virginia and Lowe's Home Centers, Inc., dated June 3, 2003
3. Water & Sewer Agreement among the County of Culpeper, Virginia, the Town of Culpeper, Virginia and Richmond American Homes of Virginia, Inc., dated June 3, 2003
4. Water & Sewer Agreement among the County of Culpeper, Virginia, the Town of Culpeper, Virginia and Angler Broadlands, LLC, dated November 12, 2003
5. Water & Sewer Agreement among the County of Culpeper, Virginia, the Town of Culpeper, Virginia and Petrie Ventures, LLC, dated September 14, 2004
6. Water & Sewer Agreement among the County of Culpeper, Virginia, the Town of Culpeper, Virginia and Paul W. Bates and Donna Andes Bates, dated September 14, 2004
7. Water & Sewer Agreement among the County of Culpeper, Virginia, the Town of Culpeper, Virginia and Cannon Properties, dated July 5, 2005
8. Water & Sewer Agreement among the County of Culpeper, Virginia, the Town of Culpeper, Virginia and Robbins Development Corporation, dated July 12, 2006

Exhibit 10 to Voluntary Settlement

List of Customers Served Pursuant to 2003 Agreement, as Amended, and 2011 Interim Agreement

	<u>Service</u>	<u>Size of Water Meter</u>
<u>Prior to 2009 Amendment</u>		
Terremark Data Center A	water/sewer	1.5"
Terremark Guard House	water/sewer	5/8"
Terremark Shipping and Receiving	water/sewer	5/8"
Eastern View High School	Water	3"
Eastern View High School	Water	2"
Eastern View High School	Water	2"
J.K. Patio - Speidel Construction	Water	5/8"
<u>Post 2009 Amendment</u>		
Culpeper Business Center	Sewer	3"
Rapidan Community Service	Sewer	1.5"
Terremark Data Center B	water/sewer	1.5"
Terremark Administration	water/sewer	2"
Rappahannock Electric Cooperative	Water	1.5"
Rappahannock Electric Cooperative	Water	1.5"
Rappahannock Electric Cooperative	Water	1"
Greens Corner WWTP	Water	5/8"
<u>2011 Interim Agreement</u>		

Exhibit 11 to Voluntary Settlement

TAP PRIVILEGE FEE ASSESSMENT POLICY

The tap privilege fee is based upon the single-family unit as equal to one (1) tap.

Water and wastewater tap privilege fees are set by the Town Council.

Administration

This assessment policy will be administered by the Department of Planning and Community Development subject to the conditions as outlined in this policy.

Definitions

Pre-Purchased Tap Privilege – A customer is guaranteed service, once they have paid in full for a Tap Privilege, at the corresponding capacity associated with that Tap Privilege.

Use of a Tap Privilege – A Tap Privilege shall be deemed to have been used once a water meter has been installed for water or lateral connected for sewer. Once used, the customer will be charged based on consumption but in no incidence less than the minimum monthly bill.

Pre-Purchased Tap Privilege

Possession of Pre-Purchased Tap Privilege prior to November 10, 2009

1. Customers in possession of a pre-purchased tap privilege prior to November 10, 2009 will not have a time limit to use the pre-purchased tap privilege.
2. A reimbursement may be requested by the customer as long as the tap privilege has not been used. A 2% administrative fee based on the tap fee paid will be retained to cover a portion of the costs associated with the reimbursement.

Purchased a Tap Privilege after November 10, 2009

1. Customers who purchase a tap privilege after November 10, 2009 shall have 24 months from the date of purchase to use the tap privilege.
2. During the 24 month period, a reimbursement may be requested by the customer as long as the tap privilege has not been used. A 15% administrative fee based on the tap fee paid will be retained to cover the costs associated with the reimbursement.
3. After the 24 month period, the Town shall have the right to withdraw the tap privilege after giving the customer one (1) month notice. A 15% administrative fee based on the tap fee paid will be retained to cover the costs associated with the reimbursement.
4. During the one (1) month notification period, the customer will be allowed to use the tap privilege if they desire.

New Construction

The tap privilege fee will be based upon the water meter size requested or on the projected monthly consumption as compared to the maximum allowable gallons for each meter size, whichever is determined by the Town to be closest to the actual usage subject to the minimum fee being based on meter size. The Town shall have the right to monitor non-residential monthly consumption for a period of one (1) year. Monthly consumption will be reviewed after twelve (12) months of operation. Should the average monthly consumption exceed the maximum allowable

gallons for the particular meter size, the supplemental tap fee will equal the difference between the fee for the initial meter size and the fee for the larger meter size which corresponds to the customer's actual use. All calculations will be made at the tap privilege fees in effect on the date of the bill. Should a business change ownership during these first twelve (12) months of operation, the new business owner and/or property owner will be responsible for the final tap fee adjustment which will be due and payable to the Town within sixty (60) days of written notification to the owner. All users will be assessed one tap for each meter set.*

Tap fees are to be paid in full simultaneous with the issuance of all permits necessary to commence construction. If during construction more meters are required than tap fees were paid, the additional fees must be paid before meters will be installed.

Residential Multi-family Metering

With mass metering such as an apartment building, a 5/8" tap privilege fee will be assessed for each residential unit within the building.

Change of Use / Additions / Alterations

For Changes of Use / Additions / Alterations of an existing building, additional tap fees will be required if the meter size increases or if the projected consumption exceeds the maximum allowable gallons for the existing tap credits. Tap fees will be assessed on the difference between the existing service and the new service requested or if additional meters are requested. If additional tap fees are required, they will be due simultaneous with the issuance of a zoning permit. Twelve (12) month monitoring will be performed as with new construction.

Discount for Existing Dwellings

Existing single-family dwellings with permitted well and/or septic systems may purchase taps at 50% of the prevailing rate.

Tap Credits

Tap credits on existing or demolished buildings will be based on the meter size or on prior taps paid and on record with the Town of Culpeper. There will be no tap credit for buildings demolished before 1968. The burden of proof for prior tap credits will be on the applicant.

Downtown Economic Development Incentive Program

No additional tap fees will be assessed for changes of use of existing buildings or structures within the Community Development Block Grant area. This incentive program applies to existing structures only, applies to all commercial and residential uses allowable under the Town's Zoning Ordinance and expires December 31, 2001.

The utility meters (water, wastewater and electric) must be installed and in service by the expiration date. Following the expiration of this program, tap credits may remain with the property provided there is no change of use. When the existing buildings undergo changes of use, the Town shall reassess the number of taps required using the adopted schedule herein.

Miscellaneous

A time and material charge for installation of water service and sewer service to the property will be paid by the owner.

*A second meter for a single user may be installed next to the existing water meter for water use only. An additional water tap fee will not be charged, however, a charge for all time and materials; to include the meter and meter box, will be made.

WATER & WASTEWATER TAP PRIVILEGE ASSESSMENT FEES

METER SIZE	MAXIMUM ALLOWABLE GALLONS	IN-TOWN FEE		OUT-OF-TOWN FEE	
		WATER	SEWER	WATER	SEWER
FIVE-EIGHTHS (5/8")	10,000	6,500	10,000	9,750	15,000
ONE INCH (1")	25,000	9,434	11,676	18,868	23,352
ONE & ONE HALF (1½")	75,000	12,368	13,352	24,736	26,704
TWO INCH (2")	150,000	18,552	20,028	37,104	40,056
THREE INCH (3")	225,000	30,920	33,380	61,840	66,760
FOUR INCH (4")	300,000	46,380	50,070	92,760	100,140

Rates shall be set by Town Council for meters larger than four inches.

* Previous tap assessment policy fees were based on categories, usage and square footage.

I, _____, the undersigned, have read and understand the Tap Privilege Fee Assessment Policy.

I understand that water consumption for my business will be monitored at 12 months; and that payment of additional tap fees may be necessary per the above referenced policy.

Signature of Business Owner or Authorized Agent

Date

Business Owner or Authorized Agent: _____

Address of New business: _____

Business Mailing Address: _____

City/State/Zip: _____

Business Phone: _____

Cc: Planning Dept. & Applicant

Revisions:

12/13/88, 2/14/95, 1/14/97, 10/14/97, 1/11/2000 (Rescinded 2/2000), 1/15/02, 1/14/03 (Effective 2/15/03), 5/11/04, 7/11/06, 8/9/06, 11/10/09

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APPENDIX B:
Town of Culpeper
Supplemental Tables 1-6

Table 1

Town of Culpeper

Government-wide	2010	2009	2008	2007	2006	2010	2009	2008	2007	2006
						Common-Size Statements				
Assets										
Current Assets										
Cash and cash equivalents	\$33,207,523	\$12,383,292	\$8,881,455	\$6,267,320	\$4,117,728	24.9%	9.7%	7.0%	6.5%	4.6%
Cash and cash equivalents, restricted	4,144,464	21,195,408	38,856,631	24,703,368	21,751,938	3.1%	16.6%	30.4%	25.5%	24.2%
Investments		217,196	330,711	317,720	351,930	0.0%	0.2%	0.3%	0.3%	0.4%
Receivables	2,808,633	2,276,922	2,322,669	2,053,503	1,874,851	2.1%	1.8%	1.8%	2.1%	2.1%
Accrued interest receivable	101,267	105,507	106,612	41,970	81,589	0.1%	0.1%	0.1%	0.0%	0.1%
Due from other governmental units	815,105	160,792	169,126	191,672	192,694	0.6%	0.1%	0.1%	0.2%	0.2%
Inventories	1,035,952	956,164	862,672	1,127,404	1,052,406	0.8%	0.7%	0.7%	1.2%	1.2%
Loans receivable				4,442	71,000	0.0%	0.0%	0.0%	0.0%	0.1%
Prepaid expenses	73,652	56,347	66,693	65,260		0.1%	0.0%	0.1%	0.1%	0.0%
Total Current	42,186,596	37,351,628	51,596,569	34,772,659	29,494,136	31.7%	29.2%	40.4%	35.9%	32.8%
Noncurrent Assets										
Deferred expenses	553,296	554,280	560,429	67,285	41,295	0.4%	0.4%	0.4%	0.1%	0.0%
Due from other funds		2,750,000				0.0%	2.2%	0.0%	0.0%	0.0%
Capital assets:										
Nondepreciable	4,155,616	34,711,506	20,113,176	5,063,935	5,380,585	3.1%	27.2%	15.7%	5.2%	6.0%
Depreciable, net	86,276,869	52,440,071	55,515,761	56,952,684	55,057,458	64.8%	41.0%	43.4%	58.8%	61.2%
Total Noncurrent	90,985,781	90,455,857	76,189,366	62,083,904	60,479,338	68.3%	70.8%	59.6%	64.1%	67.2%
Total Assets	133,172,377	127,807,485	127,785,935	96,856,563	89,973,474	100.0%	100.0%	100.0%	100.0%	100.0%
Liabilities										
Current Liabilities										
Accounts payable and accrued liabilities	1,266,749	3,014,534	3,709,125	1,553,585	1,306,817	1.0%	2.4%	2.9%	1.6%	1.5%
Accrued payroll and related liabilities	462,001	504,379	234,867	204,719	190,556	0.3%	0.4%	0.2%	0.2%	0.2%
Accrued interest payable	720,587	625,607	535,659	252,099	158,435	0.5%	0.5%	0.4%	0.3%	0.2%
Unearned revenue		51,353	154,806	127,209	62,375	0.0%	0.0%	0.1%	0.1%	0.1%
Deferred bond revenue		19,833	22,539			0.0%	0.0%	0.0%	0.0%	0.0%
Due to other governmental units	2,999,947	50,969	49,722			2.3%	0.0%	0.0%	0.0%	0.0%
Customer security deposits	968,924	906,708	879,272	803,298	678,706	0.7%	0.7%	0.7%	0.8%	0.8%
Compensated absences - within one year		601,102	595,561	504,528	731,204	0.0%	0.5%	0.5%	0.5%	0.8%
General obligation bonds - within one year	2,527,263	1,358,568	1,366,663	1,439,713	1,461,806	1.9%	1.1%	1.1%	1.5%	1.6%
Other liabilities	1,485,908	1,609,201	1,645,331	1,669,550	1,731,901	1.1%	1.3%	1.3%	1.7%	1.9%
Total Current	10,431,379	8,742,254	9,193,545	6,554,701	6,321,800	7.8%	6.8%	7.2%	6.8%	7.0%
Noncurrent Liabilities										
Due to other funds		2,750,000				0.0%	2.2%	0.0%	0.0%	0.0%
Compensated absences - more than one year		88,060	117,903	258,726		0.0%	0.1%	0.1%	0.3%	0.0%
General obligation bonds - more than one year	41,722,838	37,682,683	38,651,503	15,873,655	13,520,449	31.3%	29.5%	30.2%	16.4%	15.0%
Total Noncurrent	41,722,838	40,520,743	38,769,406	16,132,381	13,520,449	31.3%	31.7%	30.3%	16.7%	15.0%
Total Liabilities	52,154,217	49,262,997	47,962,951	22,687,082	19,842,249	39.2%	38.5%	37.5%	23.4%	22.1%
Net Assets										
Invested in capital assets, net of related debt	49,843,601	45,828,574	35,610,771	41,215,192	45,455,788	37.4%	35.9%	27.9%	42.6%	50.5%
Restricted	592,481	2,470,415	20,634,121	2,709,578		0.4%	1.9%	16.1%	2.8%	0.0%
Unrestricted	30,582,078	30,245,499	23,578,092	30,244,711	24,675,437	23.0%	23.7%	18.5%	31.2%	27.4%
Total Net Assets	81,018,160	78,544,488	79,822,984	74,169,481	70,131,225	60.8%	61.5%	62.5%	76.6%	77.9%
Liabilities and Net Assets	\$133,172,377	\$127,807,485	\$127,785,935	\$96,856,563	\$89,973,474	100.0%	100.0%	100.0%	100.0%	100.0%
Source:										
	Town of Culpeper, <u>Comprehensive Annual Financial Report</u> , editions (2006-2010)									

Note: Common-Size Statements allow the reader to analyze the proportion that an individual asset or liability represents as a percentage of total assets.

Table 2

Town of Culpeper

General Fund	2010	2009	2008	2007	2006	2010	2009	2008	2007	2006
						Common-Size Statements				
Assets										
Cash and cash equivalents	\$6,478,824	\$4,847,918	\$4,711,652	\$4,302,668	\$3,895,013	56.8%	52.1%	48.5%	47.6%	63.5%
Cash and cash equivalents, restricted	4,144,464	3,824,315	4,190,691	4,013,073	1,431,506	36.3%	41.1%	43.1%	44.4%	23.3%
Investments			119,363	116,229	159,054	0.0%	0.0%	1.2%	1.3%	2.6%
Receivables	497,974	417,180	460,553	349,139	387,993	4.4%	4.5%	4.7%	3.9%	6.3%
Due from other governmental units	231,334	160,792	169,126	191,675	192,694	2.0%	1.7%	1.7%	2.1%	3.1%
Loans receivable				4,442	71,000	0.0%	0.0%	0.0%	0.0%	1.2%
Prepaid expenses	53,524	56,347	66,693	65,260		0.5%	0.6%	0.7%	0.7%	0.0%
Total Assets	11,406,120	9,306,552	9,718,078	9,042,486	6,137,260	100.0%	100.0%	100.0%	100.0%	100.0%
Liabilities										
Current Liabilities										
Accounts payable and accrued liabilities	354,700	633,623	295,727	193,060	274,254	3.1%	6.8%	3.0%	2.1%	4.5%
Accrued payroll and related liabilities	320,597	420,375	164,187	143,823	126,120	2.8%	4.5%	1.7%	1.6%	2.1%
Deferred bond revenue	292,661	143,608	217,833	173,529	114,933	2.6%	1.5%	2.2%	1.9%	1.9%
Due to other governmental units		50,969	49,722			0.0%	0.5%	0.5%	0.0%	0.0%
Due to other funds		2,750,000	46,760			0.0%	29.5%	0.5%	0.0%	0.0%
Other liabilities	1,485,908	1,609,201	1,645,331	1,669,550	1,731,901	13.0%	17.3%	16.9%	18.5%	28.2%
Total Liabilities	2,453,866	5,607,776	2,419,560	2,179,962	2,247,208	21.5%	60.3%	24.9%	24.1%	36.6%
Net Assets										
Invested in capital assets, net of related debt	237,575					2.1%	0.0%	0.0%	0.0%	0.0%
Restricted	3,933,900		1,415,016			34.5%	0.0%	14.6%	0.0%	0.0%
Unrestricted	4,780,779	3,698,776	5,883,502	6,862,521	3,890,052	41.9%	39.7%	60.5%	75.9%	63.4%
Total Net Assets	8,952,254	3,698,776	7,298,518	6,862,521	3,890,052	78.5%	39.7%	75.1%	75.9%	63.4%
Liabilities and Net Assets	\$11,406,120	\$9,306,552	\$9,718,078	\$9,042,483	\$6,137,260	100.0%	100.0%	100.0%	100.0%	100.0%

Source:

Town of Culpeper, Comprehensive Annual Financial Report, editions (2006-2010)

Note: Common-Size Statements allow the reader to analyze the proportion that an individual asset or liability represents as a percentage of total assets.

