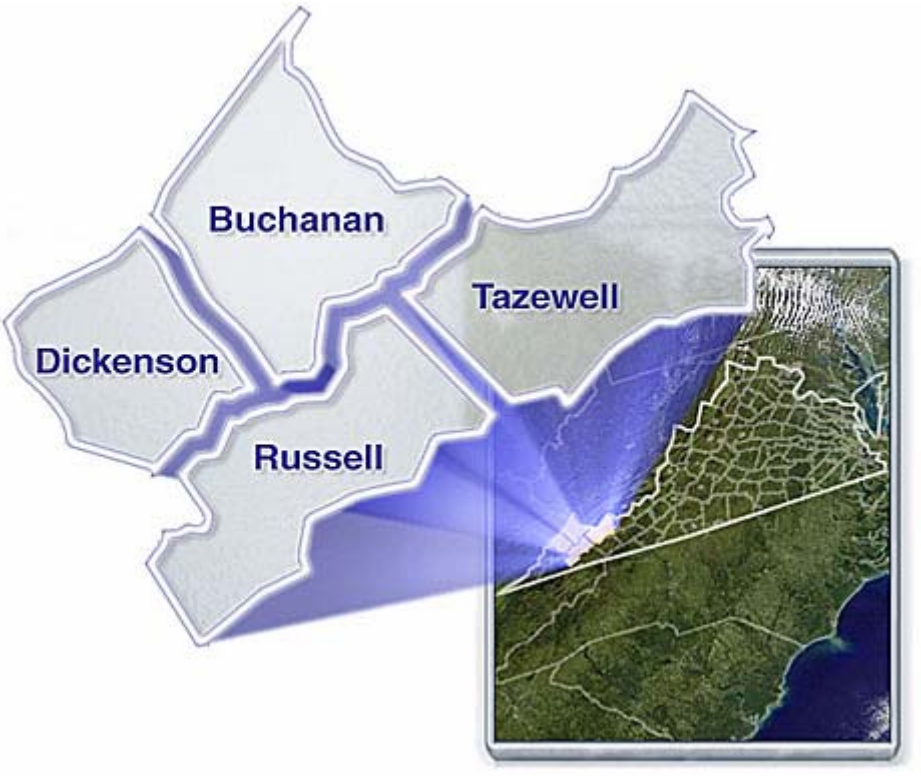
Cumberland Plateau
Planning District Commission

Hazard Mitigation Plan

July 1, 2005



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SECTION I. EXECUTIVE SUMMARY

For the purposes of this Hazard Mitigation Plan, the Cumberland Plateau Planning District is comprised of the counties of Buchanan, Dickenson, Russell and Tazewell and the towns of Grundy, Clinchco, Clintwood, Haysi, Cleveland, Honaker, Lebanon, Bluefield, Cedar Bluff, Pocahontas, Richlands and Tazewell. Hereinafter and throughout the document, the area will be referred to as the Cumberland Plateau Planning District. The area is vulnerable to many types of natural hazards — including floods, tornadoes, winter storms, earthquakes, and severe thunderstorms — and has experienced the effects of each of these at some point in its history.

The last few decades of growth within the Cumberland Plateau Planning District have placed more development than ever in harm's way, increasing the potential for severe economic and social consequences if a major disaster or other catastrophic event were to occur today. Such an event could have the potential to cost the local governments, residents, and businesses millions of dollars in damages to public buildings and infrastructure, lost tax revenues, unemployment, homelessness, and emotional and physical suffering for many years to come.

A multi-hazard mitigation plan has been prepared for the Cumberland Plateau Planning District in accordance with the requirements of the Disaster Mitigation Act of 2000. Having the mitigation plan in place will help the area to:

- Better understand local hazards and risks;
- Build support for mitigation activities;
- Develop more effective community hazard-reduction policies and integrate mitigation concepts into other community processes;
- Incorporate mitigation into post-disaster recovery activities; and
- Obtain disaster-related grants in the aftermath of a disaster.

Hazard Identification and Risk Assessment

Prioritizing the potential hazards that can impact the Cumberland Plateau Planning District was based on the probability that a potential hazard will affect the area and the potential impacts on it for a given disaster event. Values were assigned to each hazard type, based on the hazard's highest potential hazard level. These hazard level categories represent the likelihood of a hazard event, which could significantly affect the Cumberland Plateau Planning District. These categories are based on the classifications used in the Hazard Identification portion of this document and are ***High, Medium-High, Medium,*** and ***Low***. In order to focus on the most significant hazards, only those assigned a level of **High** or **Medium**-**High** have been included for analysis in the risk assessment.

Table I-1 summarizes the results of this analysis, which is explained more fully in Section V of this plan.

Table I-1 — Hazard Identification Results

Hazard Type	Hazard Level
Flooding	High
Sever Winter Storms	Medium-High
Wildfire	Medium-High
Landslides	Medium-High
Severe Thunderstorms/Hail Storms	Medium
Severe Wind	Medium
Earthquake	Medium
Dam/Levee Failure	Medium
Drought	Medium

The Mitigation Strategy

During the presentation of findings for the Hazard Identification and Risk Assessment workshop, the Mitigation Advisory Committee (MAC) was asked to provide comments and suggestions on actions and policies, which could lessen the area's vulnerability to the identified hazards. The MAC supported the following preliminary comments below:

- Top priorities for the area were public safety, public education, and reduction of potential economic impacts of disasters.
- Alternatives should consider the impacts on the Cumberland Plateau Planning District as a whole.
- Alternatives must not conflict with other local government programs.
- Outreach and other efforts should be attempted to repetitive loss properties, including those designated by FEMA.
- Past experiences from disasters should be built upon.
- The success of past mitigation projects should be considered in developing alternatives.

The following overarching goal and six specific goals were developed by the MAC to guide the area's future hazard mitigation activities.

OVERARCHING COMMUNITY GOAL:
"To develop and maintain disaster resistant communities that are less vulnerable to the economic and physical devastation associated with natural hazard events."

- **GOAL 1:**
  Enhance the safety of residents and businesses by protecting new and existing development from the effects of hazards.
- **GOAL 2:**
  Protect new and existing public and private infrastructure and facilities from the effects of hazards.
- **GOAL 3:**
  Increase the area's floodplain management activities and participation in the National Flood Insurance Program.
- **GOAL 4:**
  Ensure hazard awareness and risk reduction principles are institutionalized into each local jurisdiction's daily activities, processes, and functions by incorporating them into policy documents and initiatives.
- **GOAL 5:**
  Enhance community-wide understanding and awareness of Cumberland Plateau Planning District hazards.
- **GOAL 6:**
  Publicize mitigation activities to reduce the area's vulnerability to the identified hazards.

The MAC reviewed the STAPLE/E Criteria (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) process to assist in selecting and prioritizing the most appropriate mitigation actions for the Cumberland Plateau Planning District. This methodology required that social, technical, administrative, political, legal, economic, and environmental considerations be taken into account when reviewing potential projects and policies. This process was used to help ensure that the most equitable and feasible actions would be undertaken based on local jurisdiction's capabilities. These actions are laid out with an implementation strategy and timeframes in Section VII of this plan.

Conclusion

This plan symbolizes the Cumberland Plateau Planning District's continued commitment and dedication to enhance the safety of its residents and businesses by taking actions before a disaster strikes. While each jurisdiction cannot necessarily prevent natural hazard events from occurring, they can minimize the disruption and devastation that so often accompanies these disasters.

SECTION II. INTRODUCTION

Mitigation

Mitigation is commonly defined as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. Hazard mitigation focuses attention and resources on community policies and actions that will produce successive benefits over time. A mitigation plan states the aspirations and specific courses of action that a community intends to follow to reduce vulnerability and exposure to future hazard events. These plans are formulated through a systematic process centered on the participation of citizens, businesses, public officials and other community stakeholders.

A local mitigation plan is the physical representation of a jurisdiction's commitment to reduce risks from natural hazards. Local officials can refer to the plan in their day-to-day activities and decisions regarding regulations and ordinances, granting permits, and in funding capital improvements and other community initiatives. Additionally, these local plans will serve as the basis for states to prioritize future grant funding as it becomes available.

It is hoped that the Cumberland Plateau Planning District's hazard mitigation plan will be a tool for all community stakeholders to use by increasing public awareness about local hazards and risks, while at the same time providing information about options and resources available to reduce those risks. Teaching the public about potential hazards will help each of the area's jurisdictions protect themselves against the effects of the hazards, and will enable informed decision making on where to live, purchase property, or locate businesses.

The Local Mitigation Planning Impetus

On October 30, 2000, the President signed into law the Disaster Mitigation Act of 2000 (DMA 2000), which established a national disaster hazard mitigation grant program that would help to reduce loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters.

DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act and added a new section, §322 Mitigation Planning. Section 322 requires local governments to prepare and adopt jurisdiction-wide hazard mitigation plans for disasters declared after November 1, 2003, (subsequently revised to November 1, 2004) as a condition of receiving Hazard Mitigation Grant Program (HMGP) project grants and other forms of non-emergency disaster assistance. Local governments must review and if necessary, update the mitigation plan every five years from the original date of the plan to continue program eligibility.

Interim Final Rule Planning Criteria

As part of the process of implementing DMA 2000, The Federal Emergency Management Agency (FEMA) prepared an Interim Final Rule (the Rule) to define the mitigation planning criteria for States and communities. Published in the *Federal Register* on February 26, 2002, at 44 CFR Part 201, the Rule serves as the governing document for DMA 2000 planning implementation.

Organization of the Plan

This planning document has been organized in a format that follows the process enumerated in the Rule.

Section III – Planning Process describes the Cumberland Plateau Planning District's stakeholder involvement and defines the processes followed throughout the creation of this plan.

Section IV – Community Profile provides a physical and demographic profile of the Cumberland Plateau Planning District looking at such things as geography, hydrography, development, people and land uses within the three-county area.

Section V – Hazard Identification and Risk Assessment evaluates the natural hazards likely to affect the Cumberland Plateau Planning District, and quantifies whom, what, where, and how local jurisdictions may be vulnerable to future hazard events.

Section VI – Capability Assessment analyzes each of the four local jurisdiction's policies, programs, plans, resources, and capability to reduce exposure to hazards in the community.

Section VII – Mitigation Strategy addresses the Cumberland Plateau Planning District's issues and concerns for hazards by establishing a framework for loss-reduction activities and policies. The strategy includes future vision statements, goals, objectives, and a range of actions to achieve the goals.

Section VIII – Plan Maintenance Procedures specifies how the plan will be monitored, evaluated, and updated, including a process for continuing stakeholder involvement once the plan is completed.

Section IX – Appendices is the last section of the plan, and includes supplemental reference materials and more detailed calculations and methodologies used in the planning process. The Appendices also include commonly used mitigation terms and an acronym list.

SECTION III. PLANNING PROCESS

In 2003, the counties of Buchanan, Dickenson, Russell and Tazewell, Virginia, as members of the Cumberland Plateau Planning District, (referred to hereinafter as the Planning District) collaborated with the Virginia Department of Emergency Management to undertake a multi-jurisdictional natural hazards planning initiative. To facilitate the planning process, a Mitigation Advisory Committee (MAC) was established to 1) provide leadership and guidance for the planning initiative, and 2) develop a beginning set of goals to guide the development of a natural hazards mitigation plan.

These goals were based on the principles of hazard awareness and disaster prevention. These goals included:

- Ensure that the Planning District has sustainable communities and businesses resistant to the human and economic costs of disasters;
- Maintain and enhance the economic stability, public health, and safety to the communities of the area;
- Ensure that the Planning District's cultural richness and environmental quality are not jeopardized by the occurrence of a disaster; and
- Recognize the potential impact of natural or manmade hazards on public and private buildings and facilities, and the utility and transportation systems that serve them.

Beginning in March 2003, the MAC held regular meetings and commenced work to identify the area's natural hazards. They coordinated and consulted with other entities and stakeholders to identify and delineate natural and manmade hazards within the four local jurisdictions and to assess the risks and vulnerability of public and private buildings, facilities, utilities, communications, transportation systems, and other vulnerable infrastructure. Neighboring counties adjacent to the planning district were contacted by the MAC as the planning process began. However, no response was received.

In addition, the MAC initially contacted all incorporated towns within the Planning District to solicit interest and input concerning participation in the development of a multi-jurisdiction hazard mitigation plan. Representatives from the towns participated in committee meetings throughout the process. At the behest of the Virginia Department of Emergency Management (VDEM), Planning District employees re-contacted the incorporated cities and towns, by letter, at the end of October 2004 to again solicit their input for the inclusion of mitigation actions from each community into the mitigation strategy portion of the plan and to request adoption of the plan upon completion, as well. The communities' responses are incorporated into the final plan. Table III-1 provides more information on the individual MAC meetings.

Table III-1 — Mitigation Planning Workgroup Meetings	
CUMBERLAND PLATEAU PLANNING DISTRICT COMMISSION Steering Committee Participation	
Meeting Dates	Meeting Purpose
3/12/03	Kick-off Meeting
9/30/03	HIRA Meeting
2/24/04	Presentation of HIRA Findings
4/6/04	Mitigation Strategy Development Meeting
2/3/05	Second Mitigation Strategy Development Meeting

In February 2003, Cumberland Plateau Planning District Commission (CPPDC) contracted with the engineering consulting firm, Dewberry, to develop a multi-hazard mitigation plan including a Hazard Identification and Risk Assessment (HIRA) and mitigation strategies. The MAC worked with the consultants throughout the planning process to ensure that potential stakeholders participated in the process and would have opportunities for input in the draft and final phases of the plan.

The Mitigation Advisory Committee

A Mitigation Advisory Committee (MAC) comprised of public representatives, private citizens, businesses, and organizations worked with the Dewberry team and provided input at key stages of the process. Efforts to involve county departments and community organizations that might have a role in the implementation of the mitigation actions or policies included invitations to attend meetings and serve on the MAC, e-mails of minutes and updates, strategy development workshops, and outreach through local government meetings and public libraries, plus opportunities for input and comment on all draft deliverables.

The CPPDC would like to thank and acknowledge the following persons who served on the MAC and their representative departments and organizations throughout the planning process:

Table III-2 — Cumberland Plateau Planning District Commission Mitigation Advisory Committee Members	
Todd Day	Town of Bluefield, Town Manager
Paige White	Russell County Assessor
Mark Cvetnick	Dickenson County 911 Coordinator
Jim Boyd	Southwest Virginia Community College
Gary Miotke	Russell County Water and Sewerage Authority
Pat Gray	Cumberland Plateau Regional Housing Authority
Darrell Cantrell	Buchanan County Public Service Authority
Henry Murrey	Tazewell County Engineer
Dr. Charles King	Southwest Virginia Community College, President
Barbara Fuller	Southwest Virginia Community College
W.J. Caudill	Buchanan County Board of Supervisors, Administrator
Tim Taylor	Town of Richlands, Town Manager
Tim Potter	Buchanan County, Assistant Town Manager
Sandy Etter	Tazewell County Landfill Supervisor
Sam Wolford	Tazewell County 911 Coordinator
Rick Chitwood	Thompson and Litton
Richard Thacker	Russell County
Dr. Richard Hudson	Southwest Virginia Community College
Naomi Honaker	Russell County Emergency Management
Mike Gulley	VDOT
Keith Viers	Dickenson County Board of Supervisors, Administrator
Dr. John Dreyzehner	Cumberland Plateau Health District, Director
Jim Spencer	Tazewell County Board of Supervisors, Administrator
Jess Powers	Cumberland Plateau Health Department
James McGlothlin	Town of Cedar Bluff, Town Manager
James Gillespie	Russell County Board of Supervisors, Administrator
James Baker	Thompson and Litton
Jack Steele	Tazewell County
Jack Davis	Cumberland Plateau Public Works
H.D. Sargent	VDOT
Ed Moore	Town of Bluefield
Earl Griffith	Tazewell County Board of Supervisors
Dr. Shane Parson	Virginia Tech
Doug Rose	Dickenson County Schools
David Thompson	Buchanan County Emergency Coordinator

Table III-2 — Cumberland Plateau Planning District Commission Mitigation Advisory Committee Members	
Curt Breeding	Southwest Virginia Community College
Bill Payne	Town of Richlands
Betsy Summerfield	SVCC – Human Resources
Andy Jones	Russell County Medical Center
Dave Kinder	Tazewell County 911
Jim Baldwin	CPPDC
C. H. Wallace	Town of Honaker
Benny McGhee	Tazewell Co. PSA

Public Participation and Citizen Input

Several opportunities were provided to the public for input and participation throughout the planning process. Drafts of the Hazard Identification and Risk Assessment and Mitigation Strategies was made available via the project team website (http://projects.dewberry.com/CPPDC_Planning_District). The planning process was discussed on a regular basis at the Cumberland Plateau Planning District Commission board meetings, which includes representation of all counties and towns in the planning district. Additionally, the plan was discussed at Board of Supervisor meetings in the participating counties.

In April of 2005, a copy of the Draft Hazard Mitigation Plan was made available in the public libraries in Buchanan, Dickenson, Russell, and Tazewell Counties, the County administrator office in each county, and each of the town halls. Copies of the announcements notifying the public of the availability of the draft plan for review is included in Appendix D.

In addition, an open public meeting was held on June 29, 2005 at 6:30 PM at the Southwest Virginia Community College in Richlands to provide an overview to the public of the planning process and the results of the hazard identification and mitigation strategy. Also, draft copies of the complete plan were also available on the project website listed above for review and comment by the public.

Adoption

Participating jurisdictions must formally adopt the hazard mitigation plan in order for it to be approved by the State of Virginia and the Federal Emergency Management Agency. This plan was adopted by the Counties of Buchanan, Dickenson, Russell and Tazewell and the towns of Grundy, Clinchco, Clintwood, Haysi, Cleveland, Honaker, Lebanon, Bluefield, Cedar Bluff, Pocahontas, Richlands and Tazewell. Copies of the adoption language for each community is included in Appendix E.

SECTION IV. COMMUNITY PROFILE

Introduction

The Cumberland Plateau Planning District Commission was created to promote regional cooperation and coordinate regional activities and policies. Since 1968, the CPPDC has initiated and operated many programs designed to improve the quality of life for Southwest Virginians through job creation, technical assistance grantsmanship, management services, GIS services, public works, waste management, transportation planning, shell building construction, industrial park management and development financing. This profile is based largely on information directly from the Cumberland Plateau Planning District Commission's website at http://www.cppdc.org/index.htm.

Geography

The Cumberland Plateau Planning District is 67 miles long and 40 miles wide and covers approximately 1,848 square miles as shown in Figure IV-1. It borders West Virginia on the north and Kentucky on the northeast. Wise, Scott, Washington, Smyth and Bland Counties in Virginia form the boundaries on the west, south and east. The District is divided into two physiographically distinct regions, both lying in the Appalachian Highlands. The counties of Buchanan and Dickenson, along with the northern portions of Russell and Tazewell Counties, lie in the Cumberland Plateau which is, in turn, a part of the Appalachian Plateau. This area has a uniformly mountainous surface characterized by many small streams separated by sharply rising ridges, steep slopes, and narrow valleys. The remaining region of the District, comprising the greater portion of Russell and Tazewell Counties, lies in the Valley and Ridge Province of the Appalachian Highlands. This belt, consisting of alternate valleys and ridges is bordered on the south by the Clinch Mountains and on the north by the Cumberland Plateau. Elevations vary from 845 feet above sea level to 4,705 feet above sea level.[1]

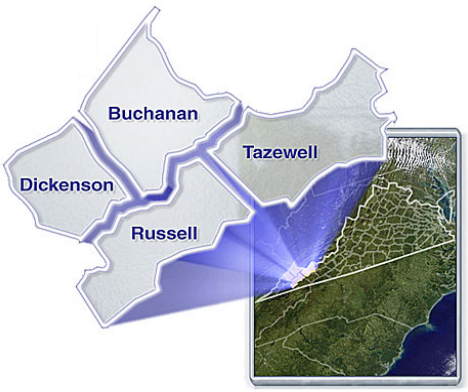


Figure IV-1 — Cumberland Plateau Planning District Commission

[1] http://www.cppdc.org/index.htm

Climate

The Cumberland Planning District is located in the northeastern Appalachian region of the United States and enjoys a seasonal climate, with an average high temperature of 75.2 degrees Fahrenheit and an average low temperature of 35.9 degrees Fahrenheit. Virginia's climate results from global-scale weather patterns that are modified by the diverse landscape of the Commonwealth. The state's landscape provides local controls primarily in three ways. First, the Atlantic Ocean and its "river" of warm water, commonly called the Gulf Stream, play a dominant role in differentiating Virginia's precipitation climate. Winter storms generally move or "track" from west to east and, in the vicinity of the east coast, move northeastward paralleling the coast and the Gulf Stream. This shift to a northeast track results in part from the tendency of the storm to follow the boundary between the cold land and the warm Gulf Stream waters. These storms grow rapidly as they cross the coast; and as they move northeastward, moisture-laden air from the storm crosses Virginia from the east and northeast. The eastern slopes and foothills of the Blue Ridge Mountains are the prime recipients of this moisture. The great coastal storms of 1962, which are remembered primarily because of the high surf and storm surges along Virginia's coast, also produced record snowfalls along the northern section of the Blue Ridge mountains.

The high relief of the Appalachian and Blue Ridge mountain systems also helps to control Virginia's climate. The influence here originates with the well-developed rainfall pattern that is evident along the great mountains of the western margin of North America. Great quantities of rain fall on these western slopes as moist air from the Pacific Ocean flows eastward, rises, condenses, and precipitates. As the air flows down over the eastern slopes, however, little rain falls and a "rain shadow" pattern results. Along the Appalachian and Blue Ridge Mountains of western Virginia, this airflow is sometimes from the west and sometimes from the east. When the flow is from the west, the New River and Shenandoah River valleys are in the rain shadow of the Appalachian Mountains; when the airflow is from the east, they are in the shadow of the Blue Ridge Mountains. As a result, both the New River and the Shenandoah River valleys are the driest portions of the state. Regions of equally low rainfall are rare in the eastern United States (although common along the eastern margins of the great plains of the central United States).

The third important local control on climate is the state's complex pattern of rivers and streams, which drain the precipitation that falls and modify the pattern of moist airflow from which the precipitation falls. These river systems drain the Commonwealth's terrain in all four geographical directions. In far southwestern Virginia, the Clinch and Holston rivers drain south into North Carolina and Tennessee. The New River drains westward into the Ohio River, while the Shenandoah River drains northward into the Potomac. Finally, the Roanoke, James, York, and Rappahannock rivers drain eastward through the Piedmont and into the Tidewater area. The air that flows across Virginia flows either up these river valleys or over the crests of the mountains and down into the valleys. With a southerly flow of air, for example, moist air would move up the Holston River drainage, and rainfall would increase up valley with increasing elevation. However, this

same southerly airflow would be downhill into the New River drainage, and on toward the Ohio River basin. This downward flow of air is not conducive to rainfall.

Weather Systems

Much of Virginia's rainfall results from storms associated with warm and cold fronts. As already noted, these storms generally move from west to east and, in the vicinity of the east coast, move northeastward. While a very large number of specific storm histories and storm tracks can occur and a great diversity of precipitation patterns can result, not all are equally common. Storms are most frequently observed to move parallel to the Appalachian or the Blue Ridge Mountains, the coastal zone, and the Gulf Stream, all of which have a northeast trend, or to move parallel to the Great Lakes and the Ohio River Valley. When storms cross the east coast well to the south of Virginia and move offshore, the heaviest rain usually falls in southeastern Virginia. When these storms become very intense or when they closely skirt the coastline, the strong up-slope winds result in heavy rainfalls on the Blue Ridge. Frequently, frontal storms tracking along the Ohio Valley move across southern Pennsylvania and off the New Jersey coast; as such storms approach the coast, great quantities of moist air flow inland and then southward into Virginia.

When sufficient cold air invades Virginia from the west and northwest, frontal storms may cause heavy snowfalls. Two of the state's most dramatic frontal snowstorms of recent years occurred during the Christmas holidays of 1966 and 1969. In both cases, the storm tracked along the Gulf and the east coasts and crossed over Tidewater Virginia; a strong east and northeast flow brought moist air across the state, overriding cold air from the west. While heavy snows are common in the Piedmont region, the average winter does not have a major coastal snowstorm, and heavy winter snows usually are confined to the mountainous areas of the state. As remarkable as it may seem, some of the heaviest snowfalls in the eastern United States occur in the Appalachians of West Virginia, just a few miles west of Highland County, Virginia. More than 2,500 millimeters (100 inches) fall annually in this area; but Virginia, being in West Virginia's snow shadow, receives only a fraction of this amount.

While heavy snowfalls usually result from frontal storms, hurricanes are created by a different weather pattern. Hurricanes and tropical storms are intense cyclones formed within the deep, moist layers of air over warm, tropical waters. Unlike frontal storms, which derive much of their energy from the great temperature contrasts on either side of fronts, hurricanes and tropical storms derive most of their energy from the warm ocean surface. Tropical storms over the low-latitude oceans generally move from east to west. As they move westward, they are displaced farther and farther to the north. Eventually, they enter the westerly airstreams of the mid-latitudes, and then recurve north and eastward. In the vicinity of Virginia, these tropical storms move in a general northeasterly track, like frontal storms: and as they move along this route, they intensify. Those storms that reach an intensity indicated by sustained winds of at least seventy-four miles an hour are classified as hurricanes.

Thunderstorms, which occur in all months of the year, are most common in the deep, moist, warm air of tropical origin that is typical of summer. In Virginia, days with thunderstorms are recorded at commercial and military airports. Over the last two decades the state has averaged one thunder-storm day a decade in January, compared with nine thunderstorm days a month in July. Thunderstorm days are most frequent in southern Virginia, particularly in the far southwestern section, while northern Virginia experiences the least number of such storms. Thunderstorms also are most likely to occur during the warmest part of the day, with 4:00 p.m. the most probable time of occurrence. In Roanoke, for example, thunderstorms occur ten times more frequently at 4:00 p.m. than at 10:00 a.m. and five times more frequently at 4:30 p.m. than at 7:00 p.m. At Norfolk, thunderstorms are also most frequent at 4:00 p.m., remaining common there until about midnight. Thunderstorms produce complex patterns of rainfall, such that areas of heavy rain may be next to areas with little or no rain.

Population

Almost 119,000 people live in the Cumberland Plateau Planning District. The population is spread out over 1,830 square miles resulting in a 64.63 people per square mile density. Tazewell County's density (85.8 people per square mile) is quite a bit higher than the planning area as a whole.

The population of the Cumberland Plateau Planning District has been declining since the 1980s after experiencing high rates of growths in the previous decade. This decline slowed between 1990 and 2000. Table IV-1 shows the 2000 population for the planning area and the growth rates since 1970.

Table IV-1 — Population and Growth Rates for Cumberland Plateau

	CPPDC	Buchanan	Dickenson	Russell	Tazewell
Population					
Total	118,279	26,978	16,395	30,308	44,598
Change					
1990-2000	-2.87%	-8.7%	-3.6%	3.5%	-2.6%
1980-1990	n/a	-17.4%	-10.9%	-9.6%	-8.9%
1970-1980	n/a	18.5%	23.2%	29.5%	26.9%

According to the 2000 Census, almost 70% of the planning area's population lived in the same home between 1995 and 2000. This indicates that residents tend not to be residentially mobile and may be more familiar with their surroundings and the associated natural hazards.

Cumberland Plateau's population is fairly balanced between the genders with 52% of the population being female. A breakdown of the population by race can be found in Table IV-2.

Table IV-2: LENOWISCO Planning District – Racial Composition*	
White persons, percent, 2000	97%
Black or African American persons, percent, 2000	2%
American Indian and Alaska Native persons, percent, 2000	0.1%
Asian persons, percent, 2000	0.3%
Native Hawaiian and Other Pacific Islander, percent, 2000	0%
Persons reporting some other race, percent, 2000	0.2%
Persons reporting two or more races, percent, 2000	0.5%
Persons of Hispanic or Latino origin, percent, 2000	1%
White persons, not of Hispanic/Latino origin, percent, 2000	96%

2000 Census data also reveals insights into potential special needs populations such as minors and seniors. Within the planning district, more than 5% of the population is under 5 years, 22% is under 18 years, and 15% is over 65 years old. In addition, about 30% of the population over the age of 5 years has a disability as defined by the U.S. Census. The 2000 Census data shows that language barrier issues may not be of concern for the Cumberland Plateau Planning District. Less than 2% of the population speaks a language other than English at home and less than one percent are foreign-born.

Almost 62% of residents graduate from high school but less than 10% percent hold bachelor's degrees or higher. These numbers, coupled with the population characteristics described in the previous paragraph are important to keep in mind when developing public outreach programs. The content and delivery of public outreach programs should be consistent with the audiences' needs and ability to understand complex information.

The average per capita household income of $13,939 is about sixty percent of the state per capita income of $23,975. About 18% of residents within the Cumberland Plateau planning area live below the poverty line. This rate is significantly higher than the national rate of 11.3% and the state rate of 9.6%. These numbers may indicate that a large portion of the population will not have the resources available to them to undertake mitigation projects that require self-funding.

Housing

There are over 53,000 housing units within the planning area. Approximately 4.6% are multi-family units. In Buchanan County, only has 2.3% of the units are in multi-family dwellings while 6.7% of Tazewell County's unit are in multi-family units. Over 80% of residents own their own homes, significantly higher than the national average of 66.2% or the state average of 68.1%. The housing characteristics are broken down by jurisdiction in Table IV-3.

Table IV-3 — Housing Characteristics*

	Buchanan County	Dickenson County	Russell County	Tazewell County	Total/Average
Housing units, 2002	12,017	7,767	13,370	20,602	53,756
Median value of owner-occupied housing units, 2000	$55,400	$55,900	$69,800	$67,900	$62,250
Homeownership rate, 2000	82.90%	82.10%	81.10%	77.30%	80.2%
Housing units in multi-unit structures, percent, 2000	2.30%	3.20%	4.50%	6.70%	4.6%

**Census 2000*

Labor and Industry

The three main industries in the CPPDC planning area are the automotive, wood products and the customer contact (telecenters) industries. The top five employers in each county are:

- Buchanan County
  - Buchanan County School Board
  - Consolidation Coal Company
  - Buchanan General Hospital
  - Keen Mountain Correctional Institute
  - Island Creek Coal Company
- Dickenson County
  - Dickenson County School Board
  - travelocity.com
  - Dickerson Russell Coal Company
  - County of Dickenson
  - Food City
- Russell County

- Russell County School Board
- Lear Automotive Industries
- Red Onion Correctional Center
- A.T.& T. Wireless Services
- Teleflex Automotive Division

❖ Tazewell County

- Tazewell County School Board
- Sam's Club
- Clinch Valley Community Hospital
- Southwest Virginia Community College
- Cumberland Mountain Community Services

Natural Resources

Coal remains the most abundant resource. Based on the Static Reserve Index (Reserves current annual production) the reserves would be depleted in 36 years. According to the Virginia Center for Coal and Energy Research there are 2,160 million tons which would be mined out in 48 years. The Virginia Division of Mineral Resources gives a range of recoverable reserves of 1,995 to 4,393 million tons, which would last 44 to 98 years. Whether the coal resources will be depleted in 36 or 98 years, coal mining will remain a major economic activity for the foreseeable future. Additionally, a major portion of the known gas fields in Virginia are located in the Cumberland Plateau Planning District and most of the area is either covered by, or suitable for hardwood forest growth.

Transportation

The District is served by three major U.S. highways (U.S. 19, U.S. 460, and U.S. 58), nine primary state highways, and numerous state secondary roads. No interstate highways pass directly through the planning area, though I-81 is easily accessible via U.S. 19 and U.S. 16.

CSX Transportation and Norfolk Southern provide industrial rail service to the district. These rail lines are used primarily to transport coal to power plants in the Southeast and to shipping nodes in Norfolk, Virginia.

The planning district is served by four commercial airports: Tri-Cities Airport (Tennessee), Roanoke Regional Airport, Richlands Municipal Airport, and Mercer County Airport. In addition, a general aviation facility is located near Richlands.

SECTION V. HAZARD IDENTIFICATION & RISK ASSESSMENT

The Hazard Identification and Risk Assessment (HIRA) serves as a guide to all communities in the Cumberland Plateau planning area when assessing potential vulnerabilities to natural hazards. When developing this plan, every effort was made to gather input from all aspects of the project area communities to assure that the results of this analysis will be as accurate as possible.

The planning area for this study includes Buchanan County, Dickenson County, Russell County, and Tazewell County. All jurisdictions located throughout these counties also have been included in this portion of the study, as this analysis has been completed on a regional basis. A more in-depth analysis for the Town of Bluefield is included in Appendix B. It should be noted, however that a local jurisdiction's inclusion in the full Mitigation Plan is dependent on the community's participation in the remainder of the planning process.

The purpose of this HIRA is to:

1) Identify all the natural hazards that could affect the Cumberland Plateau planning area;
2) Assess the extent to which the area is vulnerable to the effects of these hazards; and
3) Prioritize the potential risks to the community.

The first step, identifying hazards, will assess and rank all the potential natural hazards, in terms of probability of occurrence and potential impacts. It will also identify those hazards with the highest likelihood of significantly impacting the community. This section will be completed based on a detailed review of the Cumberland Plateau planning area's hazard history. The hazards determined to be of the highest risk will be analyzed further to determine the magnitude of potential events, and to characterize the location, type, and extent of potential impacts. This will include an assessment of what types of development are at risk, including critical facilities and community infrastructure.

Hazard Identification

While there are many different natural hazards that could potentially affect the communities within the Cumberland Plateau Planning District, some hazards are more likely to cause significant impacts and damages than others. Although reducing the community's vulnerabilities to all hazards is ideal, the highest level of consideration must be given to those hazards which pose the greatest possible risk. This analysis will attempt to quantify these potential impacts for all possible hazard events, and identify those which could most significantly impact the communities involved. Once these hazards have been identified, further analysis will be conducted to profile potential hazard events and to assess vulnerability to such events.

Types of Hazards

While nearly all disasters are possible for any given area in the United States, the most likely hazards (based on local official knowledge and professional judgment) that could potentially affect the communities in the Cumberland Plateau Planning District generally include:

- Dam Failures
- Drought
- Earthquake
- Flooding
- Landslides
- Karst Topography
- Severe Thunderstorms
- Severe Wind
- Severe Winter Storms
- Tornadoes
- Wildfires

Depending on the severity, location, and timing of the specific events, each of these hazards could have devastating effects on homes, business, agricultural lands, infrastructure and ultimately citizens.

In order to gain a full understanding of the hazards, an extensive search of historic hazard data was completed. This data collection effort utilized meetings with local community officials, existing reports and studies, state and national data sets, and other sources. A comprehensive list of sources utilized for this plan can be found at the conclusion of this document.

Unfortunately, extensive local historical data is not currently available for many of the potential hazards. In some cases, the precise number of events that have affected the Planning District and the subsequent level of impact to the local communities are not known. In these cases, state and regional hazard information was collected and referenced whenever possible.

Probability of Hazards

The historical data collected includes accounts of all the hazard types listed above. However, some hazards have occurred much more frequently than others with a wide range of impacts. By analyzing the historical frequency of each hazard, along with the associated impacts, the hazards that pose the most significant risks to the Cumberland Plateau Planning District can be identified. This analysis will allow the local communities to focus the Mitigation Strategy of those hazards that are most likely to cause significant impacts.

Prioritizing the potential hazards that can threaten the Planning District will be based on two separate factors:

- the probability that a potential hazard will affect the community, and
- the potential impacts on the community in the event such a hazard occurs.

The probability of a hazard event occurring is largely based on the historical recurrence interval of the hazard. For instance, if flood damage occurs every 5 years versus an earthquake event causing damage every 50 years, the flood probability would score higher than the earthquake.

The hazard's impact on the community is made up of three separate factors: the extent of the potentially affected geographic area, the primary impacts of the hazard event, and any related secondary impacts. While primary impacts are a direct result of the hazard, secondary impacts can only arise subsequent to a primary impact. For example, a primary impact of a flood event may be road closures due to submerged pavement. A possible secondary impact in these circumstances would be restricted access of emergency vehicles to citizens in a portion of the community due to the road closure.

Level of Hazard

A formula has been developed to assign a value for probability and impact for each of the hazards considered. A *Hazard Analysis Worksheet*, as well as a detailed description of all the calculations and formulas utilized, is included as Appendix A of this document. As a result of this analysis, the hazards were broken down into four distinct categories which represent the level of consideration they will receive throughout the planning process. These categories are *High, Medium-High, Medium,* and *Low*.

In order to focus on the most critical hazards that may affect the Planning District communities, the hazards assigned a level of *High* or *Medium-High* will receive the most extensive attention in the remainder of this analysis, while those with a *Medium* planning level will be discussed in more general terms. Those hazards with a planning level of *Low* have not been addressed in this plan. The level of *Low* should be interpreted as not being critical enough to warrant further evaluation; however, these hazards should not be interpreted as having zero probability or impact. Table V-1 summarizes the results of the hazard level analysis.

Table V-1 — Hazard Identification Results

Hazard Type	Hazard Level
Flooding	High
Sever Winter Storms	Medium-High
Wildfire	Medium-High
Landslides	Medium-High
Severe Thunderstorms/Hail Storms	Medium
Severe Wind	Medium
Earthquake	Medium
Dam/Levee Failure	Medium
Drought	Medium
Tornado	Low
Extreme Heat	Low

Table V-1 — Hazard Identification Results	
Karst Topography	Low

Because the types of the hazards discussed above are similar, some hazards will be discussed simultaneously later in this analysis. For instance, the analysis of severe wind encompasses severe thunderstorms, hurricanes, and tornadoes. In addition, the impacts of a dam/levee failure are covered by the flood analysis. A detailed discussion of the potential hazards that have been identified as high and medium-high level events will be addressed.

Extreme heat was identified in the hazard identification as a “low” level of concern for the Planning District. Generally, extreme heat is defined as temperatures that are 10 degrees or more above the average high temperature for the region during summer months, last for a prolonged period of time, and often are accompanied by high humidity levels. Given the probability and likely limited impacts of this hazard, it was ranked a “low” level for planning consideration. Detailed analysis was not considered needed.

In addition, Karst topography was also identified as a “low” level of concern for the planning district. Karst is a distinctive landscape topography largely formed by the dissolving of carbonate bedrocks such as limestone, dolomite, or marble by water. Karst topography causes unusual surface conditions such as sinkholes, caves, disappearing streams, springs, and vertical shafts. Although Karst topography is present throughout the Planning District, historic losses and damages have been low. Much of the Karst areas throughout the region have been identified, and its presence limits future development in some areas, it does not pose a significant threat for damages and loss of life.

Flooding

The most significant and frequent natural hazard to effect the Cumberland Plateau Planning District (CPPD) is flooding. The Planning District is a mountainous region with steep ridges and pronounced valleys, with three major watersheds, the Clinch River Basin, which flows through Tazewell and Russell Counties, the Levisa and Russell Forks of the Big Sandy River, which flow through Buchanan and Dickenson Counties and the Bluestone River Basin, which flows through Tazewell County. A number of smaller steams and tributaries are located within these watersheds. Watersheds in the Planning District that have minimal impact and flooding information, and therefore, are not part of this study are: the Tug Fork watershed, located in the northern portion; the Wolf Creek watershed located in the eastern portion; and the headwaters of the Holston River watershed, located in the southeastern portion of the Planning District.

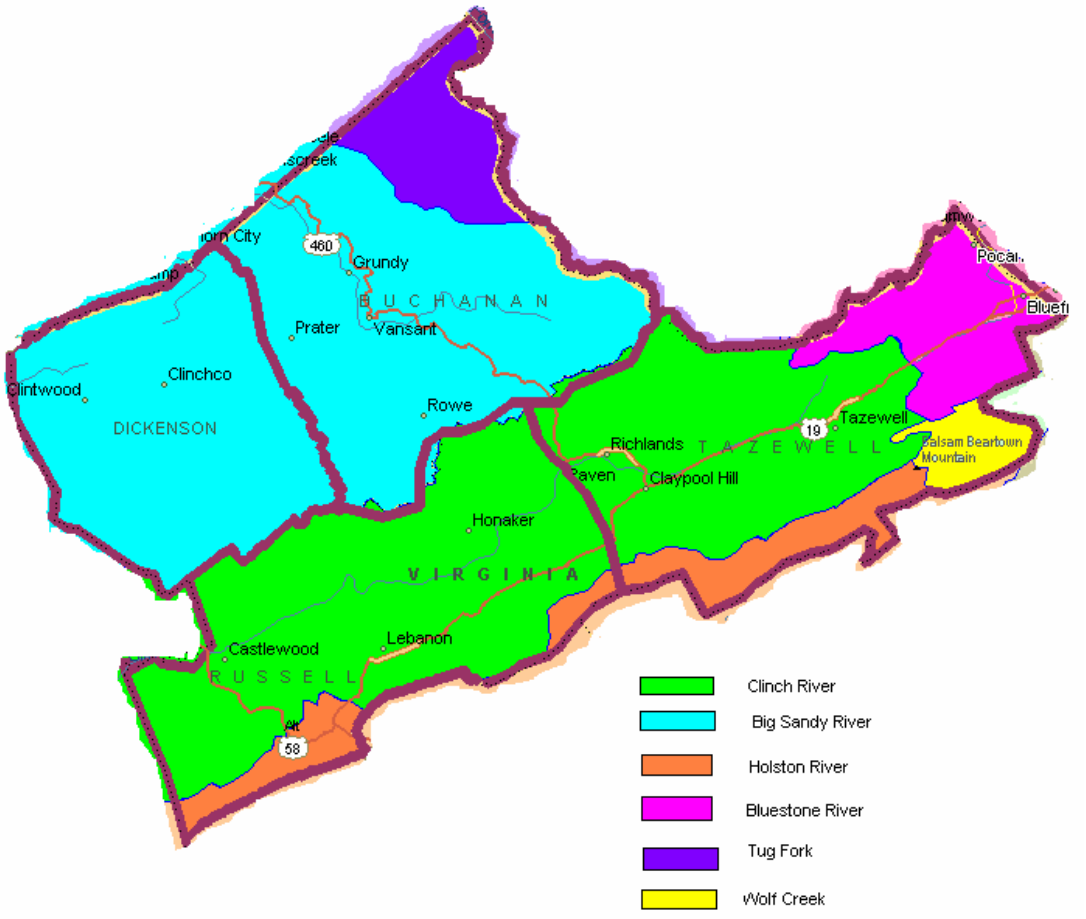


Figure V-1 — Cumberland Plateau Watersheds

Hazard History

The following sections include a description of the known flood history by major watershed. Because a majority of the flood history and flood data available for the area is organized by watershed (as opposed to by county), the discussion of flood characteristics for the CPPD also have been organized by watershed.

Clinch River Basin

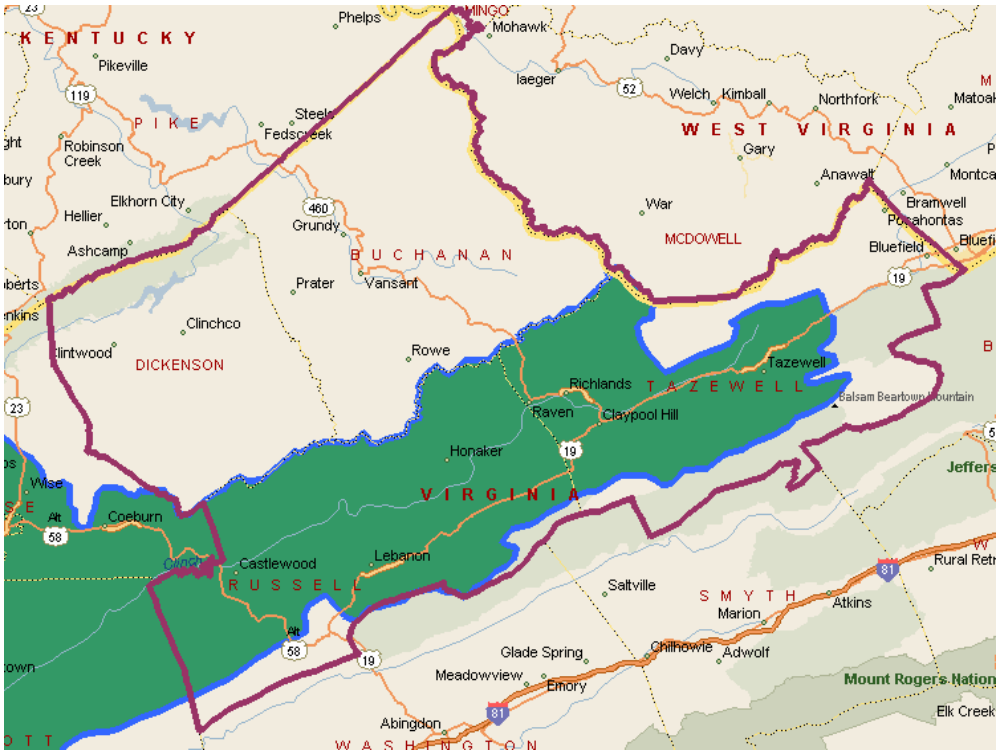


Figure V-2 — Clinch River Basin

The Clinch River is a major river located in Russell and Tazewell Counties, with a drainage area of approximately 670 square miles. The Clinch River is fed by numerous tributaries, originating from the high mountain ridges throughout the drainage area. The primary tributaries to the Clinch are the Guest River, flowing from the northwestern portion (Wise County) of the watershed and the Little River, flowing from the east near the headwaters of the watershed in Tazewell County. Due to steep mountainous terrain in the area, the potential for rapid flooding following a moderate to significant rain event or spring snowmelt is high

Records of historic events in the Planning District are numerous; floods on the Clinch and its tributaries have been well documented.

The determined flood stage for the Clinch is 16 feet at Cleveland in Russell County. There have been approximately 29 recorded floods since 1862 that have crested above this level on the Clinch. The two largest recorded floods occurred in April, 1977 and January, 1957 with the river cresting at approximately 26.4 feet at Cleveland. As for most floods in this area, much information is not available regarding damages due to these events. A Tennessee Valley Authority report produced in 1964 provides much information of previous floods and compares all floods to the January 30, 1957 flood. Records from this event indicate that several buildings were inundated with floodwaters, and roadways were blocked. Velocities of water in the 1957 flood ranged from 7 feet per second in the river channel and up to 4 feet per second on the flood plain in the Cleveland vicinity. During a Maximum Probable Flood the crest would be 12 to 16 feet

higher than the 1957 flood, velocities in the channel would range up to 12 feet per second and up to 8 feet per second in the flood plain.

The most recent flood event on the Clinch River occurred February 16, 2003. A strong but slow moving, storm system developed in the lower Mississippi Valley the morning of February 13, 2003 and moved northeast toward the southern Appalachian region. Several inches of snow had fallen across region earlier in the week, with snow pack depths varying with terrain and location. It was estimated on the 13th that up to 10 inches of snow still lay on the ground on the higher ridges and mountains, especially across southwest Virginia in the Holston, Clinch, and Powell river headwater areas. By the morning of the 16th, the ground across the southern Appalachian region was fully saturated, with small streams everywhere flowing out of their banks, and larger streams and rivers starting to show either significant rises or flooding. While no rivers reached new record levels, the widespread nature of the event, the number of people affected in a significant way, and the dollar amount of damage combined to make this flood event memorable (NOAA).

Table V-2 includes flood heights for events on the Clinch River compiled from a study completed by the TVA report of 1964 and 1977, and from USGS gauge data (TVA, USGS). The events shown are those with crest levels higher than 16 feet, the flood stage on the Clinch. It should be noted that gauge readings prior to 1957 have been adjusted to the present gage location, and from personal accounts and high water marks.

**Table V-2 — Historical Flooding on the Clinch River
TVA 1964 and 1977, USGS**

OCCURANCE	LOCATION	Height at Cleveland Gage (Zero = 1500.24 FT)	DETAILS
March, 1826	Clinton, Tennessee		Greatest known flood on the Clinch River. No information obtained about flood. Probably a great flood occurred in upper reaches of the river in the Planning District.
February 22, 1862	Clinch River Area	1523.0 ft.	Highest known flood over most of the Clinch River area.
March, 1867	Dungannon		No records, but residents say that flood was exceeded only by the flood of 1862
March 31, 1886	Clinton, Tennessee		Only minor flooding in the Planning District
April 1, 1896	Speers Ferry		First known flood reported in the records at Speers Ferry. Not a major flood up stream
February 22, 1897	Clinch River Area		Minor flooding, no high water marks found.
June 22, 1901	Entire river		Intense storms in the head water area caused great damage and loss of life in the Richlands area.
March 1, 1902	Clinch River Area	1520.5 ft.	One of the largest known floods in the area. Washouts and slides occurred on the Clinch Valley Division of the Norfolk and Western

**Table V-2 — Historical Flooding on the Clinch River
TVA 1964 and 1977, USGS**

OCCURANCE	LOCATION	Height at Cleveland Gage (Zero = 1500.24 FT)	DETAILS
			Railway.
November 20, 1906	Clinch River Area		Minor flooding reported. Railroad traffic delayed.
June 14, 1907	Clinch River Valley	1520.5 ft.	Extensive crop damage. Widely remembered flood.
April 3, 1912	Clinch River Area		Minor flooding
April 1, 1913	Clinch River Area		Minor flooding
March 5, 1917	Lower Clinch area		Major flooding in the lower reaches of the Clinch River. Only minor flooding in the upper reaches.
January 29, 1918	Clinch River	1520.1 ft.	Known as the “ice tide” Two to three inches of rain fell on snow covered frozen ground causing major flooding. Schools flooded at Dante
February 3 and June 13, 1923	Clinch River	1517.4 ft.	Two floods caused some damage to the Clinch Valley Division of the Norfolk and Western Railway
December 22, 1926	Clinch River Area	1520.3 ft.	Prolonged period of rain in the lower Clinch Basin. Many washouts occurred on the smaller streams
August 14, 1940	Clinch River Basin	1520.8 ft.	Tropical storm produced two to four inches of rain caused heavy flow in the upper reaches of the river
August 14, 1940	Clinch River Basin	1520.8 ft.	Tropical storm produced two to four inches of rain caused heavy flow in the upper reaches of the river
1940 to 1957	Clinch River Area		Seven minor floods occurred that caused no particular damage
January 30, 1957	Clinch River	1524.4 ft.	Highest known flood of its time. $180,000 flood damages in St. Paul and $60,350 damages in Russell County.
May 7, 1958	Clinch River	1515.8 ft.	Minor flood
March 12, 1963	Clinch River	1522.9 ft.	Over 100 families force to be evacuated in Richlands with two bridges in the Brooklyn area and one in the Hill Creek section were washed away or damages. Two houses in the Doran/Raven area were washed away.
March 17, 1973	Clinch River	1520.2 ft.	No record of flood damage
April , 1977	Clinch River Area	1526.6 ft.	Flood of record. $9.5 million in damages. heavy agricultural damages
January 26, 1978	Clinch River	1521.1 ft.	No record of flood damage
February 16, 2003	Clinch River Area		Rain fall on up to 10” of snow with rising temperatures caused flooding

Recurrence intervals of floods can be estimated using the number of flood occurrences over a period of time. Using the data from the USGS gauge at Cleveland and the 1964 TVA Report, there have been 29 recorded events that have exceeded the flood stage on the Clinch in the past 141 years; for a flood recurrence interval of approximately

once every 4.7 years. According to the flood profiles included in the FIS, the 100-year flood elevation at the USGS gauge is 1534 (NGVD 29), which corresponds to a flood crest of 33.76 feet, about 5.4 feet higher than the highest recorded flood level.

Levisa Fork and Russell Fork Basin

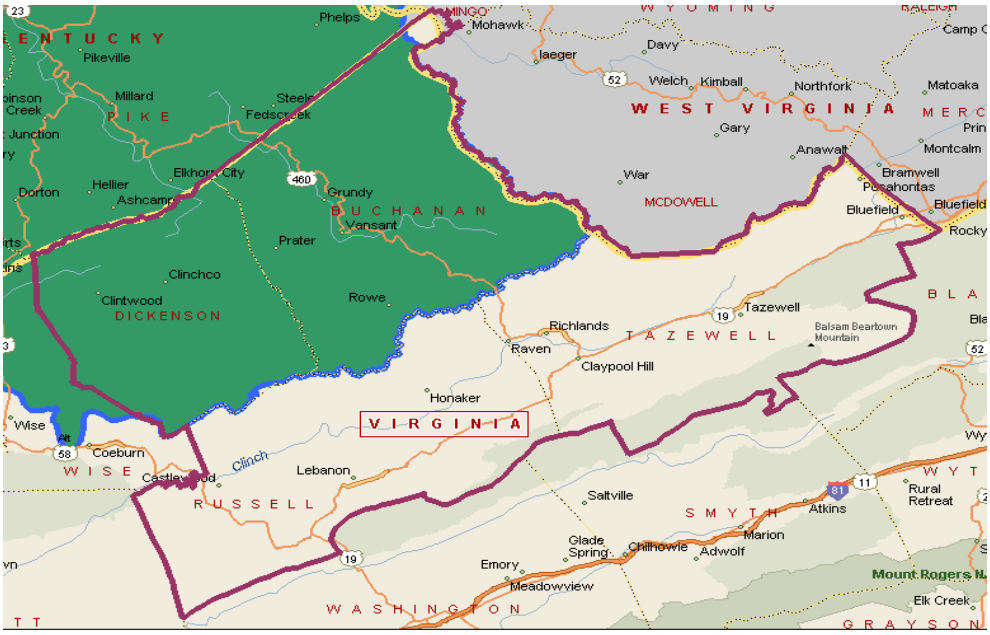


Figure V-3 — Levisa Fork / Russell Fork Big Sandy River Basin

The Levisa Fork and Russell Fork of the Big Sandy River are major rivers located in Buchanan and Dickenson Counties. The Levisa Fork located in Buchanan County, has a drainage area of approximately 300 square miles. The Levisa Fork is fed by numerous tributaries, originating from high mountain ridges throughout the drainage area. The primary tributaries to the Levisa Fork are Slate Creek, Big Prater Creek, Dismal Creek and Garden Creek. Russell Fork, located in Dickenson, is fed by numerous tributaries. The primary tributaries to the Russell Fork are Pound River, McClure River, and Cranes Nest River. Due to steep mountainous terrain in the area, the potential for rapid flooding following a moderate to significant rain event or spring snowmelt is high.

Records of historic events in the Planning District are numerous; floods on the Levisa Fork and its tributaries have been well documented.

The determined flood stage for the Levisa Fork is 12 feet near Big Rock in Buchanan County. There have been approximately 24 recorded floods since 1929 that have crested above this level on the Levisa Fork. The two largest recorded floods occurred in April, 1977 and January, 1957 with the river cresting at approximately 27.38 at Big Rock and 24.8 feet at Grundy. As for most floods in this area, much information is not available regarding damages due to these events. A Corps of Engineers report produced in 1971 provides information of previous floods and compares all floods to the January 29, 1957 flood. Records from this event indicate that several buildings were inundated with floodwaters, and roadways were blocked. During a Maximum Probable

Flood, the crest would be 19 feet higher than the 1957 flood, velocities in the channel would range up to 22 feet per second and up to 18 feet per second in the flood plain.

Table V-3 includes flood heights for events on the Levisa Fork compiled from a study completed by the Corps of Engineers report of 1971, Virginia State Water Control Board report of 1977, and from USGS gauge data located near Grundy from 1929 to 1967 and from Big Rock from 1968 to present (USGS). The events shown are those with crest levels higher than 12 feet, the flood stage on the Levisa Fork.

Table V-3 — Historical Flooding on Levisa Fork / Russell Fork
Corps of Engineers 1971 and USGS

OCCURANCE	LOCATION	Height at Grundy Gage (Zero = 988.5 FT)	DETAILS
March 1, 1929	Grundy	1005.4 ft.	
February 17, 1944	Grundy	1002.1 ft.	
February 17, 1945	Grundy	1001.4 ft.	
January 7, 1946	Grundy	1003.0 ft.	
May 19, 1953	Grundy	1000.7 ft.	
February 27, 1955	Grundy	1001.1 ft.	
January 29, 1957	Grundy	1010.4 ft	Up to 7' of rainfall. Bridge near power substation washed out taking out power and telephone service to the area. Several homes were washed away on Garden Creek and roads were impassable.
August 25, 1958	Grundy	1003.1 ft.	
March 12, 1963	Grundy	1006.7 ft.	3" to 4" of rainfall in less than 24 hours. Area declared a disaster by the Virginia Governor. Over $41 million damage.
March 7, 1967	Grundy	1005.2 ft.	
April 5, 1977	Grundy		Over 5' of water. Business and homes hard hit $20 million damage.
OCCURANCE	**LOCATION**	**Gage Height at Big Rock (Zero = 866.37 FT)**	**DETAILS**
January 21, 1972	Big Rock	881.8 ft.	
January 11, 1974	Big Rock	882.3 ft.	
March 30, 1975	Big Rock	882.1 ft.	
April 5, 1977	Big Rock	893.8 ft.	
January 26, 1978	Big Rock	883.9 ft.	
May 7, 1984	Big Rock	887.1 ft.	
OCCURANCE	**LOCATION**	**Gage Height at Haysi (Zero = 1237.61 FT)**	**DETAILS**
March 23, 1929	Haysi	1256.11 ft.	
February 3, 1939	Haysi	1254.56 ft.	
February 17, 1944	Haysi	1253.07 ft.	
January 29, 1957	Haysi	1261.32 ft.	$5.5 million damages
March 12, 1963	Haysi	1258.71 ft.	$4.5 million damages
March 7, 1967	Haysi	1257.95 ft.	

Table V-3 — Historical Flooding on Levisa Fork / Russell Fork Corps of Engineers 1971 and USGS			
April 28, 1970	Haysi	1253.32 ft.	
March 16, 1973	Haysi	1254.88 ft.	
January 11, 1974	Haysi	1253.82 ft.	
March 30, 1975	Haysi	1255.64 ft.	
April 5, 1977	Haysi	1265.85 ft.	9' of water in homes and businesses. $8 million damages.
January 6, 1978	Haysi	1256.73 ft.	
May 7, 1984	Haysi	1259.69 ft.	
March 28, 1994	Haysi	1253.86 ft.	
April 17, 1998	Haysi	1254.82 ft.	

Recurrence intervals can be estimated using the number of flood occurrences over a period of time. Using the data from the USGS gage at Big Rock and Grundy (The 1971 COR Report), there have been 24 recorded events that have exceeded the flood stage on the Levisa Fork in the past 74 years, for a recurrence interval of approximately once every 2.8 years. According to the flood profiles included in the FIS, the 100 year flood elevation at the USGS gauge is 900.2 (NGVD 29), which corresponds to a flood crest of 33.83 feet, over 6.45 feet higher than the highest recorded flood.

Bluestone River Basin

The Bluestone River is a major river located in the eastern Tazewell County area near Bluefield, with a drainage area of approximately 39.9 square miles. The Bluestone is fed by numerous tributaries, originating from the high mountain ridges throughout the drainage area. The three major tributaries are Wrights Valley Creek, Beaver Pond Creek, and Laurel Fork. Due to steep mountainous terrain in the area, the potential for rapid flooding following a moderate to significant rain event or spring snowmelt is high. The Bluestone River flows into in West Virginia into the New River.

Records of historic events in the Planning District are numerous; floods on the Bluestone and its tributaries have been well documented.

