

Mineral County, WV

Land Use Master Plan 2015



Contents

Executive Summary	5
I. Introduction	16
II. Planning Area	17
III. Existing Conditions.....	17
Population	18
Employment	22
Wages and Income	27
Education	32
Utilities and Infrastructure	39
Transportation	59
Current Post-Mine Economic Development Sites	61
Historic Preservation.....	61
Natural Resources, Environment, and Energy	64
IV. Land Use Smart Planning	77
V. Site Evaluation	79
Initial Data Collection:.....	79
Site Analysis (Distance Analysis).....	82
Suitability Model	95
Work Force Analysis	102
Retail Location Analysis.....	104
VI. Conclusion	106

List of Tables

Table A: Distances comparison between top five sites for potential development..... 7
Table B: Total score comparison between top five sites for potential development 7
Table C: Absolute/Relative score comparison between top five sites for potential development 8
Table 1: Mineral County Water and Sewer Rates..... 41
Table 2: Smart Planning Utilizations 77
Table 3: Mineral County Potential Surface Mine Sites for Development 80
Table 4: Assessment of Distances..... 83
Table 5: Shortest Distances from Sites to Other Transportation Methods..... 85
Table 6: Shortest Distances from Sites to Sewer Lines (SL) and Water Lines (WL)..... 87
Table 7: Shortest Distances from Sites to Broadband (BB) and Power Lines (PL)..... 89
Table 8: Shortest Distances from Sites to Sewer (SW) and Solid Waste (SD) Treatment Facilities..... 91
Table 9: Shortest Distances from Sites to Gas Pipe (GP) and Oil Pipe (OP) 93
Table 10: Weighting Sites Selection Criteria..... 96
Table 11: Absolute Scoring System..... 97
Table 12: Relative Scoring System..... 98
Table 13: Total Score of Mine Sites in Mineral County 99
Table 14: Employment and Unemployment within 5-, 10- and 15-mile Radii from the Site..... 102

List of Figures

Figure 1: Census Populations for Mineral County..... 18
Figure 2: Mineral County Age Breakdown..... 20
Figure 3: Population Projections..... 22
Figure 4: 2013 Mineral County Employment 23
Figure 5: Mineral County Employment by 5 Sectors 2001-2012 24
Figure 6: Mineral County Unemployment Rate..... 24
Figure 7: 2013 Mineral County Total Wages 27
Figure 8: Mineral County Total Wages 1995-2013 28
Figure 9: Mineral County Total Wages by 5 Sectors 2001-2012 28
Figure 10: Government Transfers as a Percentage of Income for Mineral County 29
Figure 11: Mineral County School Enrollment..... 32
Figure 12: Mineral County Dropout Rate 33
Figure 13: Mineral County Educational Attainment..... 39
Figure 14: Power Company Prices..... 40
Figure 15: Mineral County’s Suitability Model (Total Score of Each Surface Coal Mining Site)..... 101