Table 3

Town of Culpeper

General Fund	2010	2009	2008	2007	2006
Revenues					
General property taxes	\$3,054,303	\$2,537,620	\$2,360,641	\$1,840,804	\$1,637,218
Other local taxes	4,684,124	4,632,603	4,915,913	5,285,745	5,380,052
Permits, privilege fees, and regulatory licenses	256,426	178,108	201,372	231,778	757,956
Fines and forfeitures	166,292	158,783	157,226	151,259	175,421
Revenues from use of money and property	245,570	347,169	478,369	405,683	296,046
Charges for services	39,225	62,041	62,613	57,188	50,010
Other	401,587	510,323	250,947	206,667	224,162
Recovered costs	1,630,016	1,544,137	1,461,127	1,168,821	758,563
Intergovernmental	2,562,603	1,949,588	2,338,101	1,869,723	1,630,967
Total revenues	13,040,146	11,920,372	12,226,309	11,217,668	10,910,395
Expenditures					
General government administration	2,146,254	2,583,546	2,203,714	2,188,450	1,966,866
Public safety	3,866,967	4,006,766	3,972,387	3,762,629	3,209,213
Public works	2,678,356	3,287,064	2,413,634	2,637,275	2,385,637
Health and welfare		11,378	5,129	6,907	7,370
Parks, recreation, and cultural	489,512	512,386	582,890	516,086	452,943
Community development	1,233,053	1,115,101	1,069,575	1,052,548	1,189,295
Capital projects	2,675,162	3,408,564	2,557,650	1,263,391	1,836,753
Debt service:					
Principal retirement	498,974	835,589	406,721	399,388	388,500
Interest and fiscal charges	393,527	299,844	273,288	168,525	148,077
Total expenditures	13,981,805	16,060,238	13,484,988	11,995,199	11,584,654
Excess (deficiency) of revenues over expenditures	(941,659)	(4,139,866)	(1,258,679)	(777,531)	(674,259)
Other Financing Sources (Uses)					
Issuance of general obligation bonds	5,629,000	540,124	1,607,021	3,750,000	
Grant proceeds			87,655		
Bond issuance costs	(27,991)				
Transfers in	302,145				
Total other financing sources (uses)	5,903,154	540,124	1,694,676	3,750,000	0
Net change in fund balances	4,961,495	(3,599,742)	435,997	2,972,469	(674,259)
Prior Period Adjustment	291,983				62,004
Fund Balances at July 1	3,698,776	7,298,518	6,862,521	3,890,052	4,502,307
Fund Balances at June 30	\$8,952,254	\$3,698,776	\$7,298,518	\$6,862,521	\$3,890,052

Source:

Town of Culpeper, Comprehensive Annual Financial Report, editions (2006-2010)

Table 4

Town of Culpeper

Enterprise Fund	2010	2009	2008	2007	2006	2010	2009	2008	2007	2006
						Common-Size Statements				
Assets										
Current Assets										
Cash and cash equivalents	\$26,250,762	\$7,331,967	\$4,016,374	\$1,817,177	\$534,311	28.2%	8.1%	4.4%	2.9%	1.0%
Cash and cash equivalents, restricted		17,371,093	34,665,940	20,690,295	19,908,544	0.0%	19.2%	37.7%	33.2%	36.1%
Receivables	2,309,715	1,859,742	1,861,371	1,703,161	1,486,166	2.5%	2.1%	2.0%	2.7%	2.7%
Accrued interest receivable	101,267	104,563	106,612	41,970	81,589	0.1%	0.1%	0.1%	0.1%	0.1%
Due from other governmental units	583,771					0.6%	0.0%	0.0%	0.0%	0.0%
Inventories	1,035,952	956,164	862,672	1,127,404	1,052,406	1.1%	1.1%	0.9%	1.8%	1.9%
Note receivable - interfund	164,081	157,042	150,308	143,865	20,066	0.2%	0.2%	0.2%	0.2%	0.0%
Prepaid expenses	20,128					0.0%	0.0%	0.0%	0.0%	0.0%
Total Current	30,465,676	27,780,571	41,663,277	25,523,872	23,083,082	32.7%	30.7%	45.3%	40.9%	41.9%
Noncurrent Assets										
Deferred expenses	451,769	471,256	492,883	35,653	41,295	0.5%	0.5%	0.5%	0.1%	0.1%
Due from other funds		2,750,000				0.0%	3.0%	0.0%	0.0%	0.0%
Note receivable - interfund	3,705,166	3,869,246	4,026,288	4,176,597	1,492,707					
Capital assets:										
Nondepreciable	1,352,731	28,644,363	17,143,507	2,119,215	3,036,931	1.5%	31.7%	18.6%	3.4%	5.5%
Depreciable, net	57,051,642	26,962,462	28,722,312	30,505,512	27,489,013	61.3%	29.8%	31.2%	48.9%	49.9%
Total Noncurrent	62,561,308	62,697,327	50,384,990	36,836,977	32,059,946	67.3%	69.3%	54.7%	59.1%	58.1%
Total Assets	93,026,984	90,477,898	92,048,267	62,360,849	55,143,028	100.0%	100.0%	100.0%	100.0%	100.0%
Liabilities										
Current Liabilities										
Accounts payable and accrued liabilities	912,049	2,380,911	3,413,398	1,360,525	1,032,561	1.0%	2.6%	3.7%	2.2%	1.9%
Accrued payroll and related liabilities	141,404	84,004	70,680	60,896	64,436	0.2%	0.1%	0.1%	0.1%	0.1%
Accrued interest payable	498,638	510,474	431,024	184,284	110,930	0.5%	0.6%	0.5%	0.3%	0.2%
Capital lease payable			38,180	59,659	55,596	0.0%	0.0%	0.0%	0.1%	0.1%
Deferred bond revenue		19,833	20,518			0.0%	0.0%	0.0%	0.0%	0.0%
Due to other governmental units	2,999,947					3.2%	0.0%	0.0%	0.0%	0.0%
Customer security deposits	968,924	906,708	879,272	803,298	678,706	1.0%	1.0%	1.0%	1.3%	1.2%
Compensated absences - within one year	236,308	204,339	201,840	160,468	225,028	0.3%	0.2%	0.2%	0.3%	0.4%
General obligation bonds - within one year	1,247,585	859,594	752,886	973,332	1,006,816	1.3%	1.0%	0.8%	1.6%	1.8%
Note payable - inter fund	164,081	157,042	150,308	143,865	20,066	0.2%	0.2%	0.2%	0.2%	0.0%
Total Current	7,168,936	5,122,905	5,958,106	3,746,327	3,194,139	7.7%	5.7%	6.5%	6.0%	5.8%
Noncurrent Liabilities										
Capital lease payable				38,668	100,128	0.0%	0.0%	0.0%	0.1%	0.2%
Note payable - inter fund	3,705,166	3,869,246	4,026,288	4,176,597	1,492,707	4.0%	4.3%	4.4%	6.7%	2.7%
Compensated absences - more than one year		30,646	40,923	85,597	33,653	0.0%	0.0%	0.0%	0.1%	0.1%
General obligation bonds - more than one year	29,046,885	30,213,765	30,963,750	9,176,637	10,105,250	31.2%	33.4%	33.6%	14.7%	18.3%
Total Noncurrent	32,752,051	34,113,657	35,030,961	13,477,499	11,731,738	35.2%	37.7%	38.1%	21.6%	21.3%
Total Liabilities	39,920,987	39,236,562	40,989,067	17,223,826	14,925,877	42.9%	43.4%	44.5%	27.6%	27.1%
Net Assets										
Invested in capital assets, net of related debt	28,124,024	22,251,714	14,111,003	21,597,950	19,258,154	30.2%	24.6%	15.3%	34.6%	34.9%
Restricted		2,470,415	19,219,105			0.0%	2.7%	20.9%	0.0%	0.0%
Unrestricted	24,981,973	26,519,207	17,729,092	23,539,073	20,958,997	26.9%	29.3%	19.3%	37.7%	38.0%
Total Net Assets	53,105,997	51,241,336	51,059,200	45,137,023	40,217,151	57.1%	56.6%	55.5%	72.4%	72.9%
Liabilities and Net Assets	\$93,026,984	\$90,477,898	\$92,048,267	\$62,360,849	\$55,143,028	100.0%	100.0%	100.0%	100.0%	100.0%

Source:

Town of Culpeper, Comprehensive Annual Financial Report, editions (2006-2010)

Note: Common-Size Statements allow the reader to analyze the proportion that an individual asset or liability represents as a percentage of total assets

Table 5

Town of Culpeper

Enterprise Fund	2010	2009	2008	2007	2006
Operating Revenues					
Charges for services	\$15,780,878	\$15,643,846	\$15,135,992	\$13,718,758	\$12,227,563
Penalties	74,194	85,158	80,142	71,292	57,795
Other charges	285,830	80,950	40,899	79,794	114,841
Total operating revenues	16,140,902	15,809,954	15,257,033	13,869,844	12,400,199
Operating Expenses					
Water treatment	1,668,935				
Wastewater collection	354,081				
Wastewater treatment	2,105,203				
Transmission and distribution	1,606,096				
Power generation	5,786,405				
Administration	668,342				
Salaries		2,425,875	2,378,149	2,305,392	2,162,769
Fringe benefits		841,250	812,916	765,368	651,035
Internal services		2,040,769	1,824,431	1,492,662	1,048,178
Operation and maintenance		2,714	2,714	166,111	152,945
Contractual services		209,249	137,424	88,162	83,262
Insurance		162,041	150,853	135,068	127,685
Materials and supplies		208,911	237,380	121,901	55,372
Repairs and maintenance		883,976	942,354	832,864	776,449
Purchase of natural gas and oil		84,857	153,145	111,484	143,135
Purchase of electricity		6,261,214	6,312,703	5,818,950	5,524,983
Other	135,458	461,424	197,704	137,809	138,235
Depreciation	2,423,369	2,334,093	3,378,269	2,266,116	2,154,570
Total operating expenses	14,747,889	15,916,373	16,528,042	14,241,887	13,018,618
Operating income (loss)	1,393,013	(106,419)	(1,271,009)	(372,043)	(618,419)
Nonoperating Revenues (Expenses)					
Interest income	329,668	738,832	1,362,743	1,145,169	762,413
Interest expense	(640,096)	(1,503,188)	(904,037)	(692,278)	(549,582)
Loss on disposal of capital assets	(78,740)				
Grant proceeds			2,234,966		
Tap fees	573,216	235,513	4,499,514	4,839,024	7,133,730
Net nonoperating revenue (expenses)	184,048	(528,843)	7,193,186	5,291,915	7,346,561
Income (loss) before transfers and capital contributions	1,577,061	(635,262)	5,922,177	4,919,872	6,728,142
Transfers out	(302,145)				
Capital contributions	2,823,708	817,398			
Change in net assets	4,098,624	182,136	5,922,177	4,919,872	6,728,142
Prior Period Adjustment	(2,233,963)				99,181
Net Assets at July 1	51,241,336	51,059,200	45,137,023	40,217,151	33,389,828
Net Assets at June 30	\$53,105,997	\$51,241,336	\$51,059,200	\$45,137,023	\$40,217,151

Source:

Town of Culpeper, Comprehensive Annual Financial Report, editions (2006-2010)

Table 6**Town of Culpeper**

Ratios	<u>2010</u>	<u>2009</u>	<u>2008</u>	<u>2007</u>	<u>2006</u>
<u>From Government-wide Statements:</u>					
Current (Current Assets/Current Liabilities)	4.04	4.27	5.61	5.30	4.67
Cash (Cash and Equivalents/Current Assets)	88.5%	89.9%	92.5%	89.1%	87.7%
Debt-to-assets (Total Liabilities/Total Assets)	0.3916	0.3854	0.3753	0.2342	0.2205
LTD-to-assets (Noncurrent Liabilities/Total Assets)	0.3133	0.3170	0.3034	0.1666	0.1503
Unrestricted (Unrestricted Net Assets/Total Assets)	0.2296	0.2366	0.1845	0.3123	0.2743
<u>From General Fund Statements:</u>					
GF Unrestricted (Unrestricted Net Assets/Total GF Expenditures)	0.3419	0.2303	0.4363	0.5721	0.3358
<u>From Enterprise Fund Statements:</u>					
Ent Unrestricted (Unrestricted Net Assets/Operating Expenses)	1.6939	1.6662	1.0727	1.6528	1.6099

APPENDIX C:
County of Culpeper
Supplemental Tables 7-12

Table 7

County of Culpeper

Government-wide	2010	2009	2008	2007	2006	2010	2009	2008	2007	2006
						Common-Size Statements				
Assets										
Current Assets										
Cash and cash equivalents	\$28,921,730	\$27,833,005	\$34,542,330	\$43,094,977	\$41,621,530	14.6%	14.0%	17.7%	26.7%	33.7%
Receivables:						0.0%	0.0%	0.0%	0.0%	0.0%
Property taxes	3,785,065	3,281,276	2,426,866	1,808,884	1,085,759					
Accounts receivable	526,693	534,606	563,191	903,633	946,867	0.3%	0.3%	0.3%	0.6%	0.8%
Due from other governmental units	3,294,820	3,176,533	3,385,586	2,958,913	2,736,937	1.7%	1.6%	1.7%	1.8%	2.2%
Inventories	2,997,860	3,271,386	3,355,367	63,102	25,161	1.5%	1.6%	1.7%	0.0%	0.0%
Prepaid expenses	66,213	69,102	62,136	40,365	108,700	0.0%	0.0%	0.0%	0.0%	0.1%
Total Current	39,592,381	38,165,908	44,335,476	48,869,874	46,524,954	19.9%	19.2%	22.7%	30.3%	37.6%
Noncurrent Assets										
Capital assets (net of depreciation):										
Land and land improvements	11,517,982	11,517,982	11,351,382	11,354,173	4,499,249	5.8%	5.8%	5.8%	7.0%	3.6%
Construction in progress	94,428,753	100,296,448	90,078,073	47,645,727	27,103,804	47.5%	50.5%	46.1%	29.5%	21.9%
Buildings	37,947,660	31,612,239	30,107,142	31,260,835	21,590,125	19.1%	15.9%	15.4%	19.4%	17.5%
Equipment	2,130,109	1,889,191	2,140,832	2,533,024	1,395,865	1.1%	1.0%	1.1%	1.6%	1.1%
Jointly owned assets	13,142,557	15,117,646	17,200,262	19,832,139	22,531,127	6.6%	7.6%	8.8%	12.3%	18.2%
Total Noncurrent	159,167,061	160,433,506	150,877,691	112,625,898	77,120,170	80.1%	80.8%	77.3%	69.7%	62.4%
Total Assets	198,759,442	198,599,414	195,213,167	161,495,772	123,645,124	100.0%	100.0%	100.0%	100.0%	100.0%
Liabilities										
Current Liabilities										
Accounts payable and other current liabilities	797,717	2,809,694	2,730,971	1,632,392	1,041,807	0.4%	1.4%	1.4%	1.0%	0.8%
Accrued interest payable	2,061,989	1,811,081	1,917,685	1,963,358	1,953,015	1.0%	0.9%	1.0%	1.2%	1.6%
Unearned revenue	166,538	177,259	143,566	192,830	176,155	0.1%	0.1%	0.1%	0.1%	0.1%
Due to component unit	4,393,347	5,796,824	5,602,807	4,984,063	4,596,488	2.2%	2.9%	2.9%	3.1%	3.7%
General obligation bonds - within one year	4,864,624	12,325,524	11,876,363	3,081,929	2,903,843	2.4%	6.2%	6.1%	1.9%	2.3%
Total Current	12,284,215	22,920,382	22,271,392	11,854,572	10,671,308	6.2%	11.5%	11.4%	7.3%	8.6%
Noncurrent Liabilities										
General obligation bonds - more than one year	97,094,689	90,136,591	94,560,730	105,937,357	100,983,581	48.9%	45.4%	48.4%	65.6%	81.7%
Total Noncurrent	97,094,689	90,136,591	94,560,730	105,937,357	100,983,581	48.9%	45.4%	48.4%	65.6%	81.7%
Total Liabilities	109,378,904	113,056,973	116,832,122	117,791,929	111,654,889	55.0%	56.9%	59.8%	72.9%	90.3%
Net Assets										
Invested in capital assets, net of related debt	60,536,304	63,863,458	54,614,777	40,304,891	26,696,497	30.5%	32.2%	28.0%	25.0%	21.6%
Restricted					291,256	0.0%	0.0%	0.0%	0.0%	0.2%
Unrestricted	28,844,234	21,678,983	23,766,268	3,398,952	(14,997,518)	14.5%	10.9%	12.2%	2.1%	-12.1%
Total Net Assets	89,380,538	85,542,441	78,381,045	43,703,843	11,990,235	45.0%	43.1%	40.2%	27.1%	9.7%
Liabilities and Net Assets	\$198,759,442	\$198,599,414	\$195,213,167	\$161,495,772	\$123,645,124	100.0%	100.0%	100.0%	100.0%	100.0%

Source:

County of Culpeper, [Comprehensive Annual Financial Report](#), 5 editions (2006-2010)

Note: Common-Size Statements allow the reader to analyze the proportion that an individual asset or liability represents as a percentage of total assets.