The determined flood stage for the Bluestone is 5.42 feet. There have been approximately 8 recorded floods since 1955 that have crested above this level on the Bluestone. The two largest recorded floods occurred in August, 1964 and January, 1957 with the river cresting over 10 feet near Bluefield. As for most floods in this area, much information is not available regarding damages due to these events. A Virginia State Water Control Board report produced in 1974 provides much information of previous floods. Records from these events indicate that several buildings were inundated with floodwaters, and roadways were blocked.

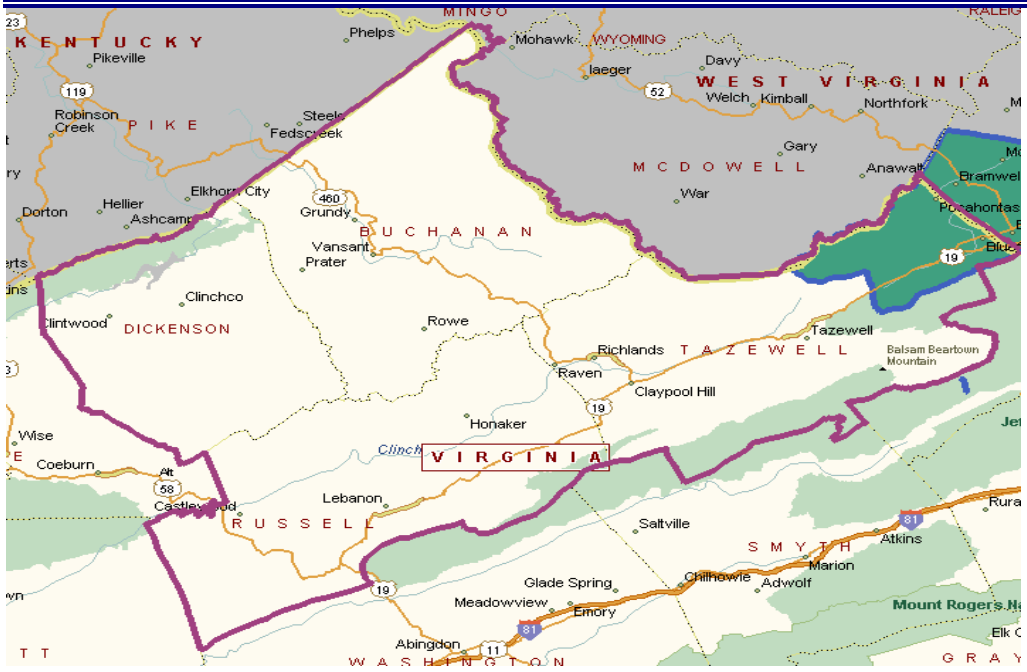


Figure V-4 — Bluestone River Basin

Table V-4 includes flood heights for events on the Bluestone River compiled from a study completed by the Corp of Engineers (State Water Control Board, 1974), and from USGS gauge data (USGS). The events shown are those with crest levels higher than 5.42 feet, the flood stage on the Bluestone. It should be noted that gauge readings prior to 1965, when the gauge was installed at this location, have been estimated from personal accounts, newspaper articles, and high water marks.

Table V-4 — Historical Flooding on the Bluestone River
USGS, 1974

OCCURANCE	LOCATION	Height at Bluefield Gage (Zero = 2350 FT)	DETAILS
March, 1955	Bluefield		4.47" rainfall
January 29, 1957	Bluefield	2360.6 ft.	3.14'" of rainfall. 1,000 person displaced over $100,000 damage
March 12, 1963	Bluefield		2.33" rainfall in 24 hours. $7,000 damages to roads
August 28, 1964	Bluefield	2361.4 ft.	2.14" rainfall in 3 hours. $20,000 to $25,000 damages
March 7, 1967	Bluefield	2356.3 ft.	
December 30, 1969	Bluefield	2356.1 ft.	
May 6, 1971	Bluefield	2356.24 ft.	
April14, 1972	Bluefield	2357.0 ft.	

Recurrence intervals can be estimated using the number of flood occurrences over a period of time. Using the data from the USGS gage near Bluefield, there have been 8 recorded events that have exceeded the flood stage on the Bluestone from 1955 to 1972, for a recurrence interval of approximately once every 2.1 years. According to

flood profiles, the 100 year flood elevation at the USGS gauge is 2,356.8 (NGVD 27), which corresponds to a flood crest of 9.58 feet, over 4.6 feet lower than the highest recorded flood.

Hazard Profile

The majority of the flooding in the Cumberland Plateau Planning District is flash flooding that occurs following a period of intense or sustained rainfall. The highly mountainous terrain and associated steep slopes cause rainwater to runoff rapidly, quickly filling streambeds following an event. Flood-producing storms can occur throughout the year; however, historically the most common months for significantly flooding have been January, February, and March. These months, along with April and May, have the highest average precipitation and the highest frequency of intense rain events. In addition, although snowfall amounts in the area are minimal, flood events can be exacerbated by rapidly melting snow during the winter months.

Because of the mountainous terrain of the drainage area, flooding occurs rapidly, often occurring before the rain event has passed, and flow passes very quickly through the smaller tributaries of the area into the larger streams. The combined effect of these smaller tributaries can create extremely fast-moving floodwaters that greatly exceed the capacity of the larger streams. These fast-moving floodwaters allow little time for residents in the floodplain to evacuate themselves or protect their property, and the force of such rapidly flowing waters increase the potential of damage and loss of life. The duration of these flood events vary depending on the specific characteristics of the rain event. Floodwaters generally recede rapidly once the rain event has ended, but can last from a few hours to a few days.

Warning System

Because flash floods occur rapidly and allow very little warning time, the only potential warning to an upcoming flood event comes through the ability to forecast a heavy rain event prior to its occurrence. The National Weather Service (NWS) issues flood watches and warnings when heavy rains or severe storms threaten the area. These warnings are carried to local residents through local media outlets such as television and radio stations. In addition, the NWS, in conjunction with the National Oceanic and Atmospheric Administration (NOAA), operates the NOAA Weather Radio System. This nationwide network of radio transmitters broadcasts severe weather data to relatively inexpensive special receivers that can be purchased by the public. When a severe weather alert is issued, the transmitter will switch to alert mode, notifying residents of the potential risk. Although not extensive, the measures provide residents and citizens located in a flood-prone area some warning time to prepare for a potential flood.

Secondary Effects

If a significant flood event occurs, there is a potential for a variety of secondary impacts. Some of the most common secondary effects of flooding are impacts to infrastructure and utilities such as roadways, water service, and wastewater treatment. Many of the

roadways in the Planning District are vulnerable to damage due to floodwaters. The effect of flood damages to roadways can limit access to areas, cutting off some residents from emergency services as well as other essential services.

Since a major heating source in the area is propane gas, many of the properties in the floodplains have above-ground fuel storage tanks. Field observations revealed that the majority of the tanks in the floodplain are not secured or strapped down. If these tanks were to be damaged or dislodged during a flood event, the resulting gas leaks could present serious explosion risks. Tanks can also become floating projectiles in quickly moving floodwaters, causing serious damage to property and danger to individuals in their path.

Hazard Areas

The portions of the Planning District most susceptible to flooding are those directly adjacent to the areas major waterways, however, flooding can occur along the smaller tributaries throughout the area. Due to the mountainous terrain in the area and the associated steep slopes, the majority of development in the Planning District is located in the valleys along these rivers. Development generally consists of residential and agricultural uses, with commercial districts typically limited within the incorporated towns. A significant amount of the development in the Planning District is located in the floodplain.

FEMA, through the National Flood Insurance Program (NFIP), has developed Flood Insurance Rate Maps (FIRMs) that identify flood zones through detailed hydrologic and hydraulic studies. These flood zones represent the areas susceptible to the 1% annual chance flood, or 100-year flood. Whenever possible, FEMA will also determine a Base Flood Elevation (BFE) for the 100-year floodplain, which is the calculated elevation of flooding during this event. The BFE is a commonly used standard level for determining flood risk, and managing potential floodplain development. Although each specific flood event is different, these maps provide a more definitive representation of the highest flood risks in the communities. The specific flood hazard areas in each of the major watersheds are described below.

Clinch River Basin

The sections of the Clinch River area most susceptible to flooding are those directly adjacent to the Clinch River and Little River, however flooding can occur along the smaller tributaries throughout the area. The majority of development is located in the valleys along the Clinch River and Little River and their tributaries. Development in this area consists of residential and agricultural uses. A significant amount of this development is in the Clinch River floodplain.

The Clinch River, and Little River have been studied in detail as part of the FEMA Flood Insurance Study, and BFE's have been determined for the 100-year flood. The 100-year floodplains along these rivers vary from 100 feet wide in some locations to over 1000 feet wide in others, depending on local topography. For areas along other small streams

and creeks throughout the Clinch River area, where minimal development is present and the potential for damages is low, approximate methods were used to determine the extent of the floodplain, and no BFE's were determined.

As noted in the hazard history section, a 100-year flood has not been exceeded on the Clinch River. This does not preclude the occurrence of a 100-year event in the future. As stated previously virtually all of the Clinch River watershed located within the CPPDC area is located within Russell County. The effective date for the FIRM in Russell County is March 16, 1988. Watershed changes that have taken place since that date have not been accounted for but should be minimal due to the rural nature of the area.

Levisa Fork and Russell Fork Basin

The sections of the Levisa Fork area most susceptible to flooding are those directly adjacent to the stream and its tributaries. The majority of development is located in the valleys along the Levisa Fork and its tributaries. Development in this area consists of residential and agricultural uses. A significant amount of this development is in the Levisa Fork floodplain.

The Levisa Fork, Slate Creek, Big Prater Creek, Dismal Creek, and Garden Creek have all been studied in detail as part of the FEMA Flood Insurance Study, and BFE's have been determined for the 100 year flood. The 100 year floodplains along these rivers vary from 50 feet wide in some locations to over 500 feet wide in others, depending on local topography. For areas along other small streams and creeks throughout the Levisa Fork area, where minimal development is present and the potential for damages is low, approximate methods were used to determine the extent of the floodplain, and no BFE's were determined.

As noted in the hazard history section, a 100-year flood has not been exceeded on the Levisa Fork. This does not preclude the occurrence of a 100-year event in the future. The areas of the Levisa Fork and Russell Fork watershed located within the CPPDC area are primarily located within Dickenson and Buchanan Counties. The effective date for the Buchanan County FIRM is August 19, 1997, while the effective date for the Dickenson County FIRM is February 6, 1991. Watershed changes that have taken place since that date have not been accounted for but should be minimal due to the rural nature of the area.

Bluestone River Basin

The sections of the Bluestone River area most susceptible to flooding are those directly adjacent to the Bluestone River, Wrights Valley Creek and Beaver Pond Creek, however flooding can occur along the smaller tributaries throughout the area. The majority of development is located in the valleys along the Bluestone River and its tributaries. Development in this area consists of residential and commercial uses.

The Bluestone River, Wrights Valley Creek and Beaver Pond Creek have all been studied in detail as part of the FEMA Flood Insurance Study, and BFE's have been determined for the 100-year flood. The 100-year floodplains along these rivers vary from 50 feet wide in some locations to over 600 feet wide in others, depending on local topography. For areas along other small streams and creeks throughout the Bluestone River area, where minimal development is present and the potential for damages is low, approximate methods were used to determine the extent of the floodplain, and no BFE's were determined.

As noted in the hazard history section, a 100-year flood has been exceeded on the Bluestone River. This does not preclude the occurrence of another 100-year event in the future, as history has proven in many other places. A majority of the Bluestone River watershed located within the CPPDC area is located within the Town of Bluefield, while portions are also located in unincorporated areas of Tazewell County. The effective date for the FIRM for the Town of Bluefield is August 2, 1994, while the effective date for the Tazewell County FIRM is March 4, 1991. Watershed changes that have taken place since that date have not been accounted for, but should be minimal due to the rural nature of the area.

Flood Maps

Historically, FEMA FIRMs have only been available as hard copy maps and not in digital format. However, in recent years FEMA has developed digital versions of the FIRMs called "Q3 flood maps". These Q3 maps can be incorporated into a GIS. The only county in the Cumberland Plateau Planning District that currently has Q3 flood data available is Buchanan County. Therefore, based on input from the Planning District of the critical flood areas, portions of the 100-year floodplains of Dickenson, Russell and Tazewell Counties, as shown on the FIRMs, were geo-referenced and scanned for use with a GIS system. Although having digital versions of the floodplain for an entire county would be ideal, digitizing the floodplain for the entire county was not determined to be cost effective within the confines of this project. The areas of Dickenson, Russell and Tazewell Counties for which the floodplains have been digitized include the following communities: Clinchco, Haysi, Cleveland, Honaker, Lebanon, St. Paul, Bluefield Cedar Bluff, Pocahontas, Richlands and Tazewell. Maps of these areas, as well as the Q3 data for the community of Grundy, in Buchanan County, can be found at the end of this section.

Vulnerability Analysis

In the previous sections of this analysis, specific areas susceptible to flooding in the Planning District were identified. The next step in a Hazard Identification and Risk Assessment is to identify what is vulnerable to the effects of potential flooding. Flooding impacts a community to the degree it affects the lives of its citizens and the community functions overall. Therefore, the most vulnerable areas of a community will be those most affected by floodwaters in terms of potential loss of life, damages to homes and businesses, and disruption of community services and utilities. For example, an area with a highly developed floodplain is significantly more vulnerable to the impacts of

flooding than a rural or undeveloped floodplain where potential floodwaters would have little impact on the community.

A number of factors contribute to the relative vulnerabilities of certain areas in the floodplain. Development, or the presence of people and property in the hazardous areas, is a critical factor in determining vulnerability to flooding. Additional factors that contribute to flood vulnerability range from specific characteristics of the floodplain to characteristics of the structures located within the floodplain. The following is a brief discussion of some of these factors and how they may relate to the area.

- **Flood depth:** The greater the depth of flooding, the higher the potential for significant damages. Flood depths have been estimated for the maximum probable event for this area by various TVA and Corps of Engineers studies. Flood heights and rise rates in Figure V-4 are based on the Maximum Probable Flood.
- **Flood duration:** The longer duration of time that floodwaters are in contact with building components such as structural members, interior finishes, and mechanical equipment, the greater the potential for damage. As stated previously, because of the steep topography of the area, floodwaters tend to recede quickly following and event, but may remain longer in localized areas. Flood durations in Figure V-4 are based on the Maximum Probable Flood.

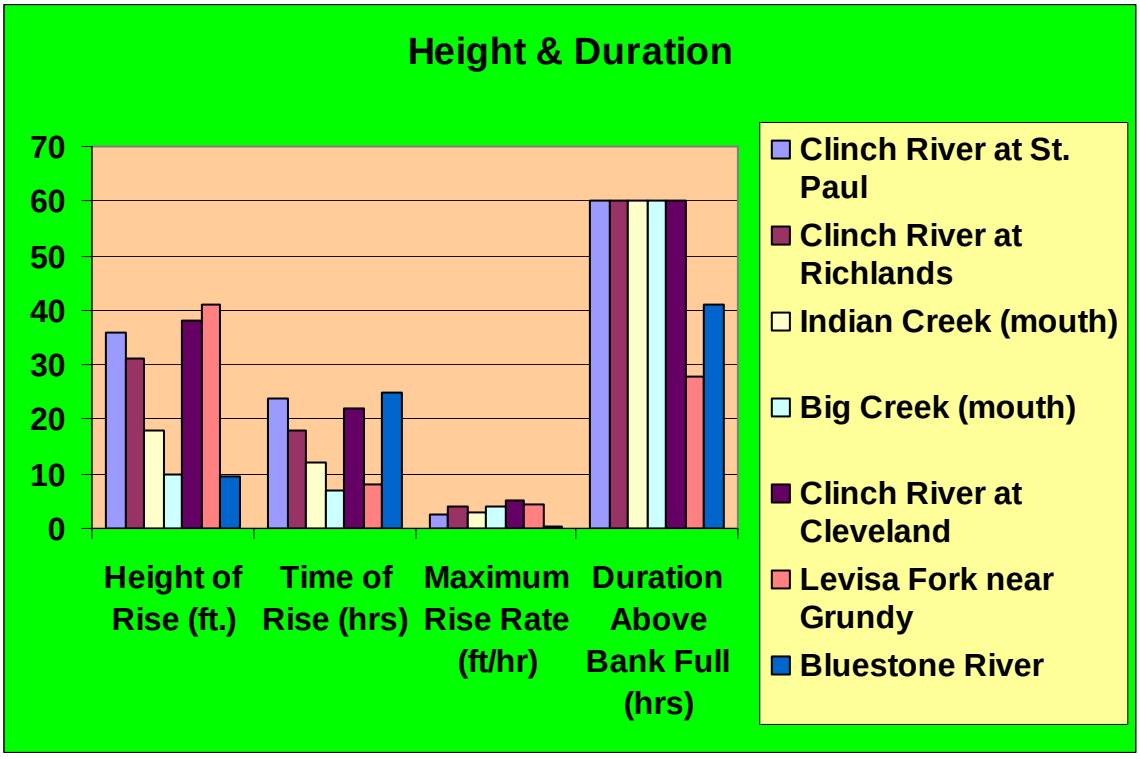


Figure V-4 — River Basin Flood Heights and Duration

- **Velocity:** Flowing water exerts forces on the structural members of a building, increasing the likelihood of significant damage. A one-foot depth of water, flowing at a velocity of 5 feet per second or greater, can knock an adult over and cause

significant scour around structures and roadways (FEMA 259). The relatively high velocity of floodwaters in the area will increase damages throughout the Planning District. Flood velocities in Figure V-5 are based on the Maximum Probable Flood.

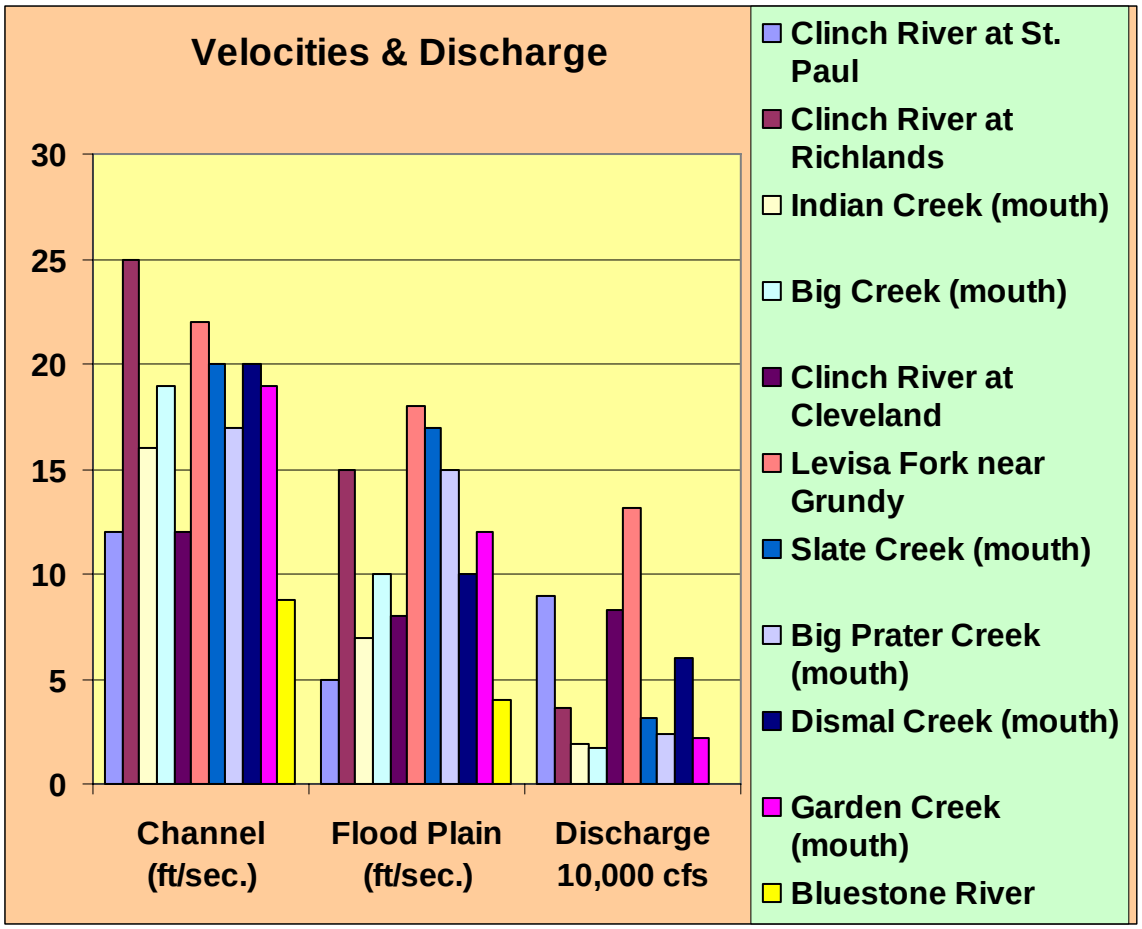


Table V-5 — River Basin Flood Velocities

- **Elevation:** The lowest possible point where floodwaters may enter a structure is the most significant factor contributing to its vulnerability to damage due to flooding. Entry point elevations of structures throughout the Planning District area vary greatly relative to the BFE. Data on the specific elevations of these structures have not been compiled for use in this analysis.

- **Construction Type:** Certain types of construction are more resistant to the effects of floodwaters than others. Masonry buildings, constructed of brick or concrete blocks, are typically the most resistant to flood damages simply because masonry materials can be in contact with limited depths of flooding without sustaining significant damage. Wood frame structures are more susceptible to flood damage because the construction materials used are easily damaged when inundated with water. The type of construction throughout the

Planning District varies from area to area. Specific building types will be discussed in the specific flood area descriptions below.

Structures at Risk

In order to assess the Planning District's potential vulnerability to flooding, specific data regarding structures located in the floodplain was collected as a part of this analysis. Structures potentially in the floodplain were identified by comparing the floodplain areas from the FEMA FIRMs with each County's existing building data. Specific data on these structures was collected during a 'windshield survey' and included the structures' occupancy type, building material type, number of stories, area, value per square foot, total value, and flooding source. Using the type, occupancy, and use of these structures, estimated building values were developed. For the purpose of this analysis, comparable buildings with the same uses, approximate age and general conditions were identified in the Planning District. Tax appraisal values for these buildings (minus land value) and R. S. Means Square Foot Costs were used to develop a square foot value for each building type, which was applied to the properties located in the flood plain to estimate a structure value. Typical per square foot costs for building construction were considered in analyzing the relative accuracy numbers developed for this analysis and some adjustments were made for certain properties in the field based on visual analysis (e.g., decreases in value for blighted or damaged buildings).

Data including the location of existing structures in all four counties located within the Planning District is available in a GIS format, however, detailed data regarding the structures is limited. A vast majority of the existing structures are classified as an unidentified building type. Additional data does vary from county to county but, in general, the location of existing hospitals, police stations, schools, fire stations, and government buildings are known. Therefore using the digital flood data described above, a count of the number of structures locate within the floodplain was generated and total value at risk approximated. The accuracy and completeness of this structure count is limited by the availability of digital flood data. As stated previously complete digital Q3 flood data is only available for Buchanan County. For Dickenson, Russell, and Tazewell County the count of structures in the floodplain includes only those in the areas that have been digitized. Total structure counts for these three counties would be expected to be considerably higher if digital floodplain data for the entire county was available.

From the data collected, a total of 6,045 structures were located in the floodplain, with an estimated total value of over $290 million dollars. This number is based on estimated values for each of the building types described above. Because the structure type for many of the structures is listed as unknown, the cost of the average residential structure was utilized.

Tables V-5 through V-8 include a summary of the number, value, and predominant use of the structures located in the floodplain of all FEMA recognized flood sources. A more detailed discussion of the vulnerability of each flood source follows these tables.

Table V-5: Structures at Risk by Flooding Source Buchanan County		
Flood Source	**Number of Structures**	**Total Value**
Big Sandy River	3,219	$150,964,600
Tug Fork	989	$55,051,000

Table V-6: Structures at Risk by Flooding Source Dickenson County		
Flood Source	**Number of Structures**	**Total Value**
Big Sandy River	322	$12,979,400

Table V-7: Structures at Risk by Flooding Source Russell County		
Flood Source	**Number of Structures**	**Total Value**
Clinch River	691	$31,190,250

Table V-8: Structures at Risk by Flooding Source Tazewell County		
Flood Source	**Number of Structures**	**Total Value**
County-wide	824	$40,533,400

The vast majority of structures located in the floodplain of the Cumberland Plateau planning area are residential. The most common type of structure in the flood plain is single-family homes or mobile homes. Mobile homes tend to be more vulnerable that other residential types due to their poor structural stability and flood-prone construction materials as well as the reduced means these residents have to protect themselves from potential flood damage.

Critical Facilities

The impacts of floodwaters on critical facilities, such as police and fire stations, hospitals, and water or wastewater treatment facilities, can greatly increase the overall effect of a flood event on a community. Some of these facilities in the Planning District are located in areas with a high risk to flooding. As stated previously, the location of some of these types of structures are known throughout the Planning Area. Using this data, a list of these facilities located in the floodplain has been generated, and is included in Table V-9. It should be noted that these facilities have been determined to be in the floodplain using a planning level analysis, and should be used only as a planning tool. In order to accurately determine if a structure is actually located in the floodplain, site-specific information must be available. In addition, this data set is limited

by the GIS data available. County-wide digital flood data is not available in Dickenson, Russell, or Tazewell Counties. Therefore additional critical facilities may be located in or near the floodplain, in addition to those listed below, in these counties.

Table V-9 — Known Critical Facilities in the Floodplain

Jurisdiction	Type	Facility
Buchanan County	Fire and Rescue	Knox Creek Volunteer Fire
	Fire and Rescue	Grundy Volunteer Fire
	Fire and Rescue	Quality Care Ambulance Service
	Fire and Rescue	Dismal River Volunteer Rescue
	Fire and Rescue	Council Volunteer Fire
	Government Building	Buchanan County Courthouse
	School	Hurley Combined School
	School	Vansant Elementary School
	Hospital	Buchanan General Hospital
Dickenson County	Fire and Rescue	McClure River Volunteer Fire
Russell County	Government Building	Lebanon Town Hall
	School	Cleveland Elementary School
	Treatment Plant	Central Shop STP
	Treatment Plant	Cleveland STP
	Treatment Plant	Honaker STP
Tazewell County	Police	Richlands Police
	School	Raven Elementary School
	Fire and Rescue	Rescue 9
	Fire and Rescue	Rescue 10

Special needs populations are those that require additional attention during a flood event, are not as able to protect themselves prior to an event, or are not able to understand potential risks. These can include non-English populations, elderly populations, or those in a lower socioeconomic group. Special needs populations in the Planning District area are primarily lower income and elderly individuals, living in a flood-prone area, without the resources to take actions to protect themselves.

Future Land Use Trends

Due to existing development and very steep topography outside of the river valleys, developable land in the Planning District is scarce. For that reason, one of the dominant development trends in the area is redevelopment. Older, lower value structures are being destroyed and replaced by newer construction with significantly higher dollar values. This is especially true with older mobile homes that are being replaced by new pre-fabricated modular homes. Many of these structures are located in the floodplain, where this redevelopment trend is increasing the value of structures at risk to damages due to flooding in the Planning District.

Winter Storms

Severe winter storms and blizzards are extra-tropical cyclones that originate as mid-latitude depressions (FEMA, 1997). Snowstorms, blizzards, and ice storms are the most

common examples. These storms can bring heavy snowfall, high winds, ice, and extreme cold with them. Historically, winter storms in southwestern Virginia have produced significant snowfall, sleet, and freezing rain.

Recent Snowstorm History

Between January 20 and 22, 1985, an arctic cold front swept across the state, ushering in extreme cold and high winds. Wind chill temperatures plunged well below zero. Winds knocked out power compounding the effects of the cold. Pipes froze and burst. Fresh snowfall of 4 inches helped temperatures across the entire state fall below zero. New records were set at several locations in the state.

During the winter of 1993-1994, Virginia was struck by a series of ice storms. Although ice storms are not an uncommon event in the valleys and foothills of the Appalachian Mountains, and the region had been overdue for an ice storm, it was unprecedented to have several occur in succession.

The most significant winter storm to affect the Cumberland Plateau Planning District was the “Super Storm of March ’93”, also known as “The Storm of the Century”. Occurring between March 12 and 15, 1993, this storm affected 26 states throughout the central and eastern portions of the United States. The storm resulted in a Federal disaster declaration. Throughout the region, the snowfall amounts ranged from 12 inches to over 48 inches depending on elevation. Extreme southwest Virginia saw 30 to 42 inches of snow from the storm (the most snow in more than 25 years). Some roofs collapsed under the weight of the snow. Winds produced blizzard conditions over portions of the west with snow drifts up to 12 feet. Interstates were shut down. Shelters were opened for nearly 4,000 stranded travelers, and those that left were without heat and electricity. Virginia called out its National Guard to help with emergency transports and critical snow removal.

During the February 10 and 11, 1994 ice storm, some areas of southern Virginia received a devastating 3 inches of ice, causing tremendous tree damage and power outages for up to a week. The "Blizzard of '96" or the "Great Furlough Storm" began late on Saturday, January 6. As much as 30 to 36 inches of snow fell over the western mountains.

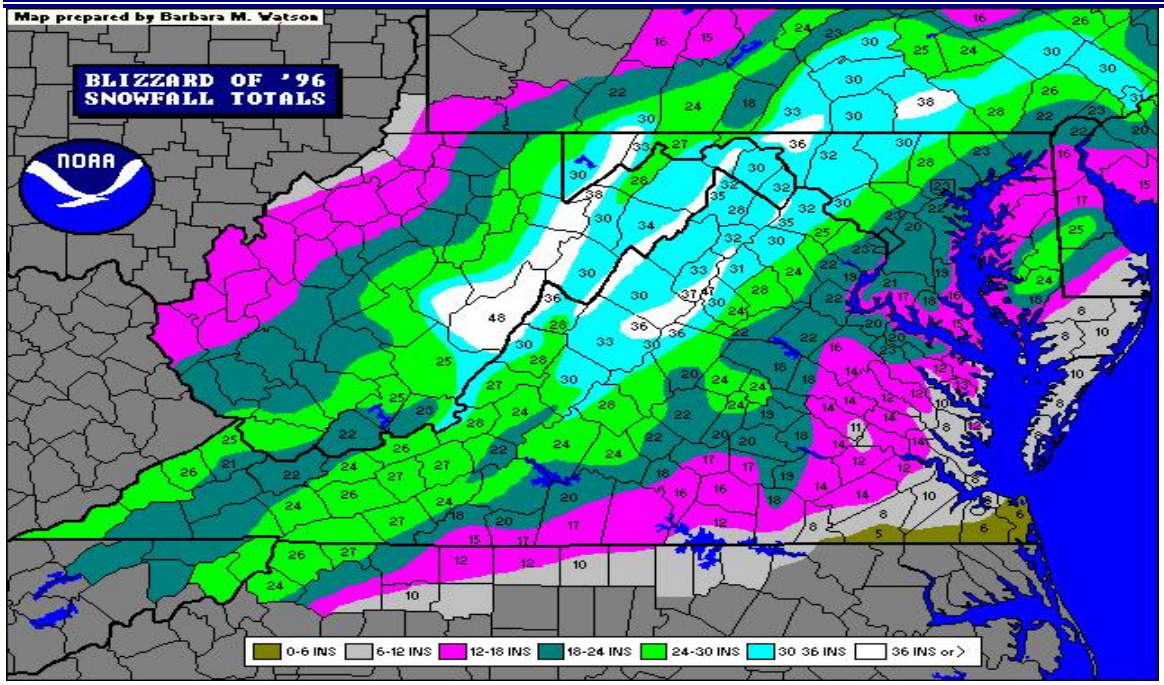


Table V-10 includes ranges of snowfall for select historic events in southwest Virginia. This table is not inclusive of all historic snowfall events.

Table V-10 — Historic Snow Fall Amounts

Date	Amount
February 12 –March 10, 1960	65 inches
December 10 – 12, 1960	4 - 13 inches
January 20 – 22, 1985	4 inches
March 13-14, 1993	30 - 42 inches
January 6-13, 1996	30 - 36 inches
January 27-28, 1998	12 - 24 inches

Hazard Profile

Although the Commonwealth of Virginia is not generally associated with severe winter storms, the mountainous area in the southwestern portion of the state regularly experiences several snow storms each year. These storms can produce between 4 and 12 inches of snow from each event. Total average annual snowfall within the Planning District varies from county to county. Buchanan County has an average annual snowfall of 23” per year, Dickenson County is 15” per year, Russell County 21” per year, and Tazewell County 40” per year as illustrated in Figure V-7.. However, as Table V-10 illustrates, storms producing higher snowfall amounts are possible.

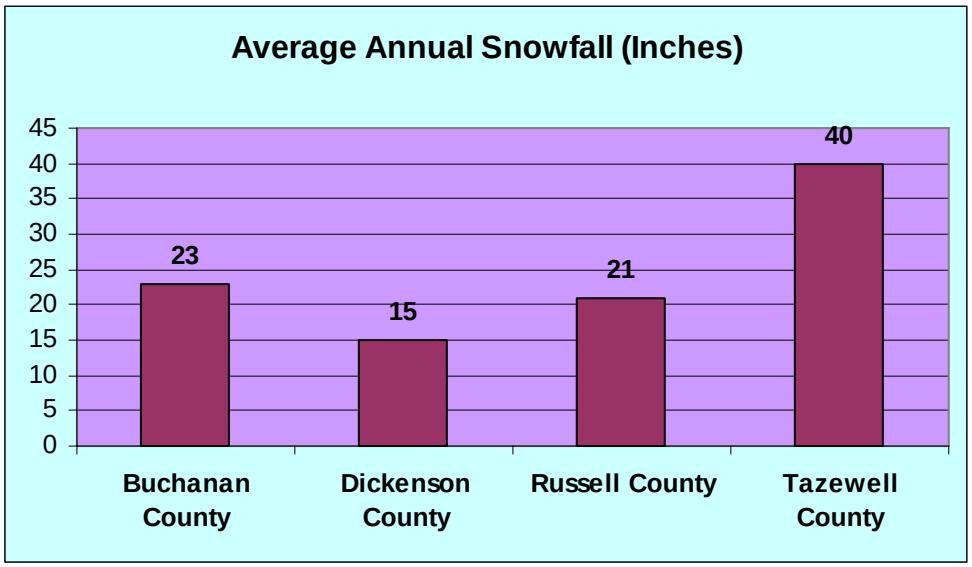


Figure V-7 — Average Annual Snowfalls

In addition to snow, winter storms can also bring sleet and freezing rain to the area. Sleet is generally described as frozen water particles that fall in the form of ice, while freezing rain falls as super cooled water which can freeze on impact with the ground, trees, or roadways. In its most severe form, freezing rain can fall as part of an ice storm that can coat the area with a layer of ice up to 3" thick. Ice storms can cause significant damage by snapping tree limbs and bending trees to the ground. These fallen limbs and trees can completely block roadways, cut access to certain areas of the Planning District for days, and interfere with and destroy overhead utility lines.

Predictability and Frequency

The National Weather Service tracks winter storms by radar. Based on this radar information as well as models, the National Weather Service provides up-to-date weather information and issues winter storm watches to indicate when conditions are favorable for a winter storm, and winter storm warnings if a storm is actually occurring or detected by radar. On average, southwestern Virginia will experience between one and two severe winter storms in a given year. Snowfalls amounts for these storms can vary from a few inches to up to a foot of snow in extreme cases. The higher elevations of the Planning District can experience several feet of snow in a severe winter storm.

Vulnerability Analysis

Winter storms can disrupt lives for periods of a few hours or up to several days, depending upon the severity of the storm. Transportation systems are usually among the first and hardest hit sectors of a community. Snow and ice can block primary and secondary roads, and treacherous conditions make driving difficult; some motorists may be stranded during a storm, and emergency vehicles may not be able to access all areas. The steep slopes found throughout the Planning District exacerbate the situation, making some of the secondary roads impassible during even a minor winter weather event.

Utility infrastructure also can be adversely affected by winter storms. Heavy snow and ice can cause power lines to snap, leaving citizens without power and, in some cases, heat for hours or even days. Likewise, telephone lines can also snap, disabling communication within portions of a community. Frozen water pipes can rupture in people's homes, and water and sewer mains can also freeze and leak or rupture if not properly maintained. These ruptures can lead to flooding and property damage.

People's health can also be adversely affected by severe winter weather. People who lose heat in their homes and do not seek alternate shelter, people who get stuck in snowdrifts while driving, or people working and playing outdoors can suffer from hypothermia and frostbite. Since winter weather hazards generally affect the entire Planning District and vary in intensity and form, it is not possible to quantify primary effects or specific damages.

Secondary effects

Secondary effects of winter storms are broad. Treacherous driving conditions can result in automobile accidents in which passengers may be injured and property damages may occur. Deliveries of heating fuel can be delayed by impassible roads. Impassable roads also can result in schools being closed because buses are not able to access their routes and bring children to school. The costs of salting and sanding roads and of snow removal can be staggering to communities both large and small. The costs to repair roads after spring thaws also can be significant.

After a significant snowfall, the resulting thaw that occurs when the temperature rises above freezing can cause flooding in some areas. As noted in the flood portion of this document, January through March are the months with the highest occurrences of flooding. The rainy season coincides with snowfall and subsequent melting. Because of the mountainous terrain in this area, flood events tend to occur rapidly and with little warning.

The local economy can also suffer if businesses close due to inclement winter weather. The impact could be significant in a larger event. In addition, disabled transportation systems may mean that shipments of goods and services are delayed, which may result in decreased inventory for retailers and increased inventory for industrial and commercial suppliers.

Wildfire

"A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures" (FEMA 386-2, 2001) and may originate from a variety of ignition sources. The risk of wildfires, though not as high as it is in the western U.S., is a genuine concern for the Commonwealth of Virginia. Each year, about 1,600 wildfires consume a total of 8,000 to 10,000 acres of forest and grassland in the Commonwealth. During the fall drought of 2001, Virginia lost more than 13,000 acres to wildfires (Virginia Department of Forestry website)

In 2003, prior to the completion of this study, the Virginia Department of Forestry (VDOF) completed a statewide *Wildfire Risk Assessment (WRA)* in an attempt to quantify the varying levels of risk throughout the state. The data gathered in this risk assessment were grouped by the various Virginia Planning District Commissions (PDCs) for the years of 1995 through 2001. This assessment utilized GIS-based data for the Cumberland Plateau Planning District, regarding a number of wildfire related factors including hazard incidents, land cover, topography, and population density, among others. Based on this data, and utilizing a detailed risk assessment methodology, VDOF identified all areas as having a wildfire risk level of *High, Medium, Low, or None.* Because the data utilized in this statewide risk assessment is current, and the overall analysis is extremely comprehensive, the VDOF risk assessment served as the basis for this study.

Hazard History

Most of Virginia's wildfires were caused either intentionally or unintentionally by humans. Due to the growth of the population of the Commonwealth, there has been an increase in people living in the urban-wildland interface, as well as an increase in use of the forest for recreational purposes. Historical records of wildfire events specific to the Cumberland Plateau Planning District are limited, and not all wildfires are reported. Based on the data obtained from the VDOF WRA, between 1995 and 2001 there have been over of 570 wildfire incidents in the Cumberland Plateau Planning District. These incidents are shown graphically on a map prepared by VDOF, *"Cumberland Plateau, Wildfire Incidents From 1995 to 2001"*, included at the end of this section. As shown on the map, there have been a higher number of incidents in the northwestern portion of the planning district. The numbers of incidents, per county per year, are listed in Table V-11.

Table V-11 — Wildfire Incidents per year per County

Fire Year	County				Total
	Buchanan	Dickenson	Russell	Tazewell	
1995	43	20	18	No data	81
1996	22	10	10	14	56
1997	20	11	9	10	50
1998	23	9	12	17	61
1999	40	16	21	14	91
2000	37	26	24	17	104
2001	71	20	19	17	127
Total	256	112	113	89	570

Buchanan County

Based on the 1995 to 2001 recorded data in Table V-11, there have been 256 wildfire incidents, which have burned more than 11,670 acres and caused an estimated amount of $1,517,454 worth of damage. Of these incidents, only eight (8) are known to have been caused naturally (by lightning). The rest have been caused by human activities such as debris burning (79 fires) and other incendiary causes (119 fires).

Dickenson County

Between 1995 and 2001, there have been 112 recorded incidences of wildfire, which have burned more than 2,020 acres and caused an estimated amount of $273,877 worth of damage. Of these incidents, only one (1) is known to have been caused naturally (by lightning). The rest have been caused by human activities such as debris burning (30 fires) and other incendiary causes (53 fires).

Russell County

Between 1995 and 2001, there have been 113 recorded incidences of wildfire, which have burned more than 1,140 acres and caused an estimated amount of $274,185 worth of damage. Of these incidents, only three (3) are known to have been caused naturally (by lightning). The rest have been caused by human activities such as debris burning (46 fires) and other incendiary causes (47 fires).

Tazewell County

Between 1995 and 2001, there have been 89 recorded incidences of wildfire, which have burned more than 660 acres and caused an estimated amount of $47,220 worth of damage. Of these incidents, none are known to have been caused naturally. They have been caused by human activities such as debris burning (38 fires) and other incendiary causes (34 fires).

Hazard Profile

Wildfires can be classified as either a wildland fire or an urban-wildland interface (UWI) fire. The former involves situations where wildfire occurs in an area that is relatively undeveloped except for the possible existence of basic infrastructure such as roads and power lines. An urban-wildland interface fire includes situations in which a wildfire enters an area that is developed with structures and other human developments. In UWI fires, the fire is fueled by both naturally occurring vegetation and the urban structural elements themselves. According to the National Fire Plan issued by the U.S. Departments of Agriculture and Interior, the urban-wildland interface is defined as "…the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildlands or vegetative fuels."

A wildfire hazard profile is necessary to assess the probability of risk for specific areas. Certain conditions must be present for a wildfire hazard to occur. A large source of fuel must be present; the weather must be conducive (generally hot, dry, and windy); and fire suppression sources must not be able to easily suppress and control the fire. Once a fire starts, topography, fuel, and weather are the principal factors that influence wildfire behavior. There are several factors that influence an area's risk to the occurrence of wildfires. These include, but are not limited to:

- Historical Wildfire Data
- Land Cover

- Percent Slope of Topography
- Slope Orientation
- Population Density
- Distance to Roads
- Railroad Buffer
- Road Density and Developed Areas

Historical Wildfire Data – It is generally accepted that areas where wildfires have historically been relatively prevalent (or absent) will remain similar in the future. As stated above, there are numerous portions of the Cumberland Plateau Planning District that have high numbers of historic wildfires. Therefore, it can be assumed that the conditions that contribute to a wildfire occurrence are present in these areas, increasing the likelihood that additional fires will occur in these areas.

Land Cover – Wildfire fuels (e.g., grasses, crops, forest, and urban development) determine the ease of ignition, as well as the burn intensity and advancement opportunities. Because of the rural nature of the Cumberland Plateau Planning District, a large portion of the area is forested. These forested areas serve as a readily available fuel source, which also increases the risk of wildfire incidents and of widespread and larger events.

Percent Slope of Topography – Through convective pre-heating, wildfires generally advance uphill. In general, the steeper the slope, the greater the ease of wildfire ignition. The mountainous terrain (i.e., steep slopes) of the planning district is conducive to the ignition and advancement of wildfires. In addition, the steep slopes are a detriment to fire fighting efforts because of the difficulty in accessing and transporting firefighting equipment to wildfire sites.

Slope Orientation – Slopes that generally face south receive more direct sunlight, thereby drying fuels and creating conditions more conducive to wildfire ignition. There are numerous south-facing slopes in the planning district, creating a greater potential for wildfire occurrence.

Population Density – An overwhelming majority of wildfires in the Commonwealth are intentionally or unintentionally ignited by humans. As population increases, the more opportunities for wildfire ignition exist. Therefore, although large portions of the Cumberland Plateau Planning District posses many of the other factors that contribute to the occurrence of wildfires, the rural characteristic of these areas decrease the risk of potential wildfires.

Distance to Roads – Travel corridors increase the probability of human presence, which in turn can result in increased potential for wildfire ignition. Hence, areas of the planning district that are in close proximity to roadways have a higher probability of wildfire. Approximately 21% of the fires reported in the planning district were caused by people in cars.

Railroad Buffer – Railroad operations can produce sparks that may ignite a wildfire. Numerous railroads run through the Cumberland Plateau Planning District; however, this risk is low, with only about 1.5% of wildfires occurring in the planning district having been reported as ignited from railroad use.

Road Density and Developed Areas – Areas that contain a large percentage of developed land and roadway networks generally feature low amounts of wildland fuels, which are typically fragmented to such a degree to minimize the risk of a wildfire. This is the case in many of the towns and villages throughout the Cumberland Plateau Planning District, thereby lowering the overall risk to the most densely populated portions of the area.

Fire Seasons

The Virginia wildfire season is normally in the spring (March and April) and then again in the fall (October and November). During these months, the relative humidity is usually lower and the winds tend to be higher. In addition, the hardwood leaves are on the ground, providing more fuel and allowing the sunlight to directly reach the forest floor, warming and drying the surface fuels.

As fire activity fluctuates during the year from month to month, it also varies from year to year. Historically extended periods of drought and hot weather can increase the risk of wildfire. Some years with adequate rain and snowfall amounts keep fire occurrences low; while other years with extended periods of warm, dry, windy, days exhibit increased fire activity.

Long-term climate trends as well as short term weather patterns play a major role in the risk of wildfires occurring (as shown in Table 5.1 for the years 2000 and 2001.) For instance, short term heat waves along with periods of low humidity can also increase the risk of fire, while high winds directed at a fire can cause it to spread rapidly.

Secondary Effects

There are numerous secondary effects that could impact the Cumberland Plateau Planning District due to wildfires. These include a negative impact on tourism, and thus the local economy, through activities such as camping, hiking, hunting, and fishing. Additional secondary impacts due to wildfire include a degradation of air and water quality, as well as a threat to wildlife habitat including endangered species. Also, areas that have been burned due to wildfire have an increased risk of flooding and landslides in the event of heavy rains.

Hazard Areas

VDOF used GIS to develop a statewide spatial Wildfire Risk Assessment model to identify areas where conditions are more conducive and favorable to wildfire occurrence and advancement. This model incorporated the factors listed in the Hazard Profile section and weighted them on the scale of 0 to 10, with 10 representing the characteristic of each factor that has the highest wildfire risk. With this model VDOF identified areas of the Cumberland Plateau Planning District as having a wildfire risk

level of High, Medium, or Low. The results are shown on the map prepared by VDOF, *"Cumberland Plateau, Virginia Fire Risk Zones"*, included at the end of this section. As indicated on the map, only a small area within Russell and Tazewell Counties has a low fire risk zone. The Cumberland Plateau Planning District is mostly a high risk area. This high risk is most likely due to the topography (steep slopes) and the inaccessibility of the area, particularly in Buchanan and Dickenson Counties.

Vulnerability Analysis

As stated in the section above, according the VDOF Wildfire Risk Assessment large portions of the Cumberland Plateau Planning District are at high risk for wildfire occurrence. Although these high risk areas tend to be located in the more rural and mountainous portions of the planning district, higher density areas have also been classified as having a high risk. Because these high risk areas are so vast, many of the residents of the planning area live or work in or near a high risk area. Therefore, the most significant threat to the Cumberland Plateau Planning District is that to human life and safety. Many residents in the area live within the urban-wildlife interface and are at the greatest risk from potential wildfires. A commonly found scenario in the Cumberland Plateau Planning District is the 'stacking' of structures up a ridge with one-way access and flammable fuels in between the structures. These circumstances can greatly increase the risk of loss from wildfire and is hazardous to firefighters trying to protect the structures.

Structures at Risk

As stated in the previous section, large portions of the Cumberland Plateau Planning District have been designated as having a high risk to wildfires as determined by VDOF. In an attempt to quantify the potential vulnerability in the areas, the approximate number structures located in these areas have been estimated. As mentioned in earlier sections of this report, the counties included in the CPPDC have a comprehensive GIS system which includes an inventory of building locations and building type. With this data available, and because the VDOF Risk Assessment is also readily available in GIS format, determining the number of structures located in each Risk Wildfire zone was relatively simple. Table V-12 below includes the results of this analysis.

Table V-12 — Structures in Wildfire Risk

Jurisdiction	High Risk Zone	Medium Risk Zone	Low Risk Zone	Percent Structures in High Risk Zone
Buchanan	22,903	660	484	95%
Dickenson	16,999	1,575	45	91%
Tazewell	27,268	13,113	865	66%
Russell	19,556	14,888	317	56%

Landslides

A landslide is an occurrence of ground movement in which soil, rock, or debris move outward and downward along a slope. Types of landslides can include rock falls, deep-seated failures of slopes, shallow debris slides, and mudslides. The difference in these types of slides depends on the type of movement, as well as the type of material. Landslides can occur suddenly and dramatically or can occur slowly over a period of time. The exact location and timing of a landslide cannot be predicted. Landslides are common throughout the Appalachian Mountain region because of the extremely steep slopes present in the area.

Hazard History

Historically, numerous landslides have occurred throughout the Cumberland Planning District. In some cases, slide locations are still visibly apparent, however, detailed historic records of the location and extent of landslides have not been kept. Because a majority of landslide occurrences have occurred adjacent to existing roadways, or around a roadway under construction, the best resource for obtaining landslide data are the local offices of the Virginia Department of Transportation (VDOT). Therefore, VDOT representatives were specifically contacted in an attempt to gather as much information on historic landslides as possible. The following section includes a description of the landslide data by county.

Buchanan County

VDOT reported six individual locations throughout Buchanan County where historic landslide activity has been documented. The reported landslides documented by VDOT occur at various locations in the county. These locations include:

- Route 672, along Copperhead Branch in the southern portion of the county
- Route 83 at Lover's Gap
- Route 648 and 460 at Dismal Creek
- Route 700 at Big Rock
- Route 643 in the northern portion of the county at Guesses Fork
- Route 697 north of Kelsa

These location can also be found on the *"Buchanan County, Virginia Landslide Locations"* map, included at the end of this section.

Dickenson County

In Dickenson County, VDOT has documented historic landslides occurring at 27 different locations throughout the County. These locations can also be found on the *"Dickenson County, Virginia Landslide Locations"* map included at the end of this section.

Russell County

VDOT has identified seven primary landslide locations throughout Russell County, a majority of which are located along major roadways throughout the county. In addition to the location of the slides, VDOT also provided additional data regarding the characteristics of some of the historic slides.

- Route 63 between Sun and Dante. Fairly stable. Monitoring for movement.
- Route 58 across from Route 71 in western portion of county.
- Route 19 near Washington County line. Southbound lane settles periodically.
- Route 19. Northbound exit ramp at Coal Tipple Hollow. Periodic cleanup and monitoring.
- Route 19. Huffman Hill. Has been stable for some time.
- Route 19 near Souls Harbor Church.
- Route 80 at Doubles Branch.
- Route 80 on Big A Mountain.
- Route 71 below Lebanon Town limits

These locations can also be found on the *"Russell County, Virginia Landslide Locations"* map included at the end of this section.

Tazewell County

In Tazewell County, VDOT has documented historic landslides occurring at 14 different locations throughout the County a majority of which are located along major roadways throughout the county. These include:

- Route 19 at several locations.
- Route 460 in the city of Cedar Bluff.
- Several locations along roadways in the Jefferson National Forest.
- Route 637 at The Jumps and the intersection with Route 626.

These locations, as well as the others can also be found on the *"Tazewell County, Virginia* Landslide *Locations"* map included at the end of this section.

It should be noted that this locations do not represent all of the historic slide locations in the Cumberland Plateau Planning District. Many small landslides that do not directly impact the public are not reported or recorded. These landslides have typically been located along smaller roadways throughout the area, and numbers of slides and potential damage amounts are unknown.

Hazard Profile

Where and when landslides occur is based on number of natural factors but can be exacerbated by conditions created by man. The most prominent natural factors affecting susceptibility to landslides are topography, geology, and precipitation. No single factor

alone will cause a landslide to occur, but a combination of factors will. Topography plays an obvious role in the occurrence of landslides. The steeper a slope, the greater the forces of gravity that are acting on the rocks or soils on that slope, which increase the potential for failure. Geology is an important factor as well, as the strength of the rock, soil, or debris to resist the forces of gravity greatly affects the likelihood of a landslide. Therefore, the type and sequence of rock and soil types and layers greatly affect slope stability. The potential for landslides on slopes with the combination of steep terrain and loose or weak soil can be exacerbated by high levels of precipitation. Precipitation is a key catalyst for the occurrence of a landslide. Water can seep into the voids between soil and rock particles, decreasing the strength of the slope, and increasing the potential for landslides. As a result, landslides are most common during or following heavy periods or rain.

Other factors that increase the potential of a landslide include erosion, undercutting, and slope loading. When the base of a slope is eroded or undercut, the strength of the entire slope can be compromised. In mountainous regions such as the Cumberland Planning District, this commonly occurs along existing roadways, or during the construction of new roadways. Slope loading can also increase the potential for landslides. The construction of structures or roadways on a steep slope can increase the strain on the material, thus increasing the potential of a slide. The amount of ground cover and vegetation on a slope also can play a role in a slopes susceptibility to landslides, as dense cover can secure an otherwise unstable slope.

Landslides can be triggered by other natural hazards. The effect of extreme precipitation including flooding has been discussed above. In addition, ground shaking associated with an earthquake can trigger landslides on unstable slopes. Thin surface soils and steep topography throughout the Cumberland Planning District create conditions favorable to erosion and landslides. Widespread construction of roads, clearing of lands, and preparation of development sites on very steep slopes exacerbate the problem.

Predictability

The exact time or location that a landslide will occur cannot be predicted. As previously discussed, landslides can be caused by a combination of many different factors. In some instances, the potential for a landslide to occur at a particular location can be identified based not only on topographical and geologic factors, but also on other physical indicators. The United States Geological Survey (USGS) has developed a landslide overview map for the United States that combines susceptibility to landslides as well as the history of past landslide incidences in the area. The map ranks the susceptibility of and area and the past incidence on a level of high, moderate, and low. A level of high incidence was given to areas where more than 15% of the land had been involved in land sliding, and a level of high susceptibility was given to areas where more than 15% of the land area was determined to be susceptible to landslides based on geologic and topographic factors. Virtually the entire Cumberland Plateau Planning District is located within an area of both high susceptibility and high incidence, indicating the highest possible national risk level.

Hazard Areas

Because of the physical characteristics of the area, virtually the entire Cumberland Plateau Planning District is located in an area that has a high risk to the effects of landslides. As stated previously, due to the many factors that contribute to when and where a landslide will occur, it is extremely difficult to indicate precise locations that are at a greater risk of being affected by a landslide than other areas. However, one of the best indicators of where a landslide may occur is the locations of past landslide activity. These areas have demonstrated susceptibility to landslide occurrence, making additional landslides at these locations likely.

Historic landslide problem areas are indicated in the landslide location maps included at the end of this section. As noted previously, these maps do not depict all areas within the planning district where historic landslides have occurred, or where they may be a problem in the future. Historically, detailed records have not been maintained by local or county governments, therefore the data required to identify all known high landslide risk areas located within the planning district is not available.

Vulnerability Assessment

Because the conditions that cause a landslide are extremely site specific, the impacts of an individual landslide can vary greatly. Landslides can damage or potentially destroy anything in the path of the slide including homes, businesses, roads, and utilities. Landslide debris can also partially or fully block rivers, in which case the potential for significant flooding exists. The precise impacts of a landslide will depend on the specific characteristics of the slide, as well as the level of development in the slide area.

Due to the extreme steep slopes throughout the Cumberland Plateau Planning District, virtually all of the development in the area is at high risk to the effects of landslides. The vulnerability of specific structures and assets can only be determined by a detailed investigation of the site characteristics, primarily the proximity to at-risk slopes. A majority of the more densely developed areas of the planning district are located in areas with more gradual slopes. Therefore, the risk of widespread damages due to landslides in the densely developed areas is limited. However, a majority of the unincorporated areas throughout the planning district have extremely steep slopes. The potential for landslide damage to structures in these areas could be high.

Based on past occurrences, the most vulnerable assets located within the Cumberland Plateau Planning District are its roadways. Many of the roads in the area traverse steep slopes increasing the vulnerability to damage. The damage to a roadway affected by a landslide can vary from partial blockage to total destruction. In addition to the damage to the road itself, more significant economic and safety impacts may be felt by the community due the loss of function of the roadway. Many of the roadways throughout the planning district provide the only direct access from one community to another, or potentially the only access certain remote areas. This reduction in access can increase the response time of emergency vehicles, creating a potentially serious threat to public safety in these areas.

Wind Events

Wind can be one of the most destructive forces of nature. Strong winds can erode mountains and shorelines, topple trees and buildings, and destroy a community's critical utilities and infrastructure. Primarily, damaging winds that affect the Cumberland Plateau Planning District are associated with severe thunderstorms, or the remnants of a tropical storm or hurricane. Winds from a severe thunderstorm can reach over 60 mph in the southwest Virginia region. These storms generally develop along a cold front and can extend for hundreds of miles.

Although rare, tornadoes can occur in the Planning District. If a tornado were to impact the Planning District, the level of damages sustained would depend most on the strength of the tornado, measured by the Fujita Scale, along with the type and number of facilities and resources impacted. Table V-13 includes the corresponding wind speeds for the Fujita Scale, and typical damage descriptions for each level.

Table V-13 — The Fujita Scale

Scale Value	Wind Speed (mph)	Description of Typical Damage
F0	40-72	Light damage. Tree branches snapped; antennas and signs damaged.
F1	73-112	Moderate damage. Roofs off; trees snapped; trailers moved and/or overturned.
F2	113-157	Considerable damage. Weak structures and trailers demolished; cars moved.
F3	158-206	Severe damage. Roofs and some walls torn off well-constructed buildings; trains overturned; trees uprooted; cars lifted up and thrown.
F4	207-260	Devastating damage. Well-constructed houses leveled; structures blown off weak foundations; cars thrown; large missiles generated.
F5	261-318	Incredible damage. Houses lifted off foundations and carried some distance; large missiles thrown over 100 yards; trees debarked.

Hazard History

Records of the impacts of high wind events in the Cumberland Plateau Planning District are limited. The relatively large distance between the Planning District and the Atlantic Coast limit the impacts of the winds associated with hurricanes and tropical storms. Because the highest winds speeds associated with a hurricane or tropical storm are typically located to the east of the storm's eye, and the path of most of these storms are to the east of the Planning District, extremely high winds from these events are rare. Damaging winds from severe thunderstorms have occurred throughout Southwest Virginia on a regular basis. Wind damages have typically been localized throughout the region and have included broken tree limbs, blown down trees, damage to power lines, and moderate building damage.

Due to the mountainous terrain, tornado occurrences in the area have been rare, although they are possible. Table V-14 includes historical tornado occurrences in the counties within the Planning District.