List of Maps

Map A: Top Five Sites for Potential Development.....	10
Site's General Info: Site 1 Permit ID S200497	11
Site's General Info: Site 2 Permit ID S200906	12
Site's General Info: Site 3 Permit ID S200788	13
Site's General Info: Site 4 Permit ID S003484	14
Site's General Info: Site 5 Permit ID S002974	15
Map 1: Demographic – Population	19
Map 2: Demographic – Median Age.....	21
Map 3: Demographic – Labor Force Participation	25
Map 4: Demographic – Unemployment Rate	26
Map 5: Demographic – Per Capita Annual Net Earning.....	30
Map 6: Demographic – Number of Establishments	31
Map 7: NCLB – Second Month Enrollment	34
Map 8: NCLB – Dropout Rate.....	35
Map 9: NCLB – Total Graduates	36
Map 10: NCLB – Graduates Rate	37
Map 11: Total Attendance by School 2015	38
Map 12: Utilities – Electricity.....	44
Map 13: Utilities – Water and Sewer.....	45
Map 14: Utilities – Solid Waste Facility.....	46
Map 15: Broadband – Internet Cable and FTTP Coverage.....	48
Map 16: Broadband – Internet DSL, BPL, Other Copper.....	49
Map 17: Broadband – Internet Wireline Coverage	50
Map 18: Broadband – Internet MaxUp Speed Wireline	51
Map 19: Broadband – Internet MaxDown Speed Wireline	52
Map 20: Broadband – Internet Total Number of Providers	53
Map 21: Broadband – Internet Fixed Wireless Coverage	54
Map 22: Broadband – Internet MaxDown Speed Wireless	55
Map 23: Broadband – MaxUp Speed Wireless.....	56
Map 24: Broadband – Internet Mobile Wireless Coverage	57
Map 25: Broadband – No Broadband Coverage	58
Map 26: Transportation.....	60
Map 27: National Register of Historic Places.....	62
Map 28: State Historic Architecture	63
Map 29: Hydrology – National Wetlands Inventory.....	65
Map 30: Public Land – Parks and Forests.....	66
Map 31: Environment – Monitoring	67
Map 32: Energy – Gas and Oil.....	69
Map 33: Energy – Marcellus Wells	70
Map 34: Energy – Percent Forest Coverage	71
Map 35: Renewable Energy – Wood By-Products Produced	72
Map 36: Renewable Energy – Wood By-Products Available.....	73

Map 37: Energy – Geothermal Resource	74
Map 38: Renewable Energy – Solar	75
Map 39: Renewable Energy – Wind	76
Map 40: Landuse Criteria	78
Map 41: Retail Location Density	105

Executive Summary

This Land Use Master Plan (LUMP) conveys information on Mineral County's current demographic and geographic status. This plan will be used to evaluate the potential of post-mine sites for development, and evaluate Mineral County's investment position.

Senate Bill (SB) 603 mandates the development of a LUMP by counties with surface mining operations. The LUMP will be an effective tool towards achieving Mineral County's development goals. The Nick J. Rahall Appalachian Transportation Institute (RTI) coordinates with the Office of Coalfield Community Development to provide this essential information. There are no major post-mine developments in Mineral County however, this plan will help Mineral take advantage of its post-mine sites for future development.

Mineral County's population has fluctuated since the 1980s, experiencing decline through the early 2000s and then increasing through 2010. The County's median age and age distribution are average for the State, indicative of a population capable of productivity in the labor force. The population is projected to decrease through 2030.

Employment consists mainly of Manufacturing; Government; and Trade, Transportation, and Utilities. Manufacturing and Government are the major wage contributors.

Mineral County total wages have been on the rise since the mid-1990s, with increases in the Government and Manufacturing sectors largely driving this increase. Of particular note is the amount of income, as opposed to wages, derived from government transfers. In 2013, approximately 27 percent of Mineral County income is from government transfers. Mineral County is not alone in this situation, as West Virginia finds many of its counties deriving almost a third of their incomes from government transfers.

Mineral County's total enrollment experienced overall decline from the 2002-2003 to the 2012-2013 school years. The County's dropout rate also experienced overall decline from the 2005-2006 to 2012-2013 school years. Approximately 13 percent of Mineral County residents 25 and over do not have a high school diploma.

Utility prices are varied throughout the County, and this plan provides municipal and private rates for electricity, sewer, and water. Broadband, an increasingly important utility in the age of globalization, is highlighted to show the necessity for improvement and access, and showcase the developable properties of this utility.

Transportation is an important consideration in any development strategy. Mineral County has no interstate, two U.S. Routes, and six State Routes. The County does have some rail presence, and hosts one local

airports, the Greater Cumberland Regional Airport.

Mineral County also has 8 historic sites in the National Register and several pieces of historic architecture designated by the State. Historic preservation can be a basis for tourism, cultural identity, and community cohesion.