Table 8

County of Culpeper

General Fund	<u>2010</u>	<u>2009</u>	<u>2008</u>	<u>2007</u>	<u>2006</u>	<u>2010</u>	<u>2009</u>	<u>2008</u>	<u>2007</u>	<u>2006</u>
						Common-Size Statements				
Assets										
Cash and cash equivalents	\$23,901,232	\$23,262,106	\$25,018,909	\$35,644,477	\$36,547,710	69.4%	69.5%	72.3%	80.1%	84.0%
Receivables:										
Taxes, including penalties	3,785,065	3,281,276	2,426,866	1,808,884	1,085,759	11.0%	9.8%	7.0%	4.1%	2.5%
Accounts	329,459	324,839	234,010	622,290	600,420	1.0%	1.0%	0.7%	1.4%	1.4%
Due from other governmental units	3,217,945	3,154,371	3,379,639	2,947,286	2,692,733	9.3%	9.4%	9.8%	6.6%	6.2%
Due from other funds	3,168,581	3,378,819	3,491,497	3,416,813	2,457,808	9.2%	10.1%	10.1%	7.7%	5.7%
Prepaid expenses	50,874	55,889	61,319	40,365	108,700	0.1%	0.2%	0.2%	0.1%	0.2%
Total Assets	34,453,156	33,457,300	34,612,240	44,480,115	43,493,130	100.0%	100.0%	100.0%	100.0%	100.0%
Liabilities										
Accounts payable	500,367	376,273	394,397	224,349	293,750	1.5%	1.1%	1.1%	0.5%	0.7%
Accrued liabilities			45,726	702,000	550,980	0.0%	0.0%	0.1%	1.6%	1.3%
Deferred revenue	3,480,926	2,978,899	2,161,131	1,664,241	1,112,174	10.1%	8.9%	6.2%	3.7%	2.6%
Due to component unit	4,393,347	5,796,824	5,602,807	4,984,063	4,596,488	12.8%	17.3%	16.2%	11.2%	10.6%
Total Liabilities	8,374,640	9,151,996	8,204,061	7,574,653	6,553,392	24.3%	27.4%	23.7%	17.0%	15.1%
Net Assets										
Designated for subsequent expenditures	2,130,135	2,067,984	3,004,067	1,618,995	1,758,229	6.2%	6.2%	8.7%	3.6%	4.0%
Designated for capital projects	1,606,334	1,606,334	2,392,005	1,892,005	3,592,005	4.7%	4.8%	6.9%	4.3%	8.3%
Unrestricted	22,342,047	20,630,986	21,012,107	33,394,462	31,589,504	64.8%	61.7%	60.7%	75.1%	72.6%
Total Net Assets	26,078,516	24,305,304	26,408,179	36,905,462	36,939,738	75.7%	72.6%	76.3%	83.0%	84.9%
Liabilities and Net Assets	\$34,453,156	\$33,457,300	\$34,612,240	\$44,480,115	\$43,493,130	100.0%	100.0%	100.0%	100.0%	100.0%

Source:

County of Culpeper, Comprehensive Annual Financial Report, 5 editions (2006-2010)

Note: Common-Size Statements allow the reader to analyze the proportion that an individual asset or liability represents as a percentage of total assets.

Table 9

County of Culpeper

General Fund	<u>2010</u>	<u>2009</u>	<u>2008</u>	<u>2007</u>	<u>2006</u>
Revenues					
General property taxes	\$45,440,793	\$48,035,130	\$44,178,683	\$44,232,779	\$36,264,828
Other local taxes	8,791,222	8,844,267	9,155,369	9,780,716	11,101,087
Permits, privilege fees and regulatory licenses	563,189	624,759	916,830	1,488,884	2,161,763
Fines and forfeitures	77,962	90,718	52,278	96,752	60,453
Revenue from use of money and property	431,455	584,203	1,806,114	2,247,950	1,627,157
Charges for services	2,369,853	2,724,504	2,971,328	1,824,721	1,811,526
Miscellaneous	258,145	287,627	249,157	256,774	521,529
Recovered costs	258,658	264,157	219,596	173,423	96,416
Intergovernmental:					
School Board Contribution to Primary Government	4,391,244				
Commonwealth	12,632,122	12,028,450	12,275,773	10,990,674	10,336,751
Federal	5,087,717	6,076,961	5,154,640	4,970,402	5,965,813
Total revenues	<u>80,302,360</u>	<u>79,560,776</u>	<u>76,979,768</u>	<u>76,063,075</u>	<u>69,947,323</u>
Expenditures					
General government administration	3,665,766	3,923,014	3,968,434	3,785,043	3,431,935
Judicial administration	2,434,963	2,529,996	2,511,337	2,327,462	2,074,360
Public safety	13,684,548	14,140,308	14,620,059	12,583,880	12,226,921
Public works	1,080,072	1,419,945	1,074,653	1,165,109	1,011,376
Health and welfare	15,004,065	14,803,422	14,799,765	12,719,822	12,005,443
Education	29,387,093	30,588,952	29,739,630	25,151,466	24,141,359
Parks, recreation, and cultural	1,761,986	1,857,970	1,814,505	1,676,136	1,413,035
Community development	1,441,027	1,908,497	1,454,190	1,219,129	1,285,455
Debt service:					
Principal retirement	4,369,831	3,944,953	2,652,946	2,584,746	2,340,953
Interest and other fiscal charges	3,999,355	4,471,945	4,561,586	4,304,967	2,473,840
Total expenditures	<u>76,828,706</u>	<u>79,589,002</u>	<u>77,197,105</u>	<u>67,517,760</u>	<u>62,404,677</u>
Excess (deficiency) of revenues over expenditures	<u>3,473,654</u>	<u>(28,226)</u>	<u>(217,337)</u>	<u>8,545,315</u>	<u>7,542,646</u>
Other Financing Sources (Uses)					
Transfers in		72,500			
Issuance of literary fund loan	288,933				
Interim financing redeemed					
Issuance of lease revenue bonds					
Premium on bonds issued					
Transfers (out)	(1,989,375)	(2,147,149)	(10,279,946)	(8,579,591)	(3,981,313)
Total other financing sources (uses)	<u>(1,700,442)</u>	<u>(2,074,649)</u>	<u>(10,279,946)</u>	<u>(8,579,591)</u>	<u>(3,981,313)</u>
Changes in fund balances	1,773,212	(2,102,875)	(10,497,283)	(34,276)	3,561,333
Fund balances at beginning of year	24,305,304	26,408,179	36,905,462	36,939,738	33,378,405
Fund balances at end of year	<u>\$26,078,516</u>	<u>\$24,305,304</u>	<u>\$26,408,179</u>	<u>\$36,905,462</u>	<u>\$36,939,738</u>

Source:

County of Culpeper, Comprehensive Annual Financial Report, 5 editions (2006-2010)

Table 10

County of Culpeper

Enterprise Fund	2010	2009	2008	2007	2006	2010	2009	2008	2007	2006
						Common-Size Statements				
Assets										
Current Assets										
Cash and cash equivalents	\$3,975,125	\$4,570,899	\$7,186,294	\$3,458,134	\$4,097,045	8.4%	9.5%	14.8%	11.2%	18.1%
Accounts receivable	197,234	209,767	329,181	281,343	346,447	0.4%	0.4%	0.7%	0.9%	1.5%
Due from other governmental units	76,875	22,162	5,947	11,627	44,204	0.2%	0.0%	0.0%	0.0%	0.2%
Inventories	2,997,860	3,271,386	3,355,367	63,102	25,161	6.3%	6.8%	6.9%	0.2%	0.1%
Prepaid expenses	15,339	13,213	817			0.0%	0.0%	0.0%	0.0%	0.0%
Total Current	7,262,433	8,087,427	10,877,606	3,814,206	4,512,857	15.4%	16.8%	22.4%	12.3%	20.0%
Noncurrent Assets										
Capital assets (net of depreciation):										
Land and land improvements	2,245,522	2,245,522	2,245,522	2,248,313	1,155,993	4.8%	4.7%	4.6%	7.3%	5.1%
Construction in progress	23,489,387	24,004,643	21,194,664	9,908,153	1,357,351	49.7%	50.0%	43.6%	32.0%	6.0%
Buildings	13,794,707	13,488,947	14,117,481	14,784,257	15,442,494	29.2%	28.1%	29.0%	47.7%	68.4%
Equipment	438,759	199,959	214,645	253,239	105,556	0.9%	0.4%	0.4%	0.8%	0.5%
Total Noncurrent	39,968,375	39,939,071	37,772,312	27,193,962	18,061,394	84.6%	83.2%	77.6%	87.7%	80.0%
Total Assets	47,230,808	48,026,498	48,649,918	31,008,168	22,574,251	100.0%	100.0%	100.0%	100.0%	100.0%
Liabilities										
Current Liabilities										
Accounts payable and other current liabilities	231,685	208,882	1,684,478	684,180	163,100	0.5%	0.4%	3.5%	2.2%	0.7%
Accrued interest payable	29,172	34,140	38,852	43,347		0.1%	0.1%	0.1%	0.1%	0.0%
Due to other funds	3,168,581	3,378,819	3,491,497	3,416,813	2,457,808					
General obligation bonds - within one year	254,385	271,434	260,430	214,414	204,191	0.5%	0.6%	0.5%	0.7%	0.9%
Total Current	3,683,823	3,893,275	5,475,257	4,358,754	2,825,099	7.8%	8.1%	11.3%	14.1%	12.5%
Noncurrent Liabilities										
General obligation bonds - more than one year	1,780,709	2,008,416	2,196,661	2,317,412	2,519,010	3.8%	4.2%	4.5%	7.5%	11.2%
Total Noncurrent	1,780,709	2,008,416	2,196,661	2,317,412	2,519,010	3.8%	4.2%	4.5%	7.5%	11.2%
Total Liabilities	5,464,532	5,901,691	7,671,918	6,676,166	5,344,109	11.6%	12.3%	15.8%	21.5%	23.7%
Net Assets										
Invested in capital assets, net of related debt	38,791,879	38,532,234	36,145,416	25,343,202	16,010,805	82.1%	80.2%	74.3%	81.7%	70.9%
Unrestricted	2,974,397	3,592,573	4,832,584	(1,011,200)	1,219,337	6.3%	7.5%	9.9%	-3.3%	5.4%
Total Net Assets	41,766,276	42,124,807	40,978,000	24,332,002	17,230,142	88.4%	87.7%	84.2%	78.5%	76.3%
Liabilities and Net Assets	\$47,230,808	\$48,026,498	\$48,649,918	\$31,008,168	\$22,574,251	100.0%	100.0%	100.0%	100.0%	100.0%

Source:

County of Culpeper, Comprehensive Annual Financial Report, 5 editions (2006-2010)

Note: Common-Size Statements allow the reader to analyze the proportion that an individual asset or liability represents as a percentage of total assets.

Table 11

County of Culpeper

Enterprise Fund	<u>2010</u>	<u>2009</u>	<u>2008</u>	<u>2007</u>	<u>2006</u>
Operating Revenues					
Charges for services	\$2,117,530	\$2,477,725	\$3,383,354	\$3,445,872	\$3,417,868
Maintenance grants	7,560	54,741	10,260	33,434	
Total operating revenues	<u>2,125,090</u>	<u>2,532,466</u>	<u>3,393,614</u>	<u>3,479,306</u>	<u>3,417,868</u>
Operating Expenses					
Personal services	667,237	721,317	681,212	635,050	532,875
Fringe benefits	175,461	185,327	163,622	153,624	124,501
Contractual services	1,980,366	2,276,333	2,905,090	2,984,295	2,871,025
Other charges	868,846	1,068,707	637,664	528,993	768,371
Depreciation	821,881	707,784	705,370	705,372	683,790
Total operating expenses	<u>4,513,791</u>	<u>4,959,468</u>	<u>5,092,958</u>	<u>5,007,334</u>	<u>4,980,562</u>
Operating income (loss)	<u>(2,388,701)</u>	<u>(2,427,002)</u>	<u>(1,699,344)</u>	<u>(1,528,028)</u>	<u>(1,562,694)</u>
Nonoperating Revenues (Expenses)					
Interest income	12,334	72,560	227,094	236,184	80,001
Other nonoperating expenses			(272,400)	(334,453)	
Federal grant				12,427	
Interest expense	(64,100)	(74,915)	(85,122)	(94,883)	(104,092)
Total nonoperating revenues (expenses)	<u>(51,766)</u>	<u>(2,355)</u>	<u>(130,428)</u>	<u>(180,725)</u>	<u>(24,091)</u>
Income (loss) before contributions and transfers	<u>(2,440,467)</u>	<u>(2,429,357)</u>	<u>(1,829,772)</u>	<u>(1,708,753)</u>	<u>(1,586,785)</u>
Capital contributions and construction gains	381,494	1,686,515	12,222,118	5,950,655	3,244,989
Transfers					
Transfers in	1,989,375	2,181,579	6,253,652	2,859,961	1,878,878
Transfers (out)	(288,933)	(291,930)			
Total transfers	<u>1,700,442</u>	<u>1,889,649</u>	<u>6,253,652</u>	<u>2,859,961</u>	<u>1,878,878</u>
Change in net assets	<u>(358,531)</u>	<u>1,146,807</u>	<u>16,645,998</u>	<u>7,101,863</u>	<u>3,537,082</u>
Prior Period Adjustment				(3)	
Net assets at beginning of year	<u>42,124,807</u>	<u>40,978,000</u>	<u>24,332,002</u>	<u>17,230,142</u>	<u>13,693,060</u>
Net assets at end of year	<u>\$41,766,276</u>	<u>\$42,124,807</u>	<u>\$40,978,000</u>	<u>\$24,332,002</u>	<u>\$17,230,142</u>

Source:

County of Culpeper, Comprehensive Annual Financial Report, 5 editions (2006-2010)

Table 12**County of Culpeper**

Ratios	<u>2010</u>	<u>2009</u>	<u>2008</u>	<u>2007</u>	<u>2006</u>
<u>From Government-wide Statements:</u>					
Current (Current Assets/Current Liabilities)	3.22	1.67	1.99	4.12	4.36
Cash (Cash and Equivalents/Current Assets)	73.0%	72.9%	77.9%	88.2%	89.5%
Debt-to-assets (Total Liabilities/Total Assets)	0.5503	0.5693	0.5985	0.7294	0.9030
LTD-to-assets (Noncurrent Liabilities/Total Assets)	0.4885	0.4539	0.4844	0.6560	0.8167
Unrestricted (Unrestricted Net Assets/Total Assets)	0.1451	0.1092	0.1217	0.0210	-0.1213
<u>From General Fund Statements:</u>					
GF Unrestricted (Unrestricted Net Assets/Total GF Expenditures)	0.2908	0.2592	0.2722	0.4946	0.5062
<u>From Enterprise Fund Statements:</u>					
Ent Unrestricted (Unrestricted Net Assets/Operating Expenses)	0.6590	0.7244	0.9489	-0.2019	0.2448



APPENDIX D

WILEY & WILSON CULPEPER COUNTY RESERVOIR STUDY

March 2001

A Study for:

Culpeper County, Virginia



CULPEPER COUNTY RESERVOIR STUDY

Submitted to:

**Culpeper County, Virginia
306 N. Main Street
Culpeper, VA 22701**

Wiley & Wilson
ARCHITECTS ENGINEERS PLANNERS
An Employee-Owned Company

Lynchburg, Virginia

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Figure 7 - Duration Curves

Figure 8 - Typical Section Earth Dam

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Property Impact/Tax Maps B

Calculations C

Cost Analysis D

March 27, 2001



Mr. Paul Howard
Director of Environmental Services
Culpeper County
306 N. Main Street
Culpeper, VA 22701

Re: Culpeper County Reservoir Study
W&W Commission No. 200156.00

Dear Mr. Howard:

We are pleased to submit our report regarding the Culpeper County Reservoir Study. As outlined in the project description, this report covers the results of:

1. Preliminary site selection
2. Stream flow analysis
3. Schematic dam and reservoir layout
4. Diversion pumping stations
5. Permitting

1. PRELIMINARY SITE SELECTION

Area of Interest

This study evaluates reservoir sites in the northern and eastern portion of Culpeper County. The study area is shown in Figure 1. The Rappahannock River forms the northeast border of the County. The study area extended as far south as Route 3 and as far west as the Rappahannock County line. The Rappahannock River was considered as the primary source for the reservoirs. Due to their size, the Thorton and Hazel Rivers, major tributaries to the Rappahannock River, were also considered.