Table V-14 — Tornadoes from 1950-2000	
County	**# of Tornadoes**
Buchanan	1
Dickenson	1
Russell	1
Tazewell	0

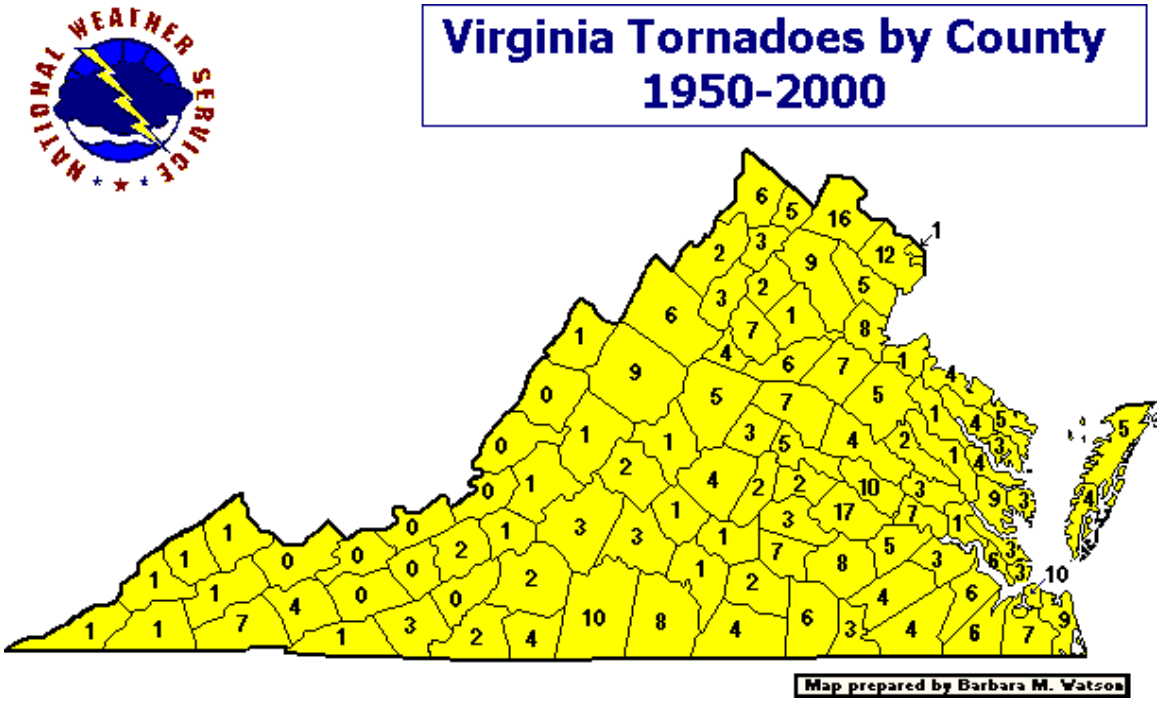


Figure V-8 — Virginia Tornadoes by County, 1950-2000

Wind Zones

The Planning District is not classified as an area with a higher than average base wind speed nationally. According to the Virginia Uniform Statewide Building Code (BOCA, 1996), the minimum design wind speed for the Planning District area is 70 mph.

High wind events, primarily severe thunderstorms, have occurred in every portion of the Planning District. There are no proven indicators to predict specifically where high winds may occur, and these events can be expansive enough to affect the entire area. Although localized geography, such as mountain ranges and gorges, can contribute to potential damages caused by these events, no specific locations within the Planning District have been identified due to these conditions. Therefore, the entire Planning District is considered to have an equal risk of being impacted by a high wind event.

Vulnerability Analysis

Depending on the type of wind event, the damage sustained can range from extremely localized to widespread, and from moderate to devastating. The potential impacts of a severe wind event to the Planning District depend on the specific characteristics of the event but can include broken tree branches and uprooted trees; snapped power, cable, and telephone lines; damaged radio, television, and communication towers; damaged and torn off roofs; blown out walls and garage doors; overturned vehicles; totally destroyed homes and businesses; and serious injury and loss of life. Downed trees and power lines can fall across roadways and block key access routes, as well as cause extended power outages to portions of the Planning District.

The extent and degree of damages from a high wind event are primarily related to the intensity of the event, measured in terms of wind speed. Sustained high winds can be the most damaging, although a concentrated gust can also cause significant damage. As wind speeds increase, the extent of damage varies depending on a number of site-specific characteristics that will be discussed later in this section.

Although no specific areas of the Planning District can be designated as having a higher risk of being affected by a severe wind event, there are a number of factors that contribute to a particular area's vulnerability to damages if a high wind event should occur. Certain characteristics of an area or of a structure increase its resistance to damages then others. Many of these factors are extremely specific to the particular location, or the particular structure in question. However, each factor's affects on vulnerability can be discussed in general. The following is a list of these factors and a description of how they relate to vulnerability, particularly in the Planning District.

Design Wind Pressures

Buildings must be designed to withstand both external and internal wind pressures on the structural framing and exterior elements. The level to which these structures are designed, as expected, directly correlates with their ability to resist damages due to high winds. The State's building code dictates to what design wind speed a structure must be designed to. When stipulating the design wind load of residential and commercial structures, the Virginia Uniform Statewide Building Code refers to the standards developed in BOCA, 1996. As described in the previous section, the design wind speed for the Planning District is determined to be 70 mph. For some building types, those structures constructed subsequent to the adoption of the building code are the most likely to be the most resistant to damages from wind. However, the resistance to wind damage based on these code requirements is only effective to the level the requirements are enforced, and no comprehensive data on the date built for these structures exists for the Planning District.

Building Types

The type of building construction will have a significant impact on potential damages from high wind events. A summary of basic building types – listed in order of decreasing vulnerability (from most to least vulnerable) – is provided below.

- **Manufactured:** This building type includes manufactured buildings that are produced in large numbers of identical or smaller units. These structures typically include light metal structures or mobile homes.
- **Non–Engineered Wood:** Wood buildings that have not been specifically engineered during design. These structures may include single and multi-family residences, some one or two story apartment units, and small commercial buildings.
- **Non-Engineered Masonry:** Masonry buildings that have not been specifically engineered during design. These structures may include single and multi-family residences, some one or two story apartment units, and some small commercial buildings.
- **Lightly Engineered:** Structures of this type may combine masonry, light steel framing, open-web steel joists, wood framing, and wood rafters. Some portions of these buildings have been engineered attention while others have not. Examples of these structures include motels, commercial, and light industrial buildings.
- **Fully Engineered:** These buildings typically have been designed for a specific location, and have been fully engineered during design. Examples include high-rise office buildings, hotels, hospitals, and most public buildings.

The Planning District includes a variety of building types. Residential construction is primarily wood framed, varying from single story to multiple stories, although some masonry residential properties are present as well. As mentioned in the list above, non-engineered wood framed structures are among the most susceptible to potential damage. With this type of construction being the most prevalent for residential properties in the Planning District, a majority of residential structures in the area could be classified to have a high level of vulnerability to damages should a high wind event occur.

Other types of structures found throughout the Planning District that are vulnerable to damages during high wind events are metal framed buildings, primarily associated with light industrial buildings, as well as some agricultural buildings.

According to the Virginia Uniform Statewide Building Code, agricultural buildings, such as barns and silos, are required to meet minimum requirements and be constructed in accordance with the state building code. Although the potential for human losses in these structures may be lower, the potential for high amounts of damages are significant.

Other building related factors that impact the potential for damage include height, shape, and the integrity of the building envelope. Taller buildings and those with complex shapes and complicated roofs are subject to higher wind pressures than those

with simple configurations. The building envelope is composed of exterior building components and cladding elements including doors and windows, exterior siding, roof coverings, and roof sheathing. Any failure or breach of the building envelope can lead to increased pressures on the interior of the structure, further damage to contents and framing, and possible collapse.

Critical Facilities

The vulnerability of critical facilities such as police and fire stations, hospitals, shelters, and utility services varies greatly depending on the factors described in the sections above. In order to accurately assess the relative vulnerability of these structures, data regarding the vulnerability factors would be required. Generalizations based on the vulnerability factors can be made in certain instances. Due to the high level of importance to the community, the ability of these structures to resist the forces of high wind events greatly affects the community's overall vulnerability to these hazards.

Estimating Losses

Due to the varying characteristics of the potential wind events that can affect the Planning District, preparing loss estimation for a particular event is not a simple task. Severe thunderstorms or straight line wind events could bring severe winds to the entire Planning District, although damages may only occur in localized areas. However, potential wind damages can be estimated on various structure types based on the potential wind speeds and building types described in the sections above.

The FEMA Benefit Cost module, used for estimating the benefits of potential wind mitigation projects, contains a wind damage function based on building type and potential wind speed. This wind damage function expresses the potential damage to a building as a percentage of the building's replacement value, and potential damages to a building's contents as a percentage of the value of its contents. For use in this module, FEMA separates structures according to the building types described in the Vulnerability Analysis section.

Using these building types, and the potential wind speeds for the Cumberland Plateau Planning District, potential damages can be expressed in terms of a percentage of the building and contents values. ASCE 7 categorizes the southwest Virginia area as a 90-mph wind zone, based on a 50-year recurrence interval. Based on ASCE 7, the potential wind speed for an event with a 100-year recurrence interval was estimated to be 107% of the 50-year wind speed, or 96.3 mph. Table V-15 includes estimates of potential damage of the specific building types in the four-county area for the 50- and 100-year interval wind event. It should be noted that the 100-year wind speed assumed corresponds with an F1 category tornado on the Fujita scale. Damages from the impact of a tornado stronger than an F1 could greatly exceed these estimates.

Table V-15: Potential Wind Damage by Building Type		
	50-Year Event (90 mph)	**100-Year Event (96.3 mph)**

Building Type	Building Damage	Contents Damage	Building Damage	Contents Damage
Manufactured	25%	40%	50%	100%
Light Engineered	5%	2.5%	15%	15%
Non-Engineered Wood	7.5%	5%	20%	20%
Non-Engineered Masonry	5%	2.5%	15%	15%
Fully Engineered	2.5%	2.5%	5%	15%

Earthquakes

The earth surface is composed of a series of tectonic plates, which are constantly moving and shifting against one another. The movement of these plates causes stress to develop along plate boundaries, and along fault lines. When the stress along one of these boundaries or fault lines exceeds the strength of the adjacent rock and earth, a slip or fracture occurs, releasing the built up energy as waves. Energy waves travel through the earth's crust up to the ground surface, causing the shaking that is associated with an earthquake.

Earthquakes in the United States occur most frequently along the West Coast, due to the close proximity to the North American plate boundary. Earthquakes can also occur along the East Coast of the United States, but the mechanisms causing these earthquakes are as not well understood, as these earthquakes occur within the plate rather than at plate boundaries (USGS, 2003).

The Commonwealth of Virginia is subject to earthquakes occurring in two primary areas of seismic activity. The Eastern Tennessee Seismic Zone extends from Charleston, South Carolina through western North Carolina and eastern Tennessee into central Virginia. The New Madrid Seismic Zone is located in southern Missouri. Both zones have the potential to affect the Cumberland Plateau Planning District. Although these faults have not produced a significant earthquake in recent years, both have a history and the potential to produce severely damaging earthquakes in the future.

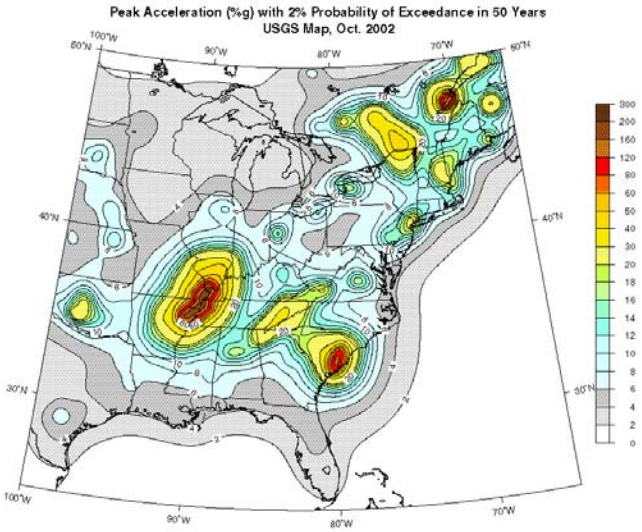


Figure V-9 — Earthquake Probability Map

When earthquakes occur, the shaking motion is measured on an instrument called a seismograph. The wave peaks on a seismograph indicate the strength of the shaking motion of the earthquake. The magnitude of an earthquake depends on how much energy is released and is used to measure the size of an earthquake's source (USGS, 2003). The magnitude is expressed in terms of the Richter scale, which is a logarithmic mathematical formula based on the amplitude of the waves measured by the seismograph. The Richter scale uses whole numbers and decimals to measure earthquake magnitudes.

In addition to magnitude, an earthquake also can be measured in terms of intensity. The intensity of an earthquake is the effect of the earthquake on the earth's surface. In the United States, the intensity is commonly measured with the Modified Mercalli Intensity Scale (MMI). This scale assigns an intensity level to an earthquake depending on the effects of an earthquake felt at a particular location, such as chimneys damaged, people awakened, and levels of building damage. Because this scale is based on the actual effects of an event, the intensity of a particular earthquake will vary by location, generally decreasing in intensity the farther the location is from the epicenter (the source of the earthquake).

The following table includes the levels for both the MMI scale and the Richter scale, as well as the associated levels of damages.

Table V-16 — Modified Mercalli Intensity Scale

Scale	Intensity	Description of Effects	Maximum Acceleration (mm/sec)	Corresponding Richter Scale
I	Instrumental	Detected only on seismographs	<10	
II	Feeble	Some people feel it	<25	<4.2
III	Slight	Felt by people resting; like a truck rumbling by	<50	

Table V-16 — Modified Mercalli Intensity Scale

Scale	Intensity	Description of Effects	Maximum Acceleration (mm/sec)	Corresponding Richter Scale
IV	Moderate	Felt by people walking	<100	
V	Slightly Strong	Sleepers awake; church bells ring	<250	<4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves	<500	<5.4
VII	Very Strong	Mild alarm; walls crack; plaster falls	<1000	<6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged	<2500	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open	<5000	<6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread	<7500	<7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards	<9800	<8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves	>9800	>8.1

Hazard History

The largest recorded earthquake to occur along the East Coast of the United States occurred in Charleston, South Carolina on September 1, 1886. This earthquake is estimated to have been magnitude 7.3 on the Richter scale and was felt as far away as Boston, Massachusetts and Milwaukee, Wisconsin. Overall, this earthquake resulted in 60 lives lost and an estimated $5 – $6 million in damages.

The largest historic earthquake to occur within the Commonwealth of Virginia occurred in Giles County on May 31, 1897. There were other seismic events preceding the earthquake, as tremors on May 3, 1897 caused damage in the areas around Pulaski, Radford, and Roanoke. In addition, loud rumblings were reported near the epicenter between May 3 and May 31. The event of May 31 was felt from Georgia to Pennsylvania and as far west as Indiana and Kentucky, encompassing a 280,000 square mile area. In Pearisburg, Virginia, walls of old brick houses cracked, bricks were thrown from chimney tops, springs were muddied, and some earth fissures appeared. Minor aftershocks continued through June 6, 1897, and other shocks were observed on June 28, September 3, and October 21. On February 5, 1898, Pulaski reported additional chimney damage and people rushed into the street during a tremor.

The Cumberland Plateau Planning District was also impacted by the 1811-1812 earthquakes that occurred along the New Madrid fault in Missouri. This earthquake had

an approximate magnitude of 7.2 at its epicenter and had an intensity of VI throughout the Planning District. Although powerful, damages associated with this earthquake were limited due to the relatively low population density throughout the region at the time of the event.

The following table includes a list of recorded earthquakes that have either occurred in the Commonwealth of Virginia, or have occurred in neighboring states that have affected Virginia, based on the most complete data available. The intensity and magnitude of all these events are not known, and in some cases damages may have occurred but were not recorded. This table is not intended to represent earthquakes affecting the Planning District, but to provide an overview of the seismic history of Virginia.

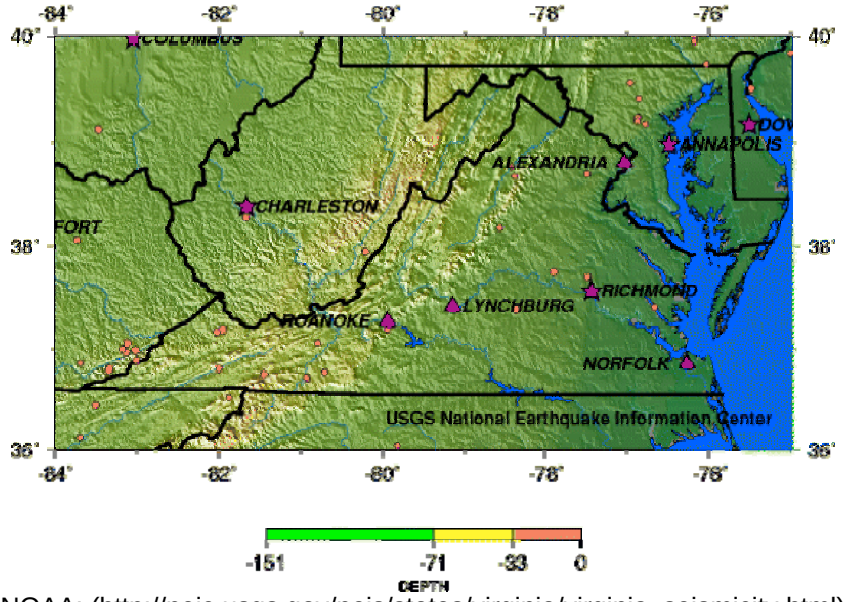
Table V-17 — Historic Earthquakes affecting Virginia

Date	Location	Magnitude Intensity	Description
February 21, 1774	Virginia/NC	Unknown	Shock felt throughout area
December 1811 February 1812	New Madrid, MO	Intensity: VI Magnitude: 7.1-7.2	Small amount of damage due to low population density
March 9, 1828	Southwestern Virginia	Intensity: V	Shaking felt throughout State
August 27, 1833	Richmond, VA	Intensity: V	Two miners killed in Dover Mills near Richmond
April 29, 1852	Wytheville, VA	Intensity: VI	Chimney damage, windows rattled
August 31, 1861	Southwestern Virginia	Intensity: VI	Chimney damage (*note: occurred during Civil War so details sketchy*)
December 22, 1875	Manakin, VA	Intensity: VII	Chimneys broken, shingles shaken off, glass broken
May 3, 1807	Pulaski, VA	Intensity: VI	Loud rumblings
May 31, 1897	Giles County, VA	Intensity: VII	Brick walls cracked, bricks thrown from chimney tops, springs muddied, earth fissures appeared
June 28, 1897	Giles County, VA	Intensity: I	Aftershock
September 3, 1897	Giles County, VA	Intensity: I	Aftershock
October 21, 1897	Giles County, VA	Intensity: I	Aftershock
February 5, 1898	Pulaski	Intensity: VI	Chimney damage, people rushed into streets
February 11, 1907	Arvonia, VA	Intensity: VI	Minor damage, small area affected
August 23, 1908	Arvonia, VA	Intensity: II	Aftershock

Table V-17 — Historic Earthquakes affecting Virginia			
Date	**Location**	**Magnitude Intensity**	**Description**
May 8, 1910	Arvonia, VA	Intensity: II	Aftershock
April 9, 1918	Luray, VA	Intensity: VI	Broken windows in Washington DC
September 5, 1919	Front Royal, VA	Intensity: VI	Chimney damage, springs & streams muddied
December 26, 1929	Charlottesville, VA	Intensity: VI	Bricks thrown from chimneys
April 23, 1959	Giles County	Intensity: VI	Chimney damage, plaster cracked, pictures fell
May 5, 2003	Goochland County, VA	Magnitude: 3.9	Rumblings, no damage, last reported earthquake in Virginia as of June

*TVA 1957, USGS

The map included in Figure V-10, prepared by the National Earthquake Information Center, displays the locations of historic earthquakes in the Commonwealth of Virginia, along with the different topographic regions of the state. The greatest concentration of earthquakes have occurred in the western portion of the state, throughout the Blue Ridge mountains, and several in the Commonwealth of Kentucky. No earthquakes have originated within the limits of the Cumberland Plateau Planning District.



NOAA: (http://neic.usgs.gov/neis/states/virginia/virginia_seismicity.html)

Figure V-10 — Seismicity of Virginia, 1990-2001

Hazard Profile

Depending on the location, magnitude, and intensity of an earthquake, the damages and associated impacts to the community can vary greatly. As described in Table V-16,

the impacts can be as mild as light shaking barely noticeable to citizens, to as large as totally destroyed building and infrastructure.

In an attempt to quantify the risk of damages due to an earthquake throughout the United States, the USGS, through the Earthquake Hazard Program, has developed maps displaying likely levels of ground motion due to future earthquakes. When developing these maps, USGS considered the potential magnitude and locations of future earthquakes based on historical data and geological information on the recurrence intervals of fault ruptures. Using this data, the extent of potential ground shaking with a 10 percent, 5 percent, and 2 percent chance of being exceeded in a 50-year period has been calculated, and contour lines have been interpolated are delineated on hazard maps.

The most commonly used method to quantify potential ground motion is in terms of peak ground acceleration (pga). During an earthquake, particles on the earth move in response to the energy waves released at the epicenter. How quickly these particles accelerate directly proportionate to the anticipated level of damages due to an earthquake, with the higher levels of acceleration causing the most significant damage. Peak ground acceleration is expressed as a percentage of a known acceleration, the acceleration of gravity ($9.8 m/s^2$), and is commonly referred to as "%g".

Figure V-11 displays the peak acceleration for the Commonwealth of Virginia with a 2 percent chance of being exceeded in a 50-year period. As can be seen in the figure, the virtually all of the Cumberland Plateau Planning District is located between the 16% of g contour and the 20% of g contour, with some portions having a value slightly greater than 20% of g.

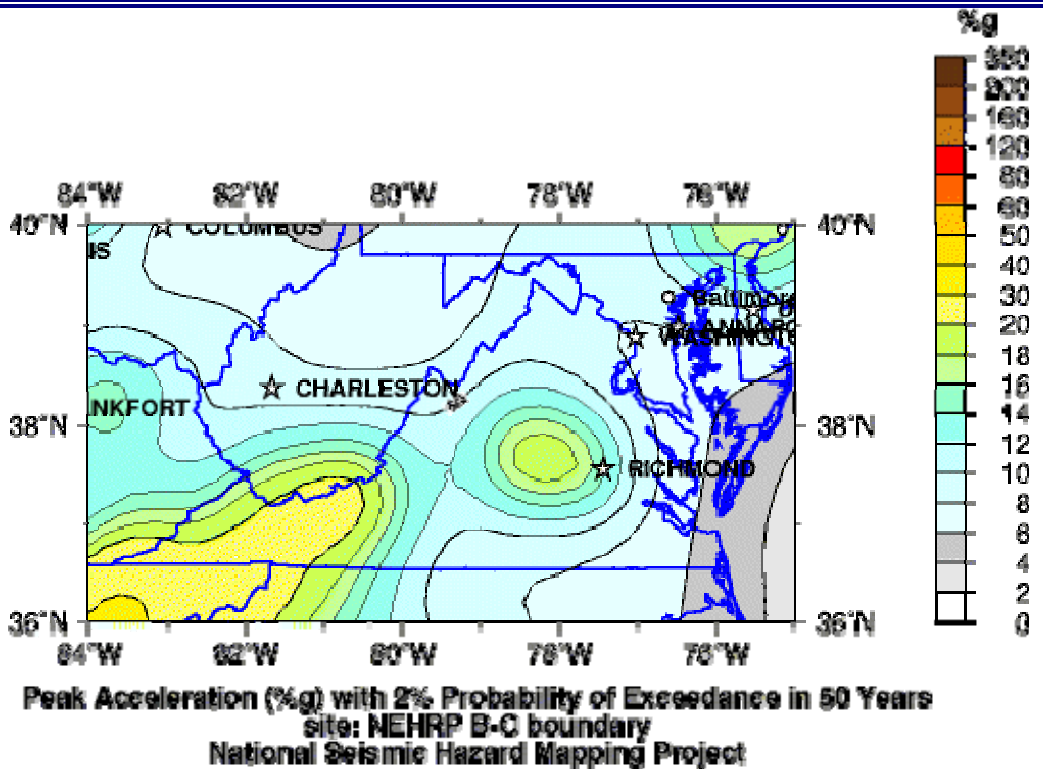


Figure V-11 — Peak Acceleration Probability Map of Virginia

Using the scale provided in Table V-16 this level of ground shaking is slightly greater to that associated with a level VII (MMI) intensity earthquake or between 6.1 and 6.9 on the Richter scale. Typical damages associated with this earthquake include cars moving uncontrollablely, masonry walls and building fracturing, and poorly constructed buildings being damaged. It should be noted that this is not the highest intensity earthquake that could affect the Planning District. Earthquakes of greater and lesser intensities can occur, and have lower and higher probability levels, respectively.

Hazard Areas

Because of the large area affected by most earthquakes, as well as the vast diversity of the locations and intensities of historic earthquakes that have and can affect southwestern Virginia, no specific areas of the Cumberland Plateau Planning District can be identified as having a higher risk of being affected by an earthquake. However, this same distinction also indicates that the entire Planning District is at a similar risk to earthquake.

Some slightly elevated hazards may be experienced in those areas subjected to deep mining. The presence of mine portals and shafts in the subterrain provide the rock strata with a void in which to settle following a seismic event. The settlement of earth into these voids can cause fissures or sinkholes on the surface, which could cause significant damage to buildings and other infrastructure on the surface, even following a minor seismic event.

Vulnerability Analysis

The effects of earthquakes are wide-ranging, from little or no effect, to major structural damage. The degree of damage largely depends on the location of the epicenter relative to the community and the magnitude of the event. As stated previously, these factors can not be controlled or predicted. Other factors such as the level of seismic design, the type of construction, and other site specific characteristics also play a role in the level of damages sustained during an earth quake.

The municipalities within the Cumberland Plateau Planning District currently utilize the Virginia Uniform Building Code. The Code, which references the seismic design level from BOCA 96, requires varying levels of seismic design, which depend on an importance factor determined by the structures use and nature of occupancy. The higher levels of seismic design are assigned to those structures where the risk of injury or loss of life is highest, or those whose function is most critical to the community should an event occur. Examples of these structures include a schools, health care facilities, power generating facilities, water and wastewater treatment facilities, police stations, and fire stations. Although these structures are required to be designed to resist higher levels of seismic activity, they also represent the highest vulnerability to earthquake losses within the Planning District.

When assessing vulnerability, a discussion of the probability of earthquake activity is necessary. As noted in earlier sections, there are two distinct seismic zones affecting the Planning District – the New Madrid Seismic Zone and the East Tennessee Seismic Zone.

Table V-18 —Periodicity of Earthquakes for the New Madrid Seismic Zone

Magnitude	Recurrence	$PROB_{15}$	$PROB_{50}$
>8.0	550-1200	0.3-1	2.7-4.0
7.0	255-500	5-9	19-29
6.0	70-90	40-63	86-97
5.0	10-12	~100	~100
4.0	14 months	~100	~100

http://www.uky.edu/ArtsSciences/Geology/webdogs/virtky/

From the above chart, it is apparent that there is a great chance that a magnitude 6 earthquake will strike the New Madrid Seismic Zone before the year 2040. This translates into the potential for property destruction when the event occurs. It has been estimated that if an earthquake similar to that of December 16, 1811, were to strike today, thousands of deaths would result at the epicenter, as well as billions of dollars in damage. Within the Cumberland Plateau Planning District, an Intensity Level of VI could be anticipated, meaning potential for chimney damage, plaster walls cracking, and some glass breakage.

Primary and Secondary Impacts

As listed in Table V-161, the primary impact of an earthquake can range from toppled chimneys and broken windows, to crack walls and roadways, to complete collapse of structures and bridges. Depending on the magnitude and location of the earthquake, the overall effects on the community can range from minimal to catastrophic. In larger events, loss of life and injuries can be extensive and the cost of damages can be massive. As stated previously, although historically moderate earthquakes have affected the Planning District, the potential for a higher magnitude earthquake does exist, due mainly to the proximity of the two key seismic zones.

In some cases, the secondary impacts from an earthquake can be as damaging and disruptive to a community and its citizens. The most significant potential secondary effect of an earthquake to the Planning District is the potential for landslides. Ground shaking during an earthquake can cause previously weakened steep slopes to fail, as well as otherwise stable slopes. The specific impacts of landslides are discussed further in other sections of this plan.

In addition to landslides other secondary effects can include disruption of critical services such as water, electrical, and telephone services. Damage to police stations, fire stations, and other emergency service facilities can weaken a community's ability to respond in the crucial hours and days following an event.

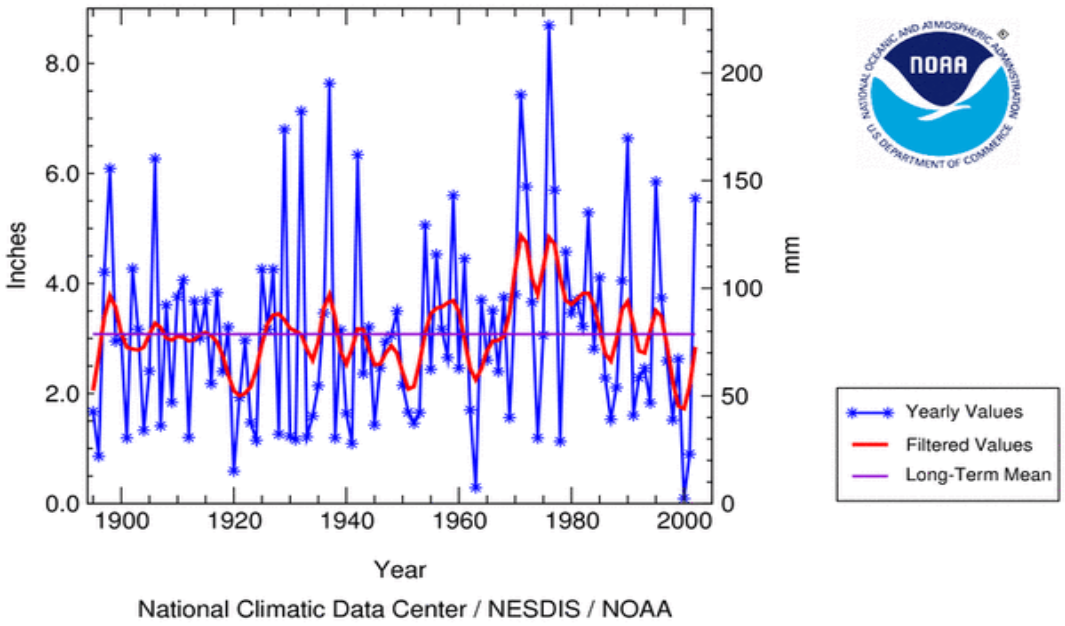
Drought

"Drought is a condition of moisture deficit sufficient to have an adverse effect on vegetation, animals, and man over a sizeable area" (USGS, 2000). Three significant types of drought can affect the Cumberland Plateau Planning District, which are meteorological, agricultural, or hydrologic drought. Meteorological drought is simply a departure from a normal precipitation amount, and is reliant on no other factors. Agricultural drought describes a soil moisture deficiency to the extent it effects the needs of plant life, primarily crops. Hydrologic drought is defined in terms of shortfall of water levels of lakes and reservoirs, and stream flow in rivers, streams, and soils (Multi Hazard Risk Assessment, 2000). Drought is a natural part of most climatic areas, but the severity of droughts differs based on duration, geographic extent, and intensity.

Hazard History

There have been a number of significant droughts recorded in Virginia since 1900. The most recent drought extended over a period of four years, from 1998 to 2002. This period saw rainfall levels well below normal and caused many communities throughout the region to institute water restrictions.

Although meteorologists have attempted to predict long term changes and trends in weather patterns, the onset of a significant drought can not be predicted. Extended periods of dry weather have occurred many times from over the past 100 years.



V-12 — Virginia Statewide Precipitation, October 1895-2002

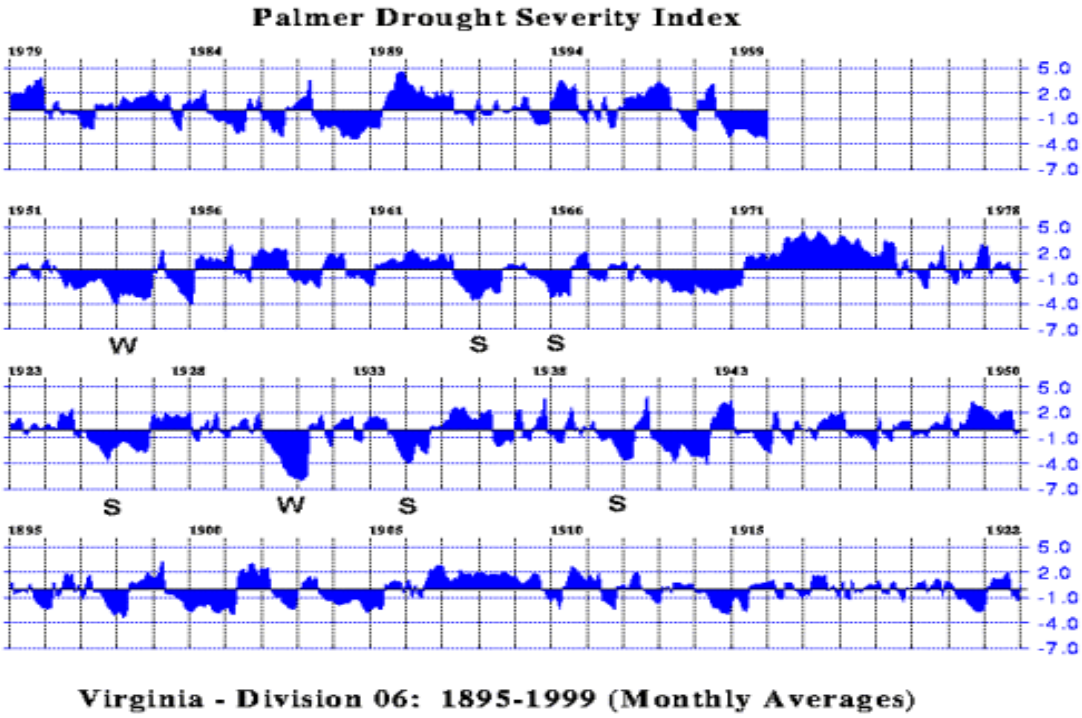
Hazard Profile

Just as there are multiple types of drought, there are multiple methods to indicate when a drought is occurring, as well as the severity of the drought. The multiple indices are based on a variety of data including precipitation amounts, stream flows, soil moisture, snow pack, as well as other water storage data. Commonly, the drought indices used depends on the type of drought being measured. It is important to note that not all types of drought must be occurring simultaneously. In some cases an area can be affected by one form of drought, while levels measuring another form of drought are normal.

The most commonly used drought indicator is the Palmer Drought Index. This index was developed in the 1960s by the National Oceanic and Atmospheric Administration, and uses temperature and rainfall data to determine dryness. Negative numbers indicate drought, while positive numbers indicate surplus rainfall. Minus two is considered a moderate drought, minus three is severe drought, and minus four is extreme drought. Likewise, positive two is considered a moderate rainfall, positive three a severe rainfall, and positive four, an extreme rainfall. In addition to the Palmer Index, the Standard Precipitation Index (SPI) and the Crop Moisture Index (CMI) also are used to measure drought. The SPI relates the deficit in precipitation compared to normal levels to varying degrees of time. Because the duration of lower than average precipitation levels has varying effects on stream flows, water storage levels, and soil moisture content, the SPI attempts to measure drought based on the long term deficit in precipitation. The CMI measures short term moisture conditions across predominate crop producing regions. It is based on the temperature and precipitation levels for a given week as well as the CMI value for the previous week (http://www.drought.unl.edu/whatis/indices.htm).

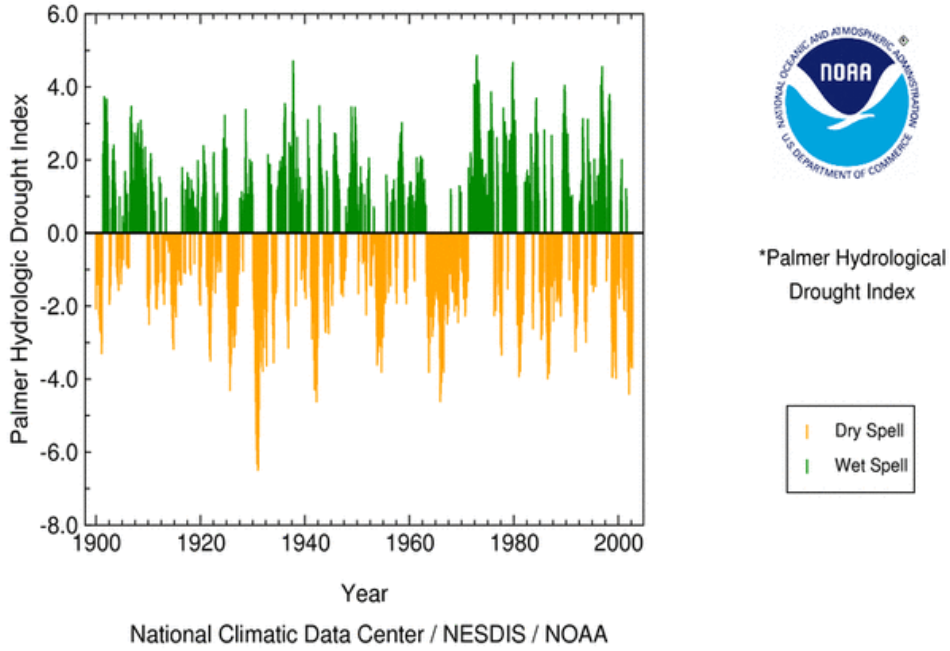
The Virginia State Climatology Office uses the Palmer Drought Severity Index (PDSI) to measure long-term moisture status. A reading of -3.0 is considered to be a "severe drought." The drought index for the week ending January 1, 2000 was -2.68.

Shown below is the PDSI history for Southwest Virginia from 1895 through January 1, 2000. Each period in which the value averaged around -3.0 for a half year or longer is underscored and marked with an "S" for similar to the existing conditions on January 1, 2000 and "W" for worse.



Virginia State Climatology Office

Figure V-13 — Southwest Virginia Palmer Drought Severity Index



V-14 — Virginia Statewide Palmer Hydrological Drought Index, January 1900 – October 2002

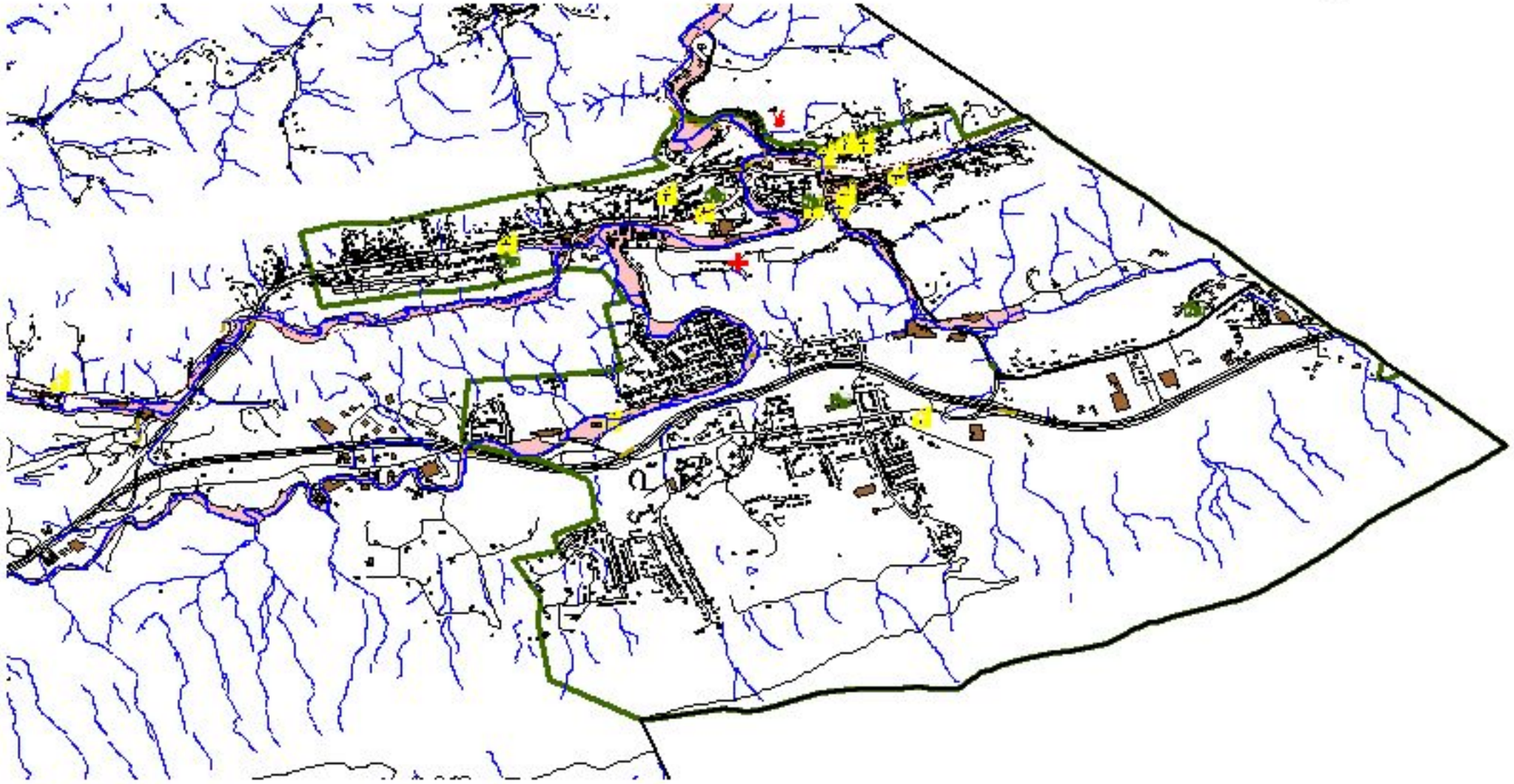
Vulnerability Analysis

If a significant drought event were to occur, it could bring extensive economic, social, and environmental impacts to the Planning District. Commonly one of the most significant economic effects to a community is the agricultural impacts. Other economic effects could be felt by businesses that rely on adequate water levels for their day to day business such as carwashes and laundromats.

Drought also can create conditions that promote the occurrence of other natural hazards such as wildfires and wind erosion. The likelihood of flash flooding is increased if a period of severe drought is followed by a period of extreme precipitation. Low-flow conditions also decrease the quantity and pressure of water available to firefighters to fight fires, while the dry conditions increase the likelihood fires will occur.

Environmental drought impacts include those on both human and animal habitats and hydrologic units. During periods of drought, the amount of available water decreases in lakes, streams, aquifers, soil, wetlands, springs, and other surface and subsurface water sources. This decrease in water availability can affect water quality such as salinity, bacteria, turbidity, and temperature increase and pH changes. Changes in any of these levels can have a significant effect on the aquatic habitat of a numerous plants and animals found throughout the Planning District. Low water flow can result in decreased sewage flows and subsequent increases in contaminants in the water supply. Decrease in the availability of water also decreases drinking water supply and the food supply as food sources become scarcer. This disruption can work its way up the food chain within a habitat. Loss of biodiversity and increases in mortality can lead to increases in disease and endangered species.

Bluefield, Virginia 100-YR Floodplain



Legend

- Streams
- Bridge
- Utility
- Railroad
- Police
- Government Building
- Industrial Park
- Hospitals and Clinics
- Fire
- Ambulance
- Schools
- Church
- Water\Sewer Treatment Plant
- Structures
- 100-YR Floodplain

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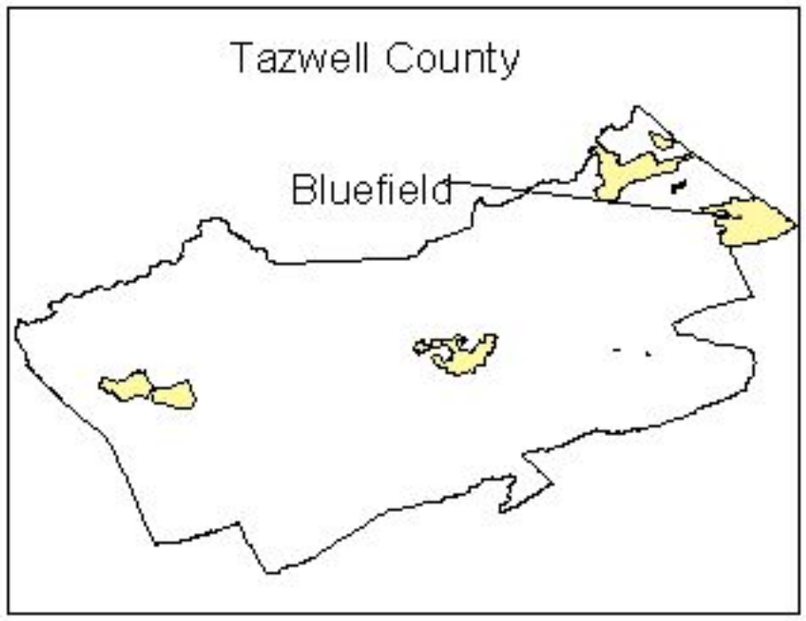
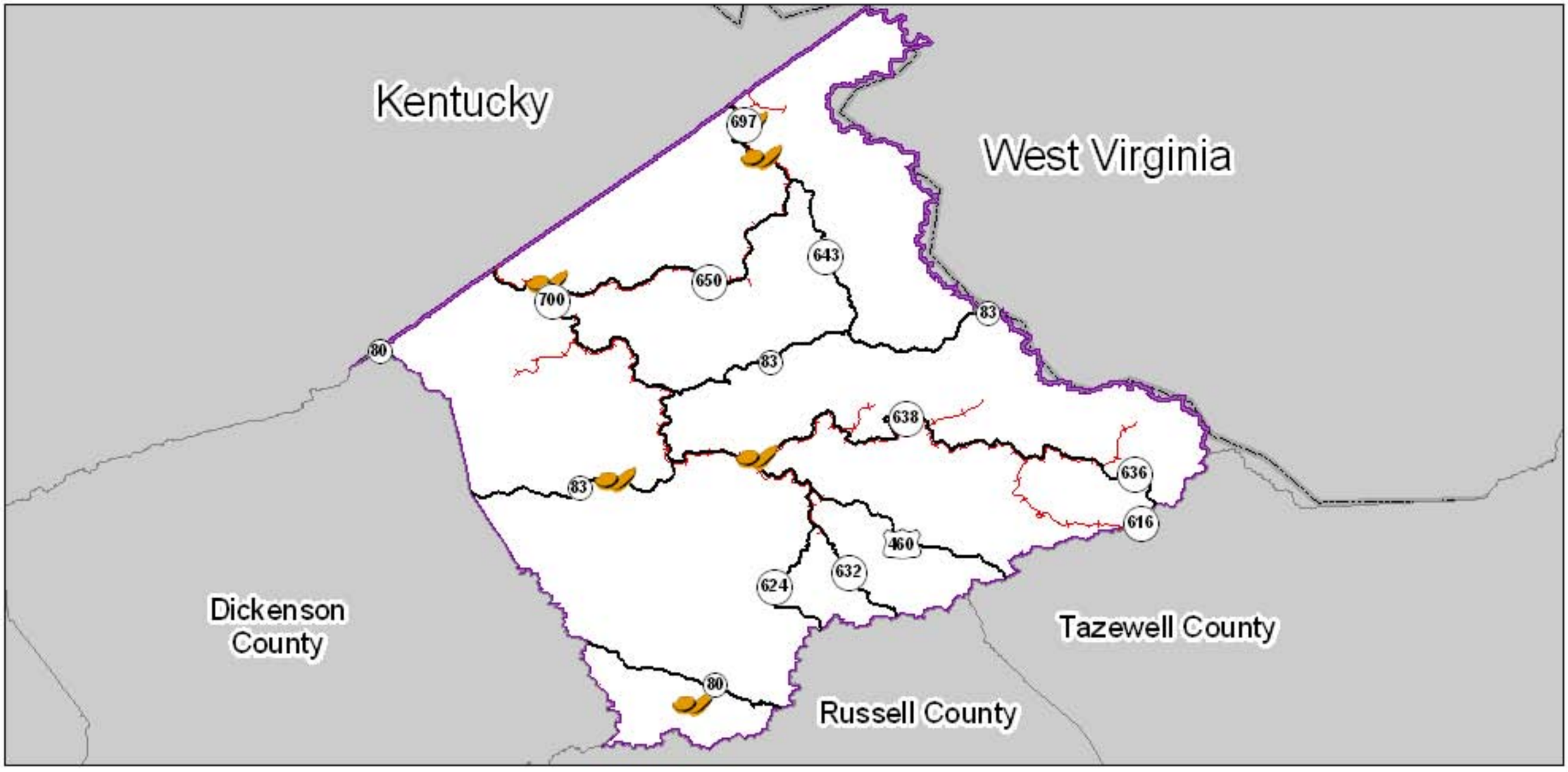


Buchanan County, Virginia Landslide Locations



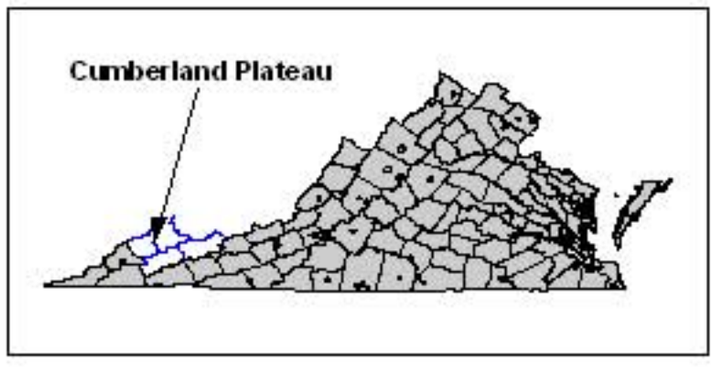
Legend

- Landslide Locations
- County Boundary
- Major Roads
- Railroads
- Water

N

6 0 6 12

Miles



Cedar Bluff, Virginia 100-YR Floodplain

Legend

- Streams
- Bridge
- Utility
- Railroad
- Police
- Government Building
- Industrial Park
- Hospitals and Clinics
- Fire
- Ambulance
- Schools
- Church
- Water\Sewer Treatment Plant
- Structures
- 100-YR Floodplain

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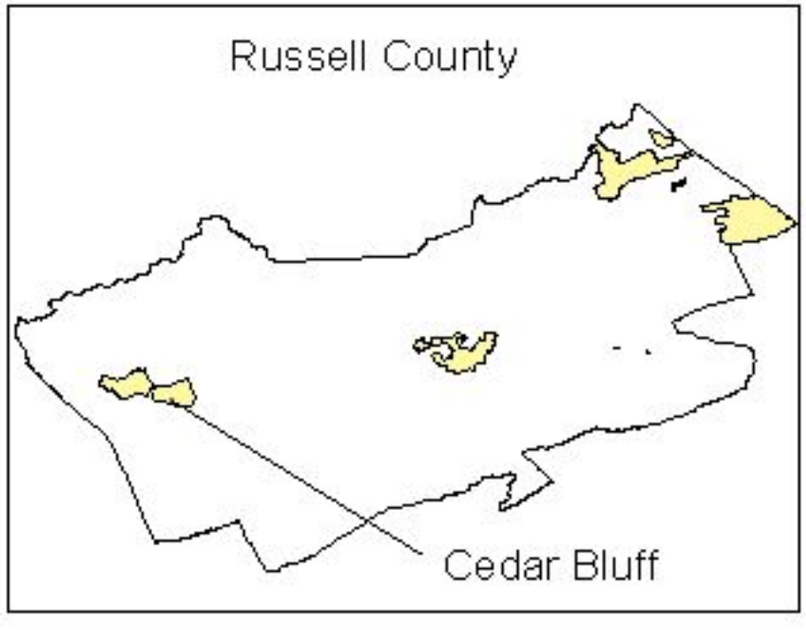
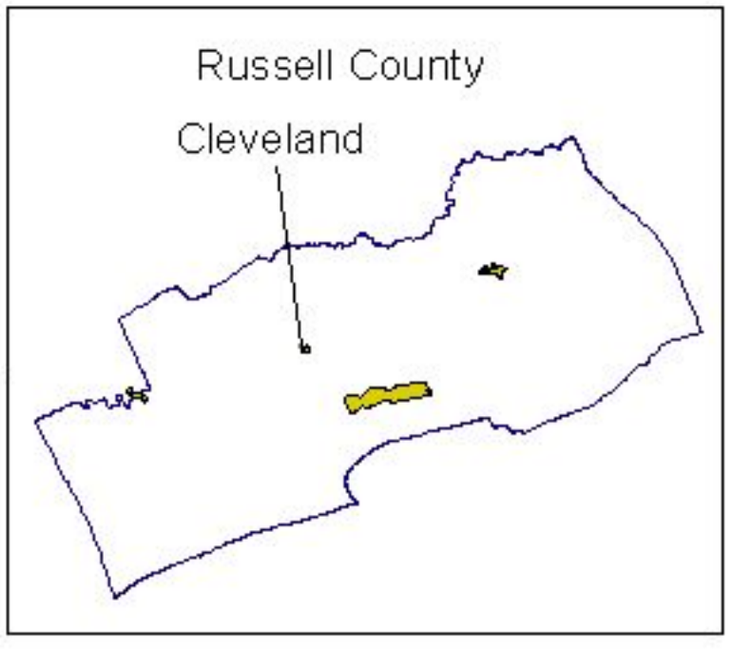


Cleveland, Virginia 100-YR Floodplain

Legend

- Streams
- Utility
- Railroad
- Police
- Government Building
- Industrial Park
- Hospitals and Clinics
- Schools
- Fire
- Ambulance
- Church
- Water\Sewer Treatment Plant
- Structures
- 100-YR Floodplain



Clinchco, Virginia 100-YR Floodplain

Legend

- Streams
- Bridge
- Utility
- Railroad
- Police
- Government Building
- Industrial Park
- Hospitals and Clinics
- Fire
- Ambulance
- Schools
- Church
- Water\Sewer Treatment Plant
- Structures
- 100-YR Floodplain

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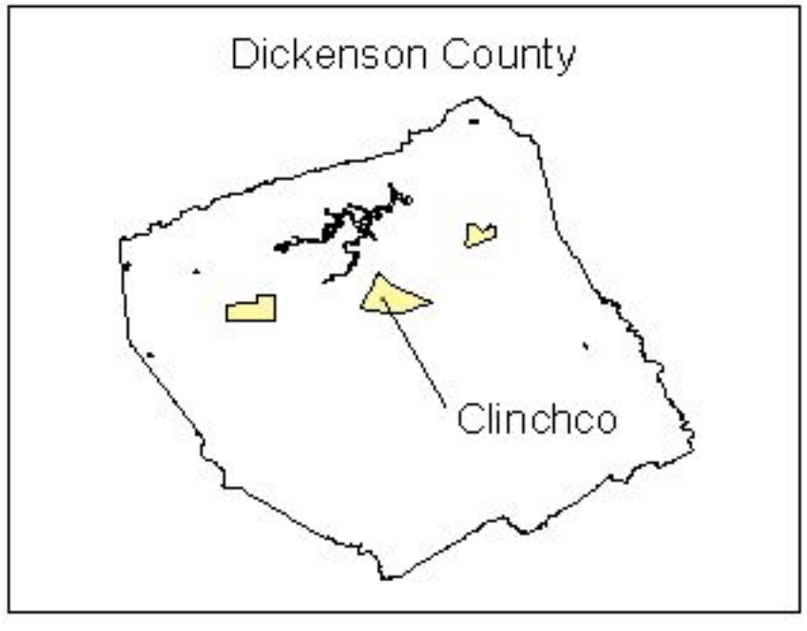
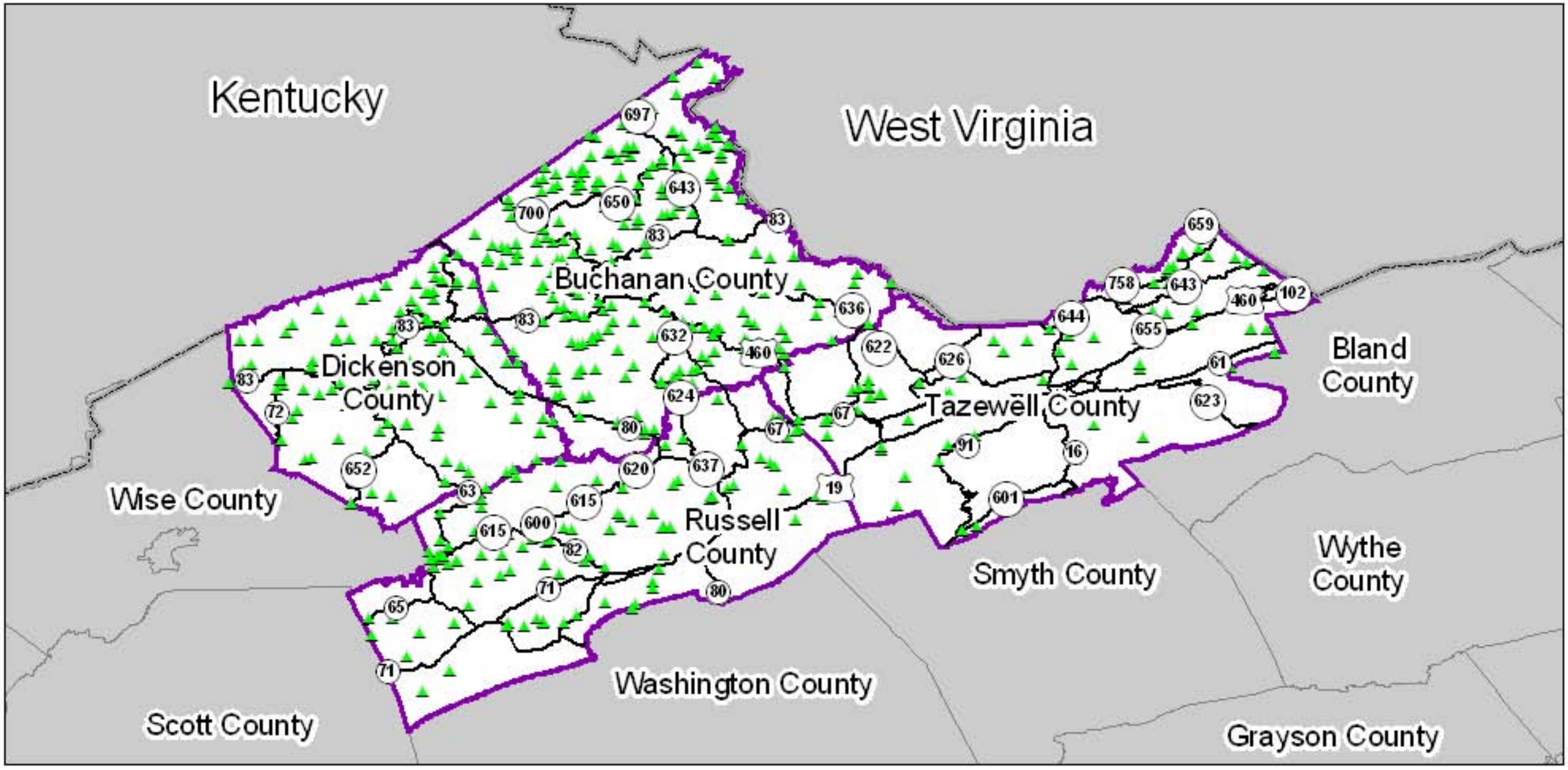


Cumberland Plateau, Wildfire Incidents From 1995 to 2001



Legend

- Wildfire Incidents
- Major Roads
- County Boundary

Wildfire Incident Data from: The Virginia Department of Forestry, July 2003, wra-03-statewide