This plan also reviews energy and environmental issues in Mineral County. The environment of the County should be considered in an overall development strategy. Mineral County is slightly forested but does not produce wood by-products, and does have a few scattered areas of state parks and wildlife management areas. Mineral County is also not on the list of air pollution non-attainment areas, which is positive. Mineral County has one completed Marcellus Shale well, and none that are permitted, and has a lower favorability for enhanced geothermal drilling throughout the County. However, Mineral appears to have very little potential with solar but portions of the county are prime for wind as a form of renewable energy resources.

This information is as critical as the site information for several reasons. One is that development is not a process that can occur in a vacuum. Without understanding the resources available in the County, and the demand for more investment, money will end up wasted. Another is that investment requires active partners who will need information on each of the County's essential demographic topics to determine their level of risk. Without this, investors will not be persuaded to enter the County.

Finally, this information can help policy makers target their land use strategies to any of these topics, as long as they understand the situation.

Site analysis is integral to this report. Researchers identified all the post mine sites given certain criteria for Mineral County. The researchers identified sites in areas that fit the County's unique geographic, demographic, and economic position. The researchers combined a distance analysis using a scoring system based on distance to certain essential utilities and features. These scores were summed and plotted. A workforce analysis was conducted to determine available labor within certain radii for each site, and a retail analysis was conducted to determine which areas had the most retail activity.

The top five mine sites were then identified, and are displayed individually. Map A contains the top five sites within a view of the County.

The tables below are comprehensive comparisons between the top five post-mine lands for potential development Tables A, B and C compare results between the top five potential development sites, as determined by suitability analysis of all post-mine lands in the County. In Table A, distances for each variable are compared between sites to give an idea of the more suitable site for specific criterion under consideration. For example, if we want to identify the site located closest to power lines, the distance measurements from each site to the nearest power line is listed in Table A.

candidates for potential redevelopment are the five with the highest total weighted score.

Table C illustrates how each criterion contributes to the final total score and the importance of the weights. A scale of values, based on ideal distances for each criteria, is used to calculate the total Absolute score. The Relative scale is calculated by comparing each site in

relationship to others instead of set distances. Because of the assumption that one criterion may be more important than others (different weights), the rank order of the sites absolute and relative scores can change once the weights for each criteria are mathematically applied. A high or low value in a heavily weighted criteria can dramatically raise or lower a sites total weighted score.

Table A: Distances comparison between top five sites for potential development

Suitability Ranking	1	2	3	4	5	Weight
Broadband	0.75	1.04	1.50	1.84	1.98	9
Gas Pipes	0.82	0.85	0.03	0.03	0.35	6
Pipe Lines	0.51	0.32	0.61	0.91	0.73	6
Power Lines	0.27	0.34	0.45	0.35	0.03	10
Railroads	1.73	1.57	0.60	0.47	0.80	5
Sewer Lines	0.94	0.88	0.29	0.52	0.77	8
Water Lines	0.04	0.21	0.29	0.53	0.79	10
Existing Highway	0.03	0.21	0.43	0.89	0.93	8
Interstate	44.14	44.53	45.51	45.71	45.80	8
Sewer Treatment Facilities	8.58	8.97	9.95	10.15	10.24	7
Solid Waste Treatment Facilities	26.31	26.70	27.69	27.88	27.97	8

Table B: Total score comparison between top five sites for potential development

Suitability Ranking	1	2	3	4	5	Weight
Broadband	63	47.25	31.5	31.5	31.5	9
Gas Pipes	31.5	31.5	60	60	60	6
Pipe Lines	30	42	22.5	13.5	22.5	6
Power Lines	100	100	75	100	100	10
Railroads	26.25	26.25	50	50	50	5
Sewer Lines	80	80	80	80	80	8
Water Lines	100	100	70	50	22.5	10
Existing Highway	80	80	80	60	60	8
Interstate	8	6	6	4	4	8
Sewer Treatment Facilities	21	15.75	10.5	3.5	3.5	7
Solid Waste Treatment Facilities	18	12	6	6	6	8
Total Weighted Score	557.75	540.75	491.5	458.5	440	