Thirteen sites were selected and evaluated regarding volume, dam height, location, and conflicts with historic areas or major utilities. The four most promising sites are presented in this report.

Reservoir Sites

The results of this study focus on four possible reservoir sites for Culpeper County. These sites can be found on the Reservoir Location map, Figure 2. Reservoir size and cost data is summarized in Table 1. Appendix D contains detailed cost analysis.

Site No. 3 & 3A: Reservoirs No. 3 and 3A would entail the construction of a dam on Indian Run, just west of Route 229.

- The water to fill this reservoir would be pumped from the Hazel River near Rixeyville and inflow directly from the watershed of Indian Run.
- The dam at this site would have a maximum height of 64 feet and crest length of 1,300 feet. The normal pool elevation would be at 393 feet, with 7 feet of freeboard, normal pool surface area of 461 acres, and a normal pool volume of 3,149 million gallons.
- The earthwork volume required for the dam embankment would be 380,000 cubic yards.
- The maximum yield of this reservoir would be 7.5 MGD with diversion pumping from the Hazel River. The yield based on the Indian Run watershed without pumping would be 4.8 MGD.
- The maximum yield of the reservoir is dictated by the drought years of 1981 to 1982, where the mean daily flow in the Hazel River was below the mean annual flow for 340 consecutive days.
- The reservoir is located on the border of a granite and a granite/gneiss area with deep soils.
- The reservoir would impact 64 land parcels and 3,375 feet of roadway (Appendix B). The reservoir impacts a number of residential home sites; however, the property impact could be minimized by reducing the size of the dam, if a lower yield would be acceptable.

Site No. 7: Reservoir No. 7 would entail the construction of a dam on Beaverdam Run, just west of Route 623.

- The water to fill this reservoir would be pumped from the Rappahannock River, directly to its east.
- The dam at this site would have a maximum height of 61.2 feet and crest length of 1,600 feet. The normal pool elevation would be at 360 feet, with 7 feet of freeboard, a normal pool surface area of 227 acres and a normal pool volume of 1,331 million gallons.
- The earthwork volume required for the dam embankment would be 390,000 cubic yards.
- The maximum yield of this reservoir would be 2.8 MGD. The maximum yield of the reservoir is dictated by the drought years of 1981 to 1982, where the mean daily flow in the Rappahannock River was below the mean annual flow for 340 consecutive days.
- It is located in an area that is dominated by metabasalt geology with deep soil containing mica schist silts.
- The reservoir would impact 16 land parcels and approximately 1,030 feet of roadway (Appendix B).

Site No. 10 & 10A: Reservoir No. 10 and 10A would entail the construction of a dam on Muddy Run, to the west of Route 265.

- The water to fill this reservoir would be pumped from the Hazel River, directly to its east and inflow directly from the watershed of Muddy Run.
- The dam at this site would have a maximum height of 33.0 feet and crest length of 408 feet. The normal pool elevation would be at 313 feet, with 7 feet of free board, a normal pool surface area of 243 acres, and a normal pool volume of 763 million gallons.
- The earthwork volume required for the dam embankment would be 33,900 cubic yards.
- The maximum yield of this reservoir would be 3.5 MGD with or without diversion pumping. This indicates that the Muddy Run Watershed is adequate to fill the reservoir and that pumping is unnecessary.
- The maximum yield of the reservoir is dictated by the drought years of 1965 to 1966, where the mean daily flow in the Hazel River was below the mean annual flow for 311 consecutive days.

- It is located in an area that is dominated by metabasalt geology with deep soil containing mica schist silts.
- The reservoir would impact 27 land parcels (Appendix B).

Site No. 13: Reservoir No. 13 would entail the construction of a dam on Mill Run and would pump its water from the Rappahannock River, directly to the east.

- The dam at this site would have a maximum height of 67.1 feet and crest length of 960 feet. The normal pool elevation would be at 280 feet, with 7 feet of freeboard, a normal pool surface area of 115 acres, and a normal pool volume of 705 million gallons.
- The earthwork volume required for the dam embankment would be 156,000 cubic yards.
- The maximum yield of this reservoir would be 2.6 MGD.
- The maximum yield of the reservoir is dictated by the drought years of 1965 to 1966, where the mean daily flow in the Rappahannock River was below the mean annual flow for 314 consecutive days.
- The reservoir is located in the Northern Piedmont area which is characterized by severely metamorphosed, soft bed rock with lots of mica and silt present.

Table 1: Summary of Reservoir Statistics

Site #	Source River	Normal Surface Area (acres)	Normal Volume (MG)	Watershed Area (acres)	Diversion Pump Capacity (MGD)	Max Yield (MGD)	Total Cost (mill \$)	Cost per MGD (mill \$ /MGD)
3	Hazel & Indian Run	461	3,149	4,897	77.6	7.5	15.1	2.01
3A	Indian Run	461	3,149	4,897	0	4.8	5.89	1.23
7	Rappahannock	227	1,331	1,360	90.5	2.8	7.25	2.59
10	Hazel	243	763	5,957	90.5	3.5	6.91	1.98
10A	Muddy Run	243	763	5,957	0	3.5	2.85	0.81
13	Rappahannock	115	705	1,706	97.0	2.3	5.32	2.31
Roanoke County, Spring Hollow Project*		158	3,200	540	80.0	17	33.0	1.94

* Yield and Cost Statistics for Roanoke County's Spring Hollow Reservoir are included for comparative purposes.

Drought Year Behavior

The maximum reservoir yield is dictated by the reservoir behavior in drought years. Table 2 summarizes each reservoir's performance during drought years. Dividing the available water yield by the number of days with no pumping generates the theoretical maximum. The values for theoretical maximum yield are similar to those generated in the watershed model and provide a good verification of the model results. Draw-down curves for each of the reservoirs, during their most severe drought years, are shown in Figures 3 through 6.

Table 2: Reservoir Performance in Drought Years.
 ET (net evaporation), Seepage, Pump, and Watershed flow are the sum of these values over the number of days with low pumping.

Reservoir #	Drought Years	Max Days Low pump	Reservoir Losses (MG)	Inflow from Pump (MG)	Inflow from Watershed flow (MG)	10% Min. Pool (MG)	Volume at beginning of No Pump (MG)	Available Water (MG)	Theo Max Yield (MGD)
3	Feb 81 – Feb 82	340	75	78	738	314.9	2,150	2,576.1	7.6
7	Feb 81 – Feb 82	340	37	37	0	133.1	1,108	974.9	2.9
10	Apr 65 – Feb 66	311	34	61	584	76.3	763	1,297.7	4.2
13	Apr 65 – Feb 66	314	32	57	146	70.5	705	805.5	2.6

2. STREAM FLOW ANALYSIS

The average daily stream flow data for this study was gathered from four USGS river gauging stations in the area: on the upper Rappahannock River near Warrenton (gauge station number 01662000), on the lower Rappahannock River near Remington (gauge station number 01664000), on the Thornton River near Laurel Hills (gauge station number 01663000), and on the Hazel River near Rixeyville (gauge station number 01663500). Data for these gauging stations is available on the USGS website (www.usgs.gov). Table 3 summarizes the available gauge station data. Flow duration curves for the gauging station are shown in Figure 7.

Table 3: Gauging Station Characteristics

Location	Drainage Area (mi ²)	Mean Annual Flow (cfs)	Median Flow, 50% Exceedance (cfs)	Average Annual Yield Above MAF (MG)*	Lowest Annual Yield Above MAF (MG)*	1 Day 30 Year Low Flow, 1Q30 (MGD)
Rappahannock River at Warrenton (#01662000)	195	195	122	28,230	4,845 ¹	0.39
Rappahannock River at Remington (#01664000)	620	699	421	101,780	19,313 ¹	2.74
Thorton River at Laurel Hills (#01663000)	142	159	97	22,740	10,879 ²	0.39
Hazel River at Rixeyville (#01663500)	287	338	212	48,061	10,933 ¹	1.00

* Yield above mean annual flow available for diversion

¹ (April 1965-March 1966)

² (April 1954-March 1955), record for gauging station on the Thorton River ended in Sept. 1956

Correlation Of The Stream Flow Data

The gauging station records were used to estimate the stream flow at each reservoir and river diversion. The gauge data was adjusted using an area ratio to account for differences in the watershed area at the gauge station and the reservoir diversion. The area ratio was also used to fill in the gaps in the record at some of the stations. For example, the data from the Hazel River gauging station was moved upstream to the Thorton River Gauging station to fill in the gaps in time. The data from the Remington gauging station on the Rappahannock River was moved upstream to the gauging station at Warrenton to fill in gaps in that data. The formula used was:

$$Q_j = Q_i \{A_j/A_i\}^x$$

Where: Q = daily average stream flow at point in stream (cfs)
 A = drainage area to point in stream (mi²)
 i = point at which full data record is known
 j = point at which daily average stream flow is to be determined
 x = experimentally determined exponent

The selection of the exponent was based upon a statistical comparison of calculated stream flows with recorded stream flows. In *USGS Water-Supply Paper 2374, Low-Flow Characteristics of Streams in Virginia*, an exponent of 1.2 was determined to most accurately predict low flows. In *USGS, Water-Resources Investigation Report 94-4148, Methods for Estimating the Magnitude and Frequency of Peak Discharges of Rural, Unregulated Streams in Virginia*, a value of 0.7 was determined to most accurately predict peak flows. A range of exponent values, from 0.7 to 1.2, was statistically analyzed for manipulating the data available for use. Independent studies were done for moving data up the Rappahannock River and for moving data from the Hazel to the Thornton River. In both cases, an exponent value of 0.7 was chosen with greater than 95 percent confidence. This makes sense in light of the fact that this study is interested in capturing the peak river discharges. An exponent of 1.0 was used for the watershed areas providing direct inflow to the reservoirs to account for the small size of these watersheds relative to the drainage area to the gauging station.

Reservoir Operation

The model generated to study reservoir yield had the following features:

- Water was only pumped from the source river in cases where the mean daily flow exceeded the mean annual flow. The amount of water pumped was also limited by the pump capacity. In addition, the first day of flow after a storm event was not pumped into the reservoir in an attempt to limit water quality issues.

- Seepage through the earthen dam was determined based upon calculations in the Appendix.
- The net evaporation was determined to be due to evaporation (as found in *the U.S. Department of Commerce, Weather Bureau, Technical Paper No. 37, Evaporation Maps for the United States*) minus the precipitation (as found in NOAA records for precipitation). The seasonal dependence of evaporation and precipitation was factored into the model. Additionally, for reservoirs with large surface areas the evaporation rates were calculated to vary with varying surface areas. For reservoirs with smaller surface areas, the evaporation rates were only varied with season.
- Each of the proposed reservoirs had a local watershed that fed directly into the reservoir. The flow into the reservoir from its local watershed was calculated based upon the area of the local watershed as described in the section on stream flow correlation.
- The volume in the reservoir was never allowed to go below 10 percent of the normal pool volume.

A copy of representative model results is included in Appendix A.

3. SCHEMATIC DAM AND RESERVOIR LAYOUT

The dams investigated in this study would be greater than 25 feet in height and 50 acre feet in capacity. Therefore, the dams would be regulated under the Virginia Dam Safety Act. The estimated construction costs in this study are based on structures that would meet the requirements of the Virginia Impounding Structures Regulations (Regulations). A typical section for a zoned earth embankment, which conforms to the Regulations, is shown in Figure 8. The design would include a cut-off trench, clay core, chimney drain, and toe drains. The crest width would range from 20 to 22 feet and the side slope would be 3.5:1 (horizontal:vertical). The soils available for the dam embankment would be predominantly low strength mica silts, therefore, the side slopes of the dam would be relatively flat. The dams would have principal spillways designed to handle the 100-year flood and emergency spillways designed for the 0.5 Probable Maximum Flood (0.5 PMF). The principal spillways for Sites 3, 7, and 13 would consist of rectangular concrete towers (drop

spillways) and concrete outlet pipes. Site 10 has a large drainage area that would require a concrete chute spillway 100 feet in width. The emergency spillways for all sites would consist of a trapezoid channel with riprap erosion protection and a concrete crest sill. The reservoir layouts showing the limits of the maximum pool for each reservoir are found in Figure 2.

4. DIVERSION PUMPING FACILITIES

The pumping facilities would be used to divert water from the main stem of the river to the proposed reservoir site. The diversion pump facilities would be required at Site No. 7 (Beaverdam Run) and Site No. 13 (Mill Run) because these sites have small watershed areas. Sites No. 3 and No. 10 have large watershed areas, and were evaluated both with and without the pumping.

The pumping facilities would consist of the river intake, pump station, transmission piping to the reservoir, and the electrical service for the pumps. The operation of the pumps would be limited to river flows greater than the MAF. The flow duration curves in Figure 7 show that the pumps could operate less than 32 percent of the time during an average year. This means the pumps would have to transfer a large amount of flow during a short period of time to fill the reservoir. The pump station would have four pump units with a total capacity of 70 to 90 MGD. These are very large pumps but they would only be able to capture about 7 to 20 percent of the average river yield above MAF.

The river intake would consist of multiple wedgewire tee screens with compressed air backwash cleaning systems. The pump station would include a wet well, four vertical turbine pumping units, discharge piping, pump control valves, pump circuits, and electrical controls. The pump units would be housed in a reinforced concrete structure located above the 100-year flood. The transmission pipes from the pump station to the reservoir would consist of two 42-inch concrete cylinder or welded steel pipelines. The duplex pipelines would permit control of velocities in the pipes for all flow conditions and would allow continued operation in the event one of the pipelines is out of service for repair.

5. PERMITTING

Permits will be required for the construction of new dams and the withdrawal of surface water using new diversion facilities. The regulatory agencies include the Corps of Engineers, the Virginia Department of Environmental Quality (VDEQ), the Virginia Marine Resources Commission (VMRC), and the Virginia Dam Safety Office. The permits for the Corps, the VDEQ, and the VMRC can be obtained through a joint permit process administered by the State. The joint permit process requires a single permit application for all three agencies. Sometimes, the agencies waive the requirement for the permits; however, the size and complexity of the projects described in this report would probably require an individual permit from each agency. A 30-day public notice and comment period will probably be required for these projects. One year should be allowed to complete the permit process. The permits are described below and referenced to the applicable improvement alternative.

Corps of Engineers 404 Permit

The 404 permit is required for the placement of fill material into the waters of the United States. The definition of the waters of the United States would include the tributaries of the Rappahannock River such as Beaverdam Run, Mill Run, Muddy Run, and Indian Run.

Virginia Department of Environmental Quality (VDEQ) Water Protection Permit

The Water Protection Permit is required to ensure the water quality in the state is not adversely impacted by the project (401 certification). The Water Protection Permit will establish surface water withdrawal criteria and downstream release requirements.

Virginia Marine Resources Commission (VMRC)

The VMRC requires a permit for encroachment on streambeds which are considered to be the property of the State.

Virginia Department of Soil and Water Conservation - Dam Safety

The dam safety section requires a permit for construction and operation of dams greater than 25 feet in height and 50 acre feet (16.3 MG) in capacity. The design and construction of the dam must conform to approved standards. The spillway size is determined by an evaluation of the downstream hazard which would occur if the dam failed. The dams described in this report would probably be Class II Medium size impounding structures. The Class II designation means there is a possible loss of life and appreciable property damage in the event of the failure of the dam. The spillways for the Class II Medium dams must be designed for the 0.5 PMF or 1.0 PMF depending on the downstream hazard.

Other

Permits will be required for erosion and sedimentation control and construction of pipelines across public right of ways.

RECOMMENDATIONS

The four alternatives presented in this report are feasible and merit further detail. Extended analysis should include a more detailed geotechnical assessment of the sites and a detailed evaluation of property acquisition, relocation costs, and raw water delivery costs via pumping and pipeline. These costs added to those contained in this study would enable a more thorough evaluation of the actual feasibility.

Based on cost efficiency, reservoir site number 10 with no pumping has the lowest cost per unit of yield. Reservoir site number 3 with pumping generates the largest yield, but has the second highest cost per unit yield.

Property acquisition is a major factor to be considered in the selection of a suitable site. At the current dam elevation, reservoir 3 encroaches on approximately 64 land parcels in a residential neighborhood. The number of properties effected could be minimized by adjusting the dam height. Reservoir site number 7 impacts the fewest number of land parcels.