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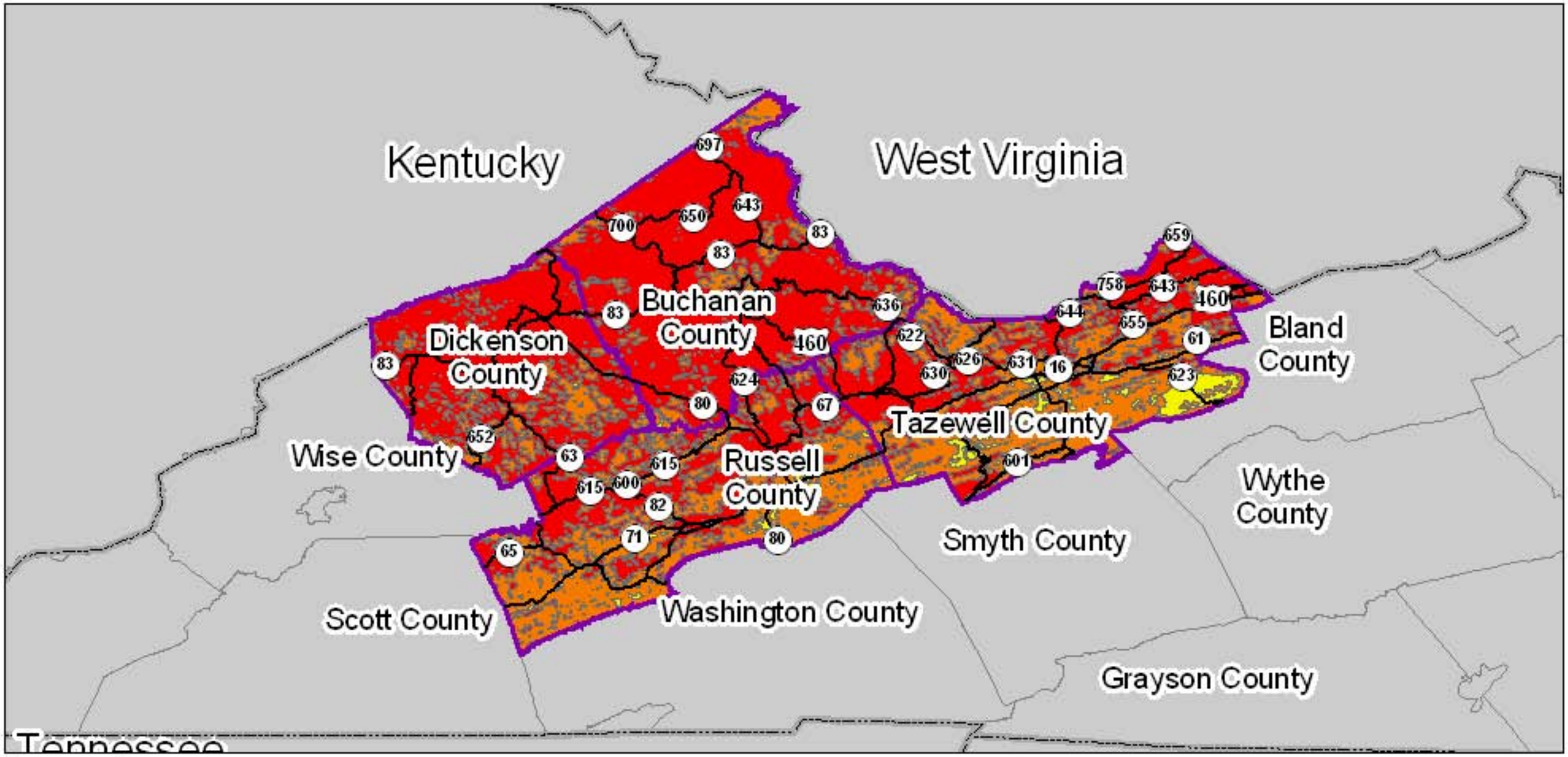
Miles

Cumberland Plateau, Virginia Fire Risk Zones



Legend

Fire Risk Zones

- Low
- Medium
- High

Major Roads

County Boundary

N

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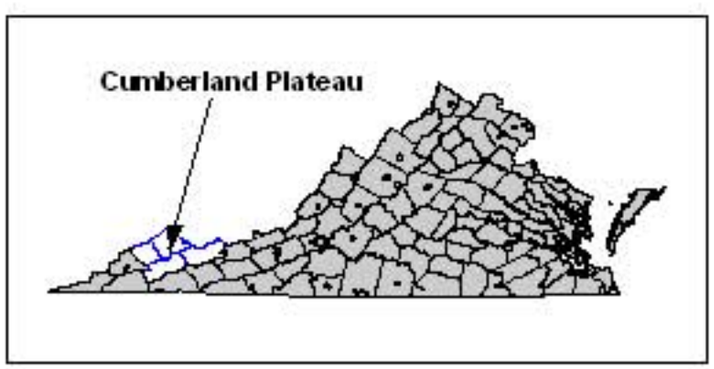
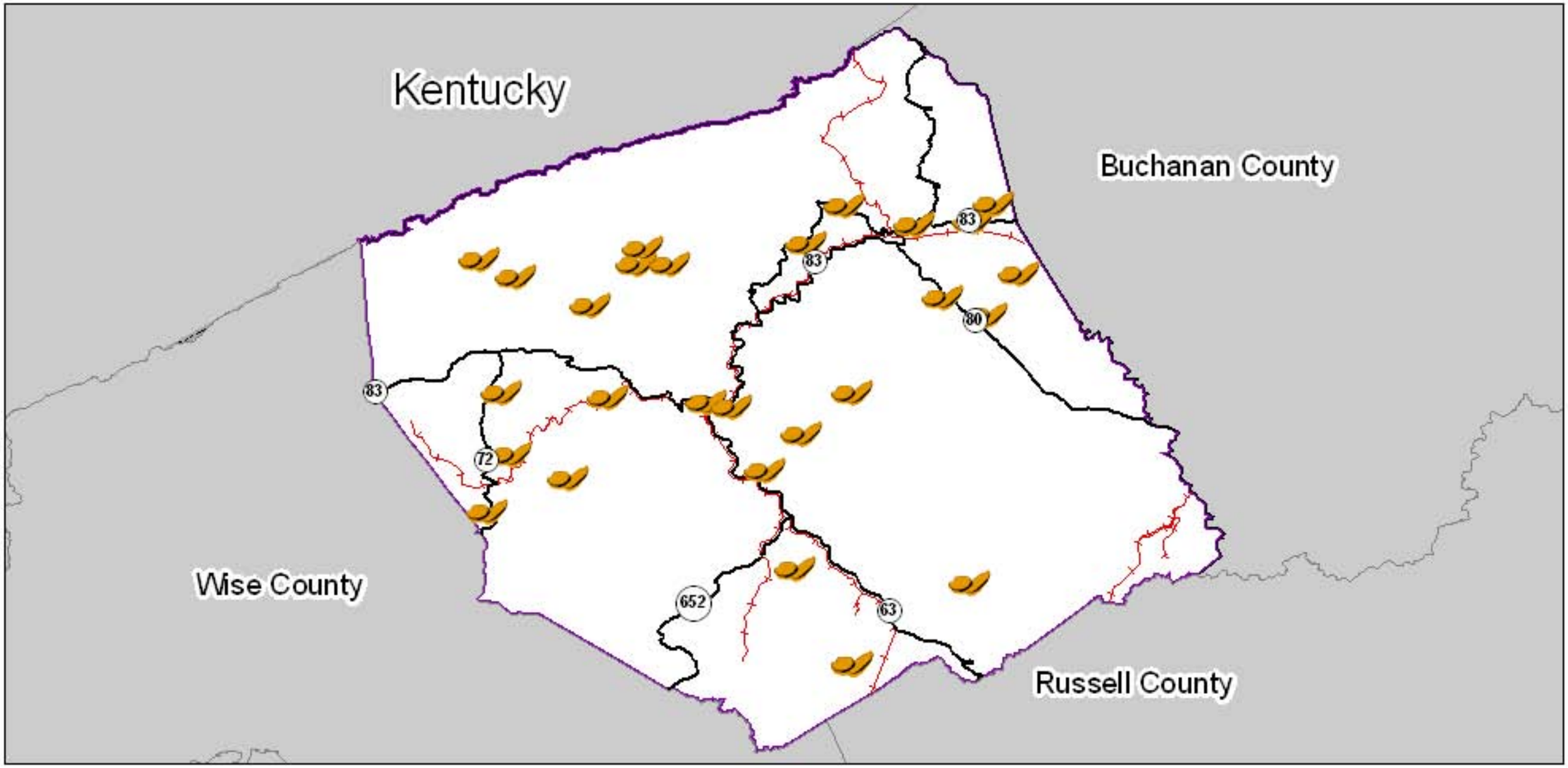
Miles



Wildfire Risk Data from The Virginia Department of Forestry, July 2003, wra-03-statewide

Dickenson County, Virginia Landslide Locations



Legend

- Landslide Locations
- County Boundary
- Major Roads
- Railroads
- Water

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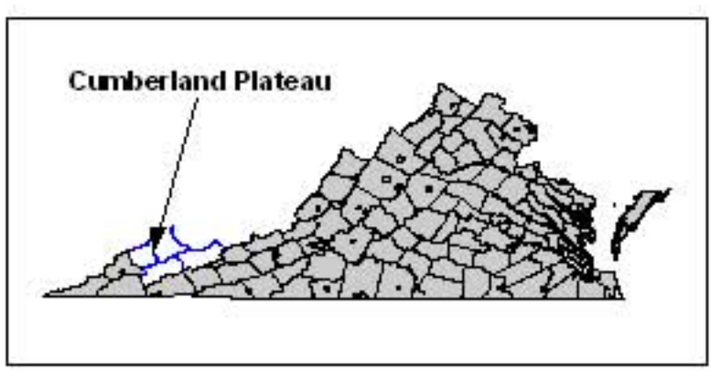
6 0 6 12

Miles



Grundy, Virginia 100-YR Floodplain

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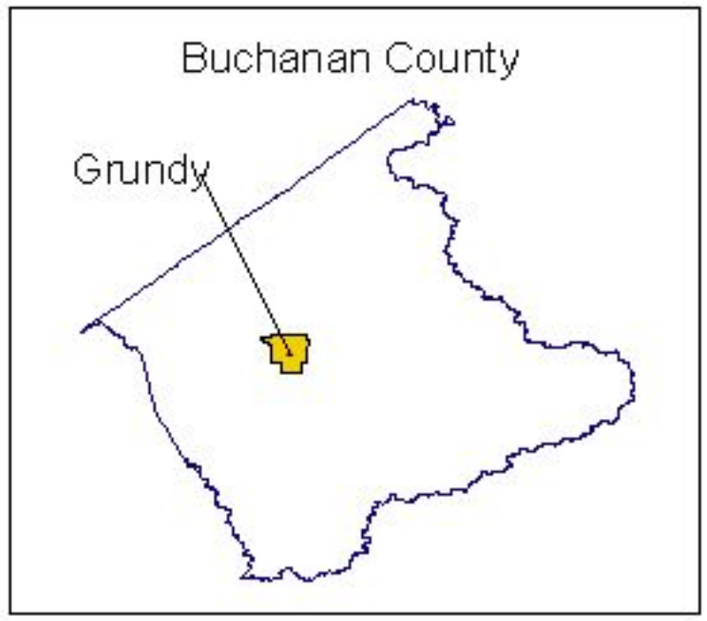
W E
S

Legend

- Streams
- Bridge
- Utility
- Railroad
- Government Building
- Hospital
- Schools
- Church
- Water/Sewer Treatment Plant
- Fire
- Ambulance
- Buildings
- 100-YR Floodplain



Haysi, Virginia 100-YR Floodplain

Legend

- Streams
- Bridge
- Utility
- Railroad
- Police
- Government Building
- Industrial Park
- Hospitals and Clinics
- Fire
- Ambulance
- Schools
- Church
- Water\Sewer Treatment Plant
- Structures
- 100-YR Floodplain

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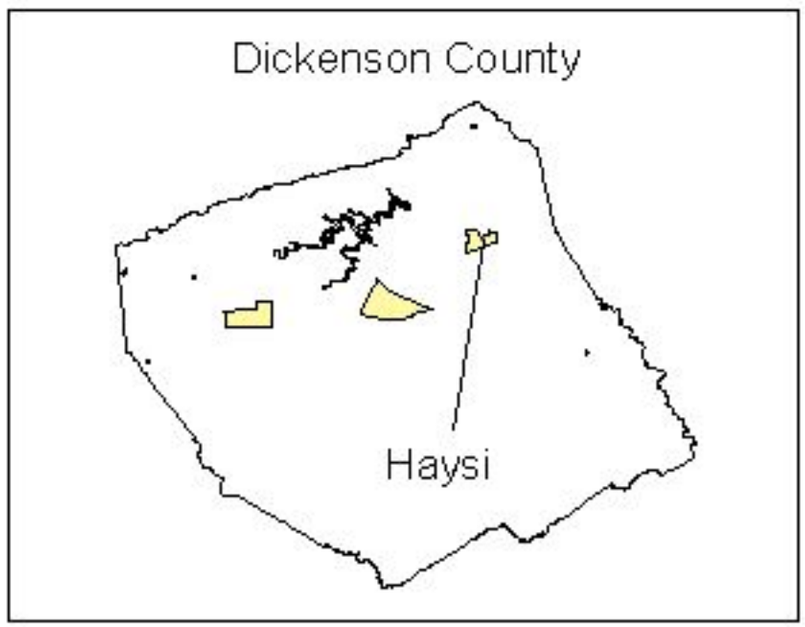

Honaker, Virginia 100-YR Floodplain

Legend

- Streams
- Bridge
- Utility
- Railroad
- Police
- Government Building
- Industrial Park
- Hospitals and Clinics
- Fire
- Ambulance
- Schools
- Church
- Water\Sewer Treatment Plant
- Structures
- 100-YR Floodplain

N
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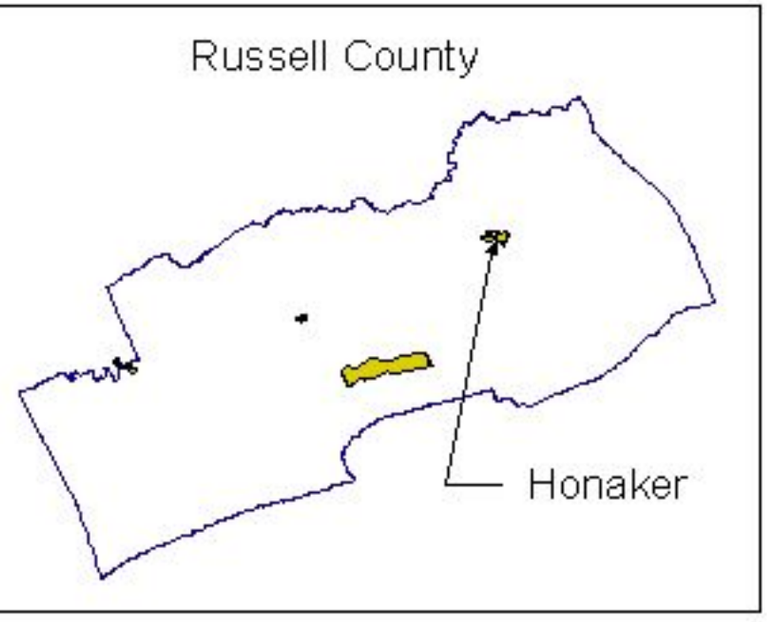

Lebanon, Virginia 100-YR Floodplain

Legend

- Streams
- Utility
- Railroad
- Police
- Government Building
- Industrial Park
- Hospitals and Clinics
- Schools
- Fire
- Ambulance
- Church
- Water\Sewer Treatment Plant
- Structures
- 100-YR Floodplain

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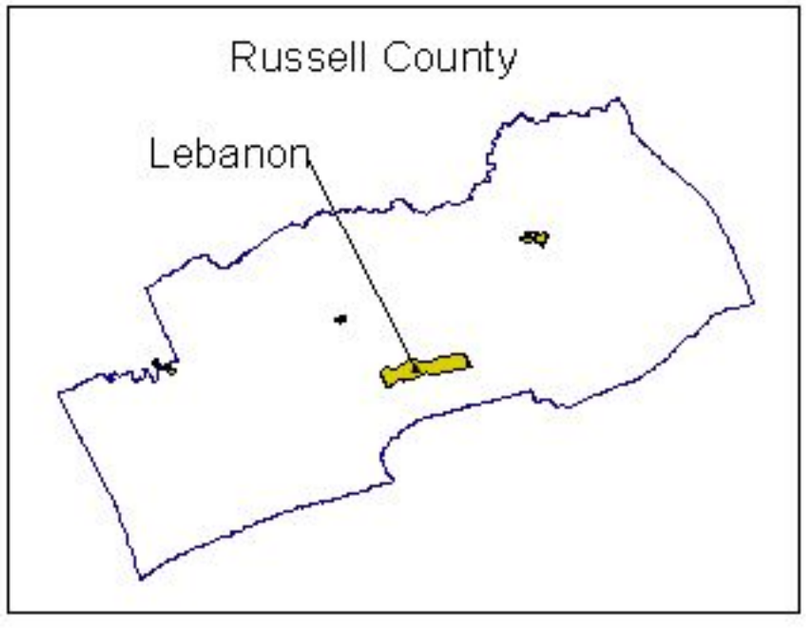
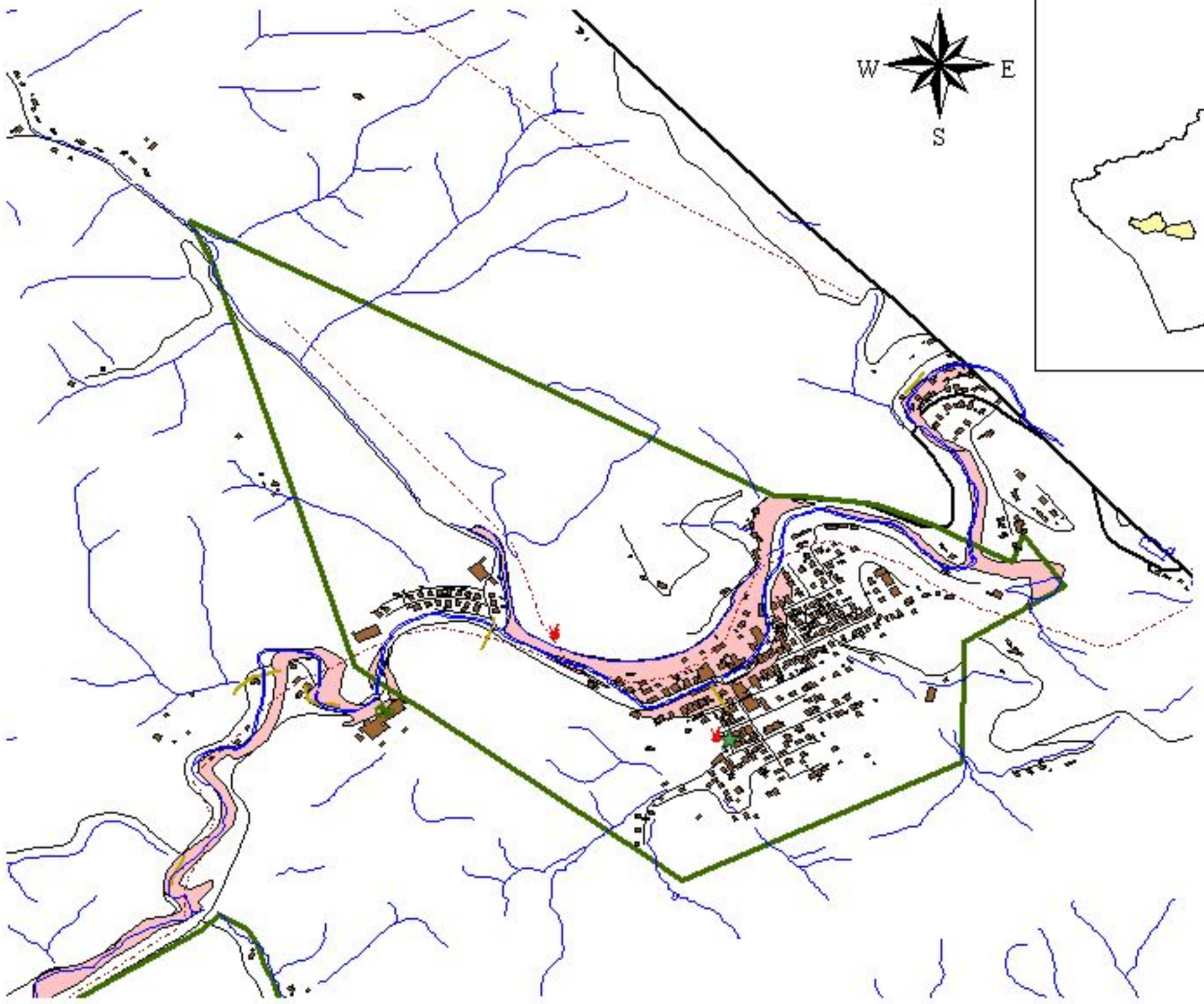
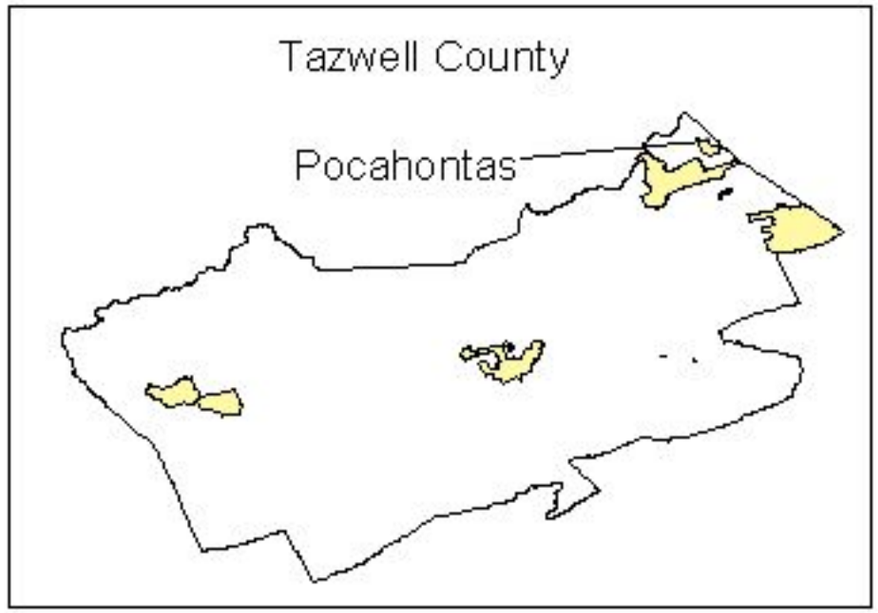


Pocahontas, Virginia 100-YR Floodplain





Legend

- Streams
- Utility
- Railroad
- Police
- Government Building
- Industrial Park
- Hospitals and Clinics
- Schools
- Fire
- Ambulance
- Church
- Water\Sewer Treatment Plant
- Structures
- 100-YR Floodplain

Richlands, Virginia 100-YR Floodplain

Legend

- Streams
- Bridge
- Utility
- Railroad
- Police
- Government Building
- Industrial Park
- Hospitals and Clinics
- Fire
- Ambulance
- Schools
- Church
- Water\Sewer Treatment Plant
- Structures
- 100-YR Floodplain

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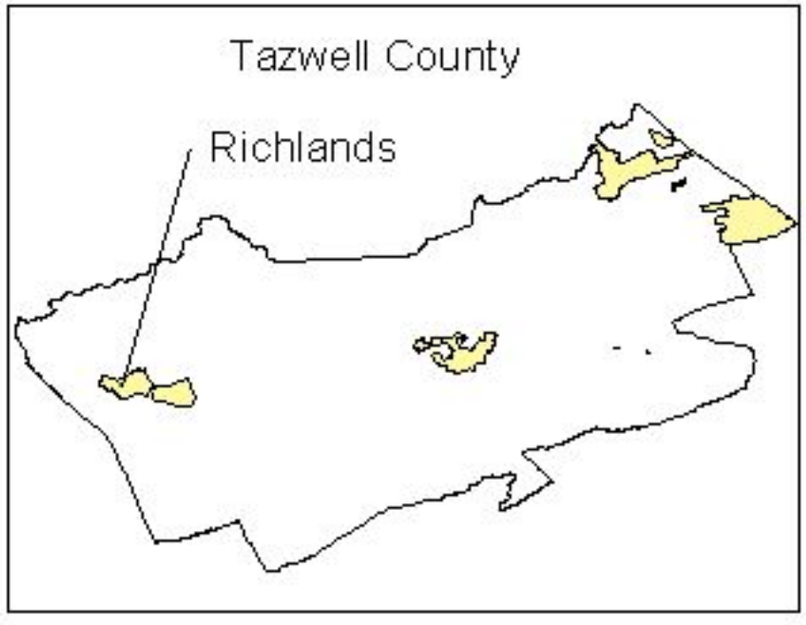


Russell County, Virginia Landslide Locations

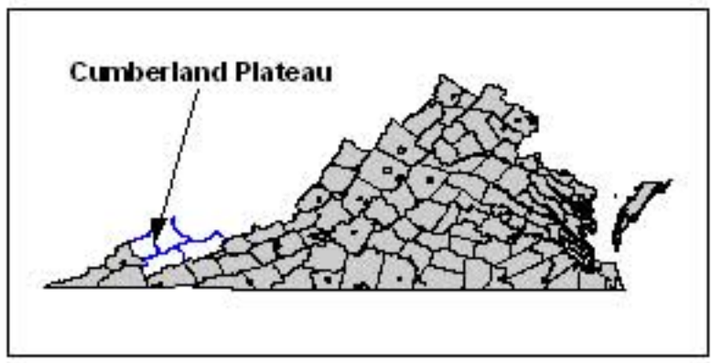
Legend

- Landslide Locations
- County Boundary
- Major Roads
- Railroads
- Water

N

6 0 6 12

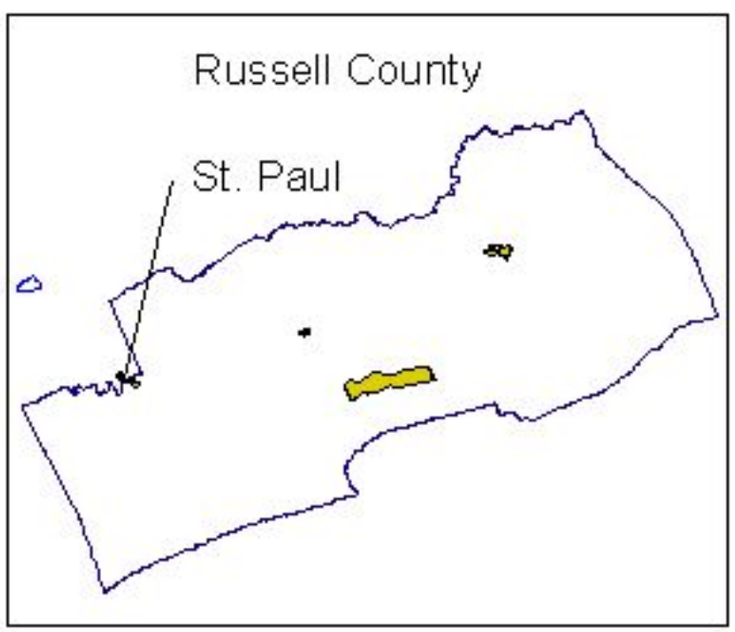
Miles



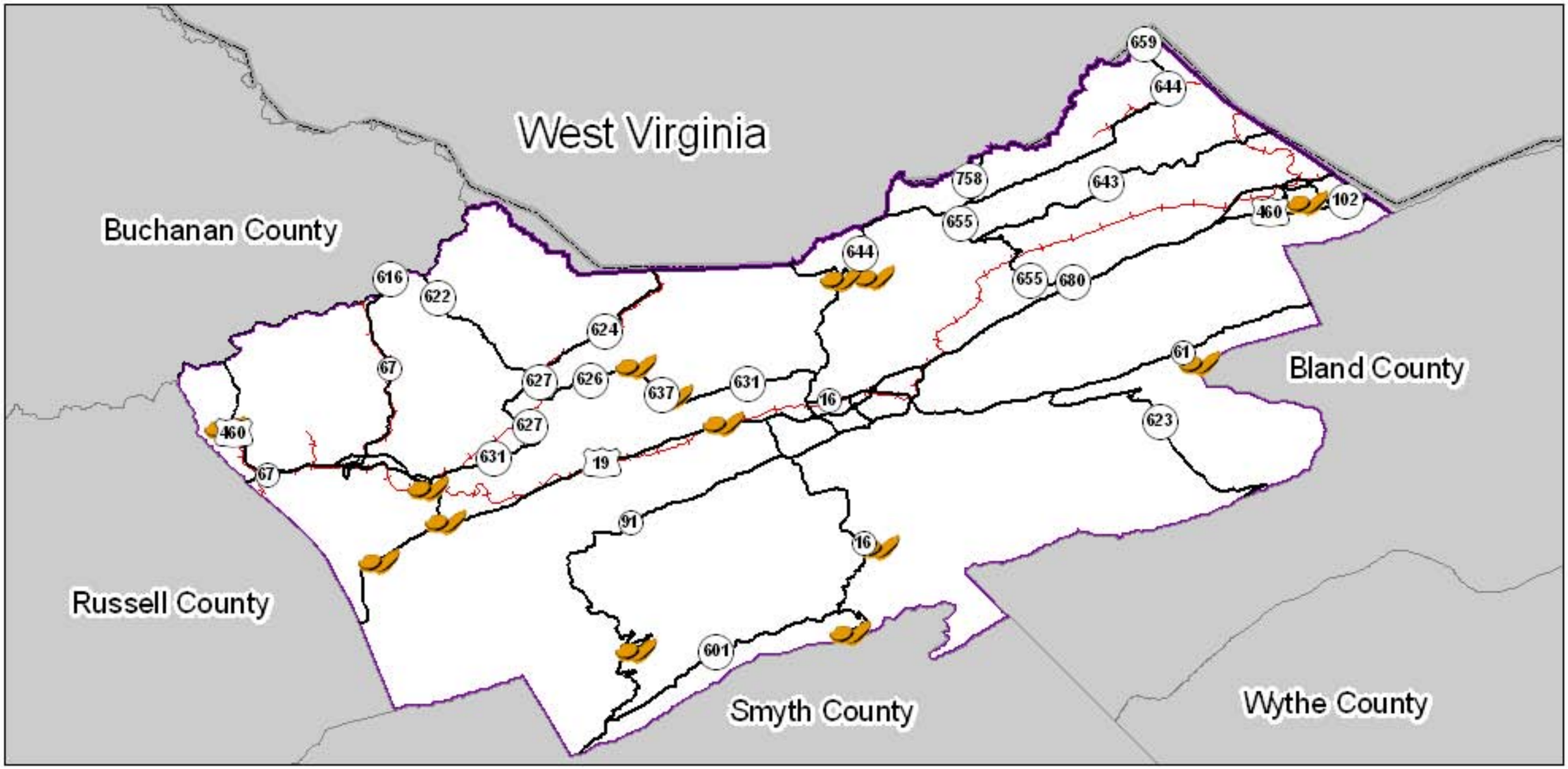
St. Paul, Virginia 100-YR Floodplain

Legend

- Streams
- Utility
- Railroad
- Police
- Government Building
- Industrial Park
- Hospitals and Clinics
- Schools
- Fire
- Ambulance
- Church
- Water\Sewer Treatment Plant
- Structures
- 100-YR Floodplain



Tazewell County, Virginia Landslide Locations



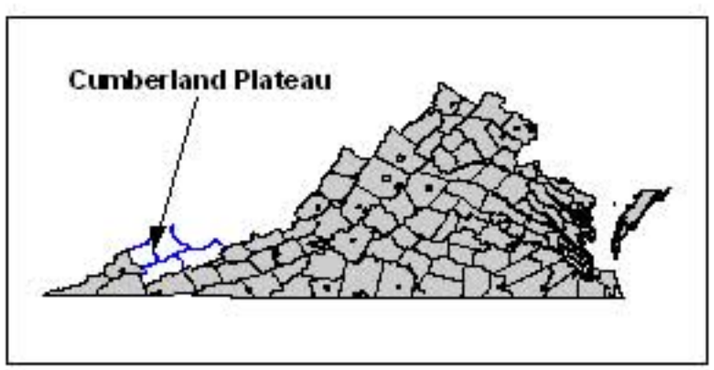
Legend

- Landslide Locations
- County Boundary
- Major Roads
- Railroads
- Water

N

6 0 6 12

Miles



Tazewell, Virginia 100-YR Floodplain

Legend

- Streams
- Bridge
- Utility
- Railroad
- Police
- Government Building
- Industrial Park
- Hospitals and Clinics
- Fire
- Ambulance
- Schools
- Church
- Water\Sewer Treatment Plant
- Structures
- 100-YR Floodplain

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Tazwell County

Tazwell

SECTION VI. CAPABILITY ASSESSMENT

Introduction

This portion of the Plan assesses the Cumberland Plateau Planning District's current capacity to mitigate the effects of the natural hazards identified in Section V of the plan. This assessment includes a comprehensive examination of the following local government capabilities:

1. *Staff and Organizational Capability*
2. *Technical Capability*
3. *Fiscal Capability*
4. *Policy and Program Capability*
5. *Legal Authority*
6. *Political Willpower*

The purpose of conducting the capabilities assessment is to identify potential hazard mitigation opportunities available to the Cumberland Plateau Planning District's local governments including the Counties of Buchanan, Dickenson, Russell and Tazewell. Careful analysis should detect any existing gaps, shortfalls, or weaknesses within existing governmental activities that could exacerbate a community's vulnerability. The assessment also will highlight the positive measures already in place or being done at the County level, which should continue to be supported and enhanced, if possible, through future mitigation efforts.

The capabilities assessment serves as the foundation for designing an effective hazard mitigation strategy. It not only helps establish the goals and objectives for the Planning District to pursue under this Plan, but assures that those goals and objectives are realistically achievable under given local conditions.

This section of the plan is divided into four parts, each of which is a brief profile of the capabilities of the participating jurisdictions. The following table summarizes the plans and ordinances of each jurisdiction that can support hazard mitigation goals and strategies.

Table VI-1 — Capability Matrix - Plans and Ordinances

Plan or Ordinance	Buchanan County	Dickenson County	Russell County	Tazewell County
Building Code		X	X	X
Capital Improvements Plan or Program				
Comprehensive Land Use Plan		X	X	X
Emergency Operations Plan		X	X	
Floodplain		X	X	X

Management Ordinance				
Floodplain Management Plan				
Land Use Regulation				
Local Hazard Mitigation Plan				
Open Space Plan				
Stormwater Management Plan				
Stormwater Ordinance				
Subdivision Ordinance		**X**	**X**	**X**
Watershed Protection Plan				
Zoning Ordinance				

Buchanan County

1. Staff and Organizational Capability

Buchanan County has limited staff and organizational capability to implement hazard mitigation strategies. Buchanan County is governed by a seven-member Board of Supervisors. The members represent the seven districts into which the county is divided. There is also a County Administrator. The Board bears the responsibility of serving the people and improving the quality of life in the County. The business of the County is conducted through the department and board system. There are eight (8) county departments and twenty-nine (29) boards and commissions.

Those professional staff departments and boards are as follows:

- Board Of Election Commissioners
- Legal Department
- Fire Department
- Sheriff's Department
- Public Works Department
- Board Of Building Code Appeals
- Black Diamond R C & D Council
- Coal Haul Road And Gas Improvements Adv. Committee
- Cumberland Mountain Community Service Board
- Cumberland Plateau Planning District
- Cumberland Plateau Regional Waste Mgmt Authority
- Disability Service Board
- Emergency Services
- Finance Committee
- Buchanan General Hospital Board
- Industrial Development Authority
- Insurance Committee
- John Flannagan Water Authority
- Parks And Recreation Board
- Personnel Committee
- Planning Commission
- Buchanan County Public Library
- Public Service Authority
- Buchanan County Public School
- Social Services Advisory Board

- Southwest Virginia Community College Board
- Southwest Virginia Community Corrections Board
- Southwest Virginia Emergency Medical Services Council
- Tourism
- Youth Services Advisory Board

The Board of Supervisors is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events.

The Buchanan County Building Code does not maintains a full time planner that is also responsible for addressing land use planning, as well as, developing mitigation strategies. The Buchanan County Building Code enforces the National Flood Insurance Program requirements and other applicable local codes.

The Buchanan County Coal Haul Road Gas Improvement Department oversees the maintenance of county roadways. The Buchanan County Public Service Authority oversees the sewer and stormwater facilities and the community's water treatment facilities.

Of the above-listed County departments, agencies and offices, the Buchanan County Emergency Management Department is assigned specifically delegated responsibilities to carry out mitigation activities or hazard control tasks. They have been involved in the development of this mitigation plan in order to identify gaps, weaknesses or opportunities for enhancement with existing mitigation programs. For the most part, it was determined that the departments are adequately staffed, trained and funded to accomplish their missions.

2. Technical Capability

Buchanan County has limited technical capability to implement hazard mitigation strategies.

2.A. Technical Expertise

The County does not have a full-time planner on staff to administer the community's hazard mitigation programs. The County Engineer provides expertise in the area of water resources and associated technical work. The County does have an inspections office which enforces a building code.

The County does not have a person responsible for Information Technology (IT) which can enhance local government operations and the community's ability to develop and maintain a state-of-the art hazard mitigation program.

2.B. Geographic Information Systems (GIS)

GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially referenced data. Many local governments are now incorporating GIS systems into their existing planning and

management operations. Buchanan County does currently have GIS capability to further hazard mitigation goals.

2.C. Internet Access

Buchanan County does provide some of its critical employees with high-speed broadband Internet service. Internet access provides an enormous opportunity for local officials to keep abreast of the latest information relative to their work and makes receiving government services more affordable and convenient. Information technology also offers increased economic opportunities, higher living standards, more individual choices, and wider and more meaningful participation in government and public life. Simply put, information technology can make distance – a major factor for County officials and residents - far less important than it used to be. It is believed that Internet access will help further the community's hazard mitigation awareness programs, but should be supplemented with more traditional (and less technical) means as well.

3. Fiscal Capability

Buchanan County has limited fiscal capability to implement hazard mitigation strategies. For Fiscal Year 2003, the County's budgeted expenditures were ($33,493.00). The majority of these funds are obligated to operations although "public safety" did cost the county ($33,493.00) for this period according to the most recent financial statements. The County receives most of its revenues through State and Local sales tax and other local services and through restricted intergovernmental contributions (federal and state pass through dollars). Considering the current budget deficits at both the State and local government level, in Virginia, combined with the apparent increased reliance on local accountability by the Federal government, this is a significant and growing concern for Buchanan County.

Under the Disaster Mitigation Act of 2000, FEMA has made special accommodations for "small and impoverished communities", who will be eligible for a 90% Federal share, 10% non-Federal cost share for projects funded through the Pre-Disaster Mitigation (PDM) grant program. Unfortunately, according to the current Interim Final Rule for Section 322 of the Act, Buchanan County will not qualify as a small and impoverished community. The definition is restricted to "communities of 3,000 or fewer individuals that is identified by the State as a rural community."

4. Policy and Program Capability

This part of the capabilities assessment includes the identification and evaluation of existing plans, policies, practices, programs, or activities that either increase or decrease the community's vulnerability to natural hazards. Positive activities, which decrease hazard vulnerability, should be sustained and enhanced if possible. Negative activities, which increase hazard vulnerability, should be targeted for reconsideration and be thoroughly addressed within Mitigation Strategy for Buchanan County.

4.A. Recent Hazard Mitigation Efforts

Buchanan County has not undertaken specific hazard mitigation efforts in the past.

4.B. Community Rating System Activities

Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction.

Buchanan County does not participate in the Community Rating System.

4.C. Emergency Operations Plan

Buchanan County has developed and adopted a Comprehensive Emergency Management Plan dated January 2003 which predetermines actions to be taken by government agencies and private organizations in response to an emergency or disaster event. For the most part, the Plan describes the County's capabilities to respond to emergencies and establishes the responsibilities and procedures for responding effectively to the actual occurrence of a disaster. The Plan does not specifically address hazard mitigation, but it does identify the specific operations to be undertaken by the County to protect lives and property immediately before, during and immediately following an emergency. There are no foreseeable conflicts between this Hazard Mitigation Plan and Buchanan County's Comprehensive Emergency Management Plan, primarily because they are each focused on two separate phases of emergency management (mitigation vs. preparedness and response). The Plan does identify the Board of Supervisors as having lead role in the long-term reconstruction phase following a disaster – which presents a unique window of opportunity for implementing hazard mitigation strategies. However, none are specified within the Emergency Management Plan.

4.D. Floodplain Management Plan

Buchanan County does not currently have a separate floodplain management plan for purposes of the National Flood Insurance Program's Community Rating System (CRS). This plan is intended to fulfill the CRS planning requirement should the City decide to enter the CRS.

4.E. Stormwater Management Plan

Buchanan County does not currently have an adopted stormwater management plan, but does apply stormwater management provisions through their subdivision regulations. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval.

4.F. Comprehensive Plan

Buchanan County has developed and adopted a Comprehensive Plan in September 1994. The plan provides the future vision for the community regarding growth and development. Hazard mitigation planning is not specifically addressed in the plan.

4.G. Ordinances

Buchanan County has adopted several ordinances that are relevant to hazard mitigation. The following worksheet provides an inventory of these ordinances, along with specific information to be considered when developing this Plan's Mitigation Strategy. For each ordinance, the following should be identified:

Table VI-2 — Dickenson County Ordinances Related to Hazard Mitigation

Title(s)	Adoption Date(s)	Description/Purpose(s)	Mitigation Effectiveness
Building Construction	7/3/1974	The Building Construction Ordinances controls all matters concerning the construction, alteration, addition, repair, removal, demolition, use, location, occupancy and maintenance of all buildings and all other functions which pertain to the installation of all systems vital to all buildings and structures and their service equipment, as defined by the Virginia Uniform Statewide Building Code.	Moderate
Erosion And Sediment Control	7-7-1998	The purpose is to conserve the land, water, air and other natural resources of Buchanan County. It establishes requirements for the control of erosion and sedimentation, and establishes procedures whereby these requirements shall be administered and enforced.	MODERATE
Flood Damage Prevention Ordinance	3/3/1997	The purpose of the ordinance is to prevent the loss of life and property, the creation of health and safety hazards, the disruption of commerce and governmental services, the extraordinary and unnecessary expenditure of public funds for flood protection and relief and the impairment of the tax base. The Flood Damage Prevention Ordinance is designed to minimize public and private losses due to flood conditions in specific areas. It requires a development permit be submitted to the County prior to any construction or substantial improvement activities. Permits will only be approved if they meet the provisions of the ordinance,	HIGH

Table VI-2 — Dickenson County Ordinances Related to Hazard Mitigation			
Title(s)	**Adoption Date(s)**	**Description/Purpose(s)**	**Mitigation Effectiveness**
		which include development standards that will minimize the potential for flood losses. Standards are established for construction materials, equipment, methods, practices and uses. Most importantly, establishes the requirements for elevation and floodproofing (non-residential) to base flood elevation. The Ordinance requires the minimum standards of the National Flood Insurance Program (NFIP). The County's floodplain areas are currently being re-studied as part of the State's Floodplain Mapping Program. It is possible those floodplain areas will be re-delineated with updated topography, and that base flood elevations will be recalculated.	
Land Use	9/3/1996	The Land Use ordinance is intended to guide and facilitate the orderly and beneficial growth of Buchanan County land to promote the public health, safety, convenience comfort, prosperity and general welfare of the county.	MODERATE
Subdivision Ordinance	9/3/1996	The Subdivision Ordinance is designed to regulate all divisions of land for purposes of sale or building development (immediate or future), including all divisions of land involving the dedication of new streets/roads or a change in existing streets/roads. All proposed subdivisions must go through an approval process involving multiple individuals/agencies. Subdivision plats are required for review and must include the location of areas subject to flooding. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements	MODERATE

Table VI-2 — Dickenson County Ordinances Related to Hazard Mitigation			
Title(s)	**Adoption Date(s)**	**Description/Purpose(s)**	**Mitigation Effectiveness**
		must be completed before final plat approval. Plats are also reviewed by the local permit officer to determine what additional permits are required. Furthermore, all waterfront development must meet setback requirements and impervious surface requirements. Plats are also reviewed by Terra Tech Inc. to identify matters of topography and drainage. Although not designed specifically for hazard mitigation purposes, this ordinance will prevent flood losses in tandem with the Flood Damage Prevention Ordinance. It will also minimize the adverse effects that development can have on stormwater drainage through impervious surface requirements and through sedimentation and erosion control. Through its roadway requirements, the ordinance also provides for adequate ingress and egress to subdivisions by emergency vehicles for fires or severe weather events.	

4.H. Open Space Plans

Buchanan County does not currently have a separate Open Space Plan.

4.I. Watershed Protection Plan

Buchanan County does not currently have a separate Watershed Protection Plan. However, the Upper Tennessee River Watershed Strategic Plan dated 2000 contains information for the Clinch, Holston and Powell Rivers.

5. Legal Authority

Local governments in Virginia have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of Virginia, which are (a) Regulation; (b) Acquisition; (c) Taxation; and (d) Spending. The scope of this local authority is subject to constraints, however, as all of Virginia' political subdivisions must not act without proper delegation from the State. All power is vested in the State and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize Virginia'

enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

5.A. Regulation

5.A.1. General Police Power

Virginia' local governments have been granted broad regulatory powers in their jurisdictions. Virginia State Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments may also use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard. Buchanan County has enacted and enforces regulatory ordinances designed to promote the public health, safety and general welfare of its citizenry.

5.A.2. Building Codes and Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through building codes. Buchanan County does have building codes. Municipalities and counties may adopt codes for their respective areas if approved by the state as providing "adequate minimum standards". Local regulations cannot be less restrictive than the state code.

Local governments in Virginia are also empowered to carry out building inspections. It empowers cities and counties to create an inspection department, and enumerates their duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. Buchanan County has adopted a building code and established a Building Inspections Office to carry out its building inspections.

5.B. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls. Each local community possesses great power to prevent unsuitable development in hazard-prone areas. Buchanan County has not adopted a land use regulation.

5.B.1. Planning

According to State Statutes, local governments in Virginia may create or designate a planning agency. The planning agency may perform a number of duties, including: make studies of the area; determine objectives; prepare and adopt plans for achieving those objectives; develop and recommend policies, ordinances, and administrative means to implement plans; and perform other related duties. The importance of the planning powers of local governments is illustrated by the requirement that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted "in accordance with a plan", the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community. Buchanan County has established a Planning Department.

5.B.2. Zoning

Zoning is the traditional and most common tool available to local governments to control the use of land. Broad enabling authority is granted for municipalities and counties in Virginia to engage in zoning. Land "uses" controlled by zoning include the type of use (e.g., residential, commercial, industrial) as well as minimum specifications for use such as lot size, building height and set backs, density of population, etc. Local governments are authorized to divide their territorial jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, and special use districts or conditional use districts. Zoning ordinances consist of maps and written text. Buchanan County does not have a county wide zoning ordinance.

5.B.3. Subdivision Regulations

Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas. Subdivision regulations require that subdivision plans be approved prior to the division/sale of land. Subdivision regulations are a more limited tool than zoning and only indirectly affect the type of use made of land or minimum specifications for structures. Subdivision is defined as all divisions of a tract or parcel of land into two or more lots and all divisions involving a new street. The definition of subdivision does not include the division of land into parcels greater than 10 acres where no street right-of-way dedication is involved. Buchanan County has adopted a Subdivision Ordinance.

5.B.4. Stormwater Regulations

Stormwater regulations are most often used to control runoff and erosion potential which results from small scale development of less than 5 acres. A reduction in damage from small scale development is achieved through requirements such as on-

site retention/detention ponds, etc. The State of Virginia encourages local governments to adopt stormwater regulations under land use authorities. Buchanan County has not adopted stormwater regulations.

5.B.5. Floodplain Regulation

Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodwater control are empowered through §15.2-2223 and §15.2-2280. Buchanan County has adopted a local floodplain ordinance as a requirement of participation in the National Flood Insurance Program.

5.C. Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazardproofing" a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Virginia legislation empowers cities, towns, and counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain. Buchanan County proposes to use acquisition as a local mitigation tool.

5.D. Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Virginia law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development. Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development. Buchanan County does levy property taxes, and uses (preferential tax districts or special assessments) for purposes of guiding growth and development.

5.E. Spending

The fourth major power that has been delegated from the Virginia General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the

local government, including the adoption annual budgets and a Capital Improvement Plan (CIP). A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs. Buchanan County has not adopted a capital improvement program.

6. Political Willpower

Most County residents are knowledgeable about the potential hazards that their community faces, and in recent years, they have become more familiar with the practices and principles of mitigation. Because of this fact, coupled with Buchanan County's history with natural disasters, it is expected that the current and future political climates are favorable for supporting and advancing future hazard mitigation strategies.

Dickenson County

1. Staff and Organizational Capability

Dickenson County has limited staff and organizational capability to implement hazard mitigation strategies. Dickenson County is governed by a five (5) member Board of Supervisors. The members represent the five (5) districts into which the county is divided. There is also a County Administrator. The Board bears the responsibility of serving the people and improving the quality of life in the County. The business of the County is conducted through the department and board system.

Those professional staff departments and boards are as follows:

- Animal Welfare Shelter
- Board of Election Commissioners
- Building Department
- Commissioner of Revenue
- County Employees Credit Union
- Economic Development Department
- Emergency Services & Disaster Agency
- Equal Opportunity Office
- Finance Department
- Fire Department
- Human Resources
- Information Systems
- Industrial Development Authority
- Inspections
- Legal Department
- Planning and Growth Management
- Planning Commission
- Public Works Department
- Sheriff's Office
- Treasurer
- Voters Registration Office

The Department of Emergency Management is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events.

The Department of Emergency Management maintains a full time planner that is also responsible for addressing land use planning, as well as, developing mitigation strategies. The department also enforces the National Flood Insurance Program requirements and other applicable local codes.

The Public Works Department oversees the maintenance of city infrastructure including roadways, sewer and stormwater facilities and the community's water treatment facilities.

Of the above-listed County departments, agencies and offices, the Emergency Management Department and the Sheriff's Department have been assigned specifically delegated responsibilities to carry out mitigation activities or hazard control tasks. They have been involved in the development of this mitigation plan in order to identify gaps, weaknesses or opportunities for enhancement with existing mitigation programs. For the most part, it was determined that the departments are adequately staffed, trained and funded to accomplish their missions.

2. Technical Capability

Dickenson County has limited technical capability to implement hazard mitigation strategies.

2.A. Technical Expertise

The County does have a full-time planner on staff to administer the community's hazard mitigation programs. The County Engineer provides expertise in the area of water resources and associated technical work. The County has an inspections office which enforces a building code.

The County has a person responsible for Information Technology (IT) which can enhance local government operations and the community's ability to develop and maintain a state-of-the art hazard mitigation program.

2.B. Geographic Information Systems (GIS)

GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially-referenced data. Many local governments are now incorporating GIS systems into their existing planning and management operations. Dickenson County has existing GIS capability to further hazard mitigation goals.

2.C. Internet Access

Dickenson County provides its employees with high speed broadband Internet service. Internet access provides an enormous opportunity for local officials to keep abreast of the latest information relative to their work and makes receiving government services more affordable and convenient. Information technology also offers increased economic opportunities, higher living standards, more individual choices, and wider and more meaningful participation in government and public life. Simply put, information technology can make distance – a major factor for County officials and residents - far less important than it used to be. It is believed that Internet access will help further the community's hazard mitigation awareness programs, but should be supplemented with more traditional and less technical means as well.

3. Fiscal Capability

Dickenson County has limited fiscal capability to implement hazard mitigation strategies. For Fiscal Year 2003, the county's budgeted expenditures were $20,276,595. The majority of these funds are obligated to operations although "public safety" did cost the county $2,893,081 for this period according to the most recent financial statements. The county receives most of its revenues through state and local sales tax and other local services and through restricted intergovernmental contributions (federal and state pass through dollars). Considering the current budget deficits at both the state and local government level, in Virginia, combined with the apparent increased reliance on local accountability by the federal government, this is a significant and growing concern for Dickenson County.

Under the Disaster Mitigation Act of 2000, FEMA has made special accommodations for "small and impoverished communities", who will be eligible for a 90% federal share, 10% non-Federal cost share for projects funded through the Pre-Disaster Mitigation (PDM) grant program. Unfortunately, according to the current Interim Final Rule for Section 322 of the Act, Dickenson County will not qualify as a small and impoverished community. The definition is restricted to "communities of 3,000 or fewer individuals that is identified by the State as a rural community."

4. Policy and Program Capability

This part of the capabilities assessment includes the identification and evaluation of existing plans, policies, practices, programs, or activities that either increase or decrease the community's vulnerability to natural hazards. Positive activities, which decrease hazard vulnerability, should be sustained and enhanced if possible. Negative activities, which increase hazard vulnerability, should be targeted for reconsideration and be thoroughly addressed within Mitigation Strategy for Dickenson County.

4.A. Recent Hazard Mitigation Efforts

Dickenson County has not undertaken specific hazard mitigation efforts in the past.

4.B. Community Rating System Activities

Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction.

Dickenson County does not participate in the Community Rating System.

4.C. Emergency Operations Plan

Dickenson County has developed and adopted a Comprehensive Emergency Management Plan dated January 2004, which predetermines actions to be taken by government agencies and private organizations in response to an emergency or disaster event. For the most part, the Plan describes the County's capabilities to respond to emergencies and establishes the responsibilities and procedures for responding effectively to the actual occurrence of a disaster. The Plan does not specifically address hazard mitigation, but it does identify the specific operations to be undertaken by the County to protect lives and property immediately before, during and immediately following an emergency. There are no foreseeable conflicts between this Hazard Mitigation Plan and Dickenson County's Comprehensive Emergency Management Plan, primarily because they are each focused on two separate phases of emergency management (mitigation vs. preparedness and response). The Plan does identify the Board of Supervisors as having lead role in the long-term reconstruction phase following a disaster – which presents a unique window of opportunity for implementing hazard mitigation strategies. However, none are specified within the Emergency Management Plan.

4.D. Floodplain Management Plan

Dickenson County does not currently have a separate floodplain management plan for purposes of the National Flood Insurance Program's Community Rating System

(CRS). This plan is intended to fulfill the CRS planning requirement should the City decide to enter the CRS.

4.E. Stormwater Management Plan

Dickenson County does not currently have an adopted stormwater management plan, but does apply stormwater management provisions through their subdivision regulations. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval.

4.F. Comprehensive Plan

Dickenson County developed and adopted a Comprehensive Plan in January 1994. The plan provides the future vision for the community regarding growth and development. Hazard mitigation planning is not specifically addressed in the plan.

4.G. Ordinances

Dickenson County has adopted several ordinances that are relevant to hazard mitigation. The following table provides an inventory of these ordinances.

Table VI-2 — Dickenson County Ordinances Related to Hazard Mitigation

Title(s)	Adoption Date(s)	Description/Purpose(s)	Mitigation Effectiveness
Flood Damage Prevention and Control Ordinance	1/23/91	The Flood Damage Prevention Ordinance is designed to minimize public and private losses due to flood conditions in specific areas. It requires a development permit be submitted to the County prior to any construction or substantial improvement activities. Permits will only be approved if they meet the provisions of the ordinance, which include development standards that will minimize the potential for flood losses. Standards are established for construction materials, equipment, methods, practices and uses. Most importantly, establishes the requirements for elevation and floodproofing (non-residential) to base flood elevation. The Ordinance requires the minimum standards of the National Flood Insurance Program (NFIP). The	HIGH

		County's floodplain areas are currently being re-studied as part of the State's Floodplain Mapping Program. It is possible those floodplain areas will be re-delineated with updated topography, and that base flood elevations will be recalculated.	
Subdivision Ordinance	5/28/96	The Subdivision Ordinance is designed to regulate all divisions of land for purposes of sale or building development (immediate or future), including all divisions of land involving the dedication of new streets/roads or a change in existing streets/roads. All proposed subdivisions must go through an approval process involving multiple individuals/agencies. Subdivision plats are required for review and must include the location of areas subject to flooding. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval. Plats are also reviewed by the local permit officer to determine what additional permits are required. Furthermore, all waterfront development must meet setback requirements and impervious surface requirements. Plats are also reviewed by (Building Department) to identify matters of topography and drainage. Although not designed specifically for hazard mitigation purposes, this ordinance will prevent flood losses in tandem with the Flood Damage Prevention Ordinance. It will also minimize the adverse effects that development can have on stormwater drainage through impervious surface requirements and through sedimentation and erosion control. Through its	MODERATE

		roadway requirements, the ordinance also provides for adequate ingress and egress to subdivisions by emergency vehicles for fires or severe weather events.	
Dickenson County State of Emergency Ordinance	(N/A)	The purpose of this ordinance is to authorize the proclamation of a State of Emergency and the imposition of prohibitions and restrictions during a State of Emergency. Establishes the authority and procedures for the Board of Supervisors to proclaim a State of Emergency, and to impose the following restrictions as described in the ordinance: curfew; evacuation; possession/transportation/transfer of intoxicating liquors, dangerous weapons and substances; access to areas; movements of people in public places; operation of businesses and other places; and other activities or conditions the control of which may be reasonably necessary to maintain order and protect lives or property during the State of Emergency. The ordinance does not incorporate any long-term mitigation actions, such as temporary moratoria on the reconstruction of structures damaged or destroyed by a disaster event.	LOW

4.H. Open Space Plans

Dickenson County does not currently have a separate Open Space Plan.

4.I. Watershed Protection Plan

Dickenson County does not currently have a separate Watershed Protection Plan. However, the Upper Tennessee River Watershed Strategic Plan dated 2000 contains information for the Clinch, Holston and Powell Rivers.

5. Legal Authority

Local governments in Virginia have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of Virginia, which are (a) regulation, (b) acquisition, (c) taxation, and (d) spending. The scope of this local authority is subject to constraints, however, as all

of Virginia's political subdivisions must not act without proper delegation from the state. All power is vested in the state and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize Virginia's enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

5.A. Regulation

5.A.1. General Police Power

Virginia' local governments have been granted broad regulatory powers in their jurisdictions. Virginia State Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments also may use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard. Dickenson County has enacted and enforces regulatory ordinances designed to promote the public health, safety, and general welfare of its citizenry.

5.A.2. Building Codes and Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through building codes. Dickenson County does have building codes. Municipalities and counties may adopt codes for their respective areas if approved by the state as providing "adequate minimum standards". Local regulations cannot be less restrictive than the state code.

Local governments in Virginia are also empowered to carry out building inspections. It empowers cities and counties to create an inspection department, and enumerates their duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. Dickenson County has adopted a building code and established a Building Inspections Office to carry out its building inspections.

5.B. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these

characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls. Each local community possesses great power to prevent unsuitable development in hazard-prone areas. Dickenson County has not adopted a land use regulation.

5.B.1. Planning

According to State Statutes, local governments in Virginia may create or designate a planning agency. The planning agency may perform a number of duties, including: make studies of the area; determine objectives; prepare and adopt plans for achieving those objectives; develop and recommend policies, ordinances, and administrative means to implement plans; and perform other related duties. The importance of the planning powers of local governments is illustrated by the requirement that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted "in accordance with a plan", the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community. Dickenson County has established a Planning Department.