Table C: Absolute/Relative score comparison between top five sites for potential development

Suitability Ranking	1	2	3	4	5	Weight
Broadband	7	7	7	7	7	9
Gas Pipes	7	7	10	10	10	6
Pipe Lines	5	7	5	3	5	6
Power Lines	10	10	10	10	10	10
Railroads	7	7	10	10	10	5
Sewer Lines	10	10	10	10	10	8
Water Lines	10	10	7	5	3	10
Existing Highway	10	10	10	10	10	8
Interstate	1	1	1	1	1	8
Sewer Treatment Facilities	3	3	3	1	1	7
Solid Waste Treatment Facilities	3	3	3	3	3	8
Total Absolute Score	73	75	76	70	70	

Suitability Ranking	1	2	3	4	5	Weight
Broadband	10	7.5	5	5	5	9
Gas Pipes	7.5	7.5	10	10	10	6
Pipe Lines	10	10	7.5	7.5	7.5	6
Power Lines	10	10	7.5	10	10	10
Railroads	7.5	7.5	10	10	10	5
Sewer Lines	10	10	10	10	10	8
Water Lines	10	10	10	10	7.5	10
Existing Highway	10	10	10	7.5	7.5	8
Interstate	10	7.5	7.5	5	5	8
Sewer Treatment Facilities	10	7.5	5	5	5	7
Solid Waste Treatment Facilities	7.5	5	2.5	2.5	2.5	8
Total Relative Score	102.5	92.5	85	82.5	80	

Tables A, B and C compare results between the top five potential development sites, as determined by suitability analysis of all post-mine lands in the county. In Table A, distances for each variable are compared between sites to give an idea of the more suitable site for specific criterion under consideration. For example, if we want to identify the site located closest to power lines, the distance measurements from each site to the nearest power line is listed in Table A.