Mr. Paul Howard
March 27, 2001
Page 12



The distance from the reservoir to the treatment plant and the point of distribution will determine the raw water delivery cost for pumping and pipelines. The reservoir site closest to the U.S. 29 corridor is number 10. Reservoir site numbers 3, 7, and 13 are about equally distant from the U.S. 29 corridor.

A final factor to be considered is the environmental impact of the proposed reservoirs due to inundation of protected wetlands. The off-channel reservoirs with smaller watersheds (for example, reservoir number 13) will have less environmental impact than the on-channel reservoirs with extensive watersheds (for example, reservoir number 10).

Thank you for this opportunity to assist you. Please call if you have any questions regarding these findings.

Sincerely,

WILEY & WILSON

A handwritten signature in black ink that reads "A. Redding".

Andria Redding, EIT
Design Engineer

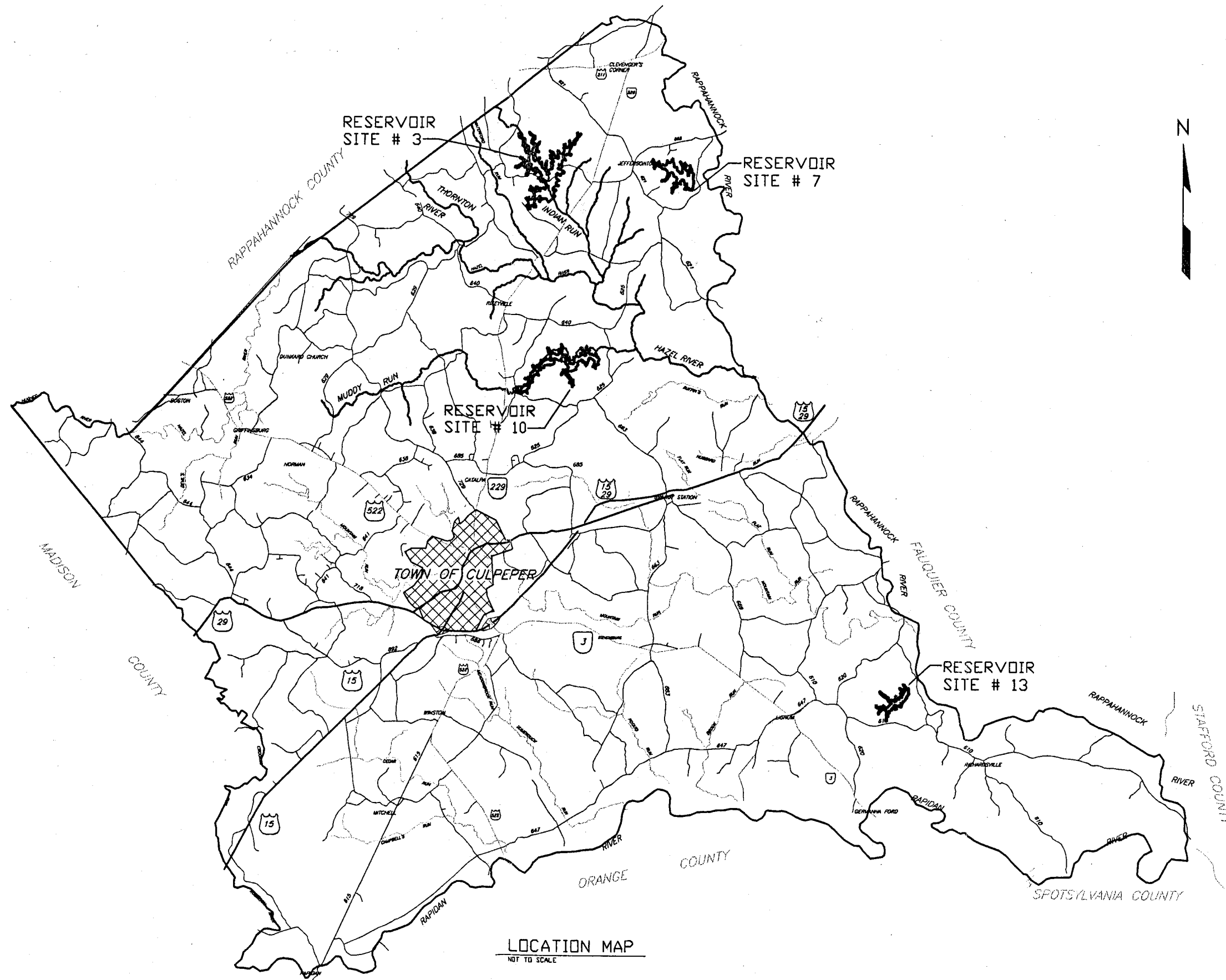
A handwritten signature in black ink that reads "Walter E. Hancock, Jr.".

Walter E. Hancock, Jr., P.E.
Vice President

A handwritten signature in black ink that reads "John D. Allis".

John D. Allis, P.E.
Senior Engineer

- Figure 1** **Study Area**
- Figure 2** **Reservoir Location**
- Figures 3 – 6** **Drawdown Curves**
- Figure 7** **Duration Curves**
- Figure 8** **Typical Section Earth Dam**

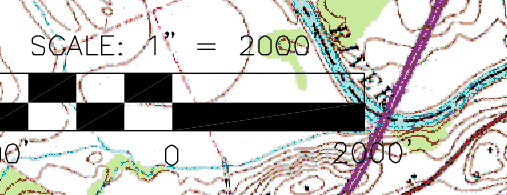
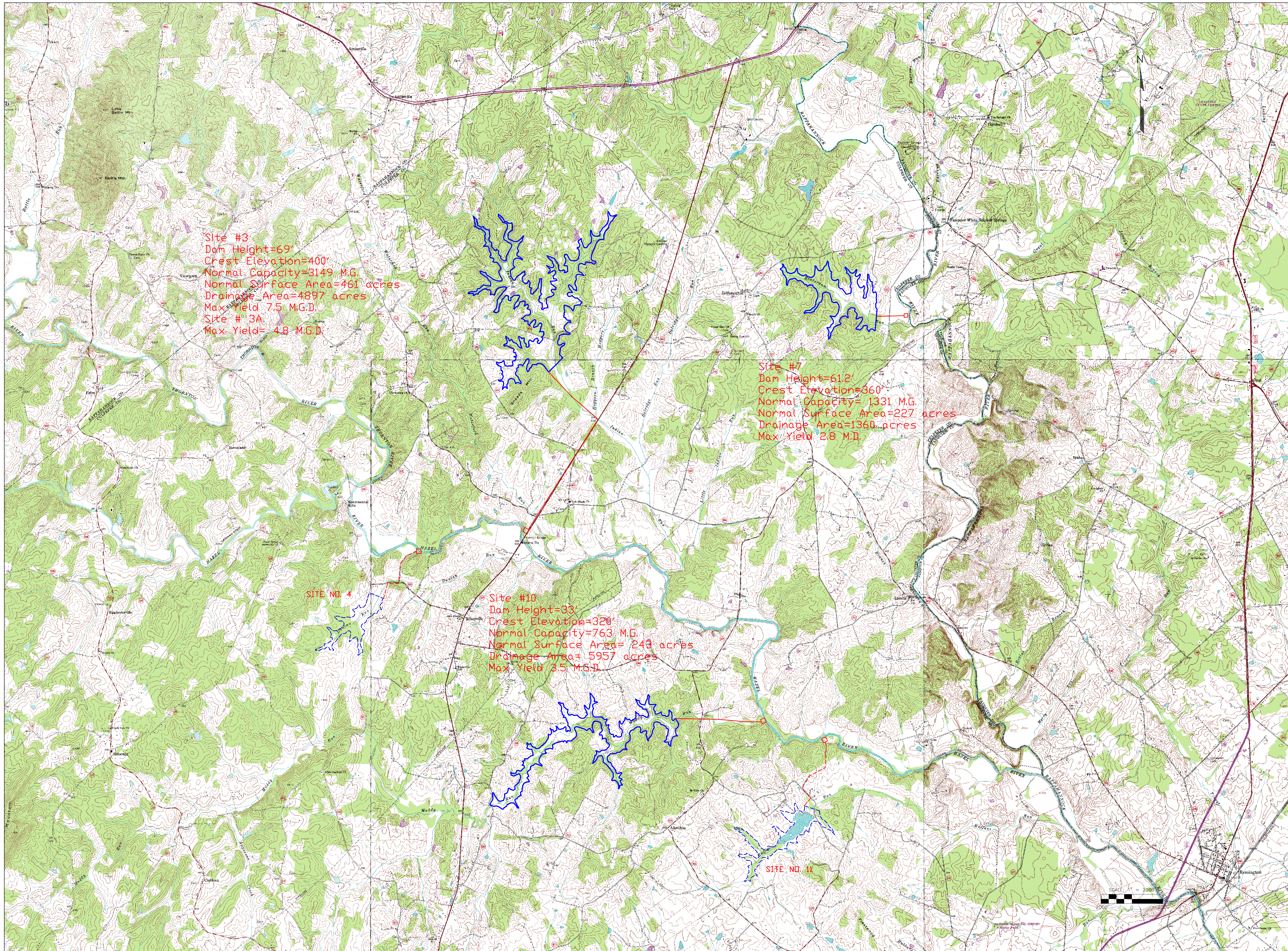


LOCATION MAP
NOT TO SCALE

OVERLAY CONTROL	REV.	DATE	BY	APP.	DESCRIPTION

Wiley & Wilson
ARCHITECTS ENGINEERS PLANNERS
 A PROFESSIONAL CORPORATION
 2310 LANGHORNE ROAD LYNCHBURG, VIRGINIA
 24505-0877

DESIGNED	DRAWN	PROJECT
CHECKED	REVIEWED	CULPEPER COUNTY RESERVOIR STUDY
APPROVED	FILE NO.	REFERENCE
CDM. NO. 200156.00		TITLE Figure 1: Study Area Map
DATE	DWG. NO.	SHEET NO.
		REV.



REV.	DATE	BY	APP.	DESCRIPTION

Wiley & Wilson
 ARCHITECTS ENGINEERS PLANNERS
 2310 LANGHORNE ROAD
 LYNCHBURG, VIRGINIA 24501
 P.O. BOX 877
 LYNCHBURG, VIRGINIA 24505-0877

DESIGNED AZR	DRAWN RAF	PROJECT CULPEPER RESERVOIR STUDY
CHECKED JDA	REVIEWED WEH	REFERENCE CIVIL
APPROVED	FILE NO.	TITLE FIGURE 2A: RESEVOIR LOCATION MAP
CDMM NO. 200156.00	DATE 03-16-01	DWG. NO. C-1
SHEET NO. 1 OF 2		REV. 0

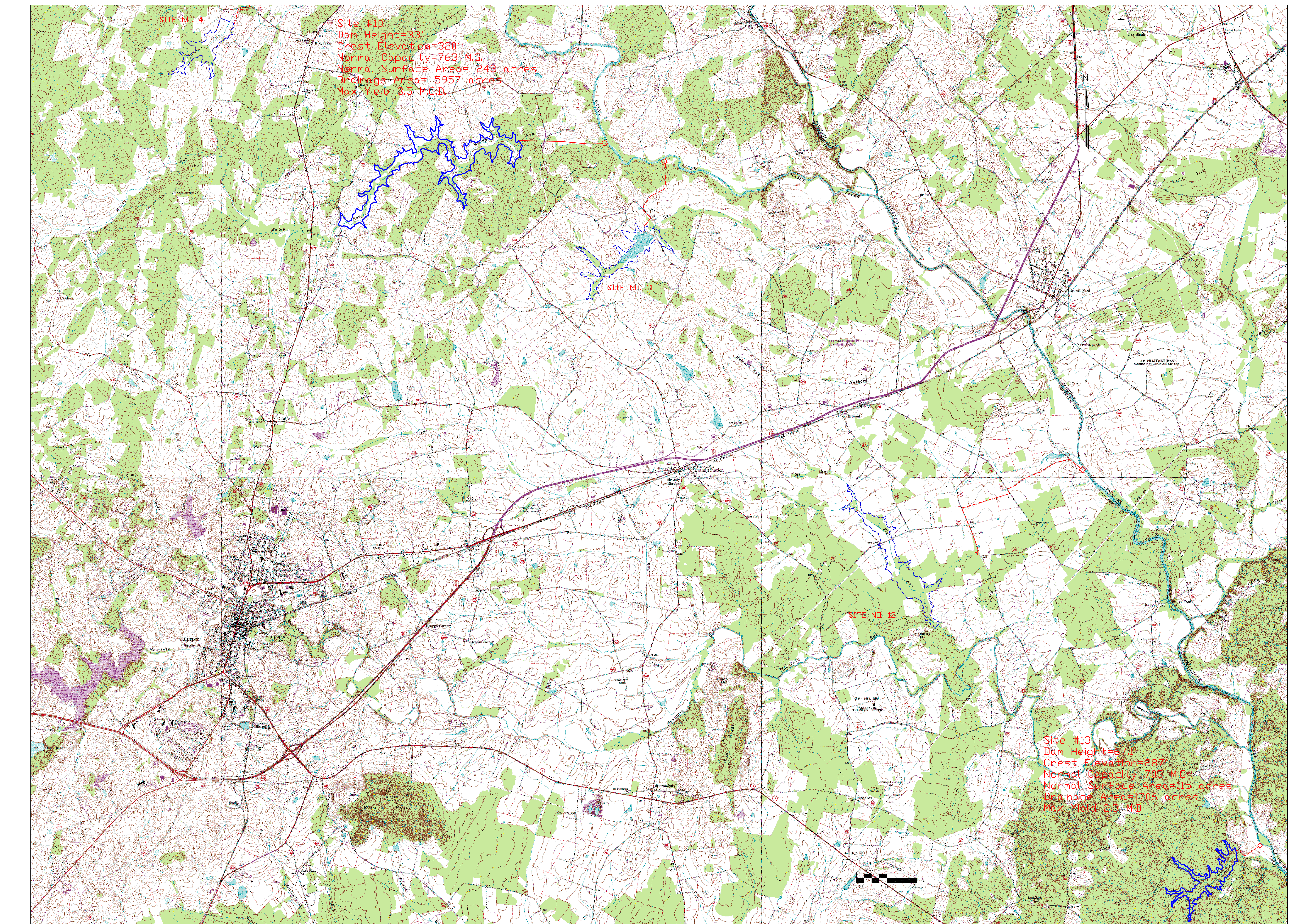
SITE NO. 4

Site #10
 Dam Height=33'
 Crest Elevation=320'
 Normal Capacity=763 MG
 Normal Surface Area= 243 acres
 Drainage Area= 5957 acres
 Max Yield 3.5 M.G.D.

SITE NO. 11

SITE NO. 12

Site #13
 Dam Height=67'
 Crest Elevation=287'
 Normal Capacity=705 MG
 Normal Surface Area=115 acres
 Drainage Area=1706 acres
 Max Yield 2.3 M.D.