5.B.2. Zoning

Zoning is the traditional and most common tool available to local governments to control the use of land. Broad enabling authority is granted for municipalities and counties in Virginia to engage in zoning. Land "uses" controlled by zoning include the type of use (e.g., residential, commercial, industrial) as well as minimum specifications that control height and bulk such as lot size, building height and set backs, and density of population. Local governments are authorized to divide their territorial jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, and special use districts or conditional use districts. Zoning ordinances consist of maps and written text. Dickenson County does not have a county wide zoning ordinance.

5.B.3. Subdivision Regulations

Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas. Subdivision regulations require that subdivision plans be approved prior to the division/sale of land. Subdivision regulations are a more limited tool than zoning and only indirectly affect the type of use made of land or minimum specifications for structures. Subdivision is defined as

all divisions of a tract or parcel of land into two or more lots and all divisions involving a new street. The definition of subdivision does not include the division of land into parcels greater than 10 acres where no street right-of-way dedication is involved. Dickenson County has adopted a subdivision ordinance.

5.B.4. Stormwater Regulations

Stormwater regulations are most often used to control runoff and erosion potential which results from small scale development of less than 5 acres. A reduction in damage from small scale development is achieved through requirements such as on-site retention/detention ponds. The State of Virginia encourages local governments to adopt stormwater regulations under land use authorities. Dickenson County has not adopted stormwater regulations.

5.B.5. Floodplain Regulation

Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodwater control are empowered through §15.2-2223 and §15.2-2280. Dickenson County has adopted a local floodplain ordinance as a requirement of participation in the National Flood Insurance Program.

5.C. Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazardproofing" a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Virginia legislation empowers cities, towns, counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain. Dickenson County proposes to use acquisition as a local mitigation tool.

5.D. Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Virginia law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development. Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can,

however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development. Dickenson County does levy property taxes, and uses preferential tax districts or special assessments for purposes of guiding growth and development.

5.E. Spending

The fourth major power that has been delegated from the Virginia General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption annual budgets and a Capital Improvement Plan (CIP). A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs. Dickenson County has not adopted and implemented a capital improvement program.

6. Political Willpower

Most County residents are knowledgeable about the potential hazards that their community faces, and in recent years, they have become more familiar with the practices and principles of mitigation. Because of this fact, coupled with Dickenson County's history with natural disasters, it is expected that the current and future political climates are favorable for supporting and advancing future hazard mitigation strategies.

Russell County

1. Staff and Organizational Capability

Russell County has limited staff and organizational capability to implement hazard mitigation strategies. Russell County is governed by a six (6) member Board of Supervisors. The members represent the five (5) election districts with one supervisor elected at large. There is also a County Administrator. The Board bears the responsibility of serving the people and improving the quality of life in the County. The business of the County is conducted through the department and board system.

Those professional staff departments and boards are as follows:

- Board of Election Commissioners
- Building Inspections Office
- Economic Development Department
- Emergency Services & Disaster Agency
- Equal Opportunity Office
- Finance Department
- Human Resources
- Information Systems
- Inspections
- Legal Department
- Animal Welfare Shelter
- Fire Department
- Planning Department
- Sheriff's Department
- Public Works Department

The Office Of Emergency Services is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events.

2. Technical Capability

Russell County has limited technical capability to implement hazard mitigation strategies.

2.A. Technical Expertise

The County does not have a full-time planner on staff to administer the community's hazard mitigation programs. The County has an inspections office which enforces a building code.

The County does have a person responsible for Information Technology (IT) which can enhance local government operations and the community's ability to develop and maintain a state-of-the art hazard mitigation program.

2.B. Geographic Information Systems (GIS)

GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially-referenced data. Many local governments are now incorporating GIS systems into their existing planning and management operations. Russell County has GIS capability to further hazard mitigation goals.

2.C. Internet Access

Russell County provides its employees with high speed broadband Internet service. Internet access provides an enormous opportunity for local officials to keep abreast of the latest information relative to their work and makes receiving government services more affordable and convenient. Information technology also offers increased economic opportunities, higher living standards, more individual choices, and wider and more meaningful participation in government and public life. Simply put, information technology can make distance – a major factor for County officials and residents - far less important than it used to be. It is believed that Internet access will help further the community's hazard mitigation awareness programs, but should be supplemented with more traditional (and less technical) means as well.

3. Fiscal Capability

Russell County has limited fiscal capability to implement hazard mitigation strategies. For Fiscal Year 2003, the County's budgeted expenditures were $13,758,910.00. The majority of these funds are obligated to operations although "public safety" did cost the county $2,724,979.00 for this period according to the most recent financial statements. The county receives most of its revenues through state and local sales tax and other local services and through restricted intergovernmental contributions (federal and state pass through dollars). Considering the current budget deficits at both the state and local government level, in Virginia, combined with the apparent increased reliance on local accountability by the federal government, this is a significant and growing concern for Russell County.

Under the Disaster Mitigation Act of 2000, FEMA has made special accommodations for "small and impoverished communities", who will be eligible for a 90% federal share, 10% non-Federal cost share for projects funded through the Pre-Disaster Mitigation (PDM) grant program. Unfortunately, according to the current Interim Final Rule for Section 322 of the Act, Russell County will not qualify as a small and impoverished community. The definition is restricted to "communities of 3,000 or fewer individuals that is identified by the State as a rural community."

4. Policy and Program Capability

This part of the capabilities assessment includes the identification and evaluation of existing plans, policies, practices, programs, or activities that either increase or decrease the community's vulnerability to natural hazards. Positive activities, which decrease hazard vulnerability, should be sustained and enhanced if possible. Negative activities, which increase hazard vulnerability, should be targeted for reconsideration and be thoroughly addressed within the Mitigation Strategy for Russell County.

4.A. Recent Hazard Mitigation Efforts

Russell County has not undertaken specific hazard mitigation efforts in the past.

4.B. Community Rating System Activities

Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction.

Russell County does not participate in the Community Rating System.

4.C. Emergency Operations Plan

Russell County has developed and adopted a Comprehensive Emergency Management Plan dated August 2001 which predetermines actions to be taken by government agencies and private organizations in response to an emergency or disaster event. For the most part, the Plan describes the County's capabilities to respond to emergencies and establishes the responsibilities and procedures for responding effectively to the actual occurrence of a disaster. The Plan does not specifically address hazard mitigation, but it does identify the specific operations to be undertaken by the County to protect lives and property immediately before, during and immediately following an emergency. There are no foreseeable conflicts between this Hazard Mitigation Plan and Russell County's Comprehensive Emergency Management Plan, primarily because they are each focused on two separate phases of emergency management (mitigation vs. preparedness and response). The Plan does identify the Board of Supervisors as having lead role in the long-term reconstruction phase following a disaster – which presents a unique window of opportunity for implementing hazard mitigation strategies. However, none are specified within the Emergency Management Plan.

4.D. Floodplain Management Plan

Russell County does not currently have a separate floodplain management plan for purposes of the National Flood Insurance Program's Community Rating System (CRS). This plan is intended to fulfill the CRS planning requirement should the City decide to enter the CRS.

4.E. Stormwater Management Plan

Russell County does not currently have an adopted stormwater management plan, but does apply stormwater management provisions through their subdivision regulations. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval.

4.F. Comprehensive Plan

Russell County has developed and adopted a Comprehensive Plan in April 1999. The plan provides the future vision for the community regarding growth and development. Hazard mitigation planning is not specifically addressed in the plan.

4.G. Ordinances

Russell County has adopted several ordinances that are relevant to hazard mitigation. The following table provides an inventory of these ordinances.

Table VI-3 — Russell County Ordinances Related to Hazard Mitigation

Title(s)	Adoption Date(s)	Description/Purpose(s)	Mitigation Effectiveness

Subdivision Ordinance	November 5, 2001	The Subdivision Ordinance is designed to regulate all divisions of land for purposes of sale or building development (immediate or future), including all divisions of land involving the dedication of new streets/roads or a change in existing streets/roads. All proposed subdivisions must go through an approval process involving multiple individuals/agencies. Subdivision plats are required for review and must include the location of areas subject to flooding. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval. Plats are also reviewed by the Russell County Building Official to identify matters of topography and drainage. Although not designed specifically for hazard mitigation purposes, this ordinance will prevent flood losses in tandem with the Flood Damage Prevention Ordinance. It will also minimize the adverse effects that development can have on stormwater drainage through impervious surface requirements and through sedimentation and erosion control. Through its roadway requirements, the ordinance also provides for adequate ingress and egress to subdivisions by emergency vehicles for fires or severe weather events.	MODERATE
Floodplain Management Ordinance	March 3, 1988	Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodwater control are empowered through §15.2-2223 and §15.2-2280 of the Code of Virginia. Russell County has adopted a local floodplain ordinance as a requirement of	MODERATE

		participation in the National Flood Insurance Program.	

4.H. Open Space Plans

Russell County does not currently have a separate Open Space Plan.

4.I. Watershed Protection Plan

Russell County does not currently have a separate Watershed Protection Plan. However, the Upper Tennessee River Watershed Strategic Plan, dated 2000, contains information for the Clinch, Holston and Powell Rivers.

5. Legal Authority

Local governments in Virginia have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of Virginia, which are (a) regulation, (b) acquisition, (c) taxation, and (d) spending. The scope of this local authority is subject to constraints, however, as all of Virginia's political subdivisions must not act without proper delegation from the state. All power is vested in the state and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize Virginia's enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

5.A. Regulation

5.A.1. General Police Power

Virginia' local governments have been granted broad regulatory powers in their jurisdictions. Virginia State Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments also may use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard. Russell County has enacted and enforces regulatory ordinances designed to promote the public health, safety, and general welfare of its citizenry.

5.A.2. Building Codes and Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the

buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through building codes. Russell County enforces the BOCA building codes. Municipalities and counties may adopt codes for their respective areas if approved by the state as providing “adequate minimum standards”. Local regulations cannot be less restrictive than the state code.

Local governments in Virginia are also empowered to carry out building inspections. It empowers cities and counties to create an inspection department, and enumerates their duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. Russell County has adopted the BOCA building codes and established a Building Inspections Office to carry out its building inspections.

5.B. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls. Each local community possesses great power to prevent unsuitable development in hazard-prone areas. Russell County has not adopted a land use regulation.

5.B.1. Planning

According to State Statutes, local governments in Virginia may create or designate a planning agency. The planning agency may perform a number of duties, including: make studies of the area; determine objectives; prepare and adopt plans for achieving those objectives; develop and recommend policies, ordinances, and administrative means to implement plans; and perform other related duties. The importance of the planning powers of local governments is illustrated by the requirement that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted “in accordance with a plan”, the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community. Russell County has established a Planning Department.

5.B.2. Subdivision Ordinance

Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other

measures, and they prohibit filling of floodway areas. Subdivision regulations require that subdivision plans be approved prior to the division/sale of land. Subdivision regulations are a more limited tool than zoning and only indirectly affect the type of use made of land or minimum specifications for structures. Subdivision is defined as all divisions of a tract or parcel of land into two or more lots and all divisions involving a new street. The definition of subdivision does not include the division of land into parcels greater than 6 acres where no street right-of-way dedication is involved. Russell County has adopted a subdivision ordinance.

5.B.3. Stormwater Regulations

Stormwater regulations are most often used to control runoff and erosion potential which results from small scale development of less than 5 acres. A reduction in damage from small scale development is achieved through requirements such as on-site retention/detention ponds, etc. The State of Virginia encourages local governments to adopt stormwater regulations under land use authorities. Russell County has not adopted stormwater regulations.

5.B.4. Floodplain Management Ordinance

Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodwater control are empowered through §15.2-2223 and §15.2-2280. Russell County has adopted a local floodplain ordinance as a requirement of participation in the National Flood Insurance Program.

5.C. Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazardproofing" a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Virginia legislation empowers cities, towns, counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain. Russell County proposes to continue using acquisition as a local mitigation tool.

5.D. Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Virginia law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development.

Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development. Russell County does levy property taxes, and uses preferential tax districts or special assessments for purposes of guiding growth and development.

5.E. Spending

The fourth major power that has been delegated from the Virginia General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption annual budgets and a Capital Improvement Plan (CIP). A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs. Russell County has not adopted a capital improvement program.

6. Political Willpower

Most County residents are knowledgeable about the potential hazards that their community faces, and in recent years, they have become more familiar with the practices and principles of mitigation. Because of this fact, coupled with Russell County's history with natural disasters, it is expected that the current and future political climates are favorable for supporting and advancing future hazard mitigation strategies.

Tazewell County

1. Staff and Organizational Capability

Tazewell County has limited staff and organizational capability to implement hazard mitigation strategies. Tazewell County is governed by a 5 member Board of Supervisors. The members represent the 5 districts into which the county is divided. There is also a County Administrator. The Board bears the responsibility of serving

the people and improving the quality of life in the County. The business of the County is conducted through the department and board system.

Those professional staff departments and boards are as follows:

- **Board of Supervisors**
- **Economic Development Department and Tourism**
  - Economic Development
  - Tourism
- **Environmental Management and Control**
  - Emergency Services
  - County Garage
  - Landfill and Transfer Station
  - Building Inspection
- **Grounds and Recreation**
  - Janitorial Services
  - Fairgrounds
  - Parks and Recreation
  - Maintenance Services
- **Financial Services**
  - Accounting and Budgeting
  - Payroll
- **Administrative and Human Resources**
  - Office Staff
  - CSA
  - Risk Management
- **Public Safety and Technology Services**
  - Information Technology
  - GIS
  - Communication Technology
  - E-911
  - Special Police (Animal Control)
- **Planning and Engineering**
- **County Attorney**

The Emergency Services Coordinator is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events.

The Engineering and Planning Department maintains a full time planner that is also responsible for addressing land use planning, as well as, developing mitigation strategies. The department also enforces the National Flood Insurance Program requirements and other applicable local codes.

The Public Service Authority oversees the maintenance of city infrastructure including roadways, sewer and stormwater facilities and the community's water treatment facilities.

Of the above-listed County departments, agencies and offices, the Engineering and Planning Department, Environmental Services Department, and Public Safety and Technology Department have been assigned specifically delegated responsibilities to carry out mitigation activities or hazard control tasks. They have been involved in the development of this mitigation plan in order to identify gaps, weaknesses or opportunities for enhancement with existing mitigation programs. For the most part, it was determined that the departments are adequately staffed, trained and funded to accomplish their missions.

2. Technical Capability

Tazewell County has limited technical capability to implement hazard mitigation strategies.

2.A. Technical Expertise

The County does have a full-time planner on staff to administer the community's hazard mitigation programs. The County Engineer provides expertise in the area of water resources and associated technical work. The County does have an inspections office which enforces a building code.

The County has a person responsible for Information Technology (IT), which can enhance local government operations and the community's ability to develop and maintain a state-of-the art hazard mitigation program.

2.B. Geographic Information Systems (GIS)

GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially-referenced data. Many local governments are now incorporating GIS systems into their existing planning and management operations. Tazewell County has GIS capability and a person responsible for maintaining/implementing the GIS to further hazard mitigation goals.

2.C. Internet Access

Tazewell County does provide most of its employees with high speed broadband Internet service. Internet access provides an enormous opportunity for local officials to keep abreast of the latest information relative to their work and makes receiving government services more affordable and convenient. Information technology also offers increased economic opportunities, higher living standards, more individual choices, and wider and more meaningful participation in government and public life. Simply put, information technology can make distance – a major factor for County officials and residents - far less important than it used to be. It is believed that Internet access will help further the community's hazard mitigation awareness programs, but should be supplemented with more traditional (and less technical) means as well.

3. Fiscal Capability

Tazewell County has limited fiscal capability to implement hazard mitigation strategies. For Fiscal Year 2003, the County's budgeted expenditures were $80,553,735. This figure represents the total fund, Not the general fund. The majority of these funds are obligated to operations although "public safety" did cost the county $5,569,537 for this period according to the most recent financial statements. For these purposes, public safety would entail E-911, Sheriff's Office, Jail, and Rescue Squads. The county receives most of its revenues through state and local sales tax and other local services and through restricted intergovernmental contributions (federal and state pass through dollars). Considering the current budget deficits at both the state and local government level, in Virginia, combined with the apparent increased reliance on local accountability by the federal government, this is a significant and growing concern for Tazewell County.

Under the Disaster Mitigation Act of 2000, FEMA has made special accommodations for "small and impoverished communities", who will be eligible for a 90% Federal share, 10% non-federal cost share for projects funded through the Pre-Disaster Mitigation (PDM) grant program. Unfortunately, according to the current Interim Final Rule for Section 322 of the Act, Tazewell County will not qualify as a small and impoverished community. The definition is restricted to “communities of 3,000 or fewer individuals that is identified by the State as a rural community.”

4. Policy and Program Capability

This part of the capabilities assessment includes the identification and evaluation of existing plans, policies, practices, programs, or activities that either increase or decrease the community’s vulnerability to natural hazards. Positive activities, which decrease hazard vulnerability, should be sustained and enhanced if possible. Negative activities, which increase hazard vulnerability, should be targeted for reconsideration and be thoroughly addressed within the Mitigation Strategy for Tazewell County.

4.A. Recent Hazard Mitigation Efforts

Tazewell County has not undertaken specific hazard mitigation efforts in the past.

4.B. Community Rating System Activities

Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction.

Tazewell County does not participate in the Community Rating System and has been issued a rating of 10.

4.C. Emergency Operations Plan

Tazewell County has developed and adopted a Comprehensive Emergency Management Plan, which predetermines actions to be taken by government agencies and private organizations in response to an emergency or disaster event. For the most part, the Plan describes the County’s capabilities to respond to emergencies and establishes the responsibilities and procedures for responding effectively to the actual occurrence of a disaster. The Plan does not specifically address hazard mitigation, but it does identify the specific operations to be undertaken by the county to protect lives and property immediately before, during and immediately following an emergency. There are no foreseeable conflicts between this Hazard Mitigation Plan and Tazewell County’s Comprehensive Emergency Management Plan, primarily because they are each focused on two separate phases of emergency management (mitigation vs. preparedness and response). The Plan does identify the Board of Supervisors as having lead role in the long-term reconstruction phase following a disaster – which

presents a unique window of opportunity for implementing hazard mitigation strategies. However, none are specified within the Emergency Management Plan.

4.D. Floodplain Management Plan

Tazewell County does currently have a separate floodplain management plan for purposes of the National Flood Insurance Program's Community Rating System (CRS). This plan is intended to fulfill the CRS planning requirement should the City decide to enter the CRS.

4.E. Stormwater Management Plan

Tazewell County does not currently have an adopted stormwater management plan, but does apply stormwater management provisions through their subdivision and Erosion and Sediment Control regulations. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval.

4.F. Comprehensive Plan

Tazewell County developed and adopted a Comprehensive Plan in November 2001. The plan provides the future vision for the community regarding growth and development. Hazard mitigation planning is not specifically addressed in the plan.

4.G. Ordinances

Tazewell County has adopted several ordinances that are relevant to hazard mitigation. The following table provides an inventory of these ordinances.

Table VI-4 — Tazewell County Ordinances Related to Hazard Mitigation

Title(s)	Adoption Date(s)	Description/Purpose(s)	Mitigation Effectiveness
Flood Damage Prevention and Control Ordinance	8/17/99 (readopted)	The Flood Damage Prevention Ordinance is designed to minimize public and private losses due to flood conditions in specific areas. It requires a development permit be submitted to the County prior to any construction or substantial improvement activities. Permits will only be approved if they meet the provisions of the ordinance, which include development standards that will minimize the potential for flood losses. Standards are established for construction materials, equipment, methods, practices and uses. Most importantly, establishes the	HIGH

		requirements for elevation and floodproofing (non-residential) to base flood elevation. The Ordinance requires the minimum standards of the National Flood Insurance Program (NFIP). The County's floodplain areas are currently being re-studied as part of the State's Floodplain Mapping Program. It is possible those floodplain areas will be re-delineated with updated topography, and that base flood elevations will be recalculated.	
Subdivision Ordinance	1/27/1971	The Subdivision Ordinance is designed to regulate all divisions of land for purposes of sale or building development (immediate or future), including all divisions of land involving the dedication of new streets/roads or a change in existing streets/roads. All proposed subdivisions must go through an approval process involving multiple individuals/agencies. Subdivision plats are required for review and must include the location of areas subject to flooding. Lands subject to flooding, irregular drainage conditions, excessive erosion and other reasons unsuitable for residential use shall not be platted for residential use unless the hazards can be and are corrected. For major subdivisions, a stormwater drainage plan must be prepared and necessary stormwater drainage improvements must be completed before final plat approval. Plats are also reviewed by the local permit officer to determine what additional permits are required. Furthermore, all waterfront development must meet setback requirements and impervious surface requirements. Plats are also reviewed by County Engineer to identify matters of topography and drainage. Although not designed specifically for hazard mitigation purposes, this ordinance will prevent flood losses in tandem with the Flood Damage Prevention Ordinance. It will also minimize the adverse effects that development can have on stormwater drainage through impervious surface requirements and through sedimentation and erosion control. Through its roadway requirements, the ordinance also provides for adequate ingress and egress to subdivisions	MODERATE

		by emergency vehicles for fires or severe weather events.	
Tazewell County State of Emergency Ordinance	Unknown	The purpose of this ordinance is to authorize the proclamation of a State of Emergency and the imposition of prohibitions and restrictions during a State of Emergency. Establishes the authority and procedures for the Board of Supervisors to proclaim a State of Emergency, and to impose the following restrictions as described in the ordinance: curfew; evacuation; possession/transportation/transfer of intoxicating liquors, dangerous weapons and substances; access to areas; movements of people in public places; operation of businesses and other places; and other activities or conditions the control of which may be reasonably necessary to maintain order and protect lives or property during the State of Emergency. The ordinance does not incorporate any long-term mitigation actions, such as temporary moratoria on the reconstruction of structures damaged or destroyed by a disaster event.	LOW

4.H. Open Space Plans

Tazewell County does not currently have a separate Open Space Plan.

4.I. Watershed Protection Plan

Tazewell County does not currently have a separate Watershed Protection Plan. However, the Upper Tennessee River Watershed Strategic Plan dated 2000 contains information for the Clinch, Holston and Powell Rivers.

5. Legal Authority

Local governments in Virginia have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of Virginia, which are (a) regulation; (b) acquisition; (c) taxation; and (d) spending. The scope of this local authority is subject to constraints, however, as all of Virginia's political subdivisions must not act without proper delegation from the state. All power is vested in the state and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize Virginia's enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

5.A. Regulation

5.A.1. General Police Power

Virginia' local governments have been granted broad regulatory powers in their jurisdictions. Virginia State Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments also may use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard. Tazewell County has enacted and enforces regulatory ordinances designed to promote the public health, safety, and general welfare of its citizenry.

5.A.2. Building Codes and Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through building codes. Tazewell County does have building codes. Municipalities and counties may adopt codes for their respective areas if approved by the state as providing "adequate minimum standards". Local regulations cannot be less restrictive than the state code.

Local governments in Virginia are also empowered to carry out building inspections. It empowers cities and counties to create an inspection department, and enumerates their duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. Tazewell County has adopted the BOCA building code and established a Building Inspections Office to carry out its building inspections.

5.B. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls. Each local community possesses great power to prevent unsuitable development in hazard-prone areas. Tazewell County has not adopted a land use regulation.

5.B.1. Planning

According to State Statutes, local governments in Virginia may create or designate a planning agency. The planning agency may perform a number of duties, including: make studies of the area; determine objectives; prepare and adopt plans for achieving those objectives; develop and recommend policies, ordinances, and administrative means to implement plans; and perform other related duties. The importance of the planning powers of local governments is illustrated by the requirement that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted "in accordance with a plan", the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community. Tazewell County has established a Planning Department, which is a part of the Planning and Engineering Department.

5.B.2. Zoning

Zoning is the traditional and most common tool available to local governments to control the use of land. Broad enabling authority is granted for municipalities and counties in Virginia to engage in zoning. Land "uses" controlled by zoning include the type of use (e.g., residential, commercial, industrial) as well as minimum specifications for use such as lot size, building height and set backs, density of population, etc. Local governments are authorized to divide their territorial jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, and special use districts or conditional use districts. Zoning ordinances consist of maps and written text. Tazewell County does not enforce a county wide zoning ordinance. The towns of Richlands, Tazewell, Bluefield, and Pochahontas enforce a town zoning ordinance.

5.B.3. Subdivision Regulations

Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas. Subdivision regulations require that subdivision plans be approved prior to the division/sale of land. Subdivision regulations are a more limited tool than zoning and only indirectly affect the type of use made of land or minimum specifications for structures. Subdivision is defined as all divisions of a tract or parcel of land into two or more lots and all divisions involving a new street. The definition of subdivision does not include the division of land into parcels greater than 5 acres where no street right-of-way dedication is involved. Tazewell County has adopted a subdivision ordinance.

5.B.4. Stormwater Regulations

Stormwater regulations are most often used to control runoff and erosion potential which results from small scale development of less than 5 acres. A reduction in damage from small scale development is achieved through requirements such as on-site retention/detention ponds, etc. The State of Virginia encourages local governments to adopt stormwater regulations under land use authorities. Tazewell County has not adopted stormwater regulations.

5.B.5. Floodplain Regulation

Virginia State Statutes provide cities and counties the land use authority. In particular, issues such as floodwater control are empowered through §15.2-2223 and §15.2-2280. Tazewell County has adopted a local floodplain ordinance as a requirement of participation in the National Flood Insurance Program.

5.C. Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazardproofing" a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Virginia legislation empowers cities, towns, counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain. Tazewell County does not currently use acquisition as a local mitigation tool.

5.D. Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Virginia law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development. Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development. Tazewell County levies property taxes for purposes of guiding growth and development.

5.E. Spending

The fourth major power that has been delegated from the Virginia General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption annual budgets and a Capital Improvement Plan (CIP). A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs. Tazewell County has not adopted and implemented a separate capital improvement program.

6. Political Willpower

Most County residents are knowledgeable about the potential hazards that their community faces, and in recent years, they have become more familiar with the practices and principles of mitigation. Because of this fact, coupled with Tazewell County's history with natural disasters, it is expected that the current and future political climates are favorable for supporting and advancing future hazard mitigation strategies.

SECTION VII. MITIGATION STRATEGY

The Mitigation Advisory Committee attended workshops on February 24, 2004; April 6, 2004; and February 3, 2005 to discuss the results of the hazard identification and risk assessment, review mitigation goals and objectives based on the priority areas and hazard types, discuss community strengths and weaknesses, and begin developing the mitigation strategy.

This section of the Hazard Mitigation Plan describes the most challenging part of any such planning effort – the development of a mitigation strategy. It is a process of:

1. **Setting mitigation goals,**
2. **Considering mitigation alternatives,**
3. **Developing objectives and implementation approaches, and**
4. **Deriving a mitigation action plan.**

Essentially these four elements comprise this mitigation strategy.

Setting Mitigation Goals

The hazard mitigation planning process followed by the MAC is a typical problem-solving methodology:

- Describe the problem (Hazard Identification),
- Estimate the impacts the problem could cause (Vulnerability Assessment),
- Assess what safeguards already exist that could/should lessen those impacts (Capability Assessment), and
- Using this information, determine if you should do something (Determine Acceptable Risk), and if so, what that something should be (Develop an Action Plan).

When a community decides that certain risks are unacceptable and that certain mitigation actions may be achievable, the development of *goals* and *actions* takes place. Goals and actions help to describe what should occur, using increasingly more narrow descriptors. Initially, broad-based goals are developed, which are long-term and general statements. Goals are accomplished by implementing actions, which are very detailed and achievable in a finite time period.

The MAC discussed goals for this plan at two points in the planning process. First, early in the planning process, the MAC established general goals to set the initial tone and direction for the overall plan. Then, after the problem-solving process as described above took place, the goals were revisited to confirm that the data collection process supported them. Lastly, actions were developed as a logical extension of the plan's objectives. Most of these actions are dynamic and can change. These actions have been utilized to develop a Mitigation Action Plan for the Planning District.

Representatives from Buchanan, Dickenson, Russell and Tazewell Counties, and the towns of Grundy, Clinchco, Clintwood, Haysi, Cleveland, Honaker, Lebanon, Bluefield, Cedar Bluff, Pocahontas, Richlands and Tazewell used the results of the data collection efforts to develop goals and prioritize their actions. The priorities differ somewhat from jurisdiction to jurisdiction. Overall, for the entire planning area, protecting new and existing development from the effects of hazards is the top priority because it is can be achieved on an individual community-by-community basis but at the same time be integrated into an overarching plan goal. Each jurisdiction's additional priorities were developed based on past damages, existing exposure to risk, other community goals, and weaknesses identified by the local government capability assessments.

Following the ***final*** public meeting on June 29, 2005, the following goals for the Planning District were accepted by the Mitigation Advisory Committee. The goals and their associated actions form the basis for the development of a mitigation action plan for implementation to be considered for the Planning District. The Mitigation Action Plan, located at the end of this section, contains recommended mitigation projects including timelines.

OVERARCHING COMMUNITY GOAL:
"To develop and maintain disaster resistant communities that are less vulnerable to the economic and physical devastation associated with natural hazard events."

- ***Goal 1:***

  Enhance the safety of residents and businesses by protecting new and existing development from the effects of hazards.

- ***Goal 2:***

  Protect new and existing public and private infrastructure and critical facilities from the effects of hazards.

- ***Goal 3:***

  Increase the Planning District communities floodplain management activities and participation in the National Flood Insurance Program.

- ***Goal 4:***

  Ensure hazard awareness and risk reduction principles are institutionalized into the Planning District communities' daily activities, processes, and functions by incorporating it into policy documents and initiatives.

- ***Goal 5:***

  Enhance community-wide understanding and awareness of community hazards.

- ***Goal 6:***

  Publicize mitigation activities to reduce the area's vulnerability to hazards.

General Observations — Strengths

- Several of the Planning District's four counties and twelve towns have policies with hazard mitigation elements or effects such as development and building code regulations, floodplain ordinances, zoning ordinances and stormwater management programs. Building code regulations and local enforcement have helped to ensure that new development is built to acceptable safety standards for development overall.
- Much of the language used for flood hazard mitigation is already present in some of the Planning District communities' existing comprehensive plans. These concepts involve floodplain management and the preservation of open space and natural areas.
- Over the next few years, these communities will continue to have opportunities to experience new development within their jurisdictions. Those structures that are built will be constructed built to newer codes and standards that help to reduce damage from natural hazards.
- The jurisdictions within the Planning District have a strong community foundation of mutual assistance and the "help thy neighbor" philosophy.

General Observations — Weaknesses

- Citizens within the Planning District have a historic acceptance of the cycle of damage in the community. Repairing damaged buildings and infrastructure to pre-damaged condition, only to be damaged again during the next event, is common in even the most frequently and severely damaged portions of the planning district.
- While the Planning District communities enforce their floodplain ordinances, some current ordinances could be enhanced to offer further protection to the community and need to be revised. The area's jurisdictions could offer an even greater degree of protection if they adopted cumulative substantial damage and substantial improvement requirements.
- Limited amounts of developable land within the Planning District, and historic lack of public buy-in to mitigation has restricted the number of mitigation options available for some of the most frequently and severely damaged portions of the Planning District.

During the presentation of findings for the hazard identification and risk assessment workshop, the MAC was asked to provide their preliminary input and ideas. Ranges of alternatives were then considered by the MAC based on their comments and suggestions.

Prioritizing Alternatives

The Mitigation Advisory Committee used the STAPLE/E Criteria (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) to select and prioritize the most appropriate mitigation alternatives for the Planning District communities. This

methodology requires that the social, technical, administrative, political, legal, economic, and environmental considerations be taken into account when reviewing potential actions for the area's jurisdictions to undertake. This process was used to help ensure that the most equitable and feasible actions would be undertaken based on a jurisdiction's capabilities.

Table VII-1, below, provides information regarding the review and selection criteria for alternatives.

Table VII-1 — STAPLE/E Review And Selection Criteria For Alternatives
Social
• Is the proposed action socially acceptable to the community(s)?
• Are there equity issues involved that would mean that one segment of a community is treated unfairly?
• Will the action cause social disruption?
Technical
• Will the proposed action work?
• Will it create more problems than it solves?
• Does it solve a problem or only a symptom?
• Is it the most useful action in light of other community(s) goals?
Administrative
• Can the community(s) implement the action?
• Is there someone to coordinate and lead the effort?
• Is there sufficient funding, staff, and technical support available?
• Are there ongoing administrative requirements that need to be met?
Political
• Is the action politically acceptable?
• Is there public support both to implement and to maintain the project?
Legal
• Is the community(s) authorized to implement the proposed action? Is there a clear legal basis or precedent for this activity?
• Are there legal side effects? Could the activity be construed as a taking?
• Is the proposed action allowed by a comprehensive plan, or must a comprehensive plan be amended to allow the proposed action?
• Will the community(s) be liable for action or lack of action?
• Will the activity be challenged?
Economic
• What are the costs and benefits of this action?
• Do the benefits exceed the costs?
• Are initial, maintenance, and administrative costs taken into account?
• Has funding been secured for the proposed action? If not, what are the potential funding sources (public, non-profit, and private)?
• How will this action affect the fiscal capability of the community(s)?
• What burden will this action place on the tax base or local economy?
• What are the budget and revenue effects of this activity?
• Does the action contribute to other community goals, such as capital improvements or economic development?
• What benefits will the action provide?
Environmental
• How will the action affect the environment?
• Will the action need environmental regulatory approvals?
• Will it meet local and state regulatory requirements?

Table VII-1 — STAPLE/E Review And Selection Criteria For Alternatives
• ARE ENDANGERED OR THREATENED SPECIES LIKELY TO BE AFFECTED?

The master grouping of alternatives the MAC chose from is included in the next section. These actions were then compiled into a master list for the MAC to rank. The MAC ranked the goals on a scale of 1 to 6 and the actions on a scale of 1 to 10. Ranking was done in order of relative priority based on the STAPLE/E criteria and the potential goal/action's ability to reduce vulnerability to natural hazards.

Considering Mitigation Alternatives

A wide range of potential mitigation alternatives were considered by the Mitigation Advisory Committee. The actions considered are presented in Appendix C. These actions include those for all hazards identified in the HIRA and include specific structural measures, policy and procedure revisions, and data collection measures. In many cases, actions specific to the community were developed based on the capacity of the communities and the level of data available when making decisions.

Mitigation Actions

In formulating a mitigation strategy, a wide range of activities were considered in order to help achieve the goals and to lessen the vulnerability of the Cumberland Plateau Planning District area to the effects of natural hazards. The Mitigation Action Plan is comprised of proactive mitigation actions designed to reduce or eliminate future losses from natural hazards in the participating jurisdictions.

In addition, the anticipated level of cost effectiveness of each measure was a primary consideration when developing mitigation actions. Because mitigation is an investment to reduce future damages, it is important to select measures for which the reduced damages over the life of the measure are likely to be greater than the project cost. For structural measures, the level of cost effectiveness is primarily based on the likelihood of damages occurring in the future, the severity of the damages when they occur, and the level of effectiveness of the selected measure. Although detailed analysis was not conducted during the mitigation action development process, these factors were of primary concern when selecting measures. For those measures that do not result in a quantifiable reduction of damages, such as public education and outreach, the relationship of the probable future benefits and the cost of each measure was considered when developing the mitigation actions.

Cumberland Plateau Planning District Commission Mitigation Actions

The mitigation actions proposed for the Planning District to undertake are listed on the pages that follow. Each has been designed to achieve the goals and objectives identified in this multi-jurisdictional all-hazards mitigation plan. Each proposed action includes:

(1) the appropriate category for the mitigation technique,
(2) the hazard it is designed to mitigate,

(3) the objective(s) it is intended to help achieve,
(4) some general background information,
(5) the priority level for its implementation (high, moderate, or low),
(6) potential funding sources, if applicable,
(7) the agency/person assigned responsibility for carrying out the strategy, and
(8) a target completion date.

When formulating a Mitigation Action Plan, a wide range of activities should be considered to help achieve the goals of communities and lessen the vulnerability of the participating jurisdictions to the effects of natural hazards. In general, all of these activities fall into one of the following broad categories of mitigation techniques. Tables VII-8 and VII-9 shows which jurisdictions have chosen to participate in the proposed actions. Appendix C includes the range of alternatives that were considered in by the Mitigation Advisory Committee.

ACTION #1

Obtain official recognition of the Mitigation Advisory Committee by the Planning District's communities in order to help institutionalize and develop an ongoing mitigation program.

Category: Public Information & Awareness
Hazard: All
Goal(s) Addressed: 4
Background: After the passage of the Disaster Mitigation Act of 2000 (DMA2K), local governments are required to develop and to adopt all hazards mitigation plans to be eligible for certain types of future disaster assistance including funds for mitigation activities. Nationwide, many communities have formed committees, councils or citizen groups to assist in developing and implementing plans. In the case of multi-jurisdictional plans, "mitigation advisory committees" are often formed and are comprised of local officials and residents from the participating jurisdictions. One way to assure the effectiveness of such committees is to bestow official status to them. An officially recognized Mitigation Action Committee will aid each community by sharing the workload on regionally beneficial actions and present a unified voice in dealing with state and FEMA officials.
Priority: High
Funding Sources: N/A
Responsibility Assigned to: MAC and PDC
Target Completion Date: December 31, 2005

ACTION #2

Target FEMA's Repetitive Loss Properties, and other known repetitively flooded properties, throughout the Planning District for potential mitigation projects.

Category: Property Protection

Hazard: Flood
Goal(s) Addressed: 1, 3
Background: Currently, over 40,000 of the four million properties insured under the National Flood Insurance Program have been identified by FEMA as repetitive loss properties. The known repetitive loss properties are those that have sustained flood damage and received flood insurance claim payments on multiple occasions. Repetitive loss properties, though they represent a minority of the active policies, represent the majority of claims made to the National Flood Insurance Program. In addition to these properties, there are also a number of properties throughout the planning district that are repetitively flooded yet the property owner do not carry flood insurance, so therefore would not appear on FEMA's repetitive loss properties list. Efforts should be made to identify these properties and determine the most effective mitigation approach (e.g., acquisition, relocation, elevation).
Priority: High
Funding Sources: FEMA's Pre-Disaster Mitigation (PDM) program, Hazard Mitigation Grant Program (HMGP) and Flood Mitigation Assistance (FMA) program
Responsibility Assigned to: Mitigation Advisory Committee and Planning District Commission
Target Completion Date: July 1, 2007

ACTION #3

Undertake educational outreach activities by developing and distributing brochures and education materials for FEMA's Repetitive Loss Properties with specific mitigation measures emphasizing acquisition, relocation and elevation.

Category: Public Education and Awareness
Hazard: Flood
Goal(s) Addressed: 3
Background: The Planning District has several repetitive loss properties which have been identified by FEMA. Although an acquisition program for flood-prone properties has been undertaken in the state previously, local citizens are reluctant to relocate from an area where they have strong family and community ties. Citizens should be educated about the flood loss cycle associated with flood-prone areas and encouraged to work with local government officials to develop mutually agreeable strategies to address repetitive losses in the Planning District.
Priority: High
Funding Sources: FEMA, VDEM
Responsibility Assigned to: MAC, PDC and local emergency management agencies
Target Completion Date: April 1, 2006

ACTION #4

Publicize the Virginia Department of Forestry's *Money for Mitigation Program*. Utilize existing wildfire maps to prioritize project areas in the Planning District.

Assist local residents, in priority areas, to reduce wildfire hazards through the use of funding from the *Money for Mitigation Program*.

Category: Public Education and Awareness
Hazard: Fire
Goal(s) Addressed: 1
Background: Financial assistance to reduce fire hazards has been established at the Virginia Department of Forestry. The program provides a 50% cost share funds to reduce wildfire fuels, particularly in wildland-urban interface areas. Citizen's groups and homeowner's associations are eligible applicants. A program description including eligibility criteria can be accessed at the agency's website www.vdof.org.
Priority: High
Funding Sources: Virginia Department of Forestry
Responsibility Assigned to: MAC, PDC and local emergency management agencies.
Target Completion Date: March 1, 2006

ACTION #5

Develop a comprehensive compilation of landslide activity in the Planning District to be used as a planning tool for future infrastructure projects.

Category: Prevention
Hazard: Landslide
Goal(s) Addressed: 2
Background: Landslide activity is prevalent in the mountainous regions of the Planning District. Most often, roadways are impacted by landslide events. The Virginia Department of Transportation and local government road and bridge departments usually respond to events on an as-needed basis. A compilation of landslide activity, both past and present, can assist decision-makers as a planning tool when determining where to cite new and upgraded infrastructure.
Priority: High
Funding Sources: VDOT and local public works departments/agencies
Responsibility Assigned to: MAC, PDC and local public works departments/agencies
Target Completion Date: July 1, 2006

ACTION #6

Evaluate the Planning District's community floodplain ordinances and enforcement procedures that may be outdated for possible upgrades.

Category: Prevention
Hazard: Flood
Goal(s) Addressed: 3
Background: Each county and community in the planning district has adopted and enforces the NFIP floodplain management regulations. By utilizing the working

relationship established by the formalization of the Mitigation Action Committee communities can share information on the state of current regulations as well as enforcement procedures. By sharing this information communities can learn from one another on ways to best implement, monitor, and enforce NFIP regulations and over all floodplain management.
Priority: Moderate
Funding Sources: N/A
Responsibility Assigned to: Planning District communities' floodplain managers
Target Completion Date: January 1, 2007

ACTION #7

Initiate discussion concerning which individuals shall be designated as the Floodplain Manager in each of the four Planning District's jurisdictions. MAC and PDC will make recommendations to the appropriate decision-makers in each jurisdiction.

Category: Prevention
Hazard: All
Goal(s) Addressed: 3
Background: Over nineteen thousand communities participate in the National Flood Insurance Program (NFIP) and have adopted floodplain ordinances that specify the designation of a local floodplain official or administrator. In many cases, the local floodplain administrator is either 1) an individual with little or no experience about flooding and the NFIP, or 2) an individual with many responsibilities. Buchanan, Dickenson, Russell and Tazewell Counties have adopted floodplain ordinances and designated a local floodplain administrator. A review of these individual's responsibilities, not just floodplain administration, can assist local decision-makers in the effective allocation of personnel resources and funding.
Priority: Moderate
Funding Sources: N/A
Responsibility Assigned to: MAC, PDC and local government decision-makers including county commissions.
Target Completion Date: December 31, 2005

ACTION #8

Initiate discussions with public utility companies about incorporating mitigation as infrastructure is laid, maintained, or repaired. Invite utilities to make a presentation to the MAC to begin dialogue.

Category: Prevention
Hazard: All
Goal(s) Addressed: 2

Background: Mitigation initiatives that protect utility infrastructure can most often be installed at the beginning of a project for much less money than if installed as a retrofitting project after the fact. Many utility companies have the financial capacity and desire to protect their facilities from the impacts of natural hazards but are often unaware of the risk until an event occurs. Local governments can serve to educate the companies about the risk of natural hazards and provide technical guidance and references about hazard proofing their facilities.
Priority: High
Funding Sources: FEMA; VDEM, VDC
Responsibility Assigned to: MAC, PDC, local public works departments/agencies, emergency management agencies and area Chambers of Commerce
Target Completion Date: Continuous

ACTION #9

Develop and distribute a brochure targeting the Planning District jurisdiction's community staff, which details mitigation principles and options.

Category: Public Information and Awareness
Hazard: All
Goal(s) Addressed: 4, 6
Background: Local governmental staff should be educated about the benefits of natural hazard mitigation and encouraged to incorporate the principles into the decision-making processes related to their jobs. Information on potential mitigation measures, as well as potential funding sources and partnering opportunities, should be shared with all appropriate local staff.
Priority: Moderate
Funding Sources: FEMA, NWS, VDEM, VDC
Responsibility Assigned to: MAC, PDC and local emergency management agencies.
Target Completion Date: Continuous

ACTION #10

Develop "hazard information centers" on the Planning District's community's websites and in public libraries where individuals can find hazard and mitigation information.

Category: Public Information and Awareness
Hazard: All
Goal(s) Addressed: 6
Background: As the Internet continues to become "the information super highway", more local governments around the country are using it as a primary means of official communication with community residents through the development and administration of websites. Today, many residents pay their water and power bills online, register to vote and even obtain driver's licenses over the Internet. Use of local government

websites to educate community residents about natural hazards and mitigation opportunities is growing nationwide.
Priority: Moderate
Funding Sources: Local government annual budgets for information technology
Responsibility Assigned to: Planning District community's local government communications departments/offices, the MAC and PDC.
Target Completion Date: July 1, 2006

ACTION #11

Investigate the benefits of submitting Community Rating System Applications for non-participating jurisdictions.

Category: Prevention
Hazard: All
Goal(s) Addressed: 3
Background: Communities that regulate development in floodplains are able participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for properties in the community. The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. There are ten CRS classes: Class 1 requires the most credit points and gives the largest premium reduction (45%); class 10 receives no premium reduction. Each class, starting with Class 9, receives at least a 5% premium reduction. MAC members should be educated on the benefits of participation of CRS, so that each community may potentially submit a CRS application.
Priority: Medium
Funding Sources: Local government department budgets
Responsibility Assigned to: MAC, PDC, local government planning departments work with the State NFIP Coordinator at the VDC
Target Completion Date: July 1, 2006

ACTION #12

Investigate all critical facilities to evaluate their resistance to wind, fire, landslide and flood hazards. This study will examine all critical facilities within the Planning District communities and make recommendations as to ways in which the facilities can be strengthened or hardened.

Category: Public Information and Awareness
Hazard: All
Goal(s) Addressed: 2
Background: The ability to recover quickly after a disaster rests, in part, on the community's ability to maintain critical functions during response and recovery. Efforts should be undertaken to ensure that community critical facilities (e.g., fire departments, hospitals, schools) can withstand the impact of various hazards. Local facilities

management offices/agencies and local emergency management agencies will work with the MAC and PDC to undertake a future study with recommendations for improvements. In order to finance this initiative, the MAC and PDC will submit a Pre-Disaster Mitigation (PDM) program grant application to the Virginia Department of Emergency Management.
Priority: Moderate
Funding Sources: FEMA, VDEM
Responsibility Assigned to: MAC, PDC, local facilities management agencies and local emergency management agencies
Target Completion Date: July 1, 2006

ACTION #13

Support Public Works initiatives to improve stormwater infrastructure throughout the area.

Category: Structural Projects
Hazard: Flood
Goal(s) Addressed: 2, 4
Background: Many times, local stormwater channels are not identified on FEMA Flood Insurance Rates Maps (FIRMs). Consequently, stormwater hazards are often overlooked as natural hazards although they can cause significant problems during times of high water. Many jurisdictions do not regulate stormwater runoff, thereby, increasing flood damage potential during an event.
Priority: Medium
Funding Sources: EPA, USACE, FEMA
Responsibility Assigned to: MAC, PDC and local public works departments
Target Completion Date: Continuous

Table VII-8 — Mitigation Action Item Participation by County				
Action Item	Buchanan County	Dickenson County	Russell County	Tazewell County
1	✓	✓	✓	✓
2	✓	✓	✓	✓
3	✓	✓	✓	✓
4	✓	✓	✓	✓
5	✓	✓	✓	✓
6	✓	✓	✓	✓
7	✓	✓	✓	✓
8	✓	✓	✓	✓
9	✓	✓	✓	✓
10	✓	✓	✓	✓
11	✓	✓	✓	
12	✓	✓	✓	✓
13	✓	✓	✓	✓

Table VII-9 — Mitigation Action Item Participation by Town												
Action Item	Town of Bluefield	Town of Cedar Bluff	Town of Cleveland	Town of Clinchco	Town of Clintwood	Town of Grundy	Town of Haysi	Town of Honaker	Town of Lebanon	Town of Pocahontas	Town of Richlands	Town of Tazewell
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	✓		✓			✓	✓	✓			✓	✓
3	✓		✓			✓	✓	✓			✓	✓
4	✓				✓		✓	✓				✓
5	✓						✓	✓				
6	✓					✓	✓				✓	✓
7		✓				✓	✓	✓				✓
8					✓	✓						✓
9						✓		✓				✓
10						✓		✓			✓	✓
11						✓	✓					✓
12	✓					✓	✓				✓	✓
13	✓		✓		✓	✓	✓		✓	✓	✓	✓
*Contingent upon funding												

Additional Actions

Buchanan County

Locate potential problems within our county.

Category: Prevention, Property Protection
Hazard: Flood, Winter Storm
Goal(s) Addressed: 1, 3, 4
Background: The county has streams and rivers that have experienced flooding in the past depending on the amount of precipitation in that area. The County's topography is characterized by hills and valleys. A majority of the lowest-lying areas of the valleys (i.e., the hollows) have not been studied as part of the National Flood Insurance Program mapping initiative.

The County is participating in a long-term flood project in the Town of Grundy, to mitigate the recurrence of flooding in that area. The County plans to continue to identify areas that would benefit from such projects.

Criteria would include proximity to flood source, impact of past and future flooding, number of structures potentially affected, and willingness and capacity of homeowners to participate in mitigation projects. Once the most likely targets for mitigation are determined, specific project development efforts can be undertaken.

Priority: Medium
Funding Sources:
Responsibility Assigned to: Emergency Services Director and Emergency Services Coordinator
Target Completion Date: July 1, 2006

Town of Richlands

Continuation of Strict Enforcement of Zoning Regulations

Category: Prevention
Hazard: Flood
Goal(s) Addressed: 4
Background: The Town has identified flooding as its most critical hazard based on the past number of flood occurrences, the severity of recent flood incidents, and the physical and monetary amounts of damage resulting from recent flood events. The Town has determined that reasonable mitigation strategies include the continuation of strict enforcement of the Town's Zoning Ordinance to ensure that new structures are not allowed to be constructed/placed within the flood way.

It should be noted that critical infrastructure, such as the water and wastewater facilities and the electrical substation, have already been placed outside of flood zones or have been constructed in a manner to preclude flooding.

Priority: High
Funding Sources: Town operating budget
Responsibility Assigned to: Town Manager
Target Completion Date: Continuous

SECTION VIII — PLAN MAINTENANCE PROCEDURES

The long-term success of the Cumberland Plateau Planning District's mitigation plan depends in large part on routine monitoring, evaluating, and updating of the plan so that it will remain a valid tool for the communities to use. The first step in ensuring that the plan's activities will be implemented is to obtain official recognition of the Mitigation Advisory Committee (MAC) as proposed in Mitigation Action#1 and assign the responsibility to the MAC.

Plan Adoption, Implementation and Maintenance

Formal Plan Adoption

Sixteen local governments in southwestern Virginia have participated in this planning process and formally adopted this plan by resolution of their governing Board. Those local governments are the counties of Buchanan, Dickenson, Russell and Tazewell and the towns of towns of Grundy, Clinchco, Clintwood, Haysi, Cleveland, Honaker, Lebanon, Bluefield, Cedar Bluff, Pocahontas, Richlands and Tazewell. The plan was completed under the auspices of the Cumberland Plateau Planning District.

The adoption process necessitated that the MAC 1) place the plan review and adoption on the appropriate meeting agendas in each jurisdiction, 2) produce and provide copies in official meeting packets, 3) facilitate the actual adoption, 4) collect the adoption resolutions, and 5) incorporate the adopted resolutions into the final Hazard Mitigation Plan.

The Cumberland Plateau Planning District appreciates the willingness that both Virginia Department of Emergency Management and FEMA Region III demonstrated by reviewing this plan concurrently and providing comments for revision *prior* to the adoption process. Not having done so would clearly have added more months to the adoption process.

Implementation

Upon adoption, the plan faces the biggest test: *implementation*. Implementation implies two concepts: action and priority.

While this plan puts forth many worthwhile and "High" priority recommendations, there may be competition among the participating communities in the Cumberland Plateau Planning District for limited mitigation funds. The decision of which action to undertake first will be the primary issue that the district's communities face. Fortunately, there are two factors that will help make that decision workable. First, there are high priority items for each participating community, so each can pursue an action independently. Therefore, the Plan's specific recommendations will begin to be addressed. Second, funding is always an important and critical issue. Therefore whenever possible, the Planning District communities will pursue low or no-cost recommendations.

An example of a low-cost, high-priority recommendation would be to pursue the education efforts necessary for elected officials and the general public as they relate to participation in the National Flood Insurance Program (NFIP). In other cases, some communities need to strengthen their commitment to the NFIP by amending local floodplain ordinances.

Another example would be to pursue the regional goal of increasing education opportunities for the Planning District communities' employees, MAC representatives, and public officials regarding natural hazard mitigation, floodplain management, floodplain regulations, and enforcement. These initial efforts will lead to long-standing changes in vulnerability and can be initiated at very little cost, while promoting public education through their relative "visibility" in the community.

Another important implementation approach that is highly effective, but low-cost, is to take steps to incorporate the recommendations, and equally important, the underlying principles of this Hazard Mitigation Plan into other community plans and mechanisms, such as:

- Comprehensive Planning
- Capital Improvement Budgeting
- Economic Development Goals and Incentives

Mitigation is most successful when it is incorporated within the day-to-day functions and priorities of government and development. This integration is accomplished by a constant effort to network and to identify and highlight the multi-objective, "win-win" benefits to each program, the communities and their constituents. Just as importantly, the mitigation plan and its recommendations should be presented as a *"framework for mitigation"* in all future planning efforts undertaken by the district's communities such as the development or revision of local comprehensive plans. This effort is achieved through the often tedious actions of monitoring agendas, attending meetings, sending memos, and promoting safe, sustainable communities.

Simultaneous to these efforts, it will be important to constantly monitor funding opportunities that can be utilized to implement some of the higher cost recommended actions. This will include creating and maintaining a repository of ideas on how any required local match or participation requirement can be met. Then, when funding does become available, the Cumberland Plateau Planning District communities will be in a position to take advantage of an opportunity. Funding opportunities that can be monitored include special pre- and post-disaster funds, special district budgeted funds, state or federal ear-marked funds, and grant programs, including those that can serve or support multi-objective applications.

With adoption of this plan, the Cumberland Plateau Planning District communities commit to:

- Pursuing the implementation of the high-priority, low/no-cost recommended actions.
- Keeping the concept of mitigation in the forefront of community decision-making by identifying and stressing the recommendations of the Hazard Mitigation Plan when other community goals, plans and activities are discussed and decided upon.
- Maintaining a constant monitoring of multi-objective, cost-share opportunities to assist the participating communities in implementing the recommended actions of this plan for which no current funding or support exists.

Maintenance

Plan maintenance requires an ongoing effort to monitor and evaluate the implementation of the plan, and to update the plan as progress, roadblocks, or changing circumstances are recognized.

This monitoring and updating will take place through:

1. An annual review by each Cumberland Plateau Planning District community,
2. An annual review through the Mitigation Advisory Committee, and
3. A 5-year written update to be submitted to the state and FEMA Region III, unless disaster or other circumstances (e.g., changing regulations) lead to a different time frame.

When each community convenes for a review, they will coordinate with each of the other jurisdictions that participated in the planning process – or that has joined the planning group since the inception of the planning process – to update and revise the plan. Public notice will be given and public participation will be invited, at a minimum, through available web postings and press releases to the local media outlets, primarily newspapers and radio stations.

The evaluation of the progress can be achieved by monitoring changes in the vulnerability identified in the plan. Changes in vulnerability can be identified by noting:

- Lessened vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions, and/or,
- Increased vulnerability as a result of new development (and/or annexation).

The updating of the plan will be by written changes and submissions, as the Cumberland Plateau Planning District communities and Mitigation Advisory Committee deem appropriate and necessary.

IX. REFERENCES

In addition to the general body of literature on hazard vulnerability and hazard mitigation, the following reports and data were reviewed and used during this study:

City of Chesapeake, Virginia, Natural Hazards Mitigation Plan, 2003-2008, by City of Chesapeake, VA and Dewberry & Davis LLC, September 2003.

City of Conway, South Carolina Flood Hazard Mitigation Plan, February 16, 2000, by French & Associates, Ltd. Park Forest, Illinois.

Flood Mitigation Plan for Lewes, Delaware, September 1999, by Greenhorne & O'Mara, Inc.,9001 Edmonston Road, Greenbelt, MD 20770.

Heart of Illinois Project Impact Natural Hazards Mitigation Plan, April 12, 2004 by Dewberry, 8401 Arlington Blvd., Fairfax, VA 220311-4666.

Hyde County, North Carolina, Multi-Hazard Mitigation Plan, 2003, by Hyde County, NC.

Northeast Colorado All Hazards Mitigation Plan, December 2003 by Northeast Colorado Emergency Management Association and Mitigation Assistance Corporation.

HIRA references

All about Bluefield

Buchanan County VA *Comprehensive Plan*

Cumberland Plateau PDC*, Comprehensive Economic Development Strategy*

Dickenson County VA *Comprehensive Plan*

Federal Emergency Management Agency , *Engineering Principles and Practices of Retrofitting Floodprone Residential Structures* (FEMA 259, 1995)

Federal Emergency Management Agency, *Understanding Your Risks: Identifying hazards and estimating losses (*FEMA 386-2, 2001)

National Earthquake Information Center

National Climatic Data Center, National Oceanic and Atmospheric Administration

Personal communication with Virginia Department of Transportation

Tazewell County VA *Comprehensive Plan*

Tennessee Valley Authority reports (1964, 1971)

Upper Tennessee River Watershed Conservation Roundtable, *Upper Tennessee River Watershed Strategic Plan*

Virginia State Water Control Board report (1977)

Virginia Uniform Statewide Building Code

VA Department of Forestry, *Wildfire Risk Assessment (WRA) – 2003*

Work Plan for Upper Clinch Valley Watershed

United States Corp of Army Engineers report (1971)

United States Geological Survey, Flood Gauge Data

APPENDIX A — DETAILED HAZARD IDENTIFICATION PARAMETERS AND METHODOLOGY

Based on all local and regional hazard data collected, an analysis of the potential hazards that can affect the Cumberland Plateau Planning area was performed based on the four parameters that are described below. These four parameters were based on two separate factors — *the probabilities that a potential hazard will affect the area and the potential impacts on the city should a hazard event occur*. Hazard identification parameters and computations used to prioritize the potential hazards that can threaten the Cumberland Plateau planning area are listed in tabular form at the end of this appendix.

Probability — This parameter addresses the probability that a potential hazard will affect the planning area. The probability for each hazard was determined based on the history of events in the planning area, as well as any other relevant available data. Hazard probabilities were classified into one of four distinct categories by estimating the hazard's average annual frequency, which is the probability of a specific hazard event occurring in the planning area in a given year.

Affected Area — This parameter is the first of three impact parameters, and addresses the potentially affected geographic area within the planning area should a hazard event occur. The extent of the affected area for each hazard was determined based on the specific characteristics of each hazard, the history of such events within the Cumberland Plateau planning area, and experience with similar events that have occurred near the area. The affected areas were classified into one of four distinct categories based on the extent of the planning area that would be directly impacted by the hazard, ranging from a single building or facility to a widespread area of the planning area.

Primary Impact — This second impact parameter addresses the potential direct damages to buildings, facilities, and individuals should a hazard event occur. The primary impact was determined based on the specific characteristics of each hazard, the history of such events in the Cumberland Plateau planning area, and experience with similar events that have occurred in the region. Primary impacts were classified into one of four distinct categories by estimating the typical damage to a city building or facility from a given hazard, ranging from negligible (less than 10% damage) to catastrophic (greater than 50% damage).