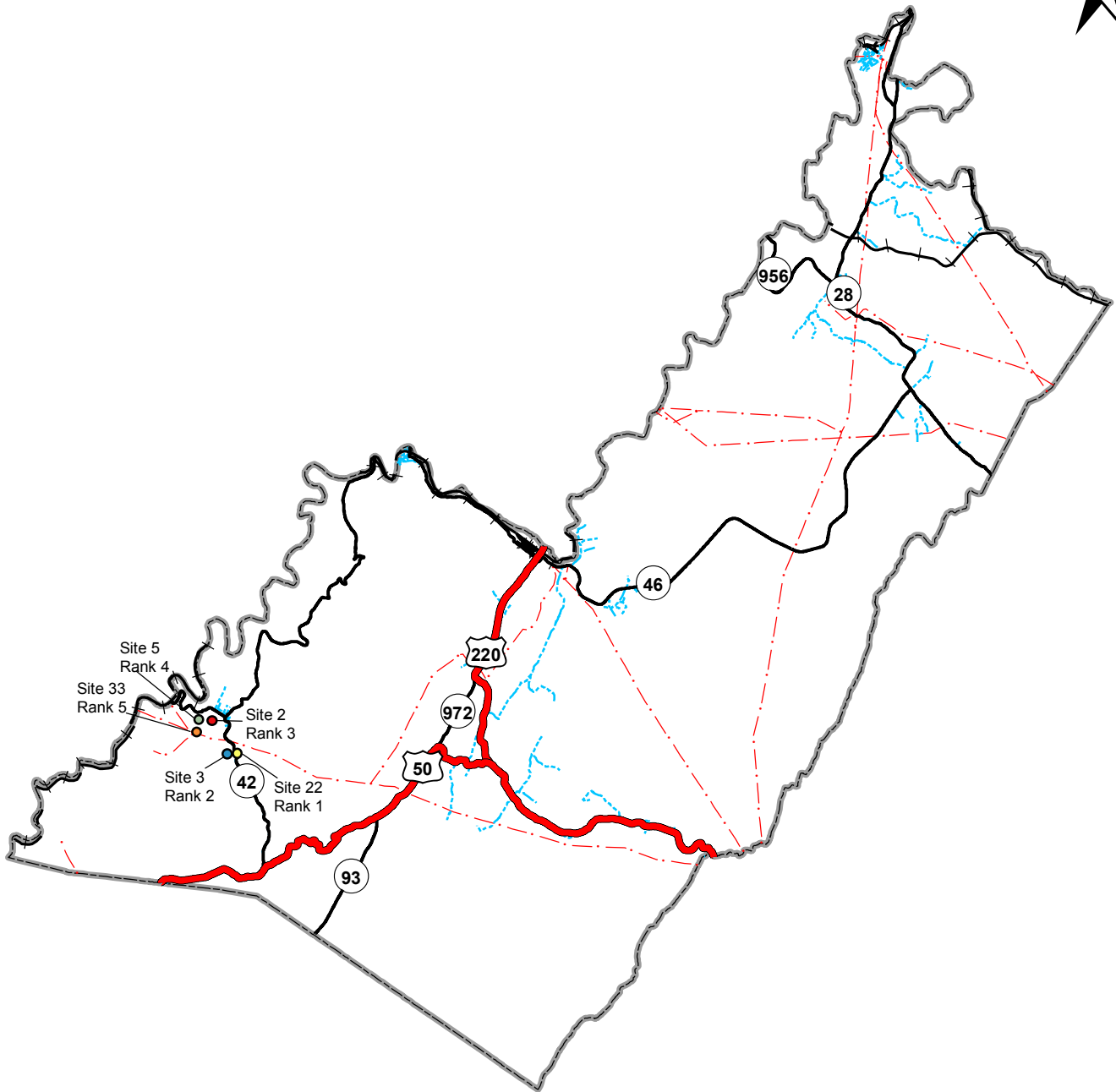
Table C illustrates how each criterion contributes to the final total score and the importance of the weights. A scale of values, based on ideal distances for each criteria, is used to calculate the total Absolute score. The Relative scale is calculated by comparing each site in relationship to others instead of set distances. Because of the assumption that one criterion may be more important than others (different weights), the rank order of the sites absolute and relative

scores can change once the weights for each criteria are mathematically applied. A high or low value in a heavily weighted criteria can dramatically raise or lower a sites total weighted score.

Table B shows the total weighted score. The mining sites considered as the best candidates for potential redevelopment are the five with the highest total weighted score.

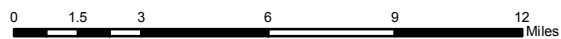
Top Five Sites for Potential Development

Mineral County



- | | |
|---------------------|-------------------|
| Mining Sites | US Routes |
| ● Site 22 | — WV Routes |
| ● Site 3 | — Railroads |
| ● Site 2 | — Water Line |
| ● Site 33 | — Power Line |
| ● Site 5 | ▭ County Boundary |

Source: Rahall Transportation Institute Analysis 2015



Site's General Info.