OVERLAY CONTROL														
REV.	DATE	BY	APP.	DESCRIPTION	REV.	DATE	BY	APP.	DESCRIPTION	REV.	DATE	BY	APP.	DESCRIPTION

Wiley & Wilson
 ARCHITECTS ENGINEERS PLANNERS
 2310 LANGHORNE ROAD P.O. BOX 877
 LYNCHBURG, VIRGINIA 24501 LYNCHBURG, VIRGINIA 24505-0877

DESIGNED AZR	DRAWN RAF	PROJECT CULPEPER RESERVOIR STUDY
CHECKED JDA	REVIEWED WEH	REFERENCE CIVIL
APPROVED	FILE NO.	TITLE FIGURE 2B: RESEVOIR LOCATION MAP
COMM. NO. 200156.00	DATE 03-16-01	DWG. NO. C-2
		SHEET NO. 2 OF 2
		REV. 0

Site No. 3
Max Yield = 7.6 MGD

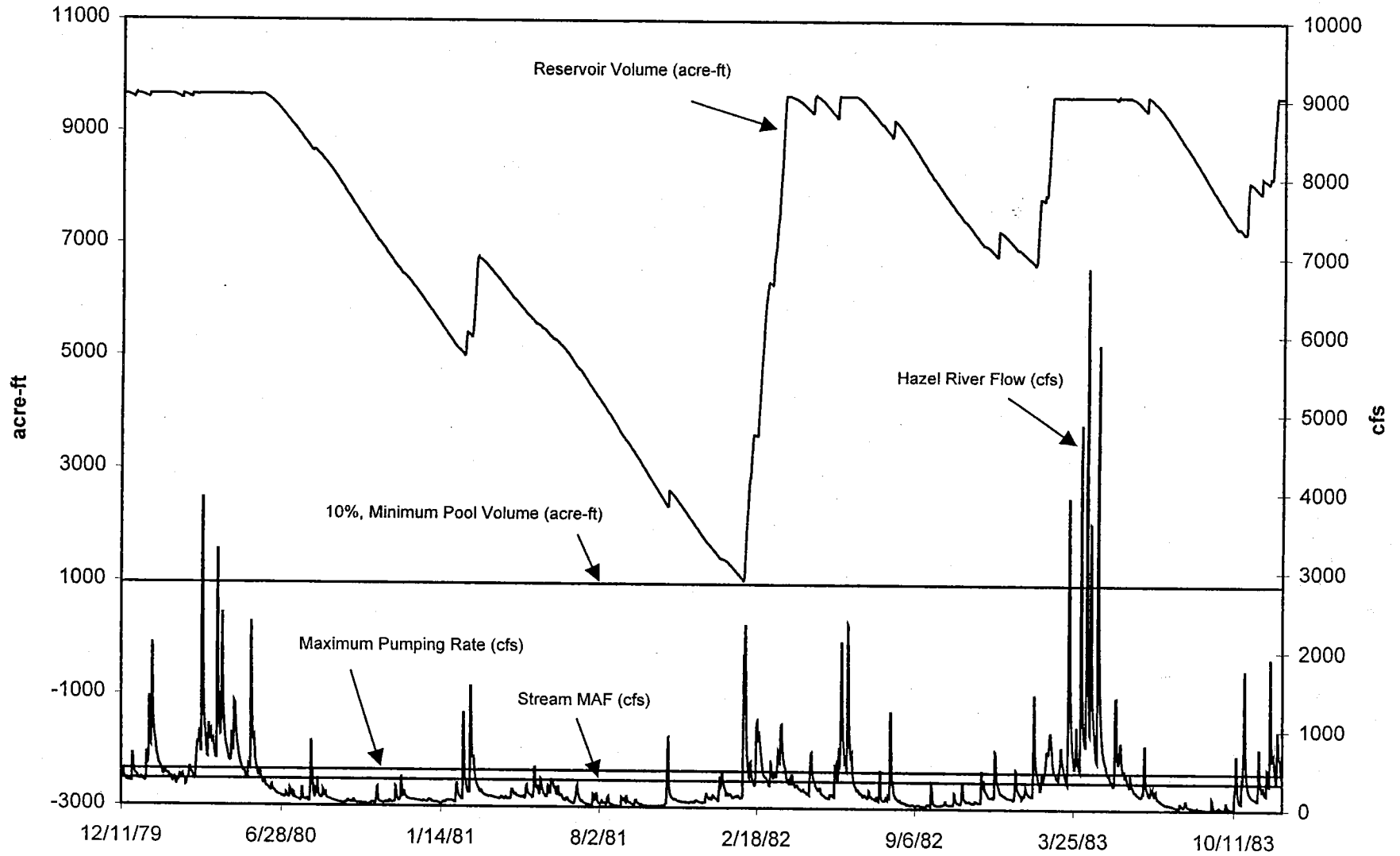


Figure 3.

Site No. 7
Max Yield = 2.8 MGD

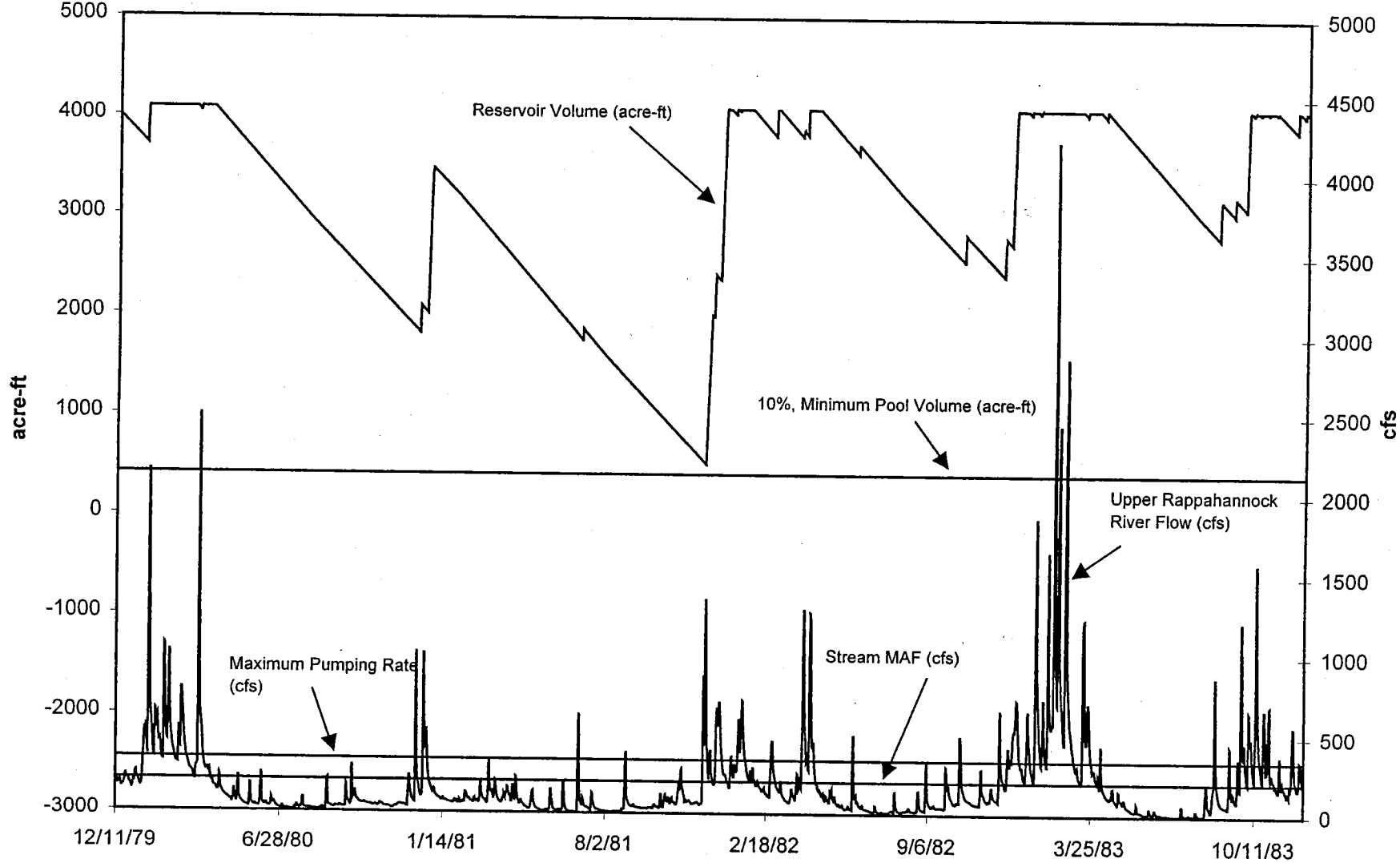


Figure 4.

Site No. 10
Max Yield = 3.5 MGD

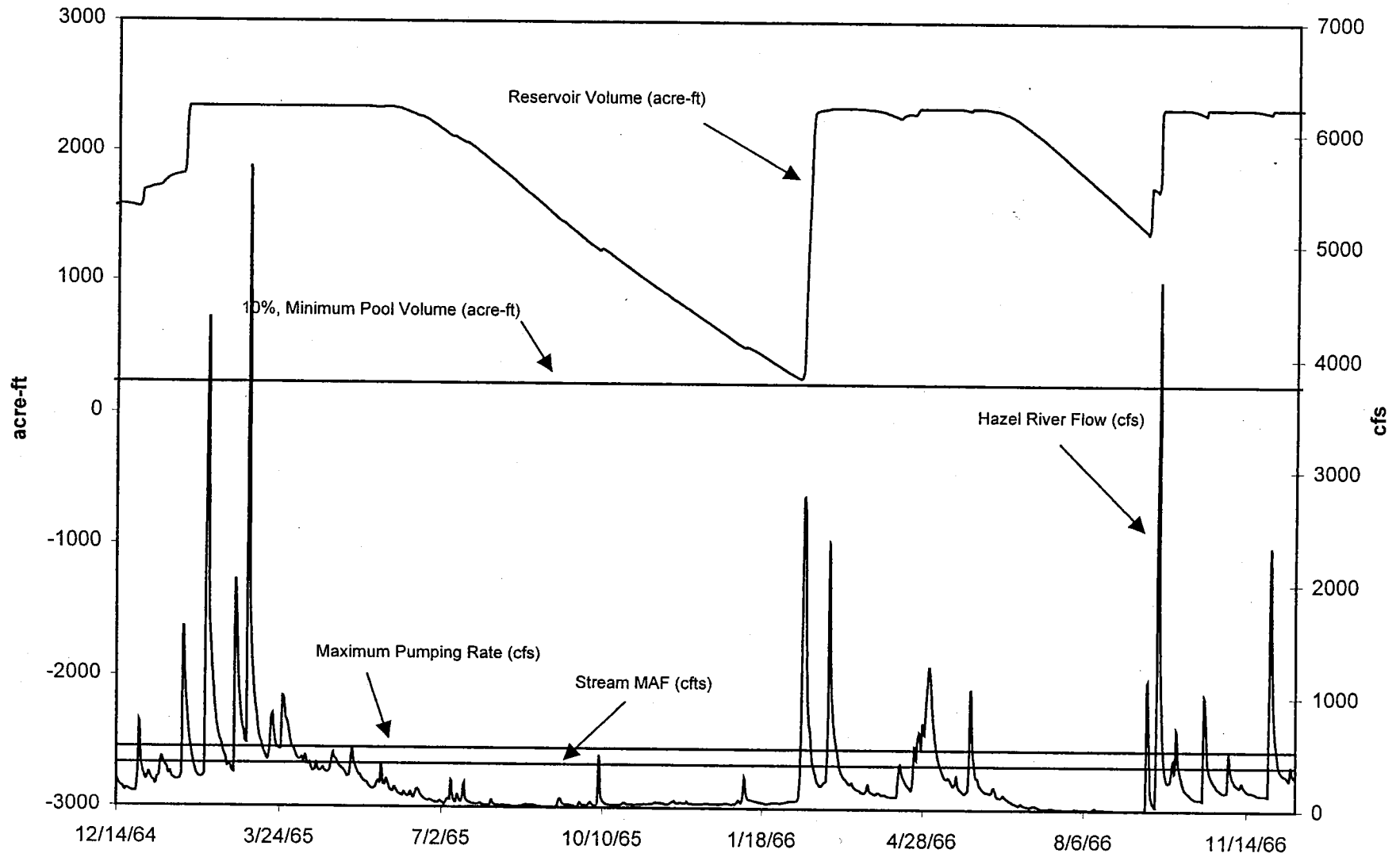


Figure 5.

Site No. 13
Max Yield = 2.3 MGD

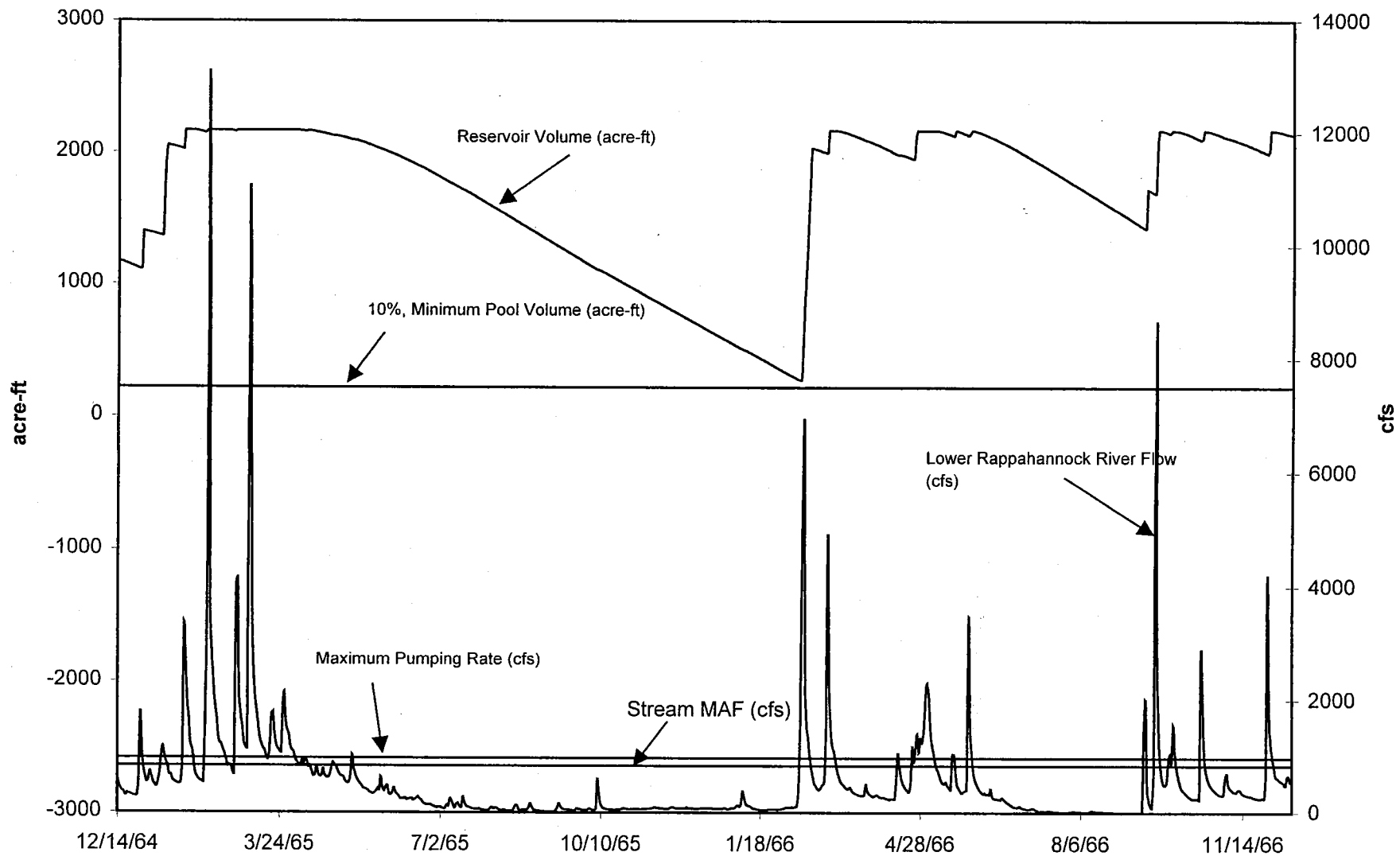


Figure 6.