Secondary Impacts — This third impact parameter addresses the potential secondary impacts on the planning area should a hazard event occur. Note that while primary impacts are a direct result of the hazard, secondary impacts can only arise subsequent to a primary impact. For

example, a primary impact of a flood event may be road closures due to submerged pavement; while a secondary impact could be restricted access of emergency vehicles to citizens in a portion of the community due to the road closure. Other examples of secondary impacts include loss of building or facility services (functional downtime), power outages, and mass evacuation of city residents. The secondary impacts were determined based on the specific characteristics of each hazard, the history of such events in the planning area, and experience with similar events in the region. Secondary impacts were classified into one of four distinct categories by estimating the typical impacts to the city at large from a given hazard, ranging from negligible (no loss of function, downtime, and/or evacuations) to high (major loss of function, downtime, and/or evacuations).

Once these parameters were determined, a preference scale was utilized to arrive at a hazard level for each of the hazard types considered for the planning area. The preference scale method has been used as a means of quantifying hazard assessment results in other communities, and similar scales were developed to rank alternatives in other FEMA documents such as FEMA Publication 259. The preference scale used for this hazard analysis first assigned a numerical value between 1 and 4 to each parameter, with 1 representing the lowest hazard potential and 4 being the highest. These numerical values were then modified by weighing each parameter by a factor to reflect the overall importance of that parameter, with 0.5 representing parameters of lowest importance and 2.0 representing parameters of highest importance. Importance factors may also be adjusted to reflect the level of confidence with the information supplied for a given parameter. For this reason, probability parameters were assigned a factor of 2.0 to reflect their high importance and the generally high confidence in the available information. However, the affected area, primary impact and secondary impacts parameter were assigned factors of 0.8, 0.7 and 0.5 to reflect their lower importance and the low confidence in the available information. Finally, the factored values assigned to the various parameters for each hazard were totaled, and the hazard types with the highest totals were considered the highest potential hazard level.

In order to quantify these hazard parameters, the following formula was developed to assign a value for probability and impact for each of the hazards considered.

Hazard Level = Probability x Impacts

Where: Probability = (Probability score x Importance factor)

Impacts = (Affected Area + Primary Impact + Secondary Impacts)

Affected Area = Affected Area score x Importance factor

Primary Impact = Primary Impact score x Importance factor

Secondary Impact = Secondary Impact score x Importance factor

The preference scale computations used to determine the hazard level for each of the potential hazards impacting the Cumberland Plateau planning area are summarized in tabular form at the end of this appendix. The hazard levels are broken down into four distinct categories that represent the likelihood of a hazard event of that type significantly impacting the planning area: High, Medium-High, Medium, and Low. Note that the assigning of numerical values and importance factors for parameters is qualitative in nature and based on data from a number of sources with varying degrees of accuracy. For this reason, a margin or error of ±10 percent was assumed for the total scores used to arrive at the hazard level values.

CUMBERLAND PLATEAU PLANNING DISTRICT

Appendix A: Hazard Identification Worksheet

Hazard Type	Probability	Impacts			Total Score	Hazard Level
		Affected Area	Primary Impact	Secondary Impacts		
SEVERE WINTER STORM	6	3.2	1.4	1.5	37	Medium-High
DROUGHT	4	3.2	0.7	1	20	Medium
EARTHQUAKE	4	3.2	1.4	1	22	Medium
WILDFIRE	8	2.4	2.1	0.5	40	Medium-High
FLOOD	8	2.4	2.1	2	52	High
EXTREME HEAT	2	3.2	0.7	0.5	9	Low
LANDSLIDES	8	1.6	2.1	1	38	Medium-High
SEVERE THNDERSTORM / HAIL STORM	8	1.6	0.7	0.5	22	Medium
DAM/LEVEE FAILURE	2	1.6	2.8	2	13	Medium
TORNADO	2	1.6	2.1	1	9	Low

Total Score = Probability x Impact, where:
Probability = (Probability Score x Importance)
Impact = (Affected Area + Primary Impact + Secondary Impacts), where:
Affected Area = Affected Area Score x Importance
Primary Impact = Primary Impact Score x Importance
Secondary Impacts = Secondary Impacts Score x Importance

Hazard Level

Total Score (Range)		Hazard Level	Distribution
0.0	12.0	Low	2
12.1	28.0	Medium	4
28.1	48.0	Medium-High	3
48.1	64.0	High	1

The probability of each hazard is determined by assigning a level, from 1 to 4, based on the likelihood of occurrence from historical data. The total impact value includes the affected area, primary impact and secondary impact levels of each hazard. These levels are then multiplied by an importance factor to obtain a score for each category. The probability score is multiplied by the sum of the three impact categories to determine the total score for the hazard. Based on this total score, the hazards will be separated into four categories based on the hazard level they pose to the planning area: high, medium-high, medium, low.

Probability Importance 2.0

Based on average annual frequency of occurrence estimated from historical data

Level	Average Annual Frequency	Score
1	Unlikely (less than 1% occurrence)	2
2	Possible (between 1% and 10% occurrence)	4
3	Likely (between 10% and 100% occurrence)	6
4	Highly likely (near 100% occurrence)	8

Affected Area Importance 0.8

Based on size of geographical area of community affected by hazard

Level	Affected Area	Score
1	Isolated - limited to one building/facility	0.8
2	Small - limited to a handful of buildings/facilities	1.6
3	Medium - affecting a portion of an area	2.4
4	Large - affecting a widespread area	3.2

Primary Impact Importance 0.7

Based on percentage of damage to typical facility in community

Level	Impact	Score
1	Negligible - less than 10% damage	0.7
2	Limited - between 10% and 25% damage	1.4
3	Critical - between 25% and 50% damage	2.1
4	Catastrophic - more than 50% damage	2.8

Secondary Impacts Importance 0.5

Based on estimated secondary impacts to community at large

Level	Impact	Score
1	Negligible - no loss of function, downtime, and/or evacuatic	0.5
2	Limited - minimal loss of function, downtime, and/or evacua	1
3	Moderate - some loss of function, downtime, and/or evacua	1.5
4	High - major loss of function, downtime, and/or evacuations	2

NOTE:
Total Score values assume a margin of error of ± 10 percent.

Appendix B

Town of Bluefield

Supplement to the CPPDC Plan

Table of Contents

Hazard Identification and Risk Assessment

Section 1 - Introduction

Background

In 2002, the Town of Bluefield was awarded several FEMA Hazard Mitigation Grant Program (HMGP) grants from DR-1386-VA for 2001 flooding. One of these grants provided funding for Bluefield to develop a multi-hazard mitigation plan to satisfy Disaster Mitigation Act of 2000 (DMA2K) requirements. This funding was awarded prior to Virginia establishing a statewide approach to develop these plans. Originally, Bluefield had planned to develop a separate, stand-alone plan to cover all DMA2K requirements. In 2002, the Virginia Department of Emergency Management established the policy of using Virginia Planning District Commissions to develop multi-jurisdictional plans. After the Cumberland Plateau Planning District Commission (CPPDC) was awarded funding, Bluefield staff met with CPPDC representations and decided to make the Bluefield efforts a supplement to the District Plan. Instead of having the limited grant funds for Bluefield used to duplicate many of the sections of the District Plan, the Bluefield supplement would focus on gathering more detailed information for the town for the hazard identification and risk assessment (HIRA) and the mitigation strategy. This also allowed Bluefield to focus on those issues that the town's government controls, such as local ordinances, rather than those issues that are controlled at the Tazewell County level, such as VDOT road improvement plans

This Appendix, to the CPPDC Plan, provides that supplemental HIRA and strategy information specific to Bluefield, Virginia be incorporated in the regional plan. For certain hazards, such as flooding, grants funds were to used to develop more detailed hazard and critical facility mapping than the CPPDC Plan funds could gather. This supplement also indicates when any additional information has been gathered or when the CPPDC Plan information and description apply. For example, additional information was gathered for karst (sinkhole) hazards, included detailed mapping in Bluefield. This has been included in the landslide section of this Bluefield supplement, but no additional descriptive information was included about basic landslides, which was covered in depth by the CPPDC Plan. This Appendix was developed by the Virginia Tech Center for Geospatial Information Technology, under a subcontract with Anderson and Associates of Blacksburg, Virginia. Additional data was provided by Marshall Miller and Associates and Willis Engineering, both in Bluefield, Virginia.

Town Description

The Town of Bluefield, Virginia is located at the northeast corner of Tazewell County, adjacent to the Jefferson National Forest. Bluefield is located at the base of East River Mountain in the Blue Ridge Mountains, with a total area of 7.6 square miles. The town developed from the railroad industry, with a need to serve the coal mines in Pocahontas, Virginia. The Town of Bluefield has been known by various names throughout the years.

In 1860 the town was called Pin Hook, in 1883 it was renamed to Harman and then later to Graham. In 1924 the Town of Graham took the name of Bluefield like Bluefield, West Virginia.

Figure B.1 shows the 2004 town limits of Bluefield, along with locations for structures, roads, and railroads. The original town limits consisted of the areas along Business Rt. 19 in the northern part of town. As the population of the area has grown, a series of boundary adjustments and annexations has expanded the Town south into the next valley along Rt. 460 and up the northern slope of East River Mountain to the county boundary with Bland County. Nicknamed the 'Virginia's Tallest Town", Bluefield elevations range from around 2,400 ft to almost 4,000 ft above sea level on East River Mountain. The census of 2000 indicates that the town has a population of 5,078 people. Because of the West Virginia state boundary to the east and the Bland County boundary to the south, any future growth of the Town will occur either to the west along Rt. 460 or north towards the Town of Pocahontas.

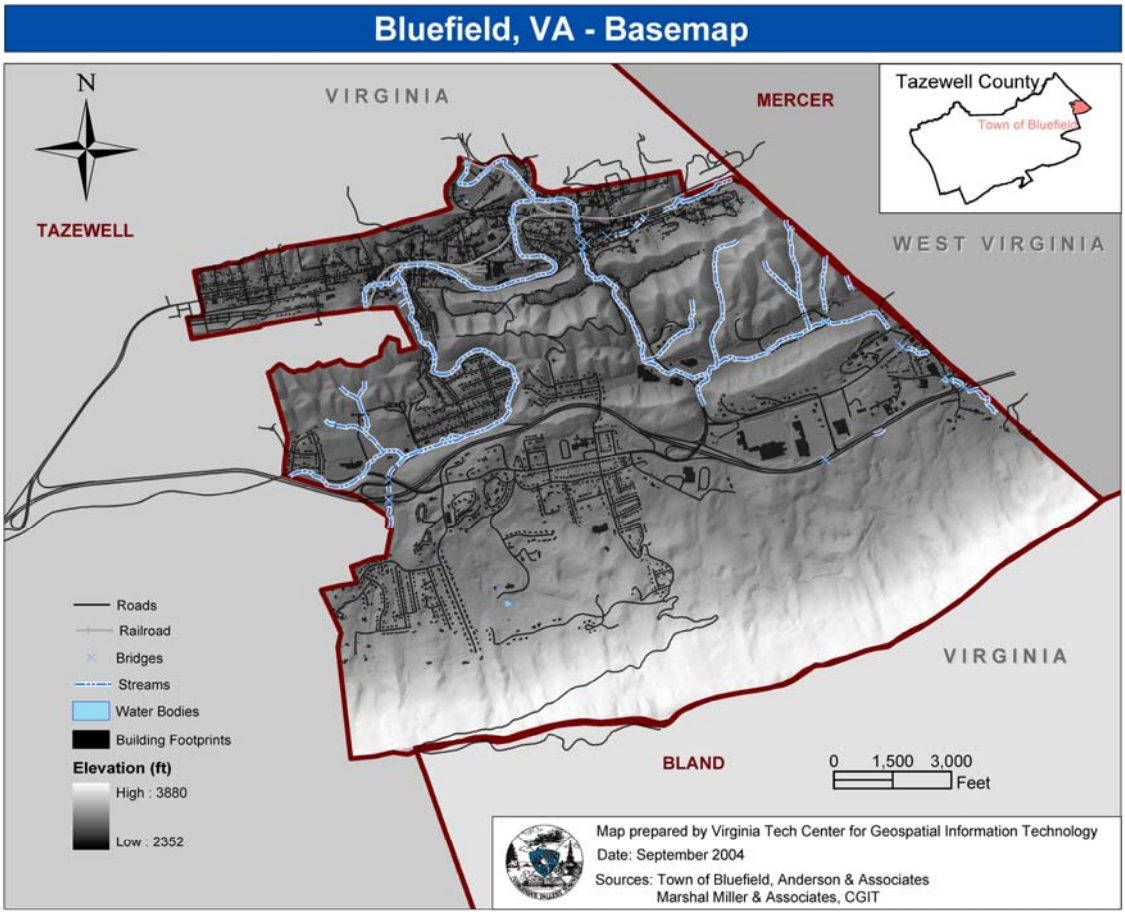


Figure B.1. Bluefield Base Map.
Note: All numbered figures in this Appendix are provided in a format for black and white reproduction. Full page, color versions of all figures are included at the end of this Appendix.

Watersheds

The Town of Bluefield has six major sub-watersheds within its boundaries. All of the sub-watersheds for Bluefield are included in the New River Basin. The watersheds include Mudfork, Wrights Valley Creek, Bluestone River, Beaver Pond Creek, Whitney Branch and Brush Fork. A majority of the town's water supply comes from the Bluestone River watershed. Figure B.2 illustrates the sub-watershed boundaries.

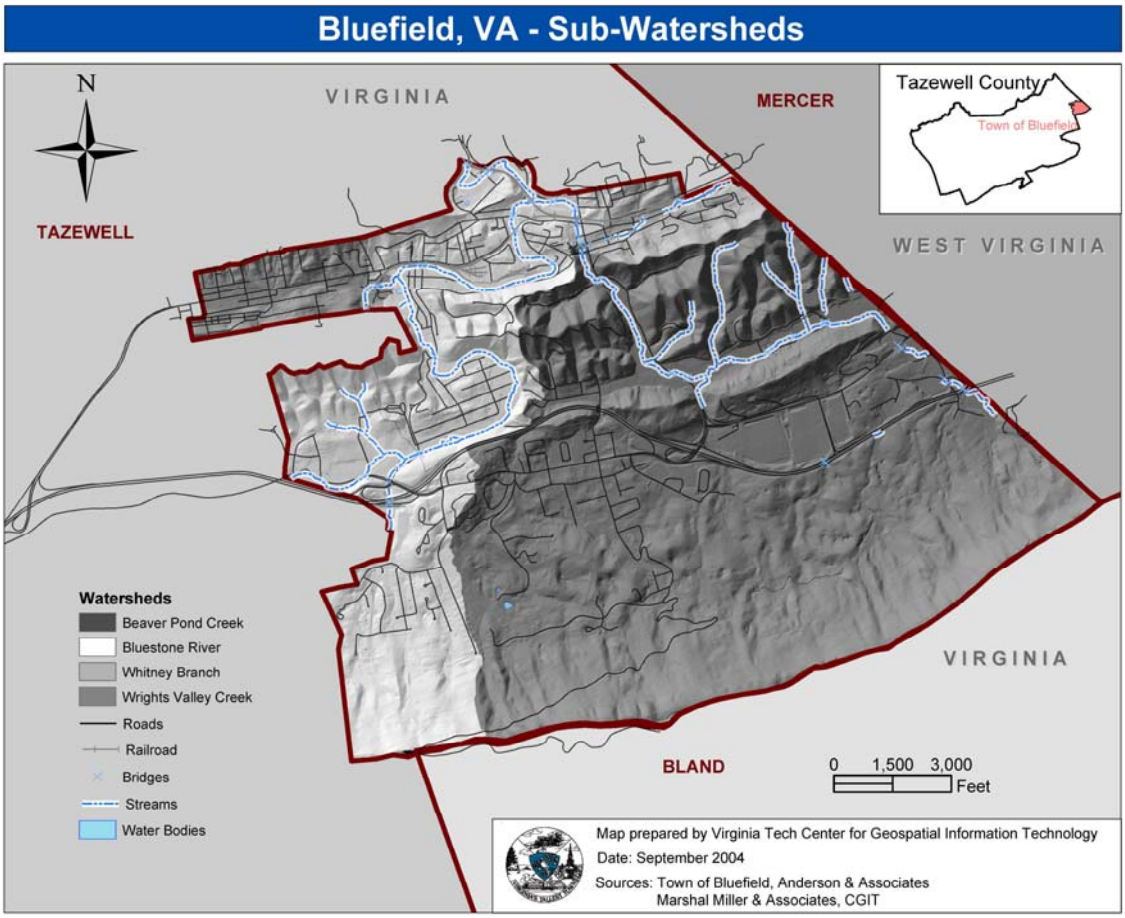


Figure B.2: Bluefield Sub-Watersheds

Critical Facilities

Town of Bluefield critical facilities were derived from the town's building records. Bridge locations were based on aerial photography and maps of roads, railroads, and streams. Structure values were located for specific areas and average neighborhood values were used in areas that structure values were not readily available and if no neighborhood value was available, the structure value from Census 2000 data was used for the average building value ($75,600). Figure B.3 details the location of critical facilities throughout town.

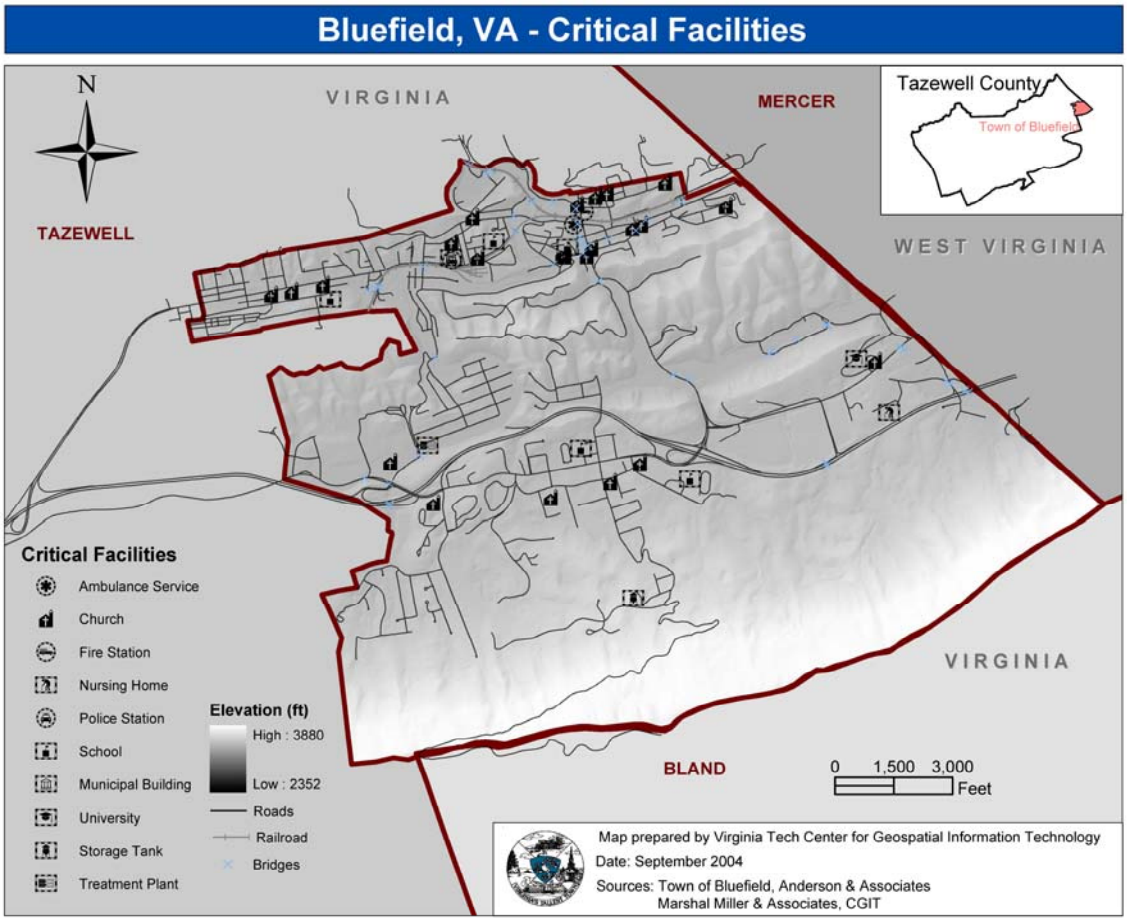


Figure B.3. Bluefield Critical Facilities

Section 2 – Hazard Identification

The FEMA guidelines emphasize using "available data" for this plan, especially for the Hazard Identification and Risk Assessment (HIRA). As mentioned earlier, this Appendix was developed by the Virginia Tech Center for Geospatial Information Technology, under a subcontract with Anderson and Associates of Blacksburg, Virginia. Besides the data provided by the Town of Bluefield, the following organizations all provided data used for this HIRA:

- Anderson and Associates, Inc.
- Bluefield Daily Telegraph
- Cumberland Plateau Planning District Commission (Virginia)
- Dewberry
- Federal Emergency Management Agency
- Marshall Miller and Associates
- Region I Planning and Development Council (West Virginia)
- Tazewell County, Virginia
- Tuck Engineering
- US Census Bureau
- US Geological Survey
- Virginia Department of Conservation and Recreation
- Virginia Department of Emergency Management
- Virginia Department of Transportation
- Virginia Geographic Information network
- Virginia Tech Center for Geospatial Information Technology
- Willis Engineering

Types of Hazards

While nearly all disasters are possible for any given area in the United States, the most likely hazards that could potentially affect the communities in the Cumberland Plateau Planning District generally include:

- Flooding
- Severe Winter Storms
- Wildfires
- Landslides
- Dam Failures
- Drought
- Earthquake
- Severe Wind
- Severe Thunderstorms
- Tornadoes

Probability of Hazards

The hazards that were dealt with are included in the Bluefield HIRA are listed in Table B.1. This is the same list of hazard types and levels as the CPPDC Plan. Analysis level was determined by the type of data available and the scale of data available for the analysis. Certain hazards were not dealt with as a result of the infrequency of occurrence. Dam failure, for example, was excluded from analysis as a result of no dams being located within the Town limits. Tornadoes were profiled but no analysis completed as a result of no recorded tornado touchdowns for the Town of Bluefield and also no touchdowns in Tazewell County.

Table B.1. Hazard Identifications (from CPPDC Plan).

Hazard Identification Results	
Hazard Type	**Hazard Level**
Flooding	High
Sever Winter Storms	Medium-High
Wildfire	Medium-High
Landslides	Medium-High
Severe Thunderstorms/Hail Storms	Medium
Severe Wind	Medium
Earthquake	Medium
Dam/Levee Failure	Medium
Drought	Medium
Tornado	Low
Extreme Heat	Low
Karst Topography	Low

Federally Declared Disasters

Table B.2. lists the six recent federally declared disasters for the Tazewell County, most of which had an impact on the Town of Bluefield. The sections on each hazard will give more information about specific impacts in Bluefield.

Table B.2. Recent Federal Disasters in Tazewell County.

Disaster Number	Dates	Description	Amount Damage
FEMA-1386-DR	July 7 - 10, 2001	Heavy rains Saturday, July 7, 2001, and Sunday, July 8, 2001, caused extensive flooding in Tazewell County.	$15 million
FEMA-1406-DR	March 17, 2002	Heavy rain fell over the counties located in Southwest Virginia. The event caused flash flooding and mudslides, which resulted in the isolation of families from their homes, local evacuations, and significant damage to private and public property. Damage estimate totals at $8,151,765	$8 million
FEMA-1411-DR	April 28 - May 2, 2002	On the evening of 28 April a severe weather system entered Virginia from the west and, once across the Blue Ridge Mountains, developed into a series of tornadoes. Local emergencies were declared in Bedford City, and Bedford, Campbell, Greensville, and Shenandoah Counties. On 2 May 2002, continuing severe weather impacted Virginia. Wind, rain and flood damage was again widespread with the most severe damage occurring in the southwest part of the state. In Buchanan County, heaviest damage was northeast of Grundy in the vicinity of Hurley, and was due to flash flooding and mudslides. Damaging floodwaters and strong winds also impacted nearby Tazewell County.	$500,000
FEMA-1458-DR	February 15, 2003	A major winter storm struck Virginia beginning February 15 2003 causing major flooding in Southwest Virginia and significant ice and snowfall in the Shenandoah Valley and areas of Northern Virginia. The weather pattern continued to bring warmer temperatures, melting snow/ice and more heavy rainfall, which combined to cause more local flooding.	$175,000
FEMA-1502-DR	November 18 -19, 2003	A severe storm system moved into the Commonwealth of Virginia on November 18 and 19, 2003 dumping up to 4.28 inches of rain in 12 hours resulting in flash floods through the southwestern part of Virginia. Two young children in Buchanan County died when their home was washed away by a flash flood. Preliminary assessments indicated the most severe impacts were to single-family residences, manufactured homes and private access bridges. Several apartment buildings with major damage were also identified, as well as damage to sewer pipes and private wells.	$1.6 million
FEMA-1525-DR	May 24 - June 15, 2004	A system of severe storms began moving through Southwest Virginia on May 24, 2004. Flash flooding occurred on May 24-25 in Tazewell and Russell counties. Tornadoes damaged homes in Lee County on May 28. Flash floods impacted Buchanan County and several other counties in Southwest Virginia over the June 12-15 period. One flood-damaged road, Route 772 in Russell County, remains closed.	

Section 3 – Flooding

Hazard History

Table B.3. Bluefield Flood History (Source: FEMA, VDEM, Town of Bluefield, Bluefield Daily Telegraph).

Date	Damages
September 28, 1878	Bridges across the Bluestone River were washed away from impacts of flooding.
March 1, 1955	
January 29, 1957	Damages estimated over $100,000.
March 12, 1963	Damages to transportation infrastructure estimated over $7,000.
August 28, 1964	Damages estimated over $25,000. The Bluestone River was responsible for the flooding of College Avenue.
March 7, 1967	
December 30, 1969	
May 6, 1971	The downtown area impacted by this rain event caused 2.5 feet of flooding, from 1.74 inches of rain over the extent of two days. College Avenue was one of the roads inundated.
April 14, 1972	
April 4, 1977	The business district was incapacitated due to flooding. Virginia Street and College Avenue were some of the areas affected by the rain event. Traffic rerouted to the side streets, with voluntary evacuation of residents.
September 22, 1989	High winds (40 mph) and rain from tropical storm Hugo resulted in power outages and uprooted trees.
August 4, 2001	Thunderstorms during the afternoon and evening of the 4th produced hail up to dime size and flash flooding. Heavy thunderstorm rains caused Big Branch Creek to flood, 4 miles northwest of Bluefield. Heavy rain also flooded and closed several streets in Bluefield.
March 17-20, 2002	FEMA declared disaster (FEMA-1406-DR). Hockman Pike, in the mobile home park, was flooded due to the precipitation of March 20.
February 15, 2003	FEMA declared disaster (FEMA-1458-DR). A mix of rain, melting snow and sleet caused flooding and high water in many areas. Areas affected include Adria Road, South College Avenue. Sandbags were placed in front of businesses in the downtown area. Property damages to homes and businesses were very minimal as compared to past events.
November 19, 2003	FEMA declared disaster (FEMA-1502-DR). Four inches of precipitation resulted in many individuals leaving their homes. Virginia Avenue was closed due to the encroaching flood waters. Downtown businesses attempted to use sandbags to hold out the water. The Westgate shopping center and an apartment complex were evacuated. Approximately 40 houses, 12 mobile homes and 30 businesses sustained damages.
June 12, 2004	FEMA declared disaster (FEMA-1525-DR) During two hours of rain, Bluefield accumulated 2.37 inches of precipitation. Preliminary flood damage indicated that at least 20 houses and 12 businesses were impacted by the flooding. Areas affected include South College Avenue, Main Street (at intersection of Beaver Pond Creek and Whitney Branch), College Avenue, Stadium Drive and Leatherwood Lane.

Hazard Profile

The majority of flooding is flash flooding in the Town of Bluefield. Refer to the Cumberland Plateau Planning District Commission for the complete flooding hazard profile. No hurricanes have been recorded for the Town of Bluefield, but impacts from hurricanes have led to many secondary hazards. Some of these hazards include flash flooding, high winds and landslides, which are addressed later sections.

Hazard Areas

Figure B.4 illustrates the location of the floodplains throughout the Town of Bluefield, based FEMA FIRM base flood elevation and 2002 LIDAR elevation mapping.

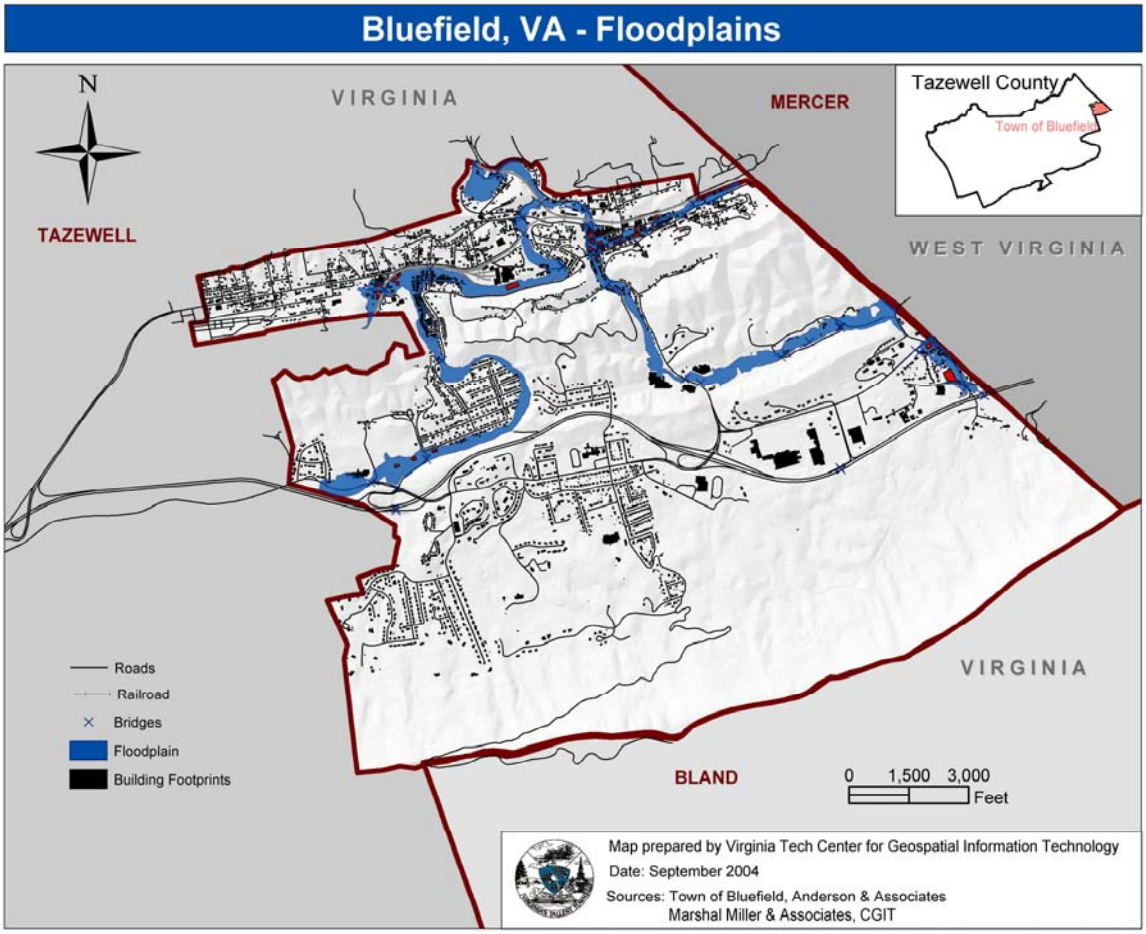


Figure B.4. Bluefield Floodplain Boundaries.

Vulnerability Analysis

Flooding is a major concern to the Town of Bluefield. Many homes and businesses are affected by flooding on an annual basis. Figure B.5. shows the location of critical facilities in the floodplains. From the analysis of buildings in the floodplain, 309 structures are at some risk of flooding with a total value of over $40 million (7% of the total building value for the town). From the buildings located in the floodplain, five of the structures are labeled critical facilities. Tables B.4– B.6 provide a breakdown of the risk from flooding and corresponding values for the structures.

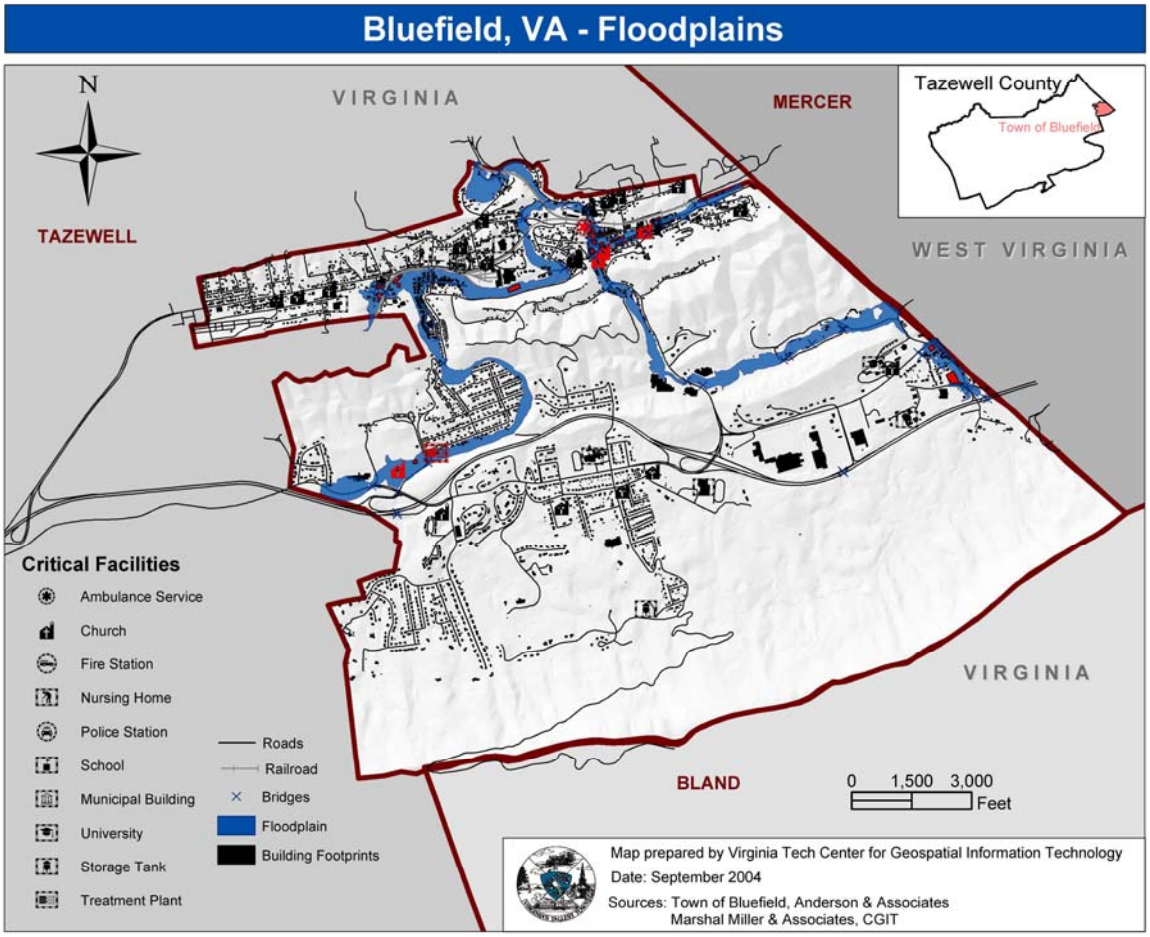


Figure B.5. Bluefield Structures and Critical Facilities in the Floodplain (shown in red).

Table B.4. Bluefield Structure Flood Risk Totals.

Infrastructure	IN FLOODPLAIN	NOT IN FLOODPLAIN	FEMA & TOWN BUY OUTS
Church	4	23	0
Fire Station	0	1	0
Nursing Home	0	1	0
Police	0	1	0
School	0	13	0
Municipal Building (Temporary)	0	1	0
University	0	23	0
Water Storage Tank	0	1	0
Water Treatment Plant	1	1	0
Non-Critical Infrastructure	304	2,854	11
GRAND TOTAL	**309**	**2,919**	**11**
% Structures in Risk Areas	10%	90.12%	0.34%

Table B.5. Bluefield Structure Flood Risk Values.

Infrastructure	Sum of Building Value in the Floodplain	Sum of Building Value not in the Floodplain	Total Value
Church	$2,223,700	$9,689,027	$11,912,727
Fire Station	$0	$35,400	$35,400
Nursing Home	$0	$75,600	$75,600
Police	$0	$75,600	$75,600
School	$0	$18,706,688	$18,706,688
Municipal Building (Temporary)	$0	$75,600	$75,600
University	$0	$185,299,500	$185,299,500
Water Storage Tank	$0	$77,057	$77,057
Water Treatment Plant	$2,175,000	$75,600	$2,250,600
Non-Critical Infrastructure	$35,697,100	$289,228,246	$324,925,346
GRAND TOTAL	**$40,095,800**	**$503,338,318**	**$543,434,118**
% BUILDING VALUE	7.38%	92.62%	

Table B.6. Known Critical Facilities in the Floodplain.

Facility Type	Location	Building Value
BAPTIST CHURCH / BURNED	401 VIRGINIA AVE	$882,400
PARKVIEW BAPTIST CHURCH	CHURCH HOCKMAN PIKE	$631,000
FIRST UNITED METHODIST CHURCH	200 S COLLEGE AVE	$528,300
GRAHAM PRESBYTERIAN CHURCH	140 S COLLEGE AVE	$182,000
TOWN WATER PLANT	104 PARKVIEW DR	$2,175,000
	TOTAL BUILDING VALUES	**$4,398,700**

Section 4 – Winter Storms

Hazard History

Table B.7. Bluefield Snowfall Totals (Source: Bluefield Daily Telegraph).

Date	Recorded Snowfall (inches)
December 11, 1944	27.5
February 19-27, 1947	35.75
November 24-26, 1950	19
March 12-14, 1993	25
January 6-8, 1996	23.6
January 28, 1998	24.7

Hazard Profile

Refer to the Cumberland Plateau Planning District Commission for the complete winter storm hazard profile.

Hazard Areas

No additional information for the Town of Bluefield, see CPPDC plan.

Vulnerability Analysis

No additional information for the Town of Bluefield, see CPPDC plan.

Secondary effects

Winter storms are an annual occurrence for the Town of Bluefield. Secondary hazards, such as snowmelts causing flooding, are a concern to the town. Flooding is addressed, in detail, in the flooding section of this report and the CPPDC plan.

Section 5 – Wildfire

Hazard History

Refer to the Cumberland Plateau Planning District Commission for the complete wildfire hazard history.

Hazard Profile

Refer to the Cumberland Plateau Planning District Commission for the complete wildfire hazard profile.

Hazard Areas

The Town of Bluefield has two distinct wildfire areas. Figure B.6. illustrates the fire zones for the Town of Bluefield. The town is dominated by the high risk zone for wildfires. Refer to the Cumberland Plateau Planning District Commission for the complete description of the wildfire hazard areas.

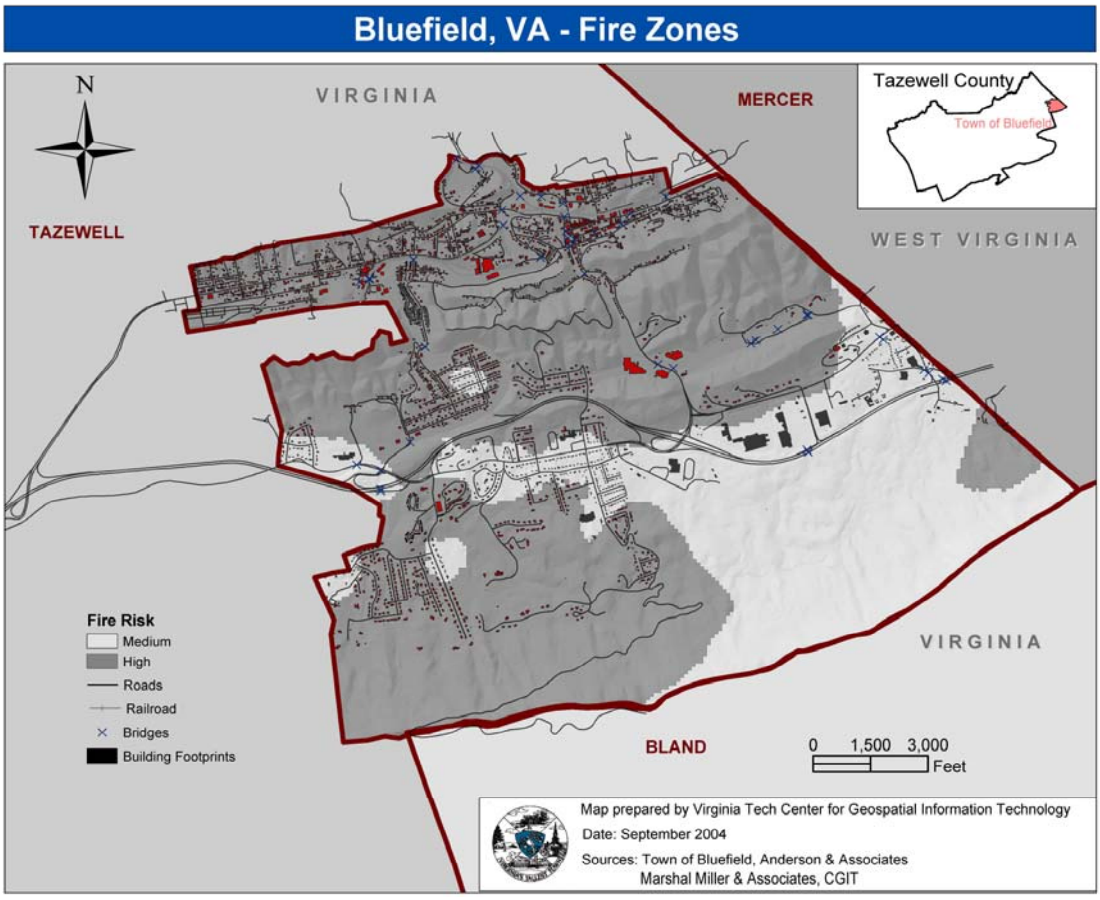


Figure B.6. Bluefield Fire Hazard Zones (based on Virginia Department of Forestry Fire Hazard Mapping with structures in high zone in red).

Vulnerability Analysis

All of the homes and businesses in the Town of Bluefield are in a Medium or High risk area for wildfires. Approximately 83% of the buildings in Bluefield are in a high risk area for wildfires, accounting for 61% of the building value for the town. Figure B.7. shows the location of critical facilities to wildfire risk areas. Most of the critical facilities are located in the high risk areas. The totals and values for these structures and critical facilities are listed in Tables B.8. and B.9.

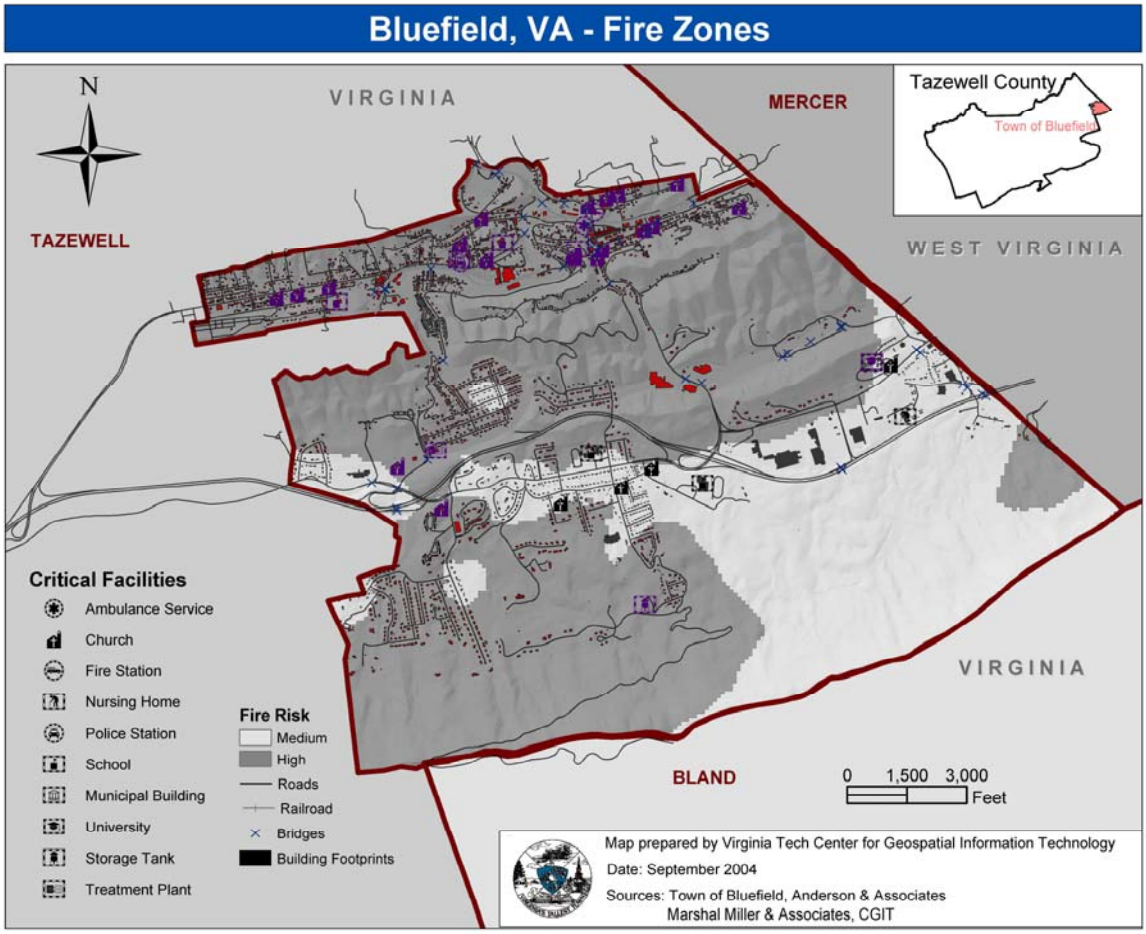


Figure B.7. Bluefield Fire Hazards for Structures and Critical Facilities (high zone structures shown in red, critical facilities in purple).

Table B.8. Bluefield Structure Fire Risk Totals.

	FIRE GRID CODE		
Infrastructure	**1 - LOW**	**2 - MEDIUM**	**3 - HIGH**
Church	0	4	23
Fire Station	0	0	1
Nursing Home	0	1	0
Police	0	0	1
School	0	3	10
Municipal Building *(Temporary)*	0	0	1
University	0	18	5
Water Storage Tank	0	0	1
Water Treatment Plant	0	0	2
Non-Critical Infrastructure	0	530	2,639
GRAND TOTAL	**0**	**556**	**2,683**
% Structures in Risk Areas	0%	17.17%	82.83%

Table B.9. Bluefield Structure Fire Risk Values.

	TOTAL BUILDING VALUES IN FIRE RISK ZONES			
Infrastructure	**1 - LOW**	**2 - MEDIUM**	**3 - HIGH**	**TOTAL VALUE**
Church	0	$8,493,712	$3,419,015	$11,912,727
Fire Station	0	$0	$35,400	$35,400
Nursing Home	0	$75,600	$0	$75,600
Police	0	$0	$75,600	$75,600
School	0	$4,660,000	$14,046,688	$18,706,688
Municipal Building (Temporary)	0	$0	$75,600	$75,600
University	0	$145,017,000	$40,282,500	$185,299,500
Water Storage Tank	0	$0	$77,057	$77,057
Water Treatment Plant	0	$0	$2,250,600	$2,250,600
Non-Critical Infrastructure	0	$56,188,565	$268,736,781	$324,925,346
GRAND TOTAL	**0**	**$214,434,877**	**$328,999,241**	**$543,434,118**
% BUILDING VALUE	0%	39.46%	60.54%	

Section 6 – Landslides and Karst

Note: Bluefield had available information about karst areas and sinkholes that was not included in the CPPDC Plan. This section will provide background information on karst not included in the CPPDC Plan.

Hazard History

Refer to the Cumberland Plateau Planning District Commission for the complete landslide hazard history.

Hazard Profile

Refer to the Cumberland Plateau Planning District Commission for the complete landslide hazard profile.

Land subsidence is the lowering of surface elevations due to changes made underground. The USGS notes that land subsidence is usually caused by human activity such as pumping of water, oil, or gas from underground reservoirs. Land subsidence often occurs in regions with mildly acidic groundwater and the geology is dominated by limestone, dolostone, marble or gypsum. Karst is the term used to refer to geology dominated by limestone and similar soluble rocks. The acidic groundwater dissolves the surrounding geology creating sinkholes. Sinkholes are classified as natural depressions of the land surface. Areas with large amounts of karst are characterized by the presence of sinkholes, sinking streams, springs, caves and solution valleys.

Marshall Miller and Associates, a local consulting firm, provided data for analysis.

Impacts

The USGS recognizes four major impacts caused by land subsidence:

1. changes in elevation and slope of streams, canals, and drains
2. damage to bridges, roads, railroads, storm drains, sanitary sewers, canals, and levees
3. damage to private and public buildings
4. failure of well casings from forces generated by compaction of fine-grained materials in aquifer systems

Predictability

Refer to the Cumberland Plateau Planning District Commission for the complete landslide predictability.

The most important current and future environmental issue with respect to karst is the sensitivity of karst aquifers to groundwater contamination. The effect of man on karst is most severe in cases where polluted surface waters enter karst aquifers. This problem is universal among all karst regions in the United States that underlie populated areas. The country's karstic groundwater problems are accelerated with the advent of (1) expanding urbanization, (2) misuse and improper disposal of environmentally hazardous chemicals, (3) shortage of suitable repositories for toxic waste (both household and industrial), and (4) ineffective public education on waste disposal and the sensitivity of the karstic groundwater system.

Occasionally the land surface in karst regions may collapse. Most of these events are triggered by man's activities in the karstic environment. Excessive pumping of groundwater from karstic aquifers may rapidly lower the water table and calls a sudden loss of buoyant forces that stabilize the roofs of cavernous openings. Man-induced changes in surface water flow and infiltration also may cause collapse. Most sinkholes that form suddenly occur where soil that overlies bedrock collapses into the pre-existing void.

Hazard Areas

The following maps provide information about the locations and severity of landslide and land subsidence from karst risks in Bluefield. Figure B.8. shows the USGS landslide zones in Bluefield from nationwide landslide mapping. Notice most of the town is either in the "Moderate Susceptibility/Low Incidence" category or the "Low Incidence" category. While these categories take into account national geologic mapping and national databases of landslide occurrence, these do not have the resolution for detailed, local slopes.

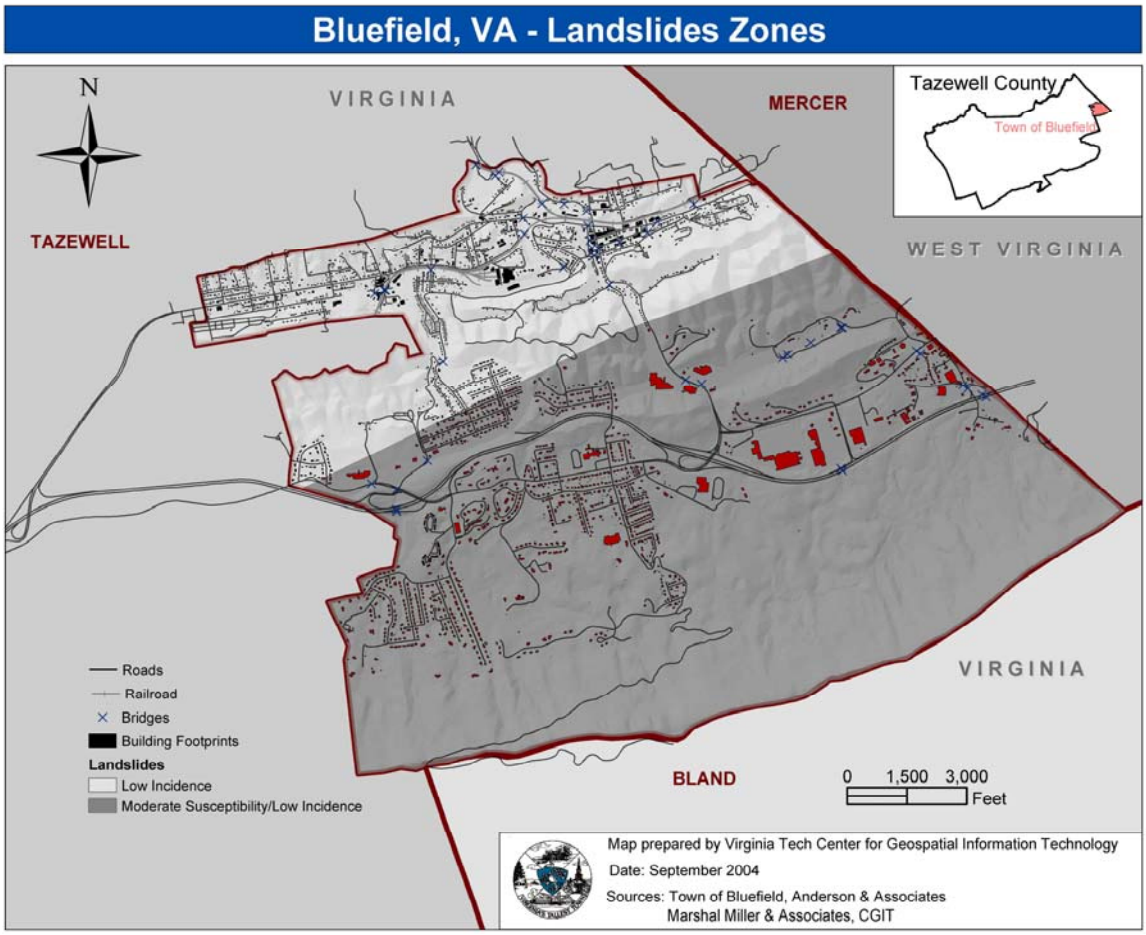


Figure B.8. Bluefield Landslide Zones (from USGS National Landslide Map, moderate susceptibility/low incidence structures shown in red).

Figure B. 9. shows three ranges of percent slope (0-15%, 15-30%, and 30%+) within Bluefield based off of 2002 LIDAR elevation data developed by Tuck Engineering.. The area with the highest slopes (30%) are expected to have the greatest landslide potential. These is especially true in location like road cuts along Rt. 460, where slopes approach 100%.

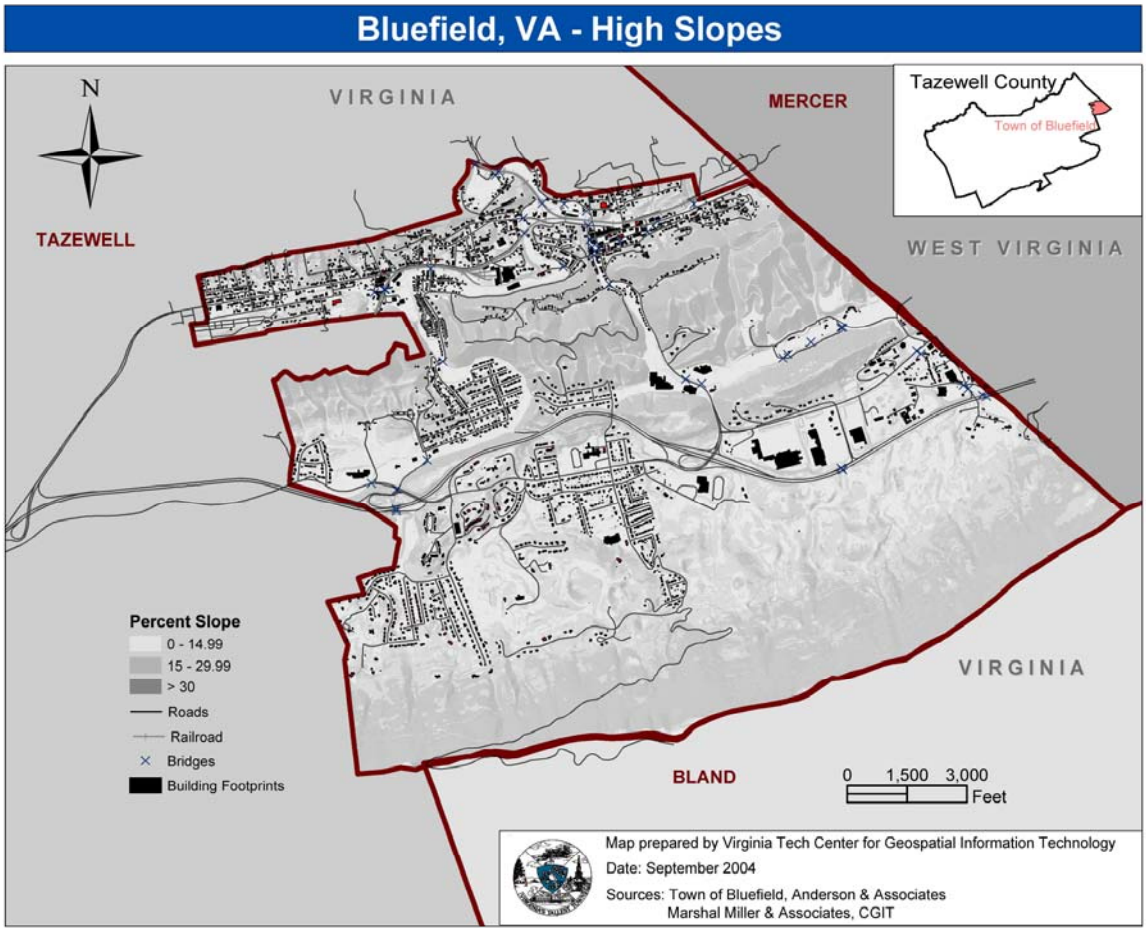


Figure B.9. Bluefield High Slopes (Source: 2002 LIDAR elevation data).

Figure B. 10. shows another way that the 2002 LIDAR elevation data can be interpreted to develop a sinkhole map for Bluefield. The areas with a substantial elevation depression that were not part of the regular drainage network were classified sinkholes. Notice most of the sinkhole are along the base of East River Mountain, south of Rt. 460. developed by Tuck Engineering.. The area with the highest slopes (30%) are expected to have the greatest landslide potential. These is especially true in location like road cuts along Rt. 460, where slopes approach 100%.