Duration Curves

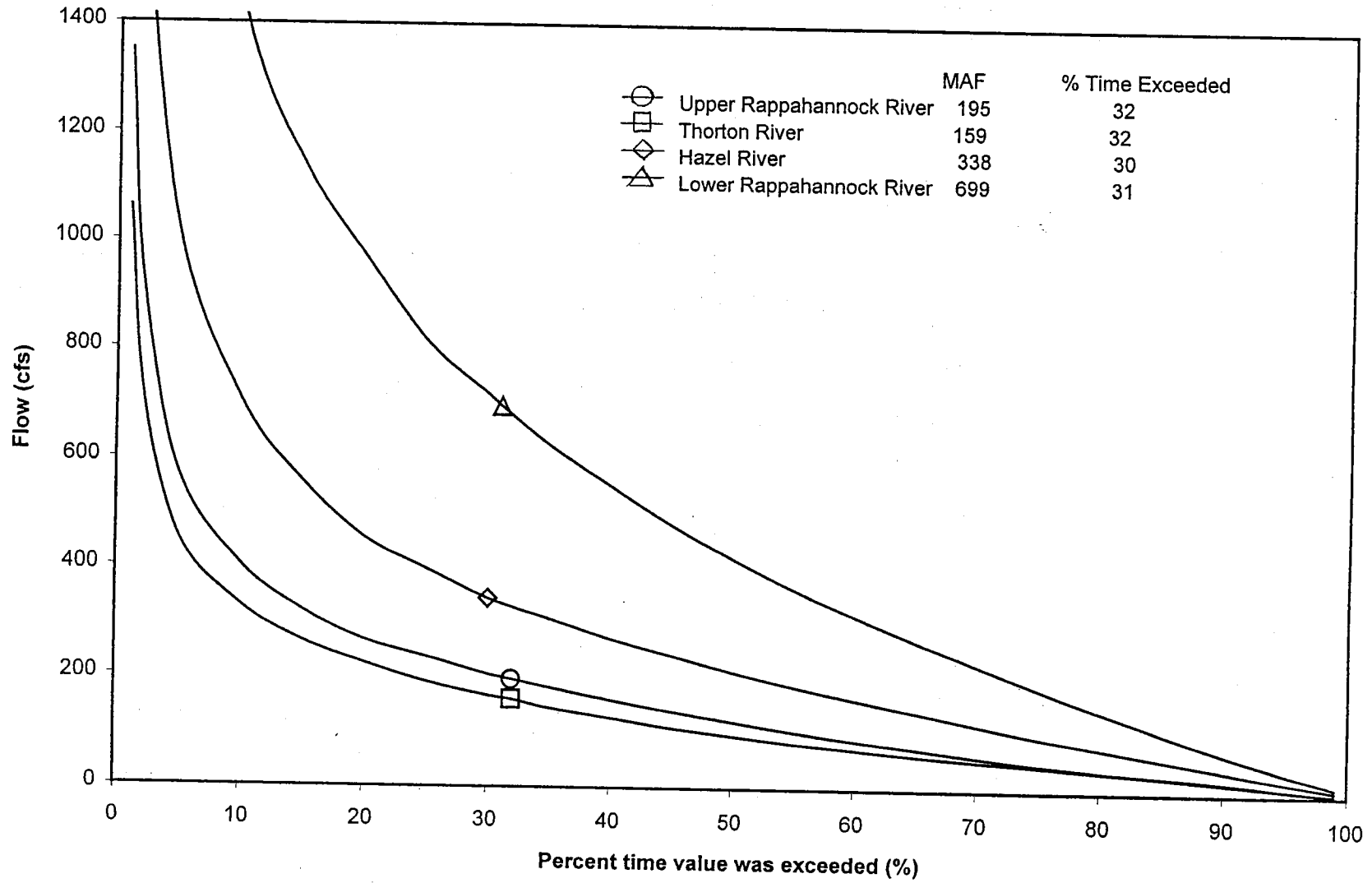
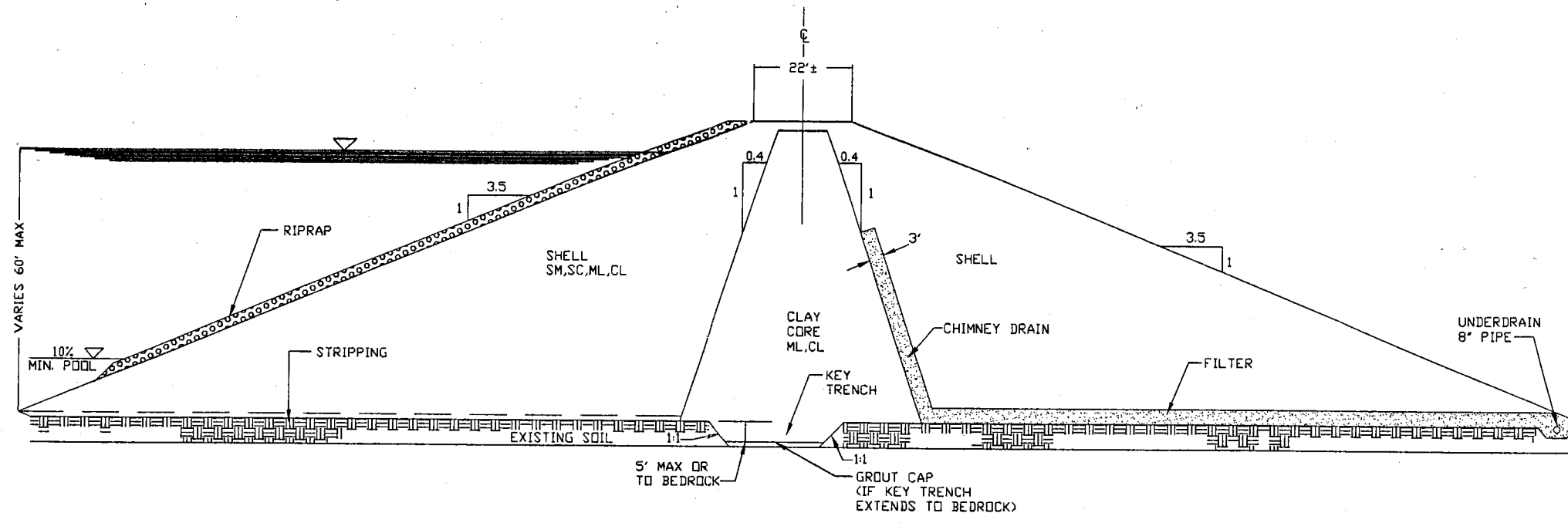


Figure 7



TYPICAL SECTION
 ZONED EARTH EMBANKMENT
 NO SCALE

OVERLAY CONTROL				
REV.	DATE	BY	APP.	DESCRIPTION

Wiley & Wilson
 ARCHITECTS ENGINEERS PLANNERS
 A PROFESSIONAL CORPORATION
 2310 LANGHORNE ROAD LYNCHBURG, VIRGINIA
 24505-0877

DESIGNED	DRAWN	PROJECT
		CULPEPER RESERVOIR STUDY
CHECKED	REVIEWED	REFERENCE
APPROVED	FILE NO.	TITLE
		FIGURE: 8 TYPICAL SECTION EARTH DAM
DATE	DWG. NO.	SHEET NO.

	<u>TAB</u>
Model Documentation.....	A
Property Impact/Tax Maps.....	B
Calculations	C
Cost Analysis	D

Culpeper Reservoir Study

Reservoir #:	13	Seepage (cfs):	0.09	0.178512397
Reservoir drainage area (acres):	1706.0	ET:	May - Oct	Nov - April
Base Gauge station used:	# 1664000	"/day	0.034	-0.012
gauge station drainage area (acres):	396800	acre-ft/day	0.33	-0.1151
corrected inlet point drainage area (acres):	504492			

flow correction factor (CF)	1.183	Individual Pump Capacity (cfs):	35.00 (acre-ft/day)	69.42
inlet MAF (cfs)	826.9419			

watershed flow correction factor	0.004299	Demand (MGD)	(acre-ft/day)
max reservoir vol (acre-ft):	2165.2		2.3 7.06
average reservoir area (acre-ft):	115.1		
average reservoir volume (acre-ft)	2165.2		

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
month	day	year	date	Recorded Gauge Station Flow (cfs)	Corrected gauge station flow x CF (cfs)	Available Flow = Corrected Flow - Inlet MAF (cfs)	Pump 1 (cfs)	Pump 2 (cfs)	Pump 3 (cfs)	Pump 4 (cfs)	Sum of Pumped water (acre-ft/day)	Flow to Avoid First Flush (acre-ft/day)	Seepage (acre-ft/day)	Evapotranspiration (acre-ft/day)	Flow from Reservoir's own watershed (acre-ft/day)	Demand (acre-ft/day)	Initial Vol (acre-ft)	Final Vol (acre-ft)	Over Flow (acre-ft)
10	1	42	10/1/42	720	852	25	25	0	0	0	50	50	0.18	-0.12	6.14	7.06	2165	2165	49
10	2	42	10/2/42	600	710	0	0	0	0	0	0	0	0.18	-0.12	5.12	7.06	2165	2163	0
10	3	42	10/3/42	550	651	0	0	0	0	0	0	0	0.18	-0.12	4.89	7.06	2163	2161	0
10	4	42	10/4/42	490	580	0	0	0	0	0	0	0	0.18	-0.12	4.18	7.06	2161	2158	0
10	5	42	10/5/42	470	556	0	0	0	0	0	0	0	0.18	-0.12	4.01	7.06	2158	2155	0
10	6	42	10/6/42	460	544	0	0	0	0	0	0	0	0.18	-0.12	3.92	7.06	2155	2152	0
10	7	42	10/7/42	400	473	0	0	0	0	0	0	0	0.18	-0.12	3.41	7.06	2152	2148	0
10	8	42	10/8/42	360	426	0	0	0	0	0	0	0	0.18	-0.12	3.07	7.06	2148	2144	0
10	9	42	10/9/42	320	379	0	0	0	0	0	0	0	0.18	-0.12	2.73	7.06	2144	2139	0
10	10	42	10/10/42	290	343	0	0	0	0	0	0	0	0.18	-0.12	2.47	7.06	2139	2135	0
10	11	42	10/11/42	260	308	0	0	0	0	0	0	0	0.18	-0.12	2.22	7.06	2135	2130	0
10	12	42	10/12/42	230	272	0	0	0	0	0	0	0	0.18	-0.12	1.96	7.06	2130	2125	0
10	13	42	10/13/42	240	284	0	0	0	0	0	0	0	0.18	-0.12	2.05	7.06	2125	2120	0
10	14	42	10/14/42	7500	8873	8048	35	35	35	35	278	0	0.18	-0.12	63.96	7.06	2120	2165	289
10	15	42	10/15/42	36000	42589	41762	35	35	35	35	278	278	0.18	-0.12	307.00	7.06	2165	2165	578
10	16	42	10/16/42	64000	75714	74887	35	35	35	35	278	278	0.18	-0.12	545.78	7.06	2165	2165	816
10	17	42	10/17/42	14000	16562	15736	35	35	35	35	278	278	0.18	-0.12	119.39	7.06	2165	2165	390

Appendix A - Model Documentation

Reservoir #	
Reservoir drainage area	Manually determined
Base Gauge station used	Closest USGS gauge station to reservoir inlet
Gauge station drainage area	Published USGS data
Corrected inlet point drainage area	Drainage area to reservoir inlet point
Flow correction factor (CF)	Determined by the method of ratios of areas, equal to (corrected inlet point drainage area/gauge station drainage area) ^{0.7}
Inlet MAF	Equal to the gauge station MAF multiplied by the correction factor
Watershed flow correction factor	Determined by method of ratios of areas with an exponent = 1
Maximum reservoir vol (acre-feet)	Determined from stage storage curve
Average reservoir area (acre)	Determined from stage storage curve with 7 feet of freeboard below max water elevation
Average reservoir volume (acre-feet)	Determined from stage storage curve with 7 feet of freeboard below max water elevation
Seepage	Seepage through an earth filled dam as determined by the equations on the attached sheet
ET	Evapotranspiration as determined by the method on the attached sheet
Individual pump capacity	Determined by considering the length of diversion and elevation head to be overcome by pump
Demand	Varied to achieve the maximum yield. Criteria used for determining max yield was that the water level in the reservoir was to never go below 10 percent of the average reservoir volume.

Column	Description
1	Month
2	Day
3	Year
4	Date
5	Average daily flow at closest gauge station from USGS website
6	Average daily flow at diversion point obtained by spatial manipulation of USGS data by the ratio of areas method as previously discussed
7	Available flow at diversion point (equal to the average daily flow at the diversion point minus the MAF at the diversion point)
8	
9	Pump control statements: each of the four pumps will turn on in sequence to capture the available flow
10	
11	
12	Total that can be pumped during the day (equal to sum of pump control statements)
13	Control statement to delay the start of pumping by a day after available flow rises above the inlet MAF
14	Daily seepage through the dam
15	Daily net evapotranspiration from the reservoir surface
16	Daily flow from reservoirs own watershed
17	Daily demand which is varied based upon the input in the area above
18	Reservoir volume at the beginning of the day (equal to the reservoir volume at the end of the previous day)
19	Reservoir volume at the end of the day equal to columns (13+16)-(14+15+17)
20	Overflow in the case that the final reservoir volume is greater than the maximum reservoir volume

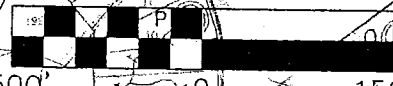


TAX MAP 6

TAX MAP 7

SITE NO. 3

SCALE 1" = 1500'



OVERLAY CONTROL				DESCRIPTION
REV.	DATE	BY	APP.	

Wiley & Wilson
 ARCHITECTS ENGINEERS PLANNERS
 A PROFESSIONAL CORPORATION
 2310 LANGHORNE ROAD LYNCHBURG, VIRGINIA
 24505-0877

DESIGNED	DRAWN	PROJECT
		CULPEPER RESERVOIR STUDY
CHECKED	REVIEWED	REFERENCE
APPROVED	FILE NO.	TITLE
		Site No. 7 Property Impact
CDM. NO.	DWG. NO.	SHEET NO.
200156.00		
DATE		REV.

TAX MAP 8

Parcel 1A Appears
On Map 7
Parcel 1B Appears
On Map 2

N

COUNTY
COUNTY

G 1

A 1

B 1

B 3

B 2

SCALE 1" = 1500'



Disputed Area

SITE NO. 7

Parcels 51E, 51E1,
Appear On Map 16

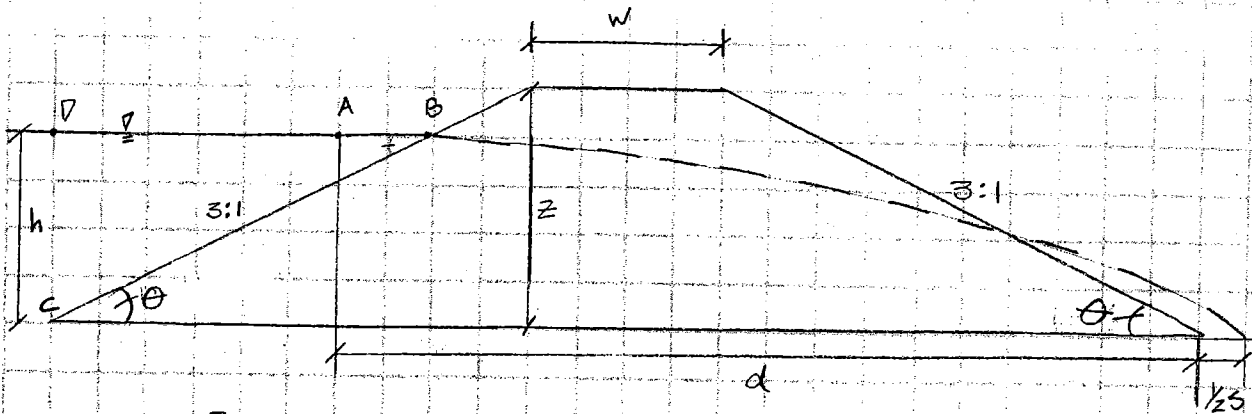
DATE:
DRAWN BY:
APPROVED BY:

SITE NO. 7 PROPERTY IMPACT
WILEY & WILSON, INC.

NUMBER:
SCALE:

Wiley & Wilson Architects, Engineers, Planners
DESIGN CALCULATIONS

SEEPAGE ESTIMATE:



$$w = \frac{z}{5} + 10$$

$$\theta = \tan^{-1} \frac{1}{3}$$

$$\overline{BC} = \sqrt{h^2 + (3h)^2}$$

$$\overline{AB} = 0.3 \overline{BC}$$

$$d = w + \frac{z}{\tan \theta} - \frac{h}{\tan \theta} + \overline{AB} = w + 3z - 3h + \overline{AB}$$

$$S = \sqrt{d^2 + h^2} - d$$

$$Q = KSL$$

$$\rightarrow K = 1E-5 \text{ ft/sec}$$

L = site specific

$$\text{Net ET} = \text{Evap} - \text{Precip}$$

ET estimate: (evapotranspiration)

annual ET in Culpeper = 36"

% of annual from May - Oct = 70% = 25.2" - - 19"

" " " " Nov - April = 30% = 10.8" - 13"

from May - Oct $\rightarrow 0.034$ /day

Nov - Apr $\rightarrow 0.012$ /day

Project Culpeper Reservoir

Comm. No. 200156.00

By A. Redding

Date Sept 7, 2000

Sheet No. _____

CULPEPER COUNTY
 RESERVOIR SITE STUDY
 RECONNAISSANCE LEVEL COST ESTIMATE - SITE NO. 3
 NEW RESERVOIR AT INDIAN RUN
 10/03/2000

A. CONSTRUCTION COST

	QUANTITY	UNIT	UNIT PRICE	COST
1. MOBILIZATION	1	L.S.	\$150,000.00	\$150,000
2. STREAM DIVERSION	1	L.S.	\$45,000.00	\$45,000
3. STRIP, STOCKPILE AND REPLACE TOPSOIL	7025	C.Y.	\$4.00	\$28,099
4. CLEAR RESERVOIR SITE	373	AC.	\$1,800.00	\$671,400
5. DEWATERING	1	EA.	\$75,000.00	\$75,000
6. CUT OFF TRENCH	6031	C.Y.	\$6.00	\$36,185
7. EMERGENCY SPILLWAY CREST SILL	119	C.Y.	\$200.00	\$23,704
8. GROUT CAP	482	C.Y.	\$120.00	\$57,897
9. EMBANKMENT	377808	C.Y.	\$4.00	\$1,511,233
10. RIPRAP	10426	C.Y.	\$40.00	\$417,037
11. DROP SPILLWAY	345	C.Y.	\$400.00	\$138,074
12. LOW LEVEL DRAIN INLET STRUCTURE	20	C.Y.	\$400.00	\$8,000
13. 36 INCH LOW LEVEL DRAIN PIPE	50	L.F.	\$160.00	\$8,000
15. 60 INCH OUTLET PIPE	470	L.F.	\$375.00	\$176,250
15. OUTLET STRUCTURE	25	C.Y.	\$400.00	\$10,000
16. EMERGENCY SPILLWAY EROSION PROTECTION	3319	C.Y.	\$40.00	\$132,741
17. FILTER BLANKET & CHIMNEY DRAIN	21093	C.Y.	\$20.00	\$421,865
18. TOE DRAIN	1303	L.F.	\$20.00	\$26,053
20. SEEDING	11	AC	\$2,500.00	\$26,794
21. EROSION AND SEDIMENT CONTROL	1	L.S.	\$30,000.00	\$30,000
22. ACCESS ROAD	4600	L.F.	\$60.00	\$276,000
23. SOIL TESTING	1	L.S.	\$20,000.00	\$20,000
24. RIVER INTAKE PIPING AND SCREENS	1	L.S.	\$125,000.00	\$125,000
25. DIVERSION PUMP STATION	1	L.S.	\$700,000.00	\$700,000
26. 42 INCH DIVERSION PIPING	13200	L.F.	\$500.00	\$6,600,000

SUBTOTAL \$11,714,331

CONTINGENCY @ 15 PERCENT \$423,650

TOTAL CONSTRUCTION COST \$12,137,981

B. RELATED COSTS

1. ENGINEERING, PERMITTING, AND CONSTRUCTION MANAGEMENT \$2,913,115

2. ENVIRONMENTAL MITIGATION \$606,899

TOTAL PROJECT COST \$15,051,097

NOTE: COSTS DO NOT INCLUDE LAND ACQUISITION OR STRUCTURE RELOCATION

CULPEPER COUNTY
 RESERVOIR SITE STUDY
 RECONNAISSANCE LEVEL COST ESTIMATE - SITE NO. 3A, NO PUMPING
 NEW RESERVOIR AT INDIAN RUN
 10/03/2000

A. CONSTRUCTION COST

	QUANTITY	UNIT	UNIT PRICE	COST
1. MOBILIZATION	1	L.S.	\$150,000.00	\$150,000
2. STREAM DIVERSION	1	L.S.	\$45,000.00	\$45,000
3. STRIP, STOCKPILE AND REPLACE TOPSOIL	7025	C.Y.	\$4.00	\$28,099
4. CLEAR RESERVOIR SITE	373	AC.	\$1,800.00	\$671,400
5. DEWATERING	1	EA.	\$75,000.00	\$75,000
6. CUT OFF TRENCH	6031	C.Y.	\$6.00	\$36,185
7. EMERGENCY SPILLWAY CREST SILL	119	C.Y.	\$200.00	\$23,704
8. GROUT CAP	482	C.Y.	\$200.00	\$96,494
9. EMBANKMENT	377808	C.Y.	\$4.00	\$1,511,233
10. RIPRAP	10426	C.Y.	\$40.00	\$417,037
11. DROP SPILLWAY STRUCTURE	345	C.Y.	\$400.00	\$138,074
12. LOW LEVEL DRAIN INLET STRUCTURE	20	C.Y.	\$400.00	\$8,000
13. 36 INCH LOW LEVEL DRAIN PIPE	50	L.F.	\$160.00	\$8,000
15. 60 INCH OUTLET PIPE	470	L.F.	\$375.00	\$176,250
15. OUTLET STRUCTURE	25	C.Y.	\$400.00	\$10,000
16. EMERGENCY SPILLWAY EROSION PROTECTION	3319	C.Y.	\$40.00	\$132,741
17. FILTER BLANKET & CHIMNEY DRAIN	21093	C.Y.	\$20.00	\$421,865
18. TOE DRAIN	1303	L.F.	\$20.00	\$26,053
20. SEEDING	11	AC	\$2,500.00	\$26,794
21. EROSION AND SEDIMENT CONTROL	1	L.S.	\$30,000.00	\$30,000
22. ACCESS ROAD	4600	L.F.	\$60.00	\$276,000
23. SOIL TESTING	1	L.S.	\$20,000.00	\$20,000

SUBTOTAL \$4,327,929

CONTINGENCY @ 15 PERCENT \$423,650

TOTAL CONSTRUCTION COST \$4,751,579

B. RELATED COSTS

1. ENGINEERING, PERMITTING, AND CONSTRUCTION MANAGEMENT \$1,140,379
 2. ENVIRONMENTAL MITIGATION \$237,579

TOTAL PROJECT COST \$5,891,958

NOTE: COSTS DO NOT INCLUDE LAND ACQUISITION OR STRUCTURE RELOCATION

CULPEPER COUNTY
 RESERVOIR SITE STUDY
 RECONNAISSANCE LEVEL COST ESTIMATE - SITE NO. 7
 NEW RESERVOIR AT BEAVERDAM RUN
 10/03/2000

A. CONSTRUCTION COST

	QUANTITY	UNIT	UNIT PRICE	COST
1. MOBILIZATION	1	L.S.	\$150,000.00	\$150,000
2. STREAM DIVERSION	1	L.S.	\$45,000.00	\$45,000
3. STRIP, STOCKPILE AND REPLACE TOPSOIL	8661	C.Y.	\$4.00	\$34,645
4. CLEAR RESERVOIR SITE	133	AC.	\$1,800.00	\$239,400
5. DEWATERING	1	EA.	\$75,000.00	\$75,000
6. CUT OFF TRENCH	10399	C.Y.	\$6.00	\$62,392
7. EMERGENCY SPILLWAY CREST SILL	41	C.Y.	\$200.00	\$8,296
8. GROUT CAP	832	C.Y.	\$120.00	\$99,827
9. EMBANKMENT	390364	C.Y.	\$4.00	\$1,561,456
10. RIPRAP	11394	C.Y.	\$40.00	\$455,759
11. DROP SPILLWAY	273	C.Y.	\$400.00	\$109,345
12. LOW LEVEL DRAIN INLET STRUCTURE	20	C.Y.	\$400.00	\$8,000
13. 36 INCH LOW LEVEL DRAIN PIPE	50	L.F.	\$160.00	\$8,000
15. 42 INCH OUTLET PIPE	439	L.F.	\$200.00	\$87,840
15. OUTLET STRUCTURE	25	C.Y.	\$400.00	\$10,000
16. EMERGENCY SPILLWAY EROSION PROTECTION	1082	C.Y.	\$40.00	\$43,265
17. FILTER BLANKET & CHIMNEY DRAIN	25223	C.Y.	\$20.00	\$504,470
18. TOE DRAIN	2246	L.F.	\$20.00	\$44,922
20. SEEDING	16	AC	\$2,500.00	\$40,253
21. EROSION AND SEDIMENT CONTROL	1	L.S.	\$30,000.00	\$30,000
22. ACCESS ROAD	1000	L.F.	\$60.00	\$60,000
23. SOIL TESTING	1	L.S.	\$20,000.00	\$20,000
24. RIVER INTAKE PIPING AND SCREENS	1	L.S.	\$125,000.00	\$125,000
25. DIVERSION PUMP STATION	1	L.S.	\$700,000.00	\$700,000
27. 42 INCH DIVERSION PIPING	1800	L.F.	\$500.00	\$900,000

SUBTOTAL \$5,422,870

CONTINGENCY @ 15 PERCENT \$423,650

TOTAL CONSTRUCTION COST \$5,846,520

B. RELATED COSTS

1. ENGINEERING, PERMITTING, AND CONSTRUCTION MANAGEMENT \$1,403,165

2. ENVIRONMENTAL MITIGATION \$292,326

TOTAL PROJECT COST \$7,249,685

NOTE: COSTS DO NOT INCLUDE LAND ACQUISITION OR STRUCTURE RELOCATION

CULPEPER COUNTY
 RESERVOIR SITE STUDY
 RECONNAISSANCE LEVEL COST ESTIMATE - SITE NO. 10
 NEW RESERVOIR AT MUDDY RUN
 10/03/2000

A. CONSTRUCTION COST

	QUANTITY	UNIT	UNIT PRICE	COST
1. MOBILIZATION	1	L.S.	\$150,000.00	\$150,000
2. STREAM DIVERSION	1	L.S.	\$45,000.00	\$45,000
3. STRIP, STOCKPILE AND REPLACE TOPSOIL	1174	C.Y.	\$4.00	\$4,698
4. CLEAR RESERVOIR SITE	325	AC.	\$1,800.00	\$585,000
5. DEWATERING	1	EA.	\$75,000.00	\$75,000
6. CUT OFF TRENCH	1889	C.Y.	\$6.00	\$11,334
7. EMERGENCY SPILLWAY CREST SILL	130	C.Y.	\$200.00	\$26,074
8. GROUT CAP	151	C.Y.	\$120.00	\$18,135
9. EMBANKMENT	33904	C.Y.	\$4.00	\$135,615
10. RIPRAP	1245	C.Y.	\$40.00	\$49,792
11. DROP SPILLWAY	118	C.Y.	\$400.00	\$47,052
12. LOW LEVEL DRAIN INLET STRUCTURE	20	C.Y.	\$400.00	\$8,000
13. 36 INCH LOW LEVEL DRAIN PIPE	270	L.F.	\$220.00	\$59,400
14. OUTLET STRUCTURE	25	C.Y.	\$400.00	\$10,000
15. SERVICE SPILLWAY	2700	C.Y.	\$250.00	\$675,000
16. EMERGENCY SPILLWAY EROSION PROTECTION	1882	C.Y.	\$40.00	\$75,289
17. FILTER BLANKET & CHIMNEY DRAIN	3290	C.Y.	\$20.00	\$65,799
18. TOE DRAIN	408	L.F.	\$20.00	\$8,161
20. SEEDING	3	AC	\$2,500.00	\$6,770
21. EROSION AND SEDIMENT CONTROL	1	L.S.	\$30,000.00	\$30,000
22. ACCESS ROAD	1000	L.F.	\$60.00	\$60,000
23. SOIL TESTING	1	L.S.	\$20,000.00	\$20,000
24. RIVER INTAKE PIPING AND SCREENS	1	L.S.	\$125,000.00	\$125,000
25. DIVERSION PUMP STATION	1	L.S.	\$700,000.00	\$700,000
26. 42 INCH DIVERSION PIPING	4320	L.F.	\$500.00	\$2,160,000

SUBTOTAL \$5,151,118

CONTINGENCY @ 15 PERCENT \$423,650

TOTAL CONSTRUCTION COST \$5,574,768

B. RELATED COSTS

1. ENGINEERING, PERMITTING, AND CONSTRUCTION MANAGEMENT \$1,337,944

2. ENVIRONMENTAL MITIGATION \$278,738

TOTAL PROJECT COST \$6,912,713

NOTE: COSTS DO NOT INCLUDE LAND ACQUISITION OR STRUCTURE RELOCATION

CULPEPER COUNTY
 RESERVOIR SITE STUDY
 RECONNAISSANCE LEVEL COST ESTIMATE - SITE NO. 10A, NO PUMPING
 NEW RESERVOIR AT MUDDY RUN
 10/03/2000

A. CONSTRUCTION COST

	QUANTITY	UNIT	UNIT PRICE	COST
1. MOBILIZATION	1	L.S.	\$150,000.00	\$150,000
2. STREAM DIVERSION	1	L.S.	\$45,000.00	\$45,000
3. STRIP, STOCKPILE AND REPLACE TOPSOIL	1174	C.Y.	\$4.00	\$4,698
4. CLEAR RESERVOIR SITE	173	AC.	\$1,800.00	\$311,400
5. DEWATERING	1	EA.	\$75,000.00	\$75,000
6. CUT OFF TRENCH	1889	C.Y.	\$6.00	\$11,334
7. EMERGENCY SPILLWAY CREST SILL	130	C.Y.	\$200.00	\$26,074
8. GROUT CAP	151	C.Y.	\$120.00	\$18,135
9. EMBANKMENT	33904	C.Y.	\$4.00	\$135,615
10. RIPRAP	1245	C.Y.	\$40.00	\$49,792
11. DROP SPILLWAY	118	C.Y.	\$400.00	\$47,052
12. LOW LEVEL DRAIN INLET STRUCTURE	20	C.Y.	\$400.00	\$8,000
13. 36 INCH LOW LEVEL DRAIN PIPE	270	L.F.	\$220.00	\$59,400
14. OUTLET STRUCTURE	25	C.Y.	\$400.00	\$10,000
15. SERVICE SPILLWAY	2700	C.Y.	\$250.00	\$675,000
16. EMERGENCY SPILLWAY EROSION PROTECTION	1882	C.Y.	\$40.00	\$75,289
17. FILTER BLANKET & CHIMNEY DRAIN	3290	C.Y.	\$20.00	\$65,799
18. TOE DRAIN	408	L.F.	\$40.00	\$16,321
20. SEEDING	3	AC	\$2,500.00	\$6,770
21. EROSION AND SEDIMENT CONTROL	1	L.S.	\$30,000.00	\$30,000
22. ACCESS ROAD	1000	L.F.	\$60.00	\$60,000
23. SOIL TESTING	1	L.S.	\$20,000.00	\$20,000

SUBTOTAL \$1,900,679

CONTINGENCY @ 15 PERCENT \$423,650

TOTAL CONSTRUCTION COST \$2,324,329

B. RELATED COSTS

1. ENGINEERING, PERMITTING, AND CONSTRUCTION MANAGEMENT \$557,839

2. ENVIRONMENTAL MITIGATION \$116,216

TOTAL PROJECT COST \$2,882,168

NOTE: COSTS DO NOT INCLUDE LAND ACQUISITION OR STRUCTURE RELOCATION

CULPEPER COUNTY
 RESERVOIR SITE STUDY
 RECONNAISSANCE LEVEL COST ESTIMATE - SITE NO. 13
 NEW RESERVOIR AT MILL RUN
 10/03/2000

A. CONSTRUCTION COST

	QUANTITY	UNIT	UNIT PRICE	COST
1. MOBILIZATION	1	L.S.	\$150,000.00	\$150,000
2. STREAM DIVERSION	1	L.S.	\$45,000.00	\$45,000
3. STRIP, STOCKPILE AND REPLACE TOPSOIL	3521	C.Y.	\$4.00	\$14,083
4. CLEAR RESERVOIR SITE	115	AC.	\$1,800.00	\$207,180
5. DEWATERING	1	EA.	\$75,000.00	\$75,000
6. CUT OFF TRENCH	3854	C.Y.	\$6.00	\$23,126
7. EMERGENCY SPILLWAY CREST SILL	107	C.Y.	\$200.00	\$21,333
8. GROUT CAP	308	C.Y.	\$120.00	\$37,002
9. EMBANKMENT	156230	C.Y.	\$4.00	\$624,922
10. RIPRAP	4505	C.Y.	\$40.00	\$180,219
11. DROP SPILLWAY	276	C.Y.	\$400.00	\$110,590
12. LOW LEVEL DRAIN INLET STRUCTURE	20	C.Y.	\$400.00	\$8,000
13. 36 INCH LOW LEVEL DRAIN PIPE	50	L.F.	\$160.00	\$8,000
15. 54 INCH OUTLET PIPE	443	L.F.	\$320.00	\$141,664
15. OUTLET STRUCTURE	25	C.Y.	\$400.00	\$10,000
16. EMERGENCY SPILLWAY EROSION PROTECTION	2805	C.Y.	\$40.00	\$112,187
17. FILTER BLANKET & CHIMNEY DRAIN	10359	C.Y.	\$20.00	\$207,183
18. TOE DRAIN	833	L.F.	\$20.00	\$16,651
20. SEEDING	6	AC	\$2,500.00	\$15,609
21. EROSION AND SEDIMENT CONTROL	1	L.S.	\$30,000.00	\$30,000
22. ACCESS ROAD	1000	L.F.	\$60.00	\$60,000
23. SOIL TESTING	1	L.S.	\$20,000.00	\$20,000
24. RIVER INTAKE PIPING AND SCREENS	1	L.S.	\$125,000.00	\$125,000
25. DIVERSION PUMP STATION	1	L.S.	\$700,000.00	\$700,000
26. 42 INCH DIVERSION PIPING	1840	L.F.	\$500.00	\$920,000

SUBTOTAL \$3,862,748

CONTINGENCY @ 15 PERCENT \$423,650

TOTAL CONSTRUCTION COST \$4,286,398

B. RELATED COSTS

1. ENGINEERING, PERMITTING, AND CONSTRUCTION MANAGEMENT \$1,028,736

2. ENVIRONMENTAL MITIGATION \$214,320

TOTAL PROJECT COST \$5,315,134

NOTE: COSTS DO NOT INCLUDE LAND ACQUISITION OR STRUCTURE RELOCATION