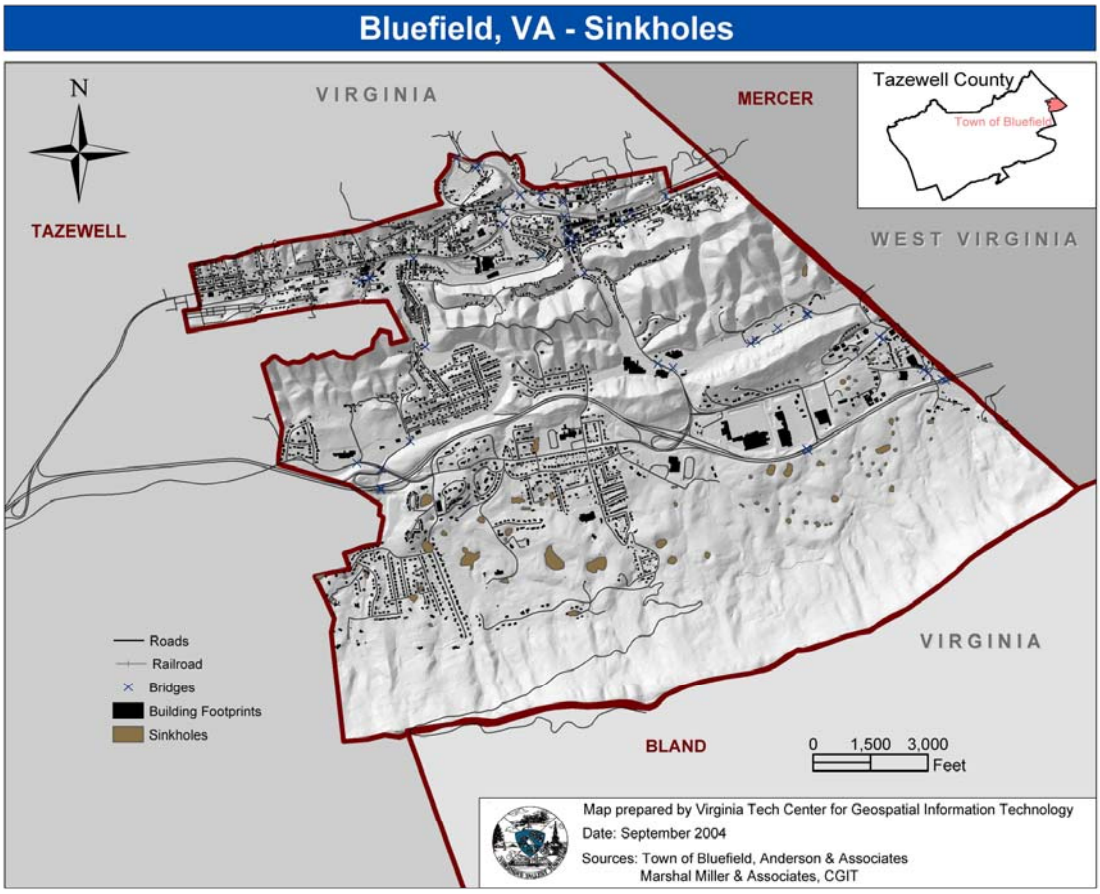
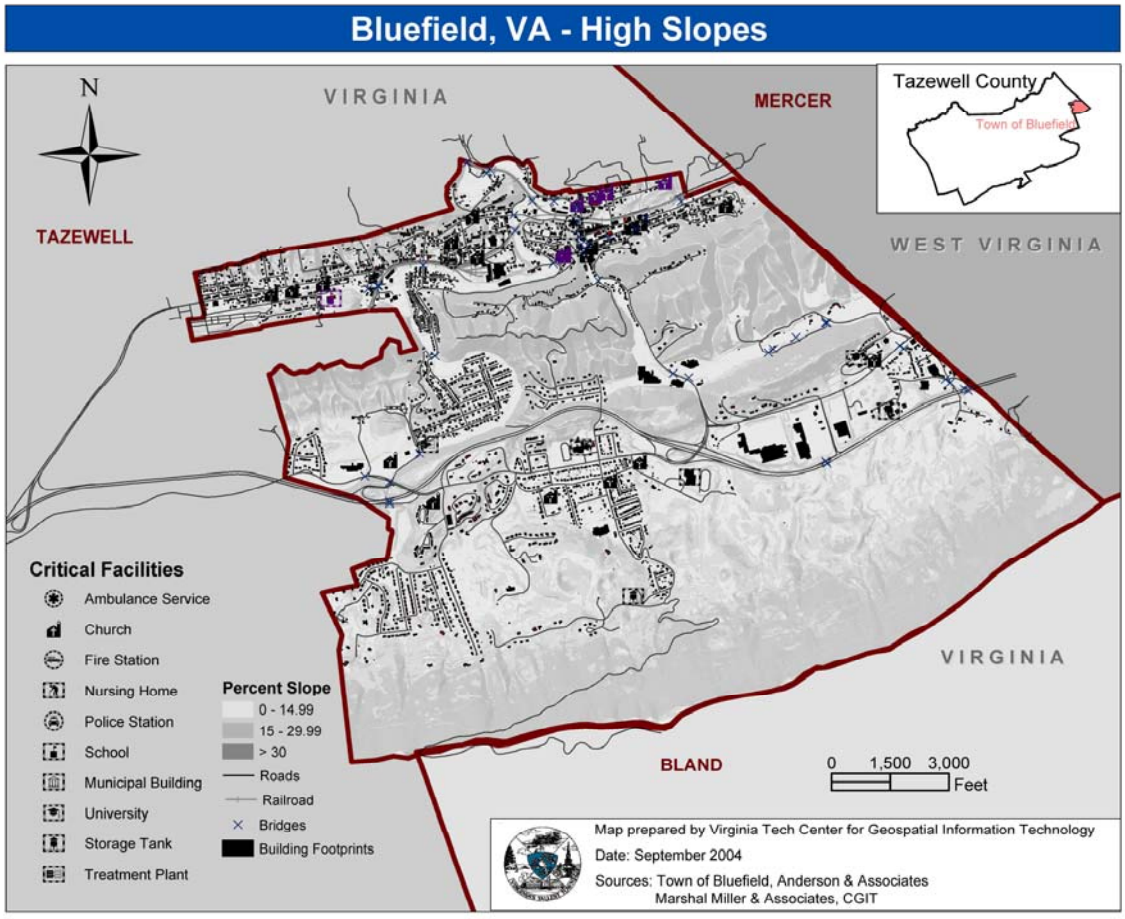


Figure B.10. Bluefield Sinkholes (Source: 2002 LIDAR elevation data).

Vulnerability Assessment

Landslides and karst topography are a medium risk to the residents and business owners in the Town of Bluefield. Structures that are built in an area of greater than 15% slope account for 31% of the total building value for structures in the Town of Bluefield, which can also be represented as 29% of the total buildings, as shown in Figure B. 11 and listed in Tables B.10 and B.11. Compared to landslide risk, risk from a building failure due to karst topography is rather small, with 0.37% of structures within 30 feet of known sinkholes, as shown in Figure B.12 in Tables B.12 and B.13. Developing in a karst landscape may pose significant problems without ordinances to limit development in high risk areas.



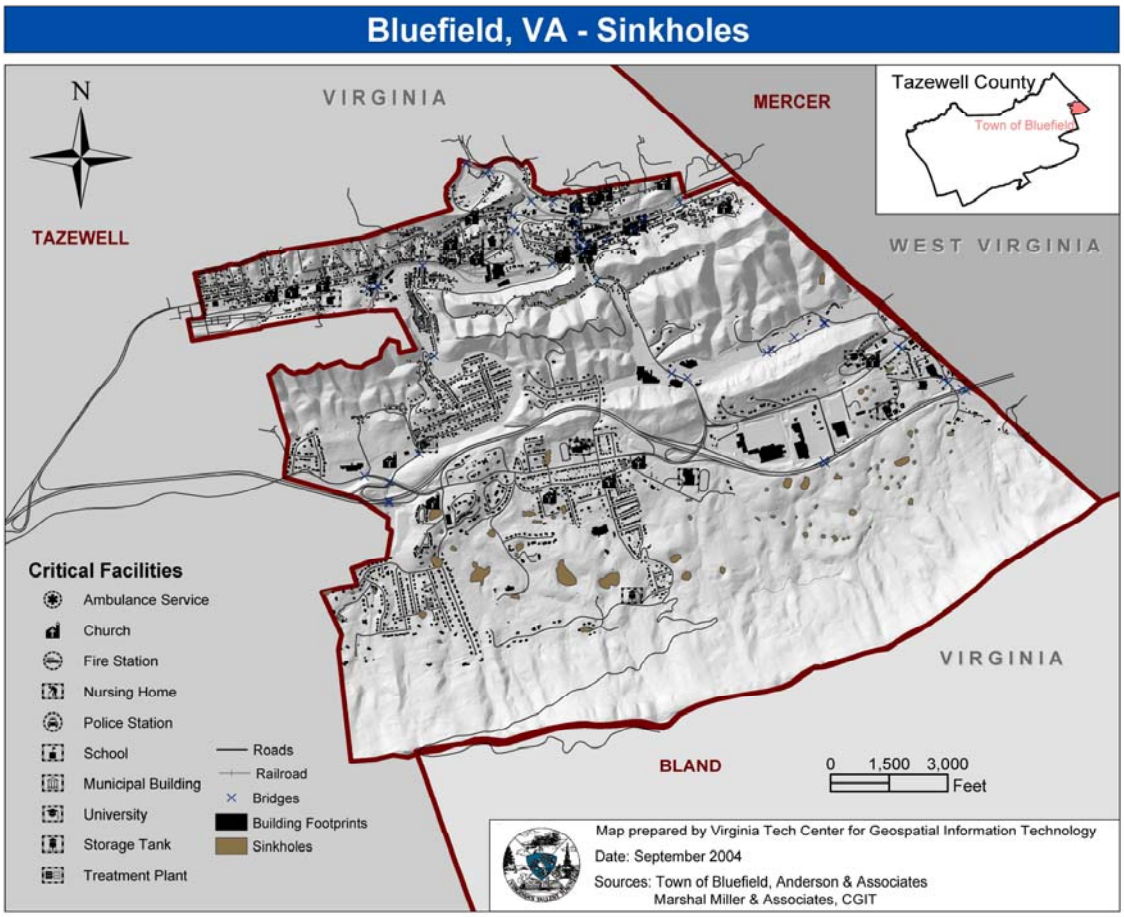
B.11. Bluefield High Slope Hazards for Structures and Critical Facilities (Structures in >30% slope shown in red, critical facilities in purple).

Table B.10. Bluefield Structure High Slope Risk Totals.

	TOTAL BUILDINGS COMPARED TO SLOPE		
Infrastructure	**Greater than 15% slope**	**Less than 15% slope**	**BUILDING TOTAL**
Church	9	18	27
Fire Station	0	1	1
Nursing Home	0	1	1
Police	0	1	1
School	3	10	13
Municipal Building (Temporary)	0	1	1
University	10	13	23
Water Storage Tank	0	1	1
Water Treatment Plant	0	2	2
Non-Critical Infrastructure	926	2243	3169
GRAND TOTAL	**948**	**2291**	**3239**
% Structures in Risk Areas	29.27%	70.73%	

Table B.11. Bluefield Structure High Slope Risk Values.

	TOTAL BUILDING VALUES COMPARED TO SLOPE		
Infrastructure	**Greater than 15% slope**	**Less than 15% slope**	**TOTAL VALUE**
Church	$1,046,388	$10,866,339	$11,912,727
Fire Station	$0	$35,400	$35,400
Nursing Home	$0	$75,600	$75,600
Police	$0	$75,600	$75,600
School	$2,434,488	$16,272,200	$18,706,688
Municipal Building (Temporary)	$0	$75,600	$75,600
University	$80,565,000	$104,734,500	$185,299,500
Water Storage Tank	$0	$77,057	$77,057
Water Treatment Plant	$0	$2,250,600	$2,250,600
Non-Critical Infrastructure	$85,113,797	$239,811,549	$324,925,346
GRAND TOTAL	**$169,159,673**	**$374,274,445**	**$543,434,118**
% Structures in Risk Areas	31.13%	68.87%	



B.12. Bluefield Sinkhole Hazards for Structures and Critical Facilities (shown in red).

Table B.12. Bluefield Structure Sinkhole Risk Totals.

	TOTAL BUILDINGS WITHIN 30 FEET OF SINKHOLES		
Infrastructure	**NO**	**YES**	**TOTAL BUILDINGS**
Church	27	0	27
Fire Station	1	0	1
Nursing Home	1	0	1
Police	1	0	1
School	13	0	13
Municipal Building (Temporary)	1	0	1
University	23	0	23
Water Storage Tank	1	0	1
Water Treatment Plant	2	0	2
Non-Critical Infrastructure	3157	12	3169
GRAND TOTAL	**3227**	**12**	**3239**
% Structures in Risk Areas	99.63%	0.37%	

Table B.13. Bluefield Structure Sinkhole Risk Values.

	TOTAL BUILDING VALUE WITHIN 30 FEET OF SINKHOLES		
Infrastructure	**NO**	**YES**	**TOTAL VALUE**
Church	$11,912,727	$0	$11,912,727
Fire Station	$35,400	$0	$35,400
Nursing Home	$75,600	$0	$75,600
Police	$75,600	$0	$75,600
School	$18,706,688	$0	$18,706,688
Municipal Building (Temporary)	$75,600	$0	$75,600
University	$185,299,500	$0	$185,299,500
Water Storage Tank	$77,057	$0	$77,057
Water Treatment Plant	$2,250,600	$0	$2,250,600
Non-Critical Infrastructure	$323,657,204	$1,268,142	$324,925,346
GRAND TOTAL	**$542,165,976**	**$1,268,142**	**$543,434,118**
% Structures in Risk Areas	99.77%	0.23%	

Section 7 – Wind Events

Hazard History

Table B.14. Bluefield High Wind Events

Date	Damages
September 22, 1989	High winds (40mph) and rain from tropical storm Hugo resulted in power outages and uprooted trees.
September 4, 1993	Thunderstorms in southwest Virginia caused damage to homes and power lines. Property damages were estimated at $5 million (for Tazewell County).

There are no notable or recorded tornadoes for the Town of Bluefield.

Wind Zones

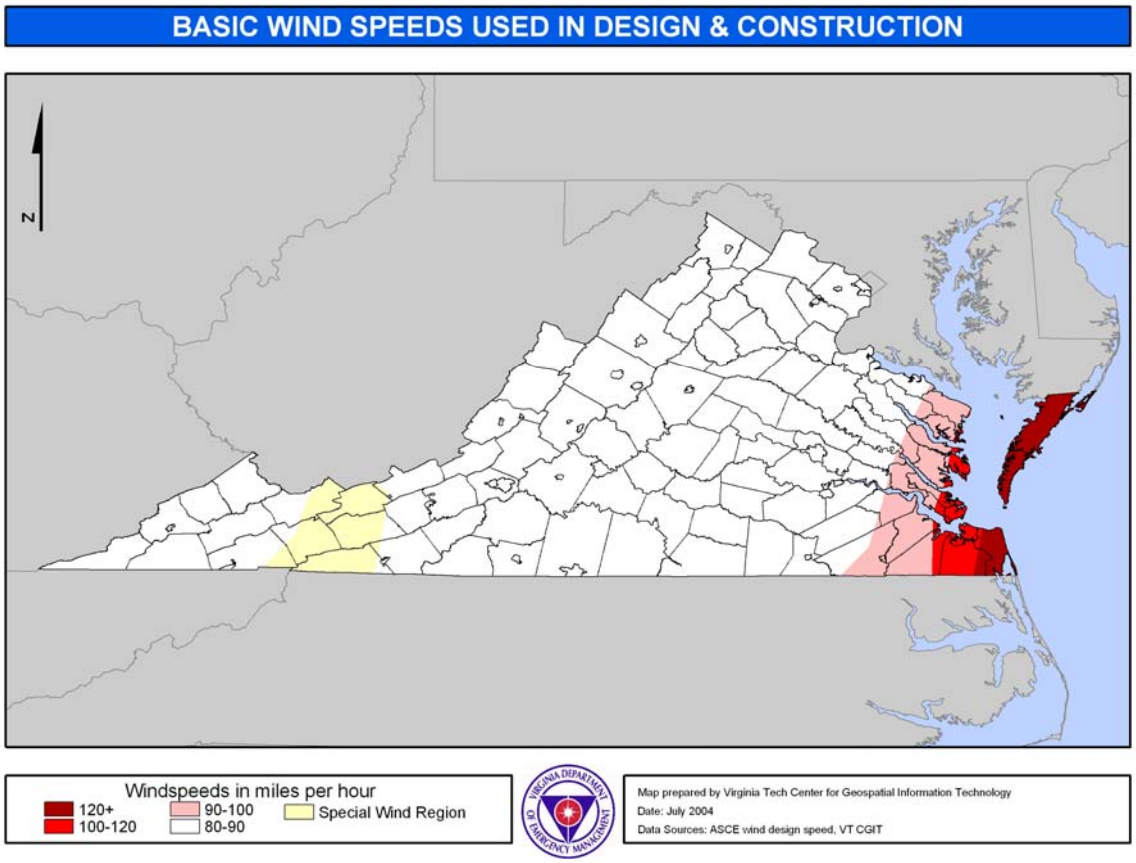


Figure B.13. 50-yr Design Wind Speeds for Virginia (from ASCE 7-98).

Figure B.13. shows the basic design wind speed used for design and construction in Virginia. This map not only applies to windstorms, but also hurricane winds and tornado winds, as a basis for structural design based on potential wind loads. The Town of Bluefield is located in the "Special Wind Region" as a result of the mountainous terrain. In these regions, localities have the option of adopting more stringent wind load designs than the minimum national codes if local meteorological information supports this. Bluefield has not adopted any such wind design loads, so the 50-yr design wind speed is 80-90 mph.

Vulnerability Analysis

Refer to the Cumberland Plateau Planning District Commission for the complete wind event vulnerability analysis.

Design Wind Pressures

Refer to the Cumberland Plateau Planning District Commission for the complete wind event design wind pressures.

Building Types

Refer to the Cumberland Plateau Planning District Commission for the complete wind event building types.

Critical Facilities

Refer to the Cumberland Plateau Planning District Commission for the complete wind event critical facilities.

Estimating Losses

Refer to the Cumberland Plateau Planning District Commission for the complete wind event estimating losses.

Section 8 - Earthquakes

Hazard History

Table B.15. Bluefield Earthquake Events.

Date	Magnitude	Comments
March 9, 1828		Centered in Southwestern Virginia. Felt from Pennsylvania to South Carolina
May 31, 1897	Magnitude 5.8 Mfa NUT	Damages to houses in Bluefield West Virginia. Earthquake centered in Giles County, Virginia. Bluefield, West Virginia was about 40 km from the epicenter
May 3, 1897	Magnitude 4.3 Mfa NUT	Centered in Southwestern Virginia

Hazard Profile

Refer to the Cumberland Plateau Planning District Commission for the complete earthquake profile.

Hazard Areas

There are a few fault lines that run through the center of the Town of Bluefield. Marshall Miller and Associates, a local consulting firm, provided data for analysis, as shown in Figure B. 14.

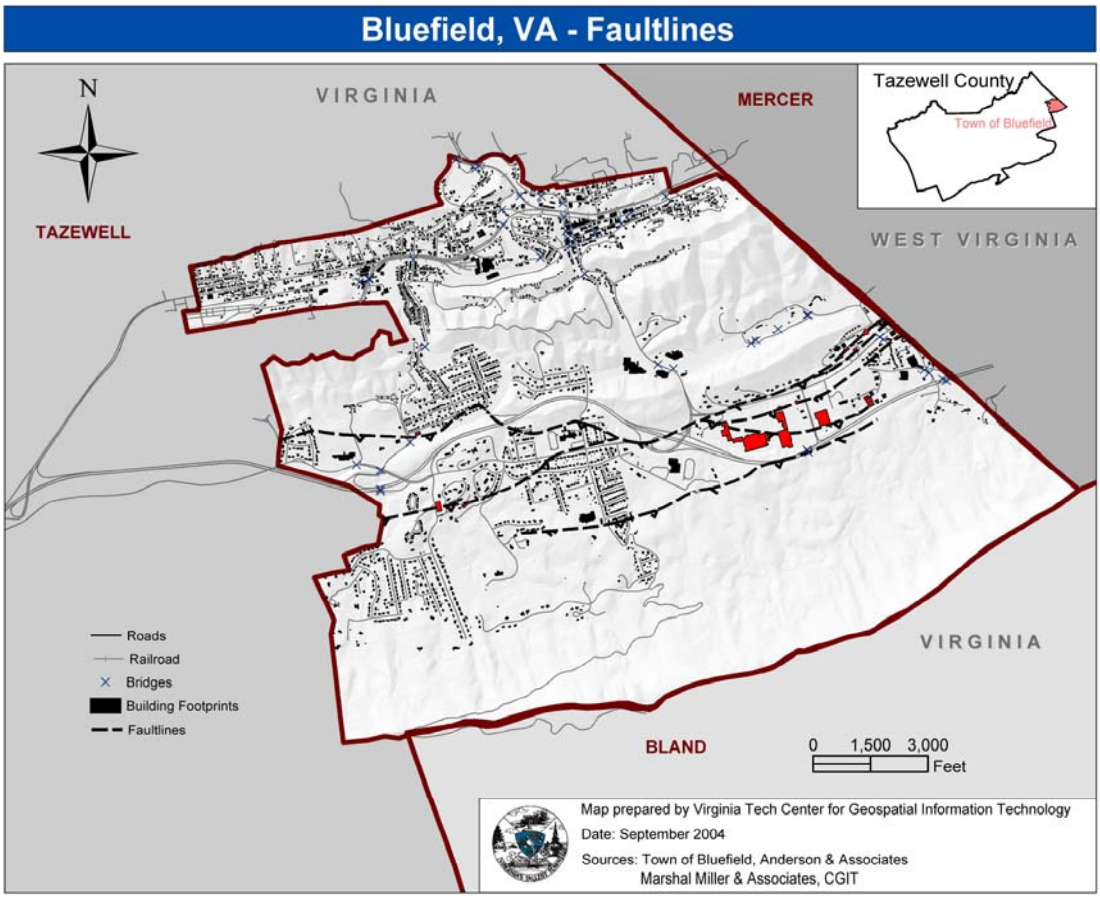
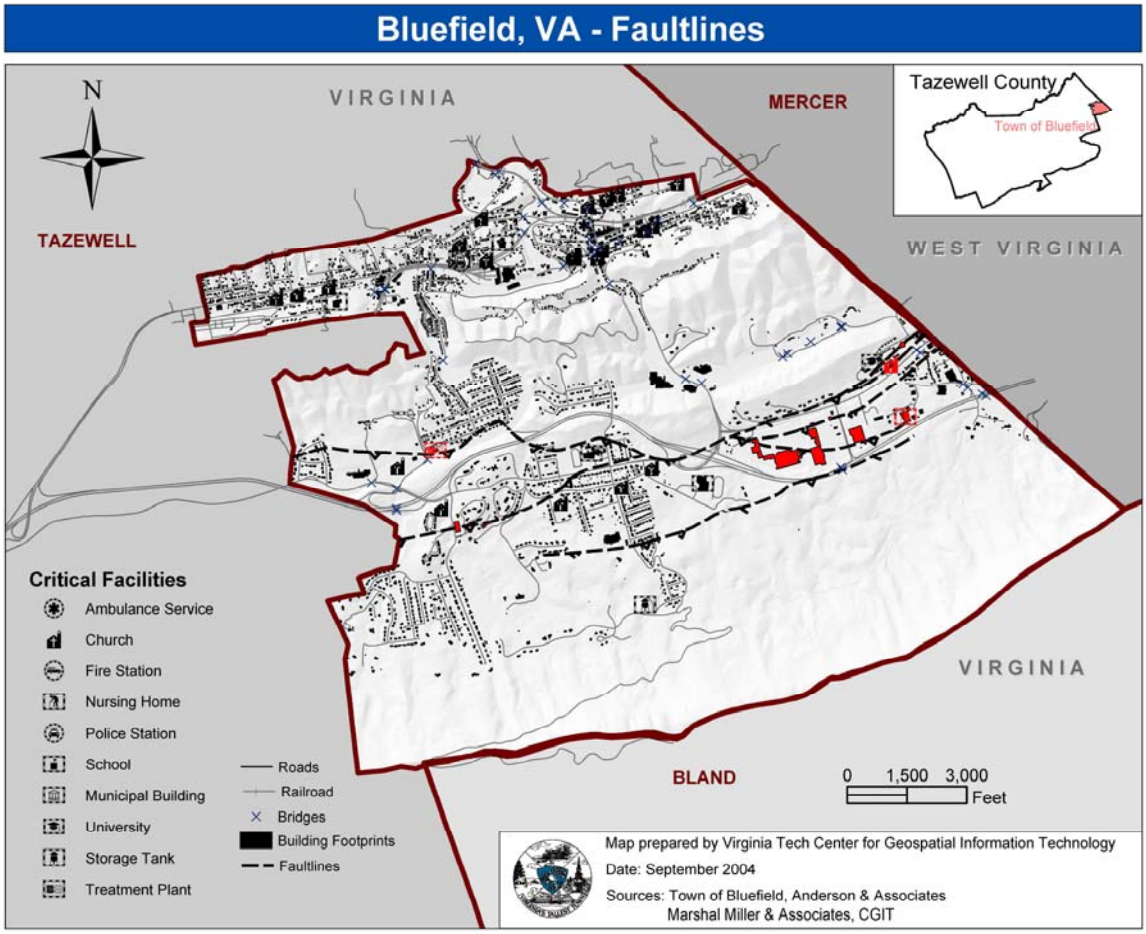


Figure B.14. Bluefield Fault Lines (Source: Marshall Miller and Associates).

Vulnerability Analysis

Figure B.15. shows those structures and critical infrastructure that are located with 30 feet of these faults. Tables B.16. and B.17. detail the totals and values of these at-risk locations.



B.15. Bluefield Fault Line Hazards for Structures and Critical Facilities (shown in red).

Table B.16. Bluefield Structure Fault Line Risk Totals.

	TOTAL BUILDINGS WITHIN 30 FEET OF FAULT LINES		
Infrastructure	**NO**	**YES**	**TOTAL BUILDINGS**
Church	26	1	27
Fire Station	1	0	1
Nursing Home	0	1	1
Police	1	0	1
School	13	0	13
Municipal Building (Temporary)	1	0	1
University	17	6	23
Water Storage Tank	1	0	1
Water Treatment Plant	1	1	2
Non-Critical Infrastructure	3095	74	3169
GRAND TOTAL	**3156**	**83**	**3239**
% Structures in Risk Areas	97.44%	2.56%	

Table B.17. Bluefield Structure Fault Line Risk Values.

	TOTAL BUILDING VALUE WITHIN 30 FEET OF FAULT LINES		
Infrastructure	**NO**	**YES**	**TOTAL VALUE**
Church	$3,856,227	$8,056,500	$11,912,727
Fire Station	$35,400	$0	$35,400
Nursing Home	$0	$75,600	$75,600
Police	$75,600	$0	$75,600
School	18706688	$0	$18,706,688
Municipal Building (Temporary)	$75,600	$0	$75,600
University	$136,960,500	$48,339,000	$185,299,500
Water Storage Tank	$77,057	$0	$77,057
Water Treatment Plant	$75,600	$2,175,000	$2,250,600
Non-Critical Infrastructure	$317,034,397	$7,890,949	$324,925,346
GRAND TOTAL	**$476,897,069**	**$66,537,049**	**$543,434,118**
% Structures in Risk Areas	87.76%	12.24%	

Section 9 – Drought

Hazard History

Table B.18. Recent Bluefield Droughts.

Date	Damages
1995	A drought, which started earlier in the summer, peaked in many sections of southwest, south- central and west-central Virginia during the first two weeks of September. The drought damaged crops and resulted in many lakes and rivers being well below normal levels. Governor George Allen declared a state of emergency for southwest, south-central and west-central Virginia because of the drought. Widespread significant rainfall on September 17 helped to alleviate the dry conditions.
1998 & 1999	Dry conditions started in July, subsided in August, started again in September, and continued through most of November. In most areas, crops were damaged or destroyed. Water levels in creeks, streams, rivers, and lakes were fairly low. Water levels in some shallow wells were low. Crop damages were estimated over $7.7 million. The drought ended in most areas with the arrival of heavy rain from the remnants of hurricane Dennis on the 4th and 5th of September.

Hazard Profile

Refer to the Cumberland Plateau Planning District Commission for the complete drought profile.

Vulnerability Analysis

Impacts from droughts in the Town of Bluefield are a major concern. Most of the town's water supply comes from surface water (or wells supplied by surface water) and as a result, droughts can be detrimental to the town in respect to the societal demands placed on the water resources. Most of Bluefield is serviced by the Town's water systems, with the treatment located on the Bluestone River. Some areas of town are supplied by a company in West Virginia, specifically the commercial strip along College Avenue. Small portions of town have their own water supply (i.e. well systems). The current Bluefield water system is near capacity and plans are already in place to expand the system throughout town. While there are connections to neighboring water systems, during a severe drought the Town would likely have some water supply issues.

Mitigation Strategy

The Town of Bluefield has been involved with the district mitigation planning efforts of the Cumberland Plateau Planning District Commission. The Bluefield Zoning Administrator (Derrick Ruble from 2002-2003 and Edward Moore from 2003-2004) have attended meetings with the Mitigation Advisory Committee and conveyed this information to the Bluefield Town Council (current members listed in Table B.19).

Table B.19. 2004 Bluefield Town Council and Town Manager

Members	Position/Office
Donald Harris	Mayor
Rick Taylor	Vice Mayor
Tom Chaffins	Council member
Brent Chambers	Council member
Ed Shaffrey	Council member
Anglis Trigg Jr.	Council member
Todd Day	Town Manager

Bluefield Town Council decided for their mitigation strategy to use the same goals and objectives as the CPPDC Plan, and developed detailed implementation details for items specifically within Bluefield.

Goals, Objectives and Implementation

The Cumberland Plateau Planning District Commission's overarching Goal, as well as the individual goals, is listed below in Table B.20. These goals were reviewed by the planning district's Mitigation Advisory Committee. The committee evaluated the strengths and weaknesses of the planning district in terms of hazard mitigation.

Table B.20. Bluefield Mitigation Goals (from CPPDC Plan).

Overarching Planning District Goal:
"To develop and maintain disaster resistant communities that are less vulnerable to the economic and physical devastation associated with natural hazard events."
Goal 1:
Enhance the safety of residents and businesses by protecting new and existing development from the effects of hazards.
Goal 2:
Protect new and existing public and private infrastructure and critical facilities from the effects of hazards.
Goal 3:
Increase the Planning District communities floodplain management activities and participation in the National Flood Insurance Program.
Goal 4:
Ensure hazard awareness and risk reduction principles are institutionalized into the Planning District communities' daily activities, processes, and functions by incorporating it into policy documents and initiatives.
Goal 5:
Enhance community-wide understanding and awareness of community hazards.
Goal 6:
Publicize mitigation activities to reduce the area's vulnerability to hazards.

The CPPDC Plan takes these goals and identifies 13 actions for jurisdictions. Table B.21 lists the 8 actions that apply to the Town of Bluefield and the CPPDC priority for each of the actions. The tables also include the Town's priority (High, Moderate, Low) for each implementation action. The Town specific priorities were developed by Town staff based on the current Town goals of focusing on flooding and stormwater issues. The Town will work closely with Tazewell County and CPPDC staff on pursuing funding, implementing, and maintaining of both Town and Regional strategies. Bluefield plans to continue to actively participate in the CPPDC MAC. Due to funding and staff limitations with the Town, all future maintenance of the Bluefield portions of the Plan will stay with the CPPDC.

Table B.21. CPPDC Actions that Apply to Bluefield

Action	CPPDC Priority	Bluefield Priority	Comments
#1. Obtain official recognition of the Mitigation Advisory Committee by the Planning District's communities in order to help institutionalize and develop an ongoing mitigation program.	High	High	Due to funding and staff limitations with the Town, all future maintenance of the Bluefield portions of this Plan will stay with the CPPDC.
#2. Target FEMA's Repetitive Loss Properties, and other known repetitively flooded properties, throughout the Planning District for potential mitigation projects.	High	High	Most repetitively flooded properties in Bluefield not on FEMA Property List.
#3. Undertake educational outreach activities by developing and distributing brochures and education materials for FEMA's Repetitive Loss Properties with specific mitigation measures emphasizing acquisition, relocation and elevation.	High	Moderate	Bluefield will look to CPPDC for lead role on this action.
#4. Publicize the Virginia Department of Forestry's *Money for Mitigation Program*. Utilize existing wildfire maps to prioritize project areas in the Planning District. Assist local residents, in priority areas, to reduce wildfire hazards through the use of funding from the *Money for Mitigation Program*.	High	Low	Small portion of Bluefield residents will qualify for this program.
#5. Develop a comprehensive compilation of landslide activity in the Planning District to be used as a planning tool for future infrastructure projects.	High	Low	Town will look to VDOT and CPPDC for lead roles for this action.
#6. Evaluate the Planning District's community floodplain ordinances and enforcement procedures that may be outdated for possible upgrades.	Moderate	Moderate	Town will update ordinances when new FEMA floodplains are adopted during next three years through FEMA Map Modernization Program.
#12. Investigate all critical facilities to evaluate their resistance to wind, fire, landslide and flood hazards. This study will examine all critical facilities within the Planning District communities and make recommendations as to ways in which the facilities can be strengthened or hardened.	Moderate	Moderate	Town will actively assist Tazewell County and CPPDC efforts for this action.
#13. Support Public Works initiatives to improve stormwater infrastructure throughout the area.	Moderate	High	Town is currently conducting stormwater master plan study.

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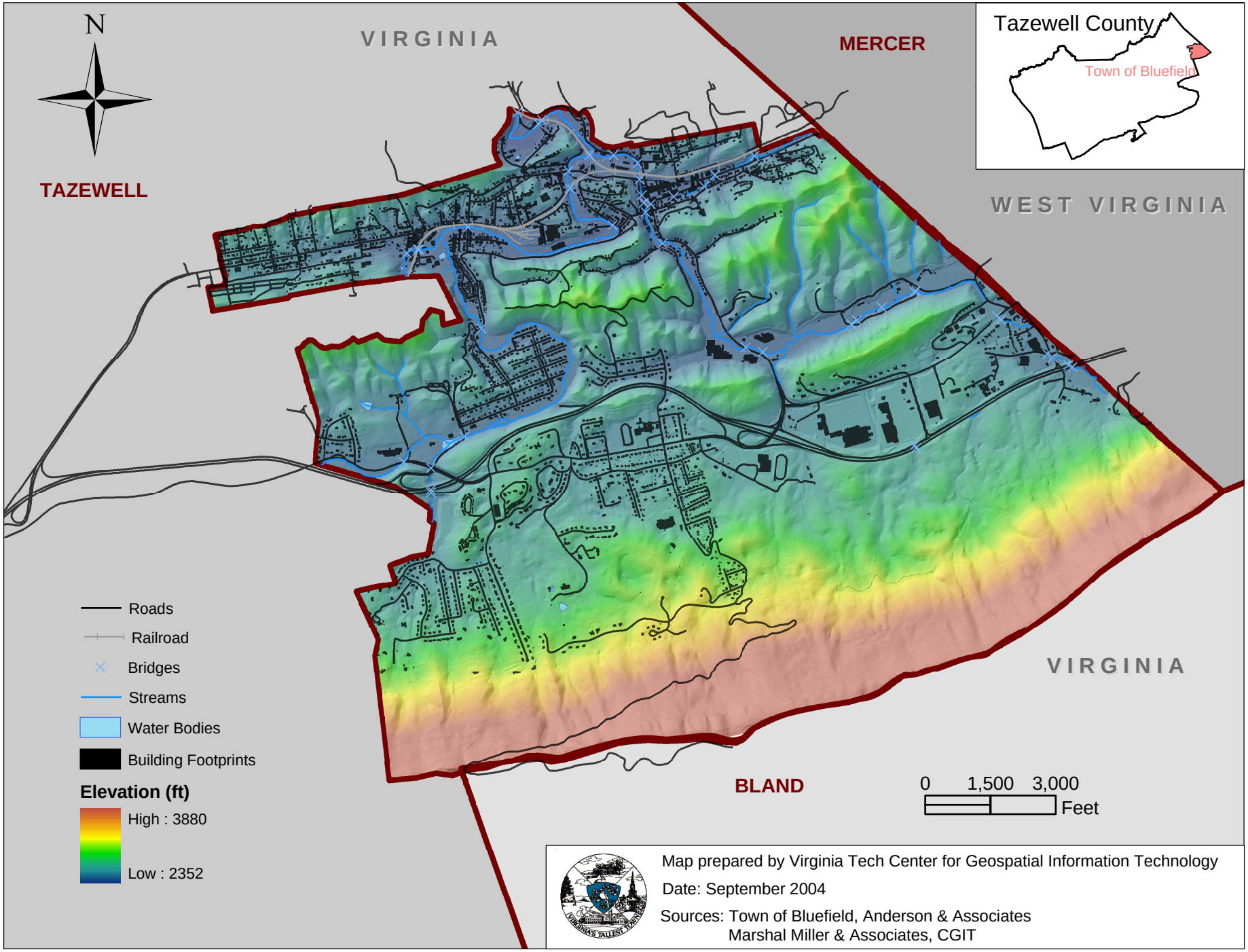
Bluefield, VA - Basemap

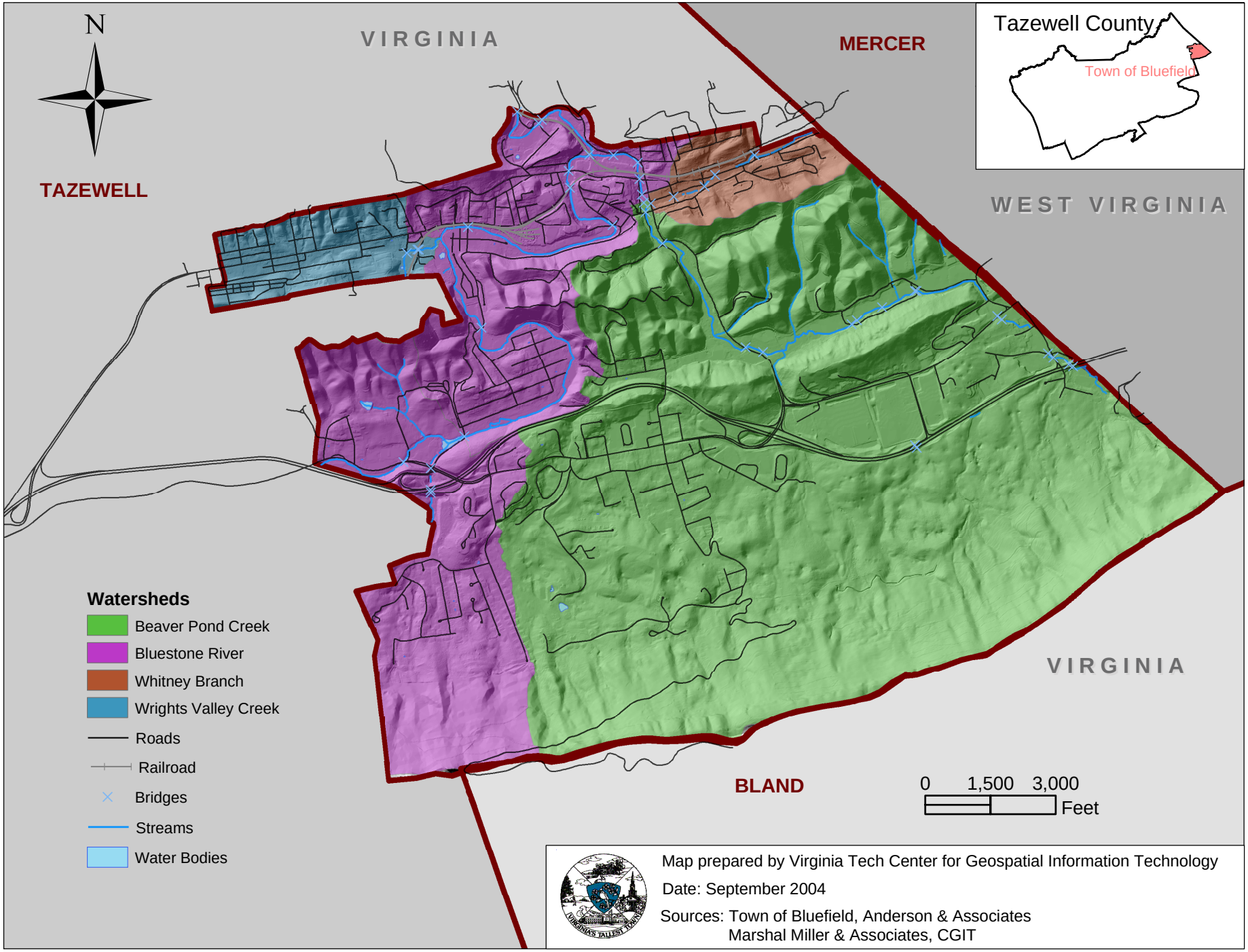


Map prepared by Virginia Tech Center for Geospatial Information Technology

Date: September 2004

Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

Bluefield, VA - Sub-Watersheds

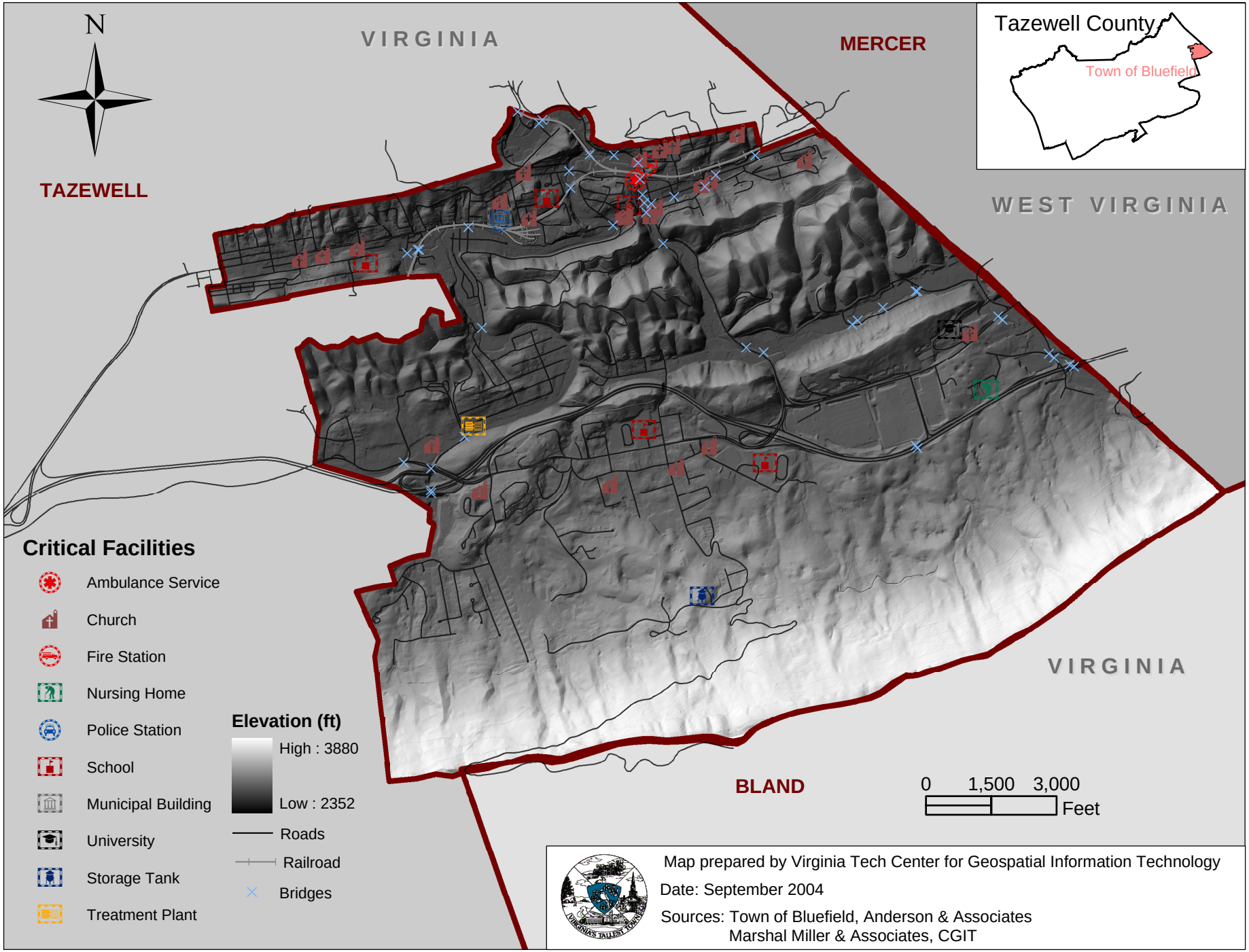


Map prepared by Virginia Tech Center for Geospatial Information Technology

Date: September 2004

Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

Bluefield, VA - Critical Facilities

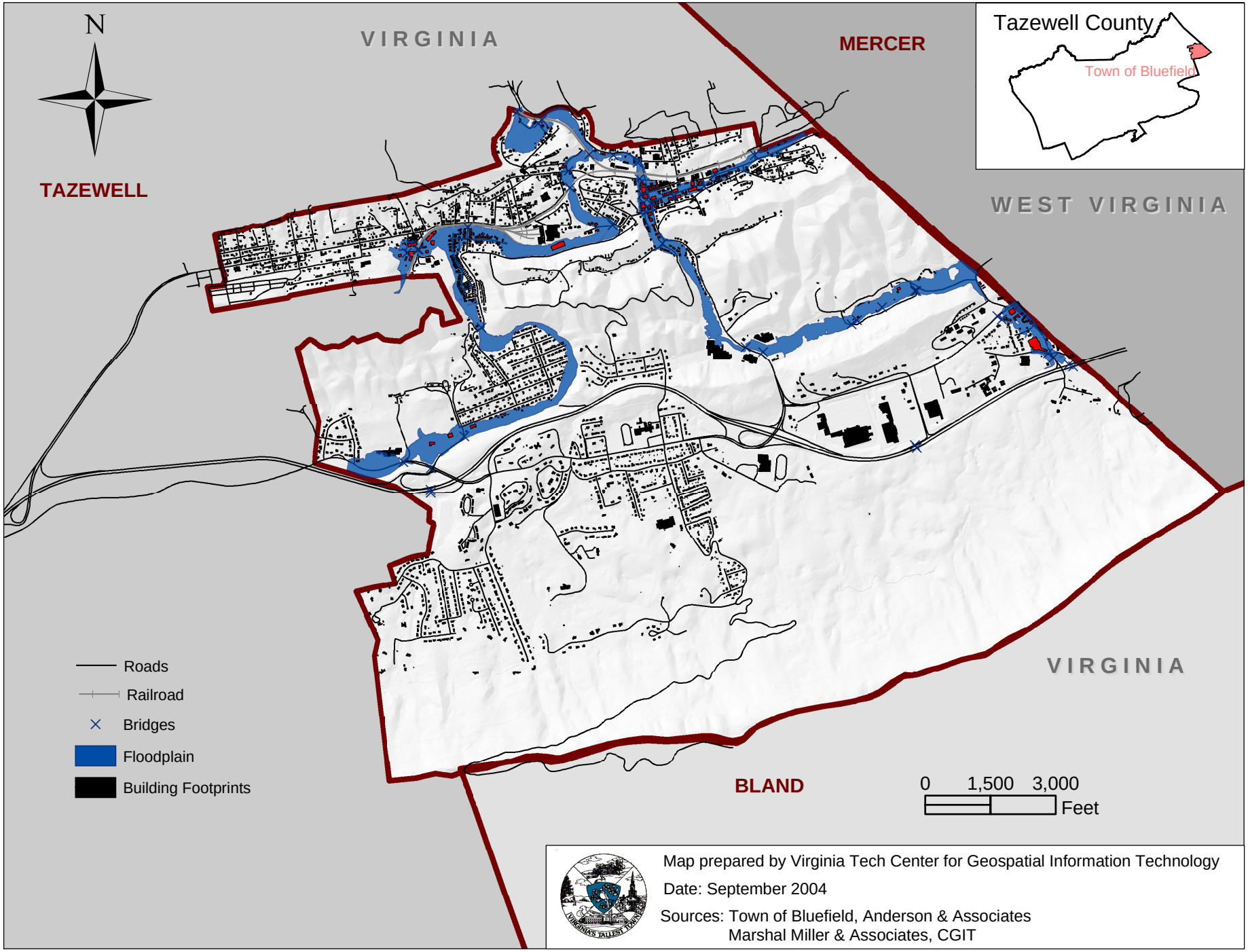


Map prepared by Virginia Tech Center for Geospatial Information Technology

Date: September 2004

Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

Bluefield, VA - Floodplains

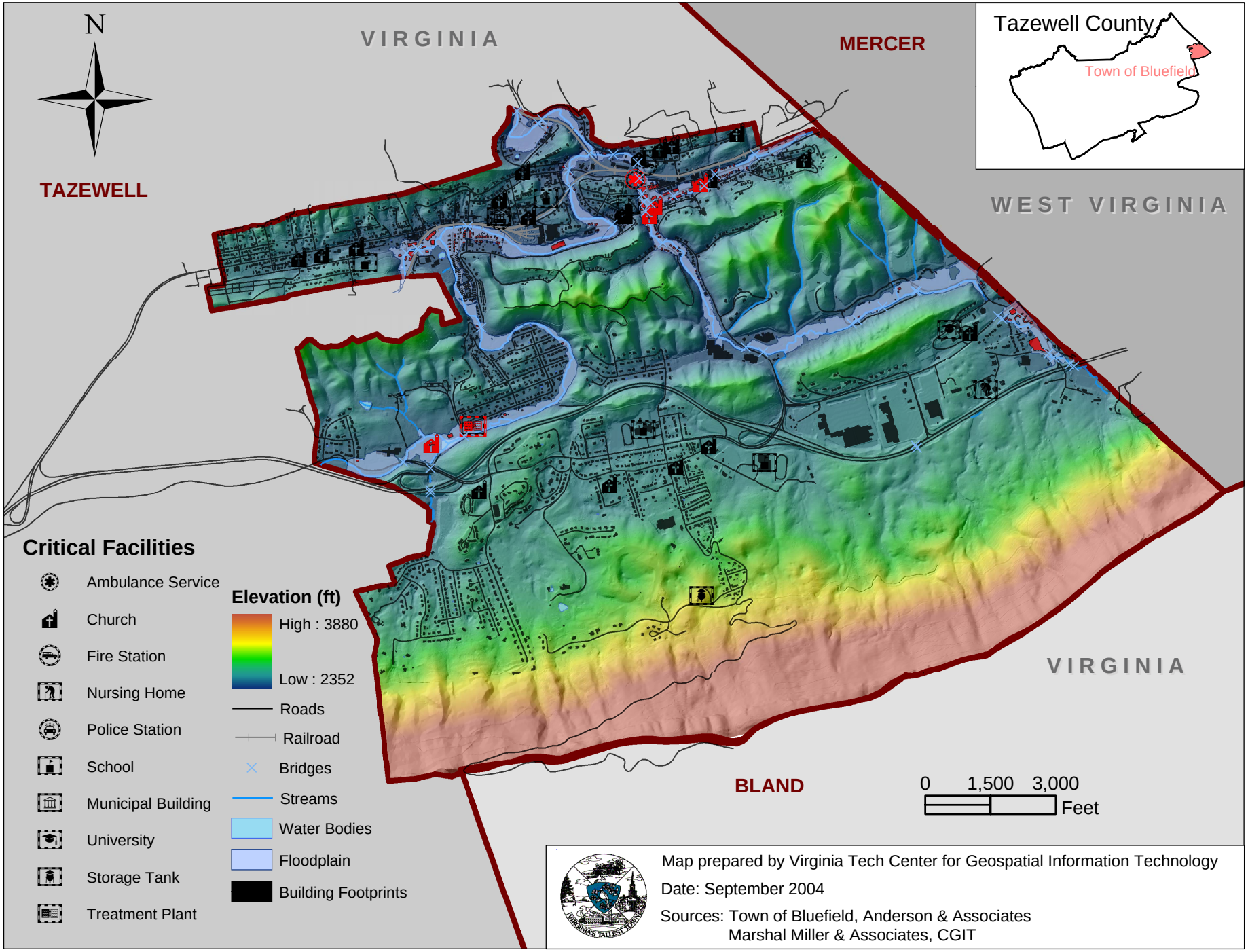


Map prepared by Virginia Tech Center for Geospatial Information Technology

Date: September 2004

Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

Bluefield, VA - Critical Facilities and Structures in Floodplains

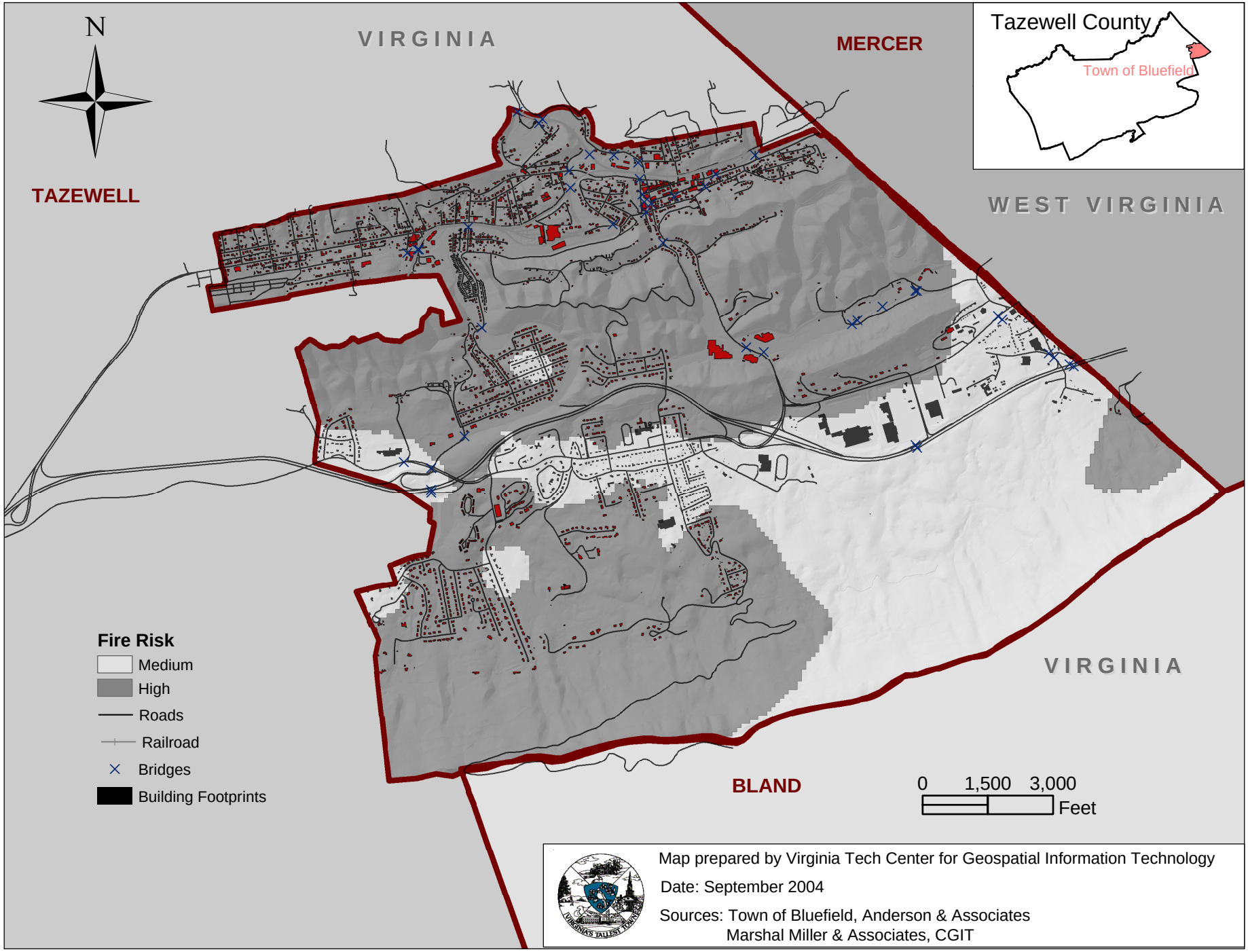


Map prepared by Virginia Tech Center for Geospatial Information Technology

Date: September 2004

Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

Bluefield, VA - Fire Zones

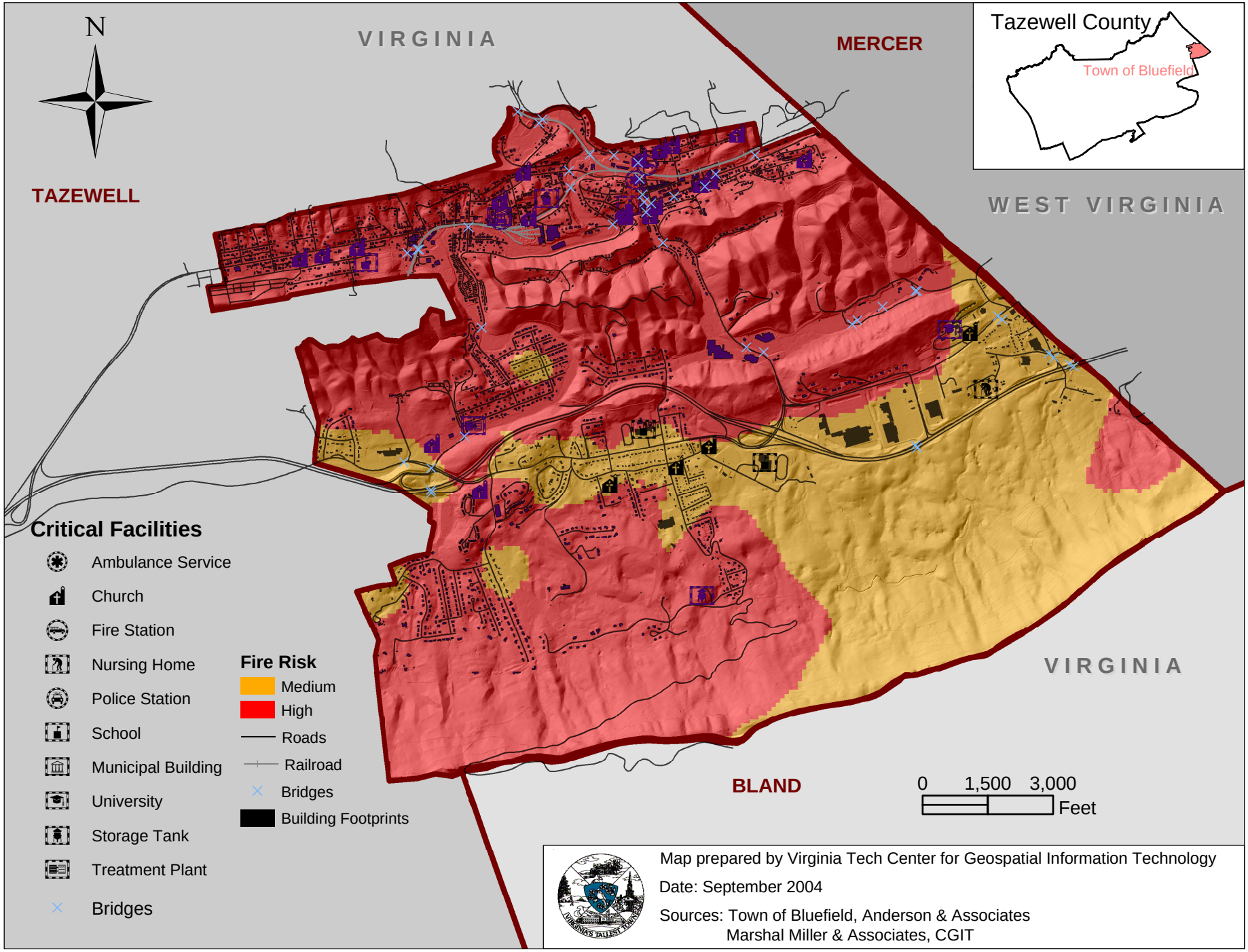


Map prepared by Virginia Tech Center for Geospatial Information Technology

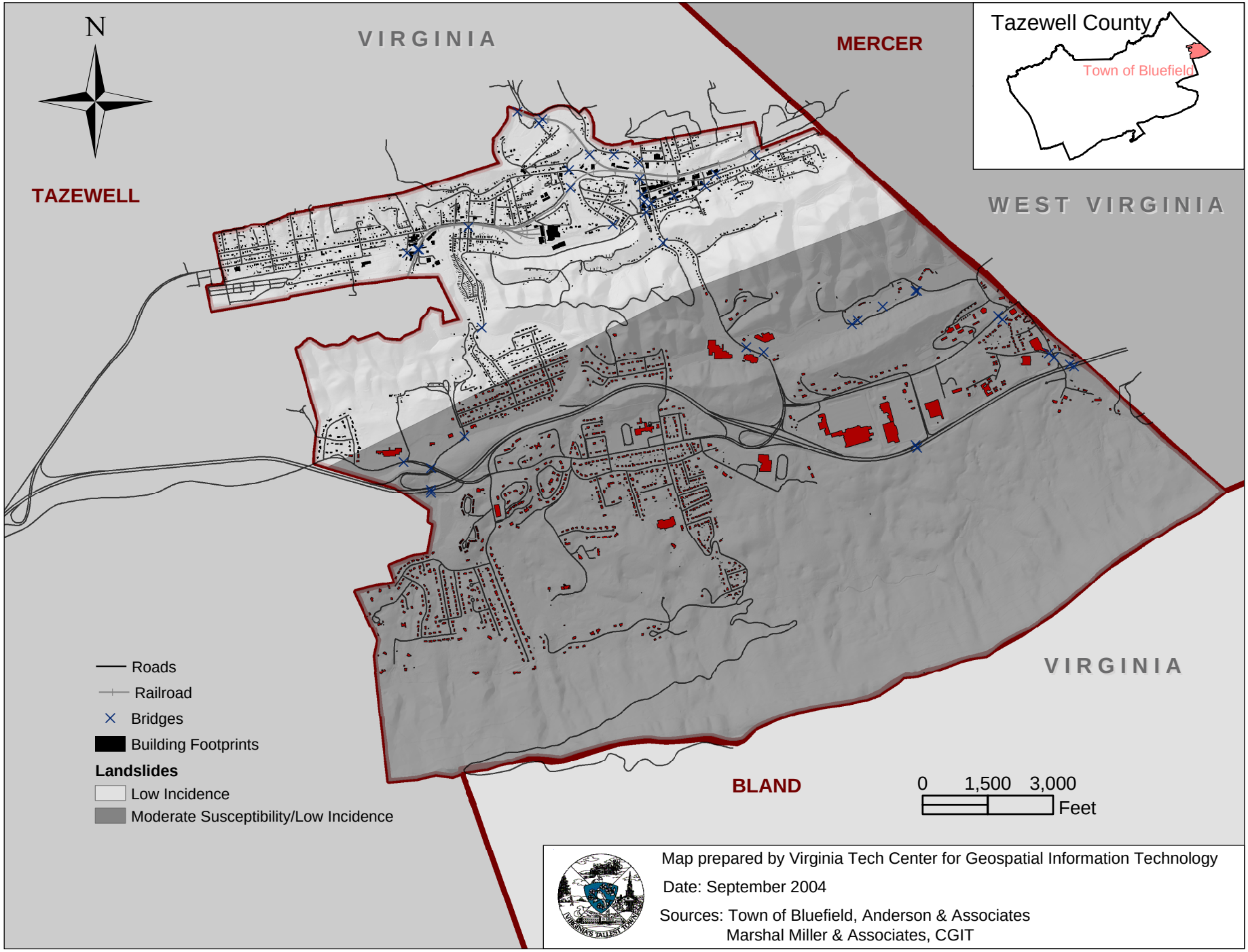
Date: September 2004

Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

Bluefield, VA - Critical Facilities and Stuctures in Fire Zones



Bluefield, VA - Landslides Zones

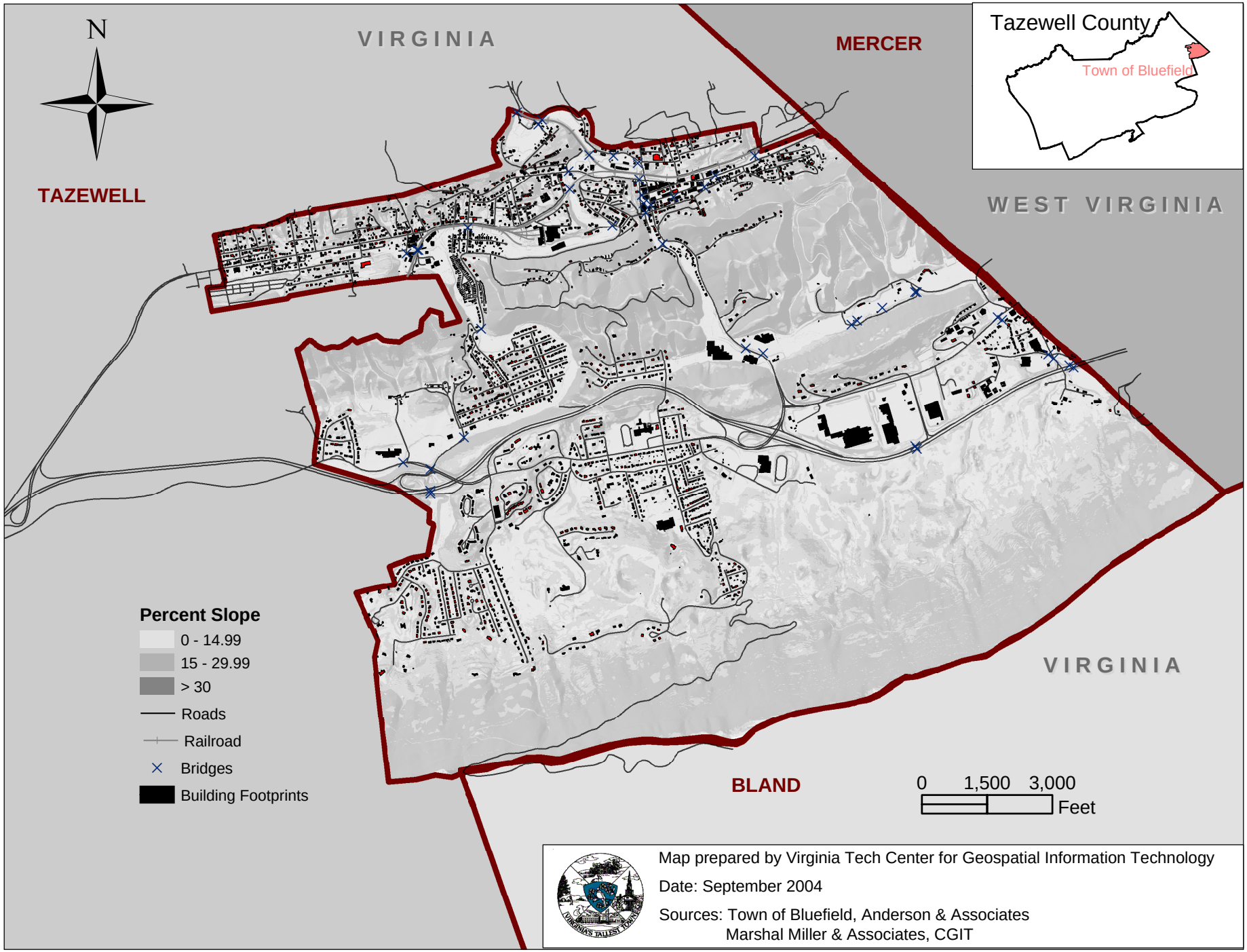


Map prepared by Virginia Tech Center for Geospatial Information Technology

Date: September 2004

Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

Bluefield, VA - High Slopes

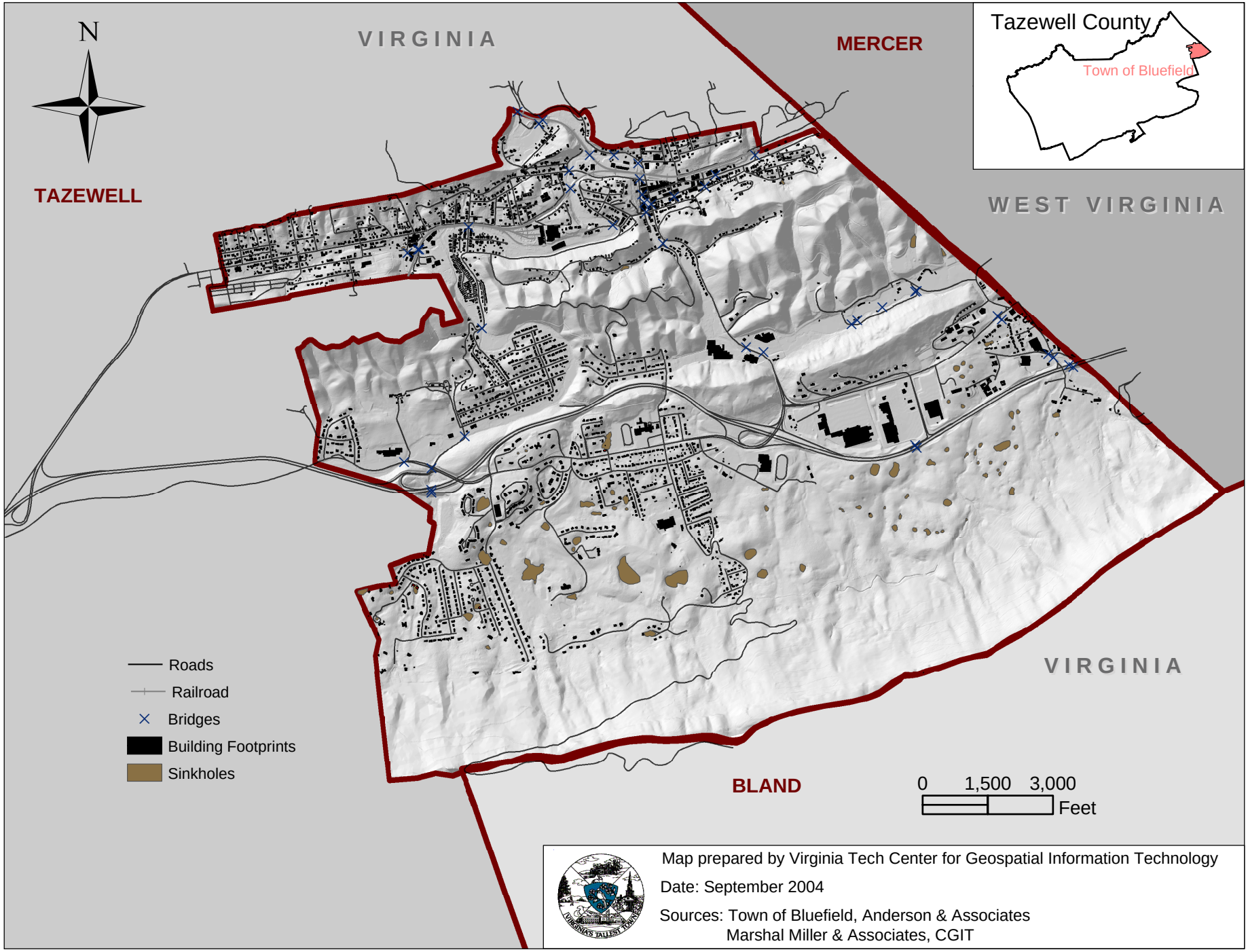


Map prepared by Virginia Tech Center for Geospatial Information Technology

Date: September 2004

Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

Bluefield, VA - Sinkholes

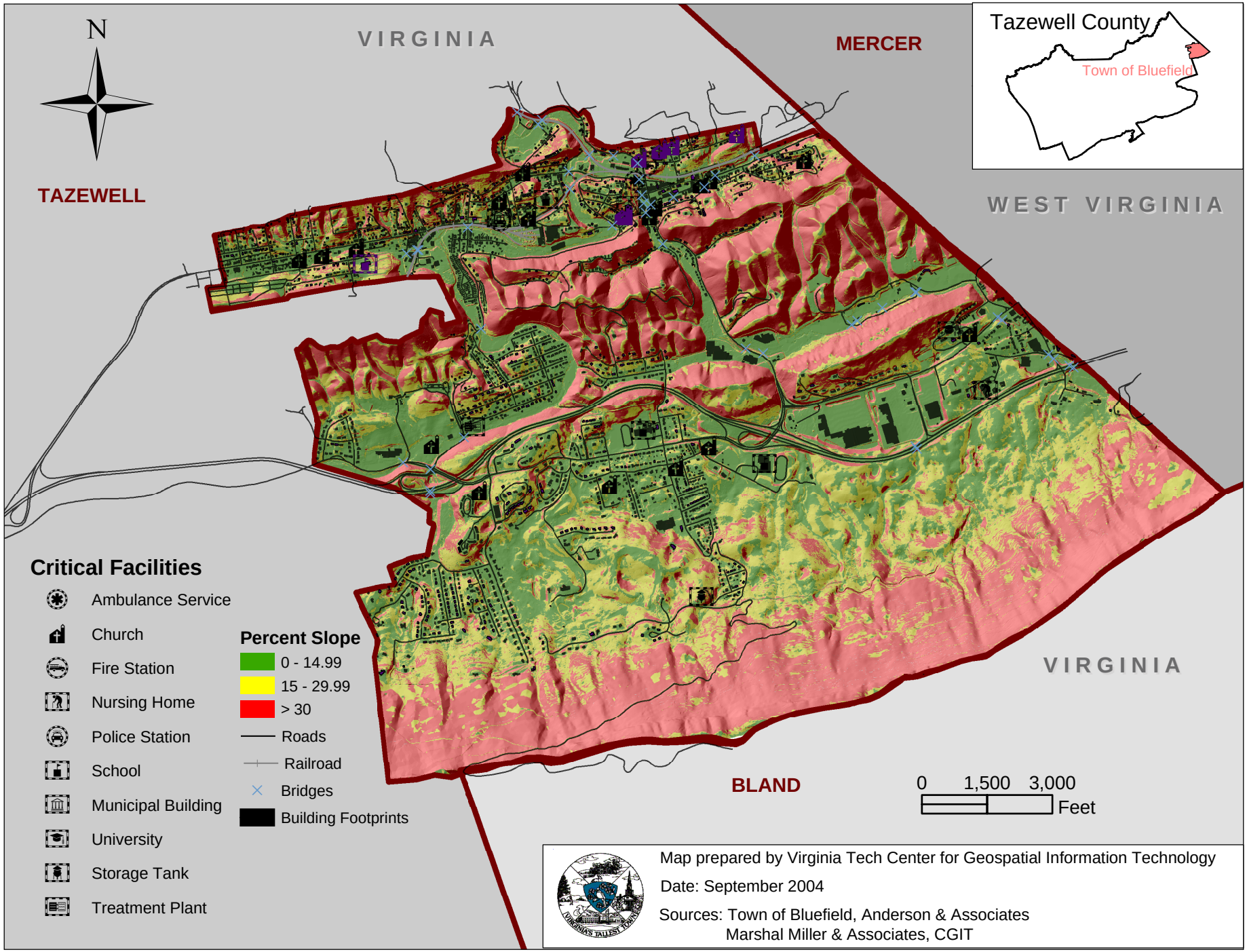


Map prepared by Virginia Tech Center for Geospatial Information Technology

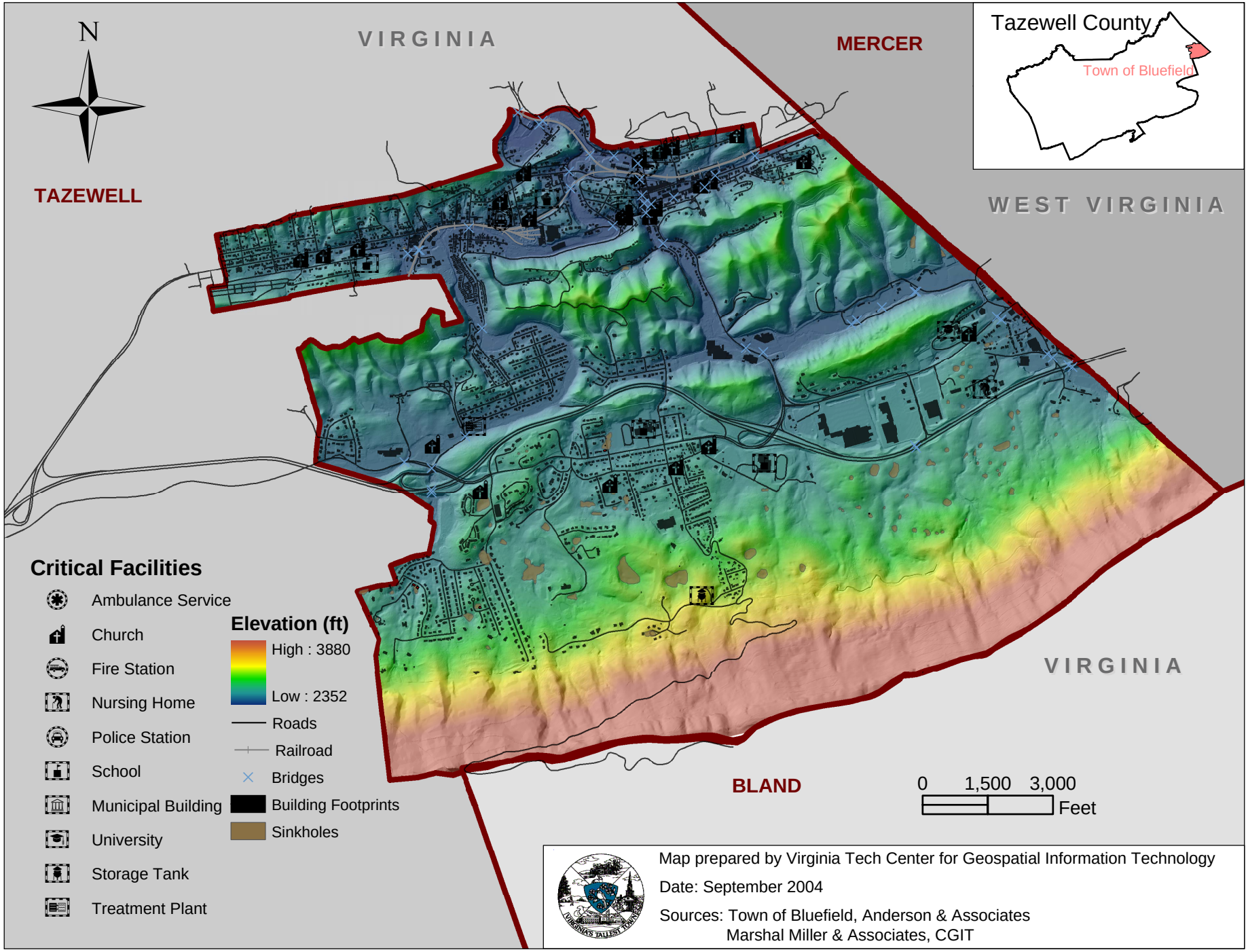
Date: September 2004

Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

Bluefield, VA - Critical Facilities and Structures in High Slopes



Bluefield, VA - Critical Facilities and Structures near Sinkholes

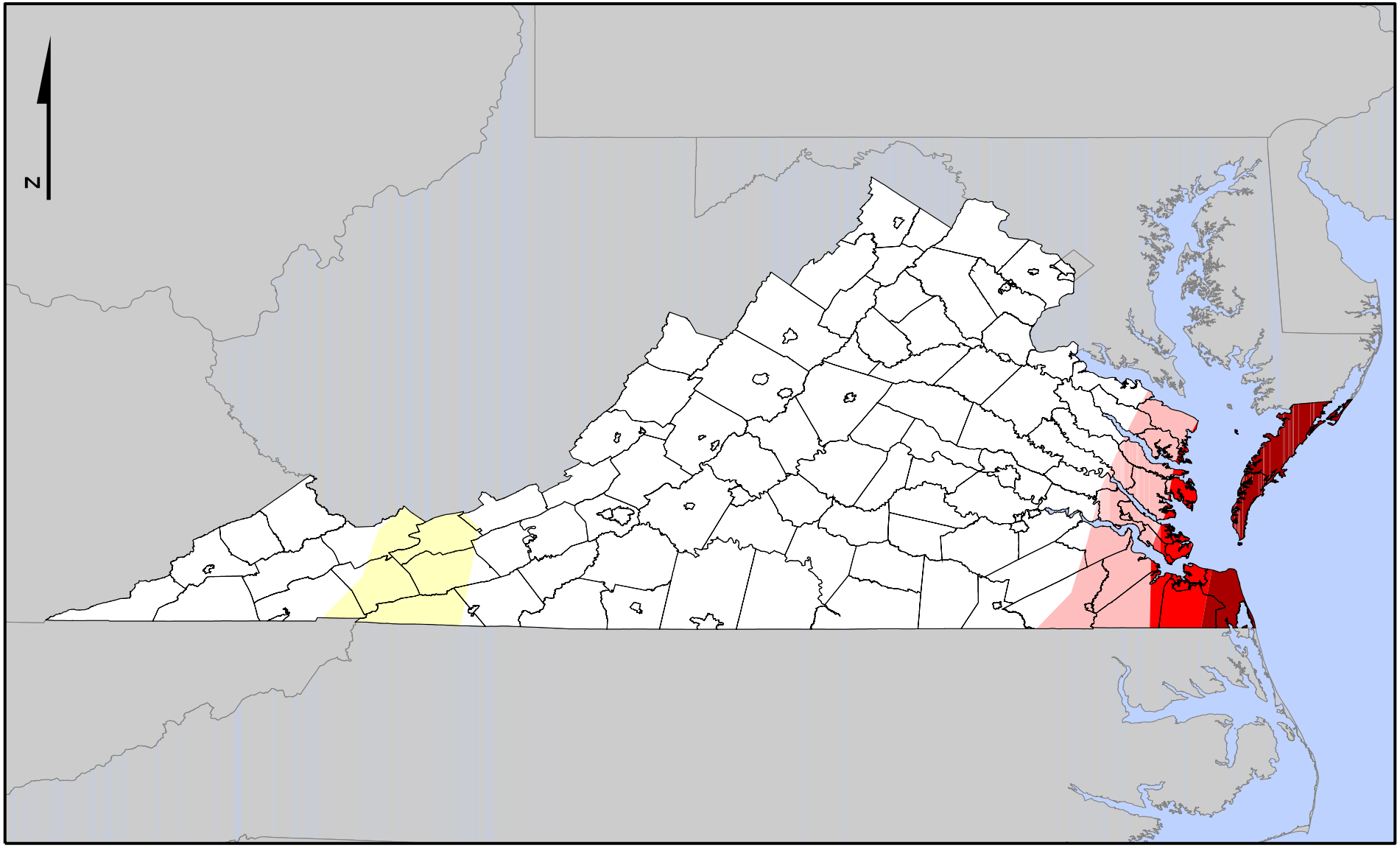


Map prepared by Virginia Tech Center for Geospatial Information Technology

Date: September 2004

Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

BASIC WIND SPEEDS USED IN DESIGN & CONSTRUCTION



Windspeeds in miles per hour

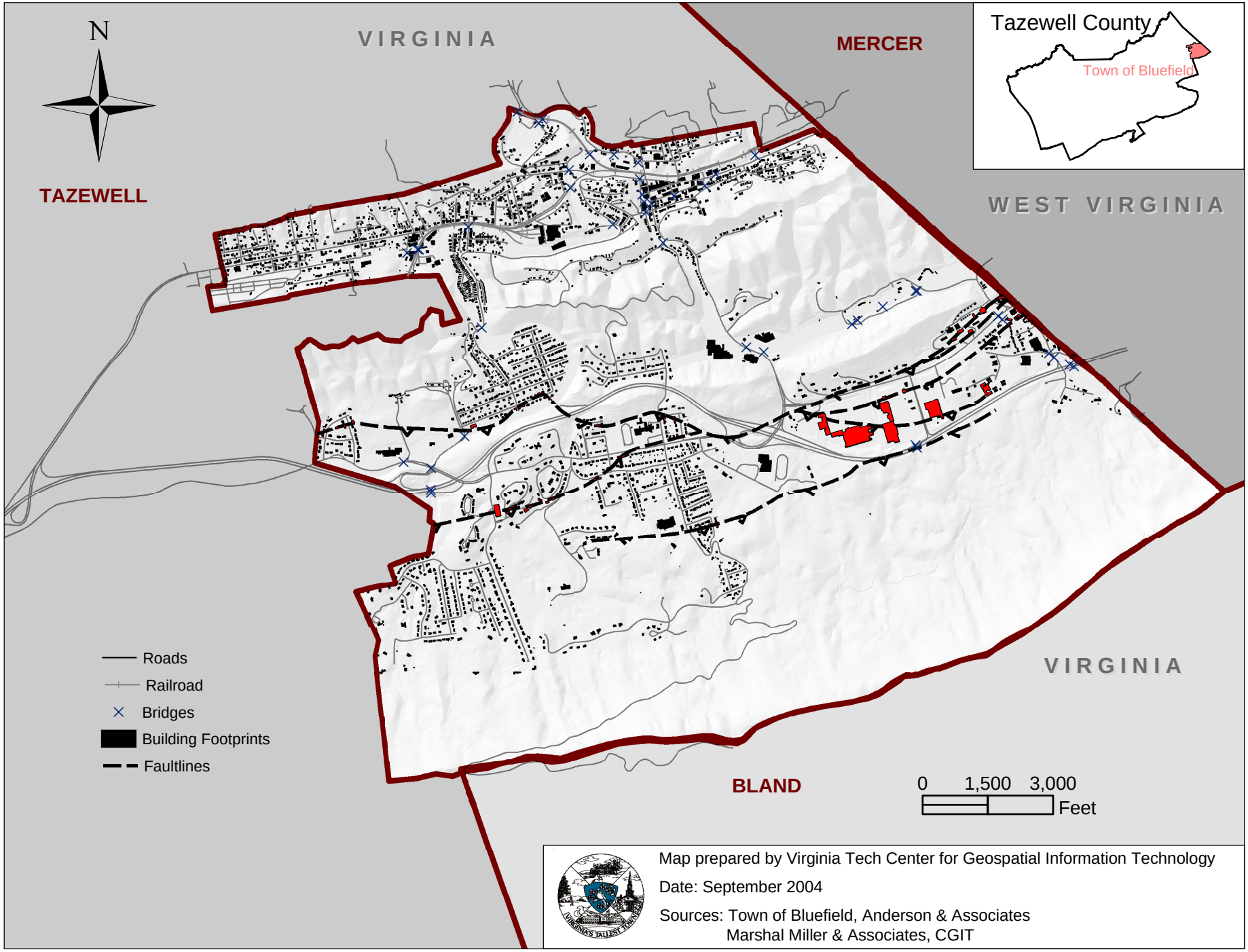
- 120+
- 100-120
- 90-100
- 80-90
- Special Wind Region

Map prepared by Virginia Tech Center for Geospatial Information Technology

Date: July 2004

Data Sources: ASCE wind design speed, VT CGIT

Bluefield, VA - Faultlines

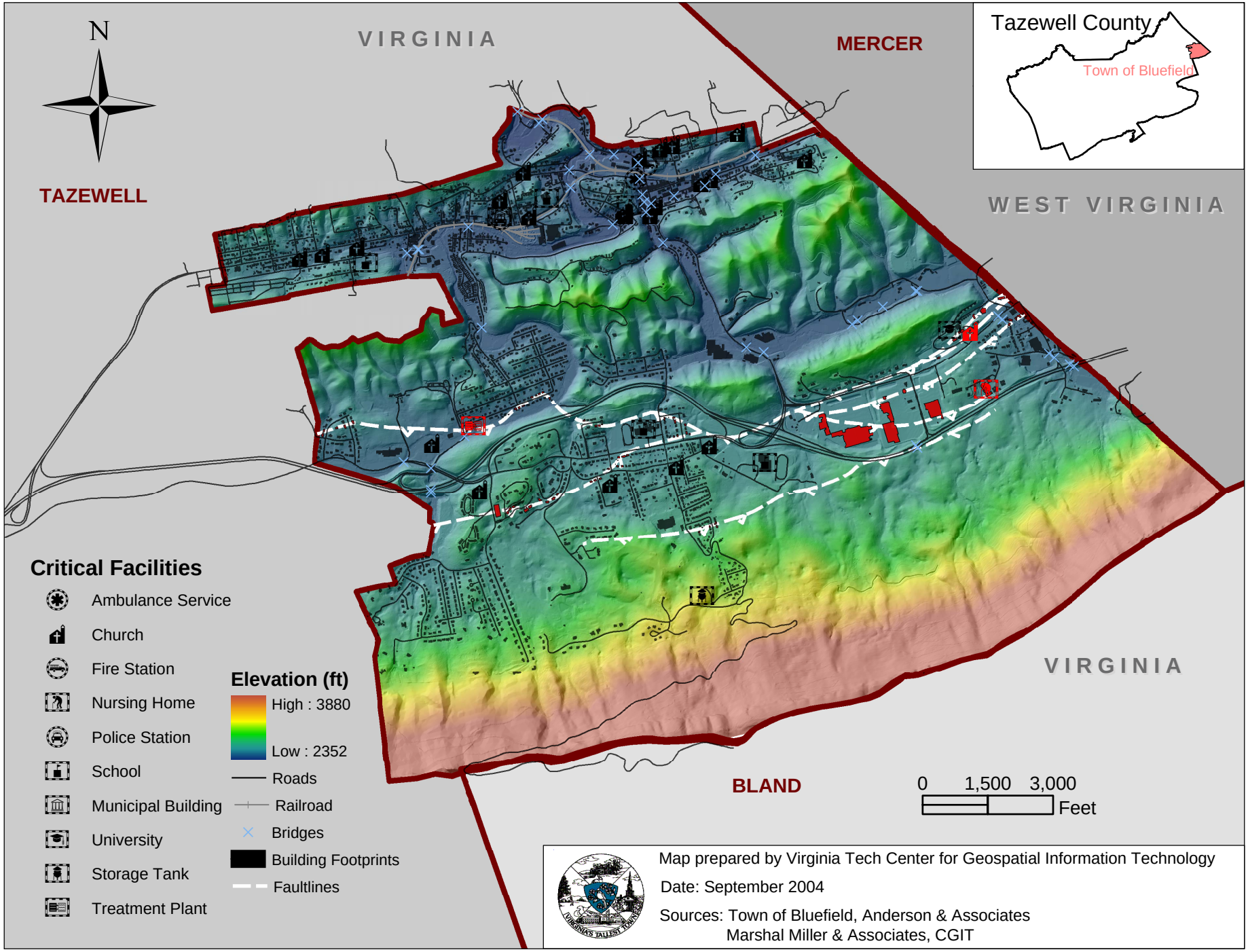


Map prepared by Virginia Tech Center for Geospatial Information Technology

Date: September 2004

Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

Bluefield, VA - Critical Facilities and Structures near Faultlines



Map prepared by Virginia Tech Center for Geospatial Information Technology

Date: September 2004

Sources: Town of Bluefield, Anderson & Associates
Marshal Miller & Associates, CGIT

Appendix C – Mitigation Alternatives

General Multi-Hazard Mitigation Alternatives

The mitigation alternatives selected should be linked to the Planning District's goals and objectives, and must address each jurisdiction's hazard risks and vulnerability outlined in the plan's Hazard Identification and Risk Assessment. The following is a list of potential mitigation measures not specific to one hazard, which can benefit a community's overall hazard reduction efforts.

Comprehensive Plans

Comprehensive plans address how and where a community should grow by guiding the rate, intensity, form, and quality of physical development. These plans address land use, economic development, transportation, recreation, environmental protection, the provision of infrastructure, and other municipal functions. Comprehensive plans help to guide other local measures such as capital improvement programs, zoning ordinances, subdivision ordinances and other community policies and programs. By integrating hazard considerations into the plan, mitigation would become integrated with community functions and could therefore be an institutionalized part of a jurisdiction's planning efforts.

Density and development patterns should reflect the Planning District communities' ability to protect their jurisdictions, the environment, and the ability to evacuate the area. Development management tools should be incorporated into the local policies that address the location, density, and use of land, with a particular emphasis on development within high-risk areas. Efforts should be made to keep people and property out of high-hazard areas whenever possible. Particularly hazardous areas could be used for recreational uses, open space, or wildlife refuges.

Capital Budget Plans

Capital budget plans typically provide for the future and ongoing provision of public facilities and infrastructure. These plans can be vital tools in keeping new development out of high-hazard areas by limiting the availability of public infrastructure. Public facilities can often be relocated to less hazardous areas in the aftermath of a disaster. Public utilities also can be relocated, or they can be upgraded or floodproofed. Power and telephone lines can be buried underground.

In order to maximize the gravity flow area of wastewater treatment plants, the facilities are often located at the lowest elevation in the community. If this point lies within a floodplain for example, consideration may be given to relocating or floodproofing such facilities. New locations for critical facilities should not be in hazard-prone areas, or in areas where their function may be impaired by a given hazard event (i.e., where water

can flood the access roads). Critical facilities should be designed and/or retrofitted in order to remain functional and safe before, during, and after a hazard event.

Zoning

Zoning is by far the most common land use control technique used by local governments. While a useful tool for regulating and restricting undesirable land uses, zoning has a somewhat more limited benefit when it comes to mitigation. Zoning is most effective on new development rather than existing development, which does little to address the pre-existing development in hazardous areas. Communities with a large amount of undeveloped land will benefit much more than older, more established communities. Even for new development, the issuance of variances, special use permits, rezoning, and the failure to enforce existing codes, however, will weaken zoning's ability to prevent certain types of building practices.

Building Codes

Building codes regulate the design, construction, and maintenance of construction within most communities. These regulations prescribe standards and requirements for occupancy, maintenance, operation, construction, use, and appearance of buildings. Building codes are an effective way to ensure than new and extensive re-development projects are built to resist natural hazards. In Virginia, communities are required by law to adopt and enforce the Uniform Statewide Building Code, which has provisions for wind, water, and seismicity.

Public Outreach and Education Programs

Educating the public about what actions they can take to protect themselves and their property from the effects of natural hazards can be an effective means for reducing losses. These types of programs could target public officials, citizens, businesses, or the local construction trade. The program could cover preparedness, recovery, mitigation, and general hazard awareness information. The information could be presented in a variety of ways, from workshops, brochures, advertisements, or local media. Potential outreach and education topics include:

- Code Awareness Training
- Sheltering and Evacuation
- Flood Insurance
- School Information (Primary, Secondary, Colleges, and Universities)
- New Homeowner/Resident Information
- Emergency Preparedness for Families, Businesses, and Tourists
- Driver Safety in Disasters

- Special Needs Outreach
- Hazard Mitigation for Homeowners (including manufactured homes and trailers), Renters, and Businesses

Vegetative Maintenance

Vegetative maintenance is the pruning and maintenance of trees, bushes, and other vegetation that could increases threats to power lines during storms, or could act as fuels during wildfires. This could be applied in limited areas that have a significant vulnerability to these hazards, such as an easement or along the urban-wildland interface.

Vegetative Planting and Treatment

Vegetative planting and treatments can help to capture and filter runoff and can reduce landslides. Perennial vegetation includes grass, trees, and shrubs, which cover the soil, reduce water pollution, slow the rate of runoff, increase filtration, and prevent erosion. This type of land treatment includes maintaining trees, shrubberies, and the vegetative cover, terracing (i.e., a raised bank of earth with vertical sloping sides and a flat top to reduce surface runoff), stabilizing slopes, grass filter strips, contour plowing, and strip farming (i.e., the growing of crops in rows along a contour). Other potential options include vegetated swales, infiltration ditches, and permeable paving blocks.

Hazard-Specific Alternatives

The following is a list of potential mitigation measures that tend to work better when applied to a specific hazard.

Flood

Flood mitigation measures can be classified as structural or non-structural. In simple terms, structural mitigation attempts to eliminate the possibility of flooding at a particular location. Non-structural mitigation removes the potentially effected people or property from the potentially flooded area. The following is a list of potential mitigation measures.

Floodplain Management Ordinances

Floodplain management ordinances are weakened by development pressures, a lack of suitable sites outside of the floodplain, community desires to be near the water, inability to effectively monitor floodplain management activities, or by land use planning policies that are encouraging development into floodplain areas. Plans or policies that place more properties at risk also are reducing the storage capacity and functions of the natural floodplains. Degradation of the floodplain in this way increases flood depths and affects the reliability of Flood Insurance Rate Maps. Structures built in floodplains,

particularly those that do not utilize a freeboard (that exceeds the minimum Base Flood Elevation), are consequently even more vulnerable to damage by floods.

Acquisition

Acquisition involves the purchasing of a property that is cleared and permanently held as open space. Acquisition permanently moves people and property out of harm's way, increases floodplain capacities, recreation areas and open space, and can help to preserve wetlands, forests, estuaries and other natural habitats. Participation in federally-funded grant programs requires voluntary participation by the owner. Acquisition programs can be expensive to undertake, and the property will no longer accrue taxes for the community and must be maintained, but it is by far the most effective and permanent mitigation technique. Acquisition is most effective when targeting repetitive loss structures, extremely vulnerable structures, or other high-hazard areas.

Elevation

Elevation is the raising of a structure above the Base Flood Elevation. Elevation is often the best alternative for structures that must be built or remain in flood-prone areas, and is less costly than acquisition or relocation. However, elevating a structure can increase its vulnerability to high winds and earthquakes. Some building types are either unsuitable or cost-prohibitive to elevate.

Relocation

Relocation involves the moving of a building or facility to a less hazardous area, on either the same parcel or another parcel. This measure also moves people and property out of harm's way, and is a very effective measure overall. Some building types are either unsuitable or cost-prohibitive to relocate.

Stormwater Management Plans

New development that increases the amount of impervious surfaces affects the land's ability to absorb the water and can intensify the volume of peak flow runoff. Without efficient stormwater management, runoff could cause flooding, erosion, and water quality problems. Stormwater management plans should incorporate both structural and nonstructural measures in order to be most effective. Structural measures include retention and detention facilities that minimize the increase of runoff due to impervious surfaces and new development. Retention facilities allow stormwater to seep into the groundwater. Detention systems accumulate water during peak runoff periods that will be released at off-peak times. Nonstructural measures include establishing impervious surface limit policies and maintenance programs for existing drainage systems.

Dry Floodproofing

Dry floodproofing involves making all areas below the flood protection level watertight by strengthening walls, sealing openings, using waterproof compounds, or applying plastic sheeting on the walls. This method is not recommended for residential structures, but may work well for new construction, retrofitting, or repairing a non-residential structure. Due to pressure exerted on walls and floors by floodwater, dry floodproofing is effective on depths less than 2 to 3 feet. Floodproofing of basements is not recommended.

Wet Floodproofing

The opposite of dry floodproofing, wet floodproofing lets the floodwater actually enter a structure. This technique is effective on deeper flood depths, as it does not have the same potential to build up exterior pressure. Again, this method is not recommended for residential structures and may not be used for basements under new construction, substantial improvements, or substantially damaged structures.

Storm Drainage Systems

Mitigation efforts include the installation, re-routing, or increasing the capacity of storm drainage systems. Examples include the separation of storm and sanitary sewers, addition or increase in size of drainage or retention ponds, drainage easements, or creeks and streams.

Drainage Easements

Easements can be granted that enable regulated public use of privately owned land for temporary water retention and drainage areas.

Structural Flood Control Measures

Water can be channeled away from people and property with structural control measures such as levees, dams, or floodwalls. These measures also may increase drainage and absorption capacities. These structural control measures also may increase Base Flood Elevations and could create a false sense of security.

Basement Backflow Prevention

Planning District communities should encourage the use of check valves, sump pumps, and backflow prevention devices in homes and buildings, if the infrastructure allows.

Wind

Proper engineering and design of a structure can increase a structure's ability to withstand the lateral and uplift forces of wind. Building techniques that provide a continuous load path from the roof of the structure to the foundation are generally recommended.

Windproofing

Windproofing is the modification of the design and construction of a building to resist damages from wind events, and can help to protect the building's occupants from broken glass and debris. Windproofing involves the consideration of aerodynamics, materials, and the use of external features such as storm shutters. These modifications could be integrated into the design and construction of a new structure or applied to reinforce an existing structure. Manufactured homes, which tend to be vulnerable to the effects of extreme wind events, can be protected by anchoring the structures to their foundations. Mobile homes could be tied down to their pads in order to prevent them from being destroyed. Public facilities, critical infrastructure, and public infrastructure (such as signage and traffic signals) should all be windproofed in vulnerable areas. However, windproofing is not a viable mitigation technique to protect against tornadoes.

Community Shelters/Safe Rooms

Community shelters and concrete safe rooms can offer protection and reduce the risk to life. Locations for these shelters or safe rooms are usually in concrete buildings such as shopping malls or schools. Communities lacking basements and other protection nearby should consider developing tornado shelters.

Burying Power Lines

Buried power lines can offer uninterrupted power during and after severe wind events and storms. Burying power lines can significantly enhance a community's ability to recover in the aftermath of a disaster. Buried power lines are typically more expensive to maintain and are more vulnerable to flooding. Encouraging back-up power resources in areas where burial is not feasible will enable the continuity of basic operations (e.g., security, refrigeration, and heat) for businesses and facilities when there is a loss of power.

Available Mitigation Techniques

Prevention

Preventative activities are intended to keep hazard problems from getting worse. They are particularly effective in reducing a community's future vulnerability, especially in

areas where development has not occurred or capital improvements have not been substantial. Examples of preventative activities include:

- Planning and Zoning
- Open space preservation
- Floodplain regulations
- Storm water management
- Drainage system maintenance
- Capital improvements programming
- Shoreline / riverine / fault zone setbacks

Property Protection

Property protection measures protect existing structures by modifying the building to withstand hazardous events, or removing structures from hazardous locations. Examples include:

- Acquisition
- Relocation
- Building elevation
- Critical facilities protection
- Retrofitting (i.e., windproofing, floodproofing, seismic design standards, etc.)
- Insurance
- Safe rooms

Natural Resource Protection

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their mitigation functions. Such areas include floodplains, wetlands, and dunes. Parks, recreation or conservation agencies, and organizations often implement these measures. Examples include:

- Floodplain protection
- Riparian buffers
- Fire resistant landscaping
- Fuel Breaks
- Erosion and sediment control
- Wetland preservation and restoration

- Habitat preservation
- Slope stabilization

Structural Projects

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event. They are usually designed by engineers and managed or maintained by public works staff. Examples include:

- Reservoirs
- Levees / dikes / floodwalls / seawalls
- Diversions / Detention / Retention
- Channel modification
- Storm sewers
- Wind retrofitting
- Utility protection/upgrades

Emergency Services

Although not typically considered a “mitigation technique,” emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:

- Warning systems
- Evacuation planning and management
- Sandbagging for flood protection
- Installing shutters for wind protection

Public Information and Awareness

Public Information and awareness activities are used to advise residents, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include:

- Outreach projects
- Speaker series / demonstration events
- Hazard map information
- Real estate disclosure

- Library materials
- School children education
- Hazard expositions
- Websites

APPENDIX D — PUBLIC ANNOUNCEMENTS

PUBLIC MEETING

Cumberland Plateau Regional Hazard Mitigation Plan

A public meeting on the Cumberland Plateau Regional Hazard Mitigation Plan will be held on Wednesday, June 29, 2005, at 6:30 p.m. at Southwest Virginia Community College in Richlands, Room T-119 in Tazewell Hall. An overview of the planning process and assessment will be presented at the meeting. In addition, a copy of the draft assessment will be available after the workshop for public review. An electronic copy is now available on the Cumberland Plateau Planning District Commission website at (http://projects.dewberry.comlCPPDC_Planning_District) Copies also are available for public view at the Planning District Commission's office at 224 Clydesway Drive, Lebanon, Virginia.

PUBLIC MEETING

Cumberland Plateau Regional Hazard Mitigation Plan

A public meeting on the Cumberland Plateau Regional Hazard Mitigation Plan will be held on Wednesday, June 29, 2005, at 6:30 p.m. at Southwest Virginia Community College in Richlands, Room T-119 in Tazewell Hall. An overview of the planning process and assessment will be presented at the meeting. In addition, a copy of the draft assessment will be available after the workshop for public review. An electronic copy is now available on the Cumberland Plateau Planning District Commission website at (http://projects.dewberry.comICPPDC_Planning_District) Copies also are available for public view at the Planning District Commission's office at 224 Clydesway Drive, Lebanon, Virginia.

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6-15-1t

PUBLIC MEETING

Cumberland Plateau Regional Hazard Mitigation Plan

A public meeting on the Cumberland Plateau Regional Hazard Mitigation Plan will be held on Wednesday, June 29, 2005, at 6:30 PM at Southwest Virginia Community College in Richlands, Room T-119 in Tazewell Hall. An overview of the planning process and assessment will be presented at the meeting. In addition, a copy of the draft assessment will be available after the workshop for public review. An electronic copy is now available on the Cumberland Plateau Planning District Commission website at (http://projects.dewberry.comICPPDC_Planning_District) Copies are also available for public review at the Planning District Commission's office at 224 Clydesway Drive, Lebanon, Virginia.

6-15-1t

NEWS RELEASE

Cumberland Plateau Draft Regional Hazard Mitigation Plan Available on Website

The Cumberland Plateau Planning District Commission, in cooperation with local counties and towns, has been working to complete a Regional Hazard Mitigation Plan for the District. Dewberry, a consultant, is assisting in this effort. The entire plan is now available for review and comments on the Planning District's website at http://projects.dewberry.com/CPPDC_Planning_District. Hard copies are available at each County Administrator's office and each Town Hall in the District, as well as each County Library.

Completion and adoption of the Plan is required by the Virginia Department of Emergency Management (VDEM) and the Federal Emergency Management Agency (FEMA) in order for localities to be eligible for certain pre-disaster mitigation funds.

Cumberland Plateau Draft Hazard Mitigation Plan Available for Public Review

For the past several months, officials and citizens in the Cumberland Plateau Planning District have been working with PDC staff and a consultant, Dewberry, to develop a regional Hazard Mitigation Plan for Buchanan, Dickenson, Russell and Tazewell counties and their towns. The purpose of the study is to identify potential natural hazards in the district and develop strategies to address these hazards. Once local governments adopt the plan, they become eligible for FEMA Hazard Mitigation funds. These funds can be used for such activities as acquiring property in the floodplain and relocating those living there, or to elevating structures in the floodplain above the 100-year flood level.

The Draft Plan has just been completed and copies are being sent to the public libraries in Buchanan, Dickenson, Russell and Tazewell Counties, as well as each County Administrator's office and each town hall in the District. Interested citizens are urged to go to any of these locations and review the draft document. Any comments or questions from the public can be sent to local governments, or the Cumberland Plateau Planning District Commission, P.O. Box 548, Lebanon, VA 24266. Questions or comments can also be made by phone to Jim Baldwin of the PDC at (276) 889-1778.

A final plan will be prepared after public comment is received.

Hazard Mitigation Plan Available for Public Review

For the past several months, officials and citizens in the Cumberland Plateau Planning District have been working with PDC staff and a consultant, Dewberry, to develop a regional Hazard Mitigation Plan for Buchanan, Dickenson, Russell and Tazewell counties and their towns.

The purpose of the study is to identify potential natural hazards in the district and develop strategies to address these hazards. Once local governments adopt the plan, they become eligible for FEMA Hazard Mitigation funds. These funds can be used for such activities as acquiring property in the floodplain and relocating those living there, or to elevating structures in the floodplain above the 100-year flood level.

The Draft Plan has just been completed and copies are being sent to the public libraries in Buchanan, Dickenson, Russell and Tazewell Counties, as well as each county administrator's office and each town hall in the district.

Interested citizens are urged to go to any of these locations and review the draft document.

Any comments or questions from the public may be sent to local governments, or the Cumberland Plateau Planning District Commission, P.O. Box 548, Lebanon, VA 24266.

Questions or comments may also be directed by phone to Jim Baldwin of the PDC at (276) 889-1778.

Cumberland Plateau hazard mitigation plan available for public review and comment

The Cumberland Plateau Planning District Commission, in cooperation with local counties and towns, has been working to complete a Regional Hazard Mitigation Plan for the District. Dewberry, a consultant, is assisting in this effort. The entire plan is now available for review and comments on the Planning District's website at http://projects.dewberry.comlCPPDC_Planning_District. Hard copies are available at each County Administrator's office and each Town Hall in the District, as well as each County Library.

Completion and adoption of the Plan is required by the Virginia Department of Emergency Management (VDEM) and the Federal Emergency Management Agency (FEMA) in order for localities to be eligible for certain pre-disaster mitigation funds.

Draft hazard mitigation plan available for public review

The Cumberland Plateau Planning District has finished a draft regional hazard mitigation plan and is seeking public input on the proposal.

Planning district staff and a consultant have been working for several months to develop the proposal for Dickenson, Buchanan, Russell and Tazewell counties and their towns. The study's purpose is to identify potential natural hazards in the district and develop strategies to address them.

Once local governments adopt the plan, they become eligible for Federal Emergency Management Agency hazard mitigation funds. These funds can be used for such activities as acquiring property in the flood plain and relocating those living there, or elevating structures the flood plain above the 100-year flood level.

Copies of the draft plan are available at public libraries, county administrator's offices and town halls in each of the four counties.

Interested citizens are urged to go to any of these locations and review the draft document. Comments or questions can be sent to local governments or the planning district commission, P.O. Box 548, Lebanon, VA 24266. Questions or comments can also be made by phone to Jim Baldwin of the planning commission at (276) 889-1778.

A final plan will be prepared after public comment is received.

Southwest Va., mitigation study ready

By CHARLES OWENS
Bluefield Daily Telegraph

TAZEWELL, Va. — A draft study of potential natural hazards in Tazewell, Buchanan, Dickenson and Russell counties is now available for public inspection.

The Cumberland Plateau Planning District has been working for the past several months to develop the regional hazard mitigation plan for the four-county district. The purpose of the study is to identify potential natural hazards in the region and to develop strategies to address those hazards, CPPD Director Jim Baldwin said.

Baldwin said an example of such a natural hazard would include flooding, winter storms, landslides and wildfires. He said the recent work by the town of Bluefield to remove commercial and residential structures from the flood plain is an example of those items to be addressed in the study.

"Once local governments adopt the plan, they become eligible for FEMA (Federal Emergency Management Agency) Hazard Mitigation funds," Baldwin said. "These funds can be used for such activities as acquiring property in the flood plain and relocating those living there, or toward elevating those structures in the flood plain above the 100-year flood level."

Baldwin said copies of the draft plan are now being forwarded to public libraries in all four counties, as well as individual county administrator offices and town halls, for public review. Baldwin said those citizens who are interested in the plan are urged to visit any of the locations to review the draft document.

A final plan for the four county district will be prepared after the public comment period is closed.

— Contact Charles Owens at cowens@bdtonline.com

PUBLIC MEETING

Cumberland Plateau Regional Hazard Mitigation Plan

A public meeting on the Cumberland Plateau Regional hazard Mitigation Plan will be held on Wednesday, June 29, 2005 at 6:30 p.m. at Southwest Virginia Community College in Richlands, Room T-119 in Tazewell Hall. An overview of the planning process and assessment will be presented at the meeting. In addition, a copy of the draft assessment will be available after the workshop for public review. An electronic copy is now available on the Cumberland Plateau Planning District Commission website at (http://projects.dewberry.comICPPDC_Planning_District)

Copies also are available for public view at the Planning District Commission's Office at 224 Clydesway Drive, Lebanon, Virginia.

24-1t

APPENDIX E — ADOPTION RESOLUTIONS

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study Buchanan County's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on Buchanan County; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including Buchanan County.

NOW THEREFORE, BE IT RESOLVED by the Buchanan County Board of Supervisors that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for Buchanan County. A copy of the plan is attached to this resolution by reference.

ADOPTED by Buchanan County this 7th **day of** November**, 2005.**

APPROVED:

Joseph Keene

Chairman

ATTEST:

W. F. Caudill

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHERE AS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study the Town of Grundy's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Town of Grundy; and

WHERE AS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHERE AS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including the Town of Grundy.

NOW THEREFORE, BE IT RESOLVED by the Grundy Town Council that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for the Town of Grundy. A copy of the plan is attached to this resolution by reference.

ADOPTED by the Grundy Town Council this 8 day of Nov., 2005.

APPROVED:

Mayor

ATTEST:

Dickenson County Board of Supervisors

COUNTY ADMINISTRATOR

KEITH L. VIERS

P.O. Box 1098
Clintwood, Virginia 24228
Telephone: 276/926-1676
Fax: 276/926-1649
keith.viers@bos.dcwin.org

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study Dickenson County's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on Dickenson County; and

WHEREAS, a request for proposals was issued to hire an experienced consulting form to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including Dickenson County.

NOW, THEREFORE, BE IT RESOLVED by the Dickenson County Board of Supervisors that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for Dickenson County. A copy of the plan is attached to this resolution by reference.

ADOPTED by Dickenson County this 25 day of OCTOBER, 2005.

Paul D. Buchanan, Chairman

ATTEST:

Betty R. Hill, Clerk

Town of Clintwood

Phone (276) 926-8383 • P.O. Box 456 • FAX (276) 926-9871
Email clintwodtown@naxs.com
CLINTWOOD, VIRGINIA 24228

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study the Town of Clintwood's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Town of Clintwood; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including the Town of Clintwood.

NOW THEREFORE, BE IT RESOLVED by the Clintwood Town Council that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for the Town of Clintwood. A copy of the plan is attached to this resolution by reference.

ADOPTED by the Clintwood Town Council this 3 **day of** November, **2005.**

APPROVED:

Donald Baker

Mayor

ATTEST:

Judy Sluss

RESOLUTION ADOPTING A NATURAL HAZARDS MITIGATION PLAN FOR THE CUMBELAND PLATEAU PLANNING DISTRICT COMMUNITIES

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of Town of Haysi citizens, members of the business community and non-profit organizations working with the Town of Haysi and staff was convened in order to study the Town of Haysi risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Town of Haysi; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members and consulting firm of Dewberry have resulted in the development of a Hazard Mitigation Plan for the Planning District including the Town of Haysi.

NOW THEREFORE, BE IT RESOLIVED by the Town of Haysi that the Hazard Mitigation Plan dated December 14, 2004, is hereby approved and adopted for the Town of Haysi. A copy of the plan is attached to this resolution.

ADOPTED by the Town of Haysi this 14th day of December, 2004.

APPROVED:

Norman Mullins

Norman Mullins, Mayor

ATTEST:

Barbara Owens

Barbara Owens, Clerk of Council

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study the Town of Clinchco's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Town of Clinchco; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including the Town of Clinchco.

NOW THEREFORE, BE IT RESOLVED by the Clinchco Town Council that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for the Town of Clinchco. A copy of the plan is attached to this resolution by reference.

ADOPTED by the Clinchco Town Council this 5th **day of** Dec. **, 2005.**

APPROVED:

Randy Moore
Mayor

ATTEST:

Shelba Mullins

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study Russell County's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on Russell County; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including Russell County.

NOW THEREFORE, BE IT RESOLVED by the Russell County Board of Supervisors that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for Russell County. A copy of the plan is attached to this resolution by reference.

ADPOTED by Russell County this 7th **day of** November, **2005.**

APPROVED:

Danny L. Brown

Chairman

ATTEST:

James A. Gilbert

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study the Town of Lebanon's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Town of Lebanon; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including the Town of Lebanon.

NOW THEREFORE, BE IT RESOLVED by the Lebanon Town Council that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for the Town of Lebanon. A copy of the plan is attached to this resolution by reference.

ADOPTED by the Lebanon Town Council this 14th **day of** November **, 2005.**

APPROVED:

Mayor

ATTEST:

Ann Clark, Clerk

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study the Town of Honaker's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Town of Honaker; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including the Town of Honaker.

NOW THEREFORE, BE IT RESOLVED by the Honaker Town Council that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for the Town of Honaker. A copy of the plan is attached to this resolution by reference.

ADOPTED by the Honaker Town Council this 4th **day of** NOVEMBER**, 2005.**

APPROVED:

C. H. Wallace

Mayor

ATTEST:

Cyndi Hale, Clerk

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study the Town of Cleveland's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Town of Cleveland; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including the Town of Cleveland.

NOW THEREFORE, BE IT RESOLVED by the Cleveland Town Council that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for the Town of Cleveland. A copy of the plan is attached to this resolution by reference.

ADOPTED by the Cleveland Town Council this 28 **day of** November, **2005.**

APPROVED:

Mina G. Dotson
Mayor

ATTEST:

Rhonda S. Holson

scan.jpg (849x1107x24b jpeg)

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study Tazewell County's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on Tazewell County; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including Tazewell County.

NOW THEREFORE, BE IT RESOLVED by the Tazewell County Board of Supervisors that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for Tazewell County. A copy of the plan is attached to this resolution by reference.

ADPOTED by Tazewell County this 1 **day of** November **, 2005.**

APPROVED:

Donnie Lowe

Chairman

ATTEST:

Mary P. Hoseclaw

TOWN OF CEDAR BLUFF

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study the Town of Cedar Bluff's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Town of Cedar Bluff; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including the Town of Cedar Bluff.

NOW THEREFORE, BE IT RESOLVED by the Cedar Bluff Town Council that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for the Town of Cedar Bluff. A copy of the plan is attached to this resolution by reference.

ADOPTED by the Cedar Bluff Town Council this 15th **day of** November, **2005.**

APPROVED:

Richard H Lee, Sr

Mayor

ATTEST:

Jana L. McClellan

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study the Town of Tazewell's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Town of Tazewell; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including the Town of Tazewell.

NOW THEREFORE, BE IT RESOLVED by the Tazewell Town Council that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for the Town of Tazewell. A copy of the plan is attached to this resolution by reference.

ADOPTED by the Tazewell Town Council this 8 **day of** November **, 2005.**

APPROVED:

Charles E. Green, Jr.

Mayor

ATTEST:

Town Manager

Pocahontas Exhibition Mine
National Historical Landmark
Virginia's Official
Coal Heritage Zone

Town of Pocahontas
June 30th 1882

Centre Street
Post Office Box 128
Pocahontas, Virginia 24635
(276) 945-9522 Town Hall
(276) 945-5959 Police Department
(276) 945-9904 Fax Line

"ORIGINAL POCAHONTAS" COAL
http://wvweb.com/www/pocahontas_mine

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study the Town of Pocahontas's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Town of Pocahontas; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including the Town of Pocahontas.

NOW THEREFORE, BE IT RESOLVED by the Pocahontas Town Council that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for the Town of Pocahontas. A copy of the plan is attached to this resolution by reference.

ADOPTED by the Pocahontas Town Council this 28 **day of** November, **2005.**

APPROVED:

Christie Brown

Mayor

ATTEST:

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study the Town of Bluefield's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Town of Bluefield; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including the Town of Bluefield.

NOW THEREFORE, BE IT RESOLVED by the Bluefield Town Council that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005 is hereby approved and adopted for the Town of Bluefield. A copy of the plan is attached to this resolution by reference.

ADOPTED by the Bluefield Town Council this 14th day of November 2005.

Donald Harris

Donald Harris, Mayor

Shelia Shrader

Shelia Shrader, Town Clerk

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive Hazard Mitigation Grant Program (HMGP) project grants and certain other forms of non-emergency disaster assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from all jurisdictions within the Cumberland Plateau Planning District was convened in order to study the Town of Richlands's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Town of Richlands; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the Cumberland Plateau Planning District; and

WHEREAS, the efforts of the MAC members in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the Cumberland Plateau Planning District communities including the Town of Richlands.

NOW THEREFORE, BE IT REOLVED by the Richlands Town Council that the Cumberland Plateau Planning District Commission Hazard Mitigation Plan dated July 1, 2005, is hereby approved and adopted for the Town of Richlands. A copy of the plan is attached to this resolution by reference.

Adopted at the Richlands Town Council this 8th day of November, 2005

Approved:

Kenneth Wysor

Kenneth Wysor, Mayor

ATTEST:

Elva Lee VanDyke

Elva Lee VanDyke, Clerk of Council