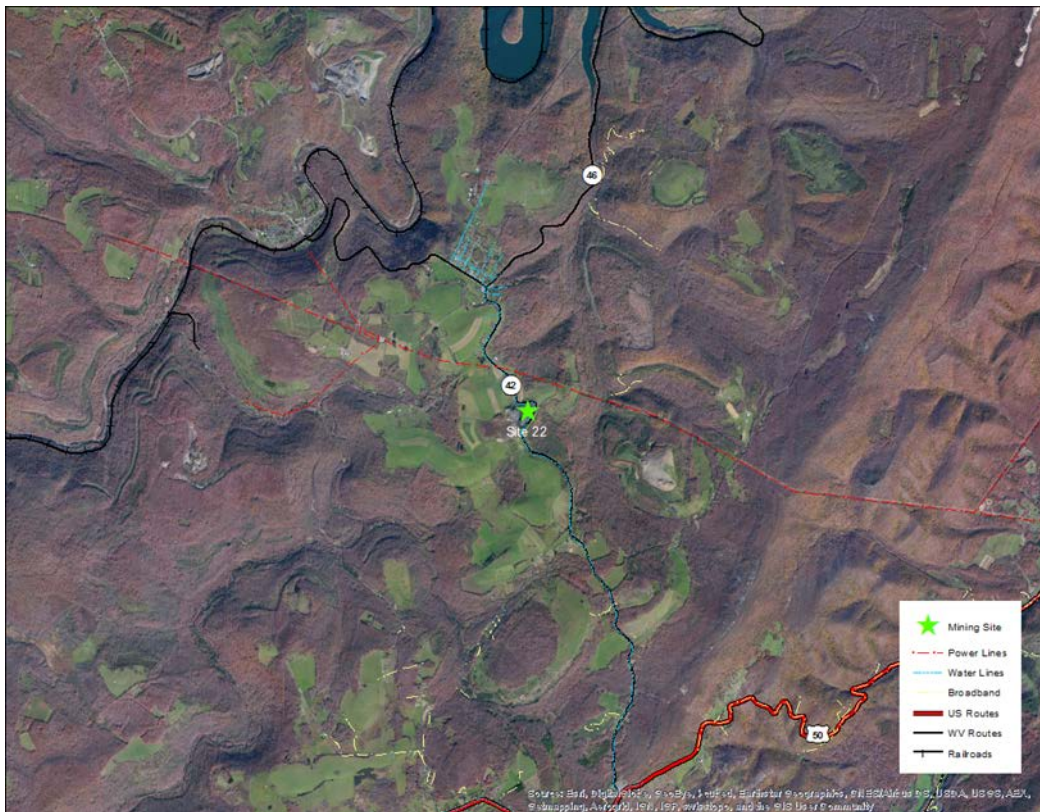
Permittee	D. & L. Coal Company, Inc.
Facility Name	Jones Mine
Permit ID	S200497
Issue Date	2/6/1998
Expiration Date	2/6/2008
Current Acres	12
Lat	39° 22'0"
Long	79° 8'40.0000"
Nearest Post Office	Elk Garden

Site Number	22
Suitability Ranking	1
Total Score	557.75

Distance Analysis Results

Broadband	0.75
Gas Pipes	0.82
Pipe Lines	0.51
Power Lines	0.27
Railroads	1.73
Sewer Lines	0.94
Water Lines	0.04
Existing Highway	0.03
Interstate	44.14
Sewer Treatment Facilities	8.58
Solid Waste Treatment Facilities	26.31

Site number 22 should be the first choice for potential development. It scores high in many of the most important features, such as Gas Pipes (0.34 mi.), Water Lines (0.04 mi.), and is close to Broadband (0.75 mi.). It is also close to an Existing Highways (0.03 mi.).



Site's General Info.

Permittee	D. & L. Coal Company, Inc.
Facility Name	Jones Remine
Permit ID	S200906
Issue Date	7/30/2007
Expiration Date	7/30/2017
Current Acres	115
Lat	39° 22'0"
Long	79° 9'0"
Nearest Post Office	Elk Garden

Site Number	3
Suitability Ranking	2
Total Score	540.75

Distance Analysis Results

Broadband	1.04
Gas Pipes	0.85
Pipe Lines	0.32
Power Lines	0.34
Railroads	1.57
Sewer Lines	0.88
Water Lines	0.21
Existing Highway	0.21
Interstate	44.53
Sewer Treatment Facilities	8.97
Solid Waste Treatment Facilities	26.70

Site number 3 has the second highest score in the suitability model. The site is located close to utility features such as Water Lines (0.21 mi.), Sewer Lines (0.88 mi.) and Power Lines (0.34 mi.), which makes the site to be a good place for future development.



Site's General Info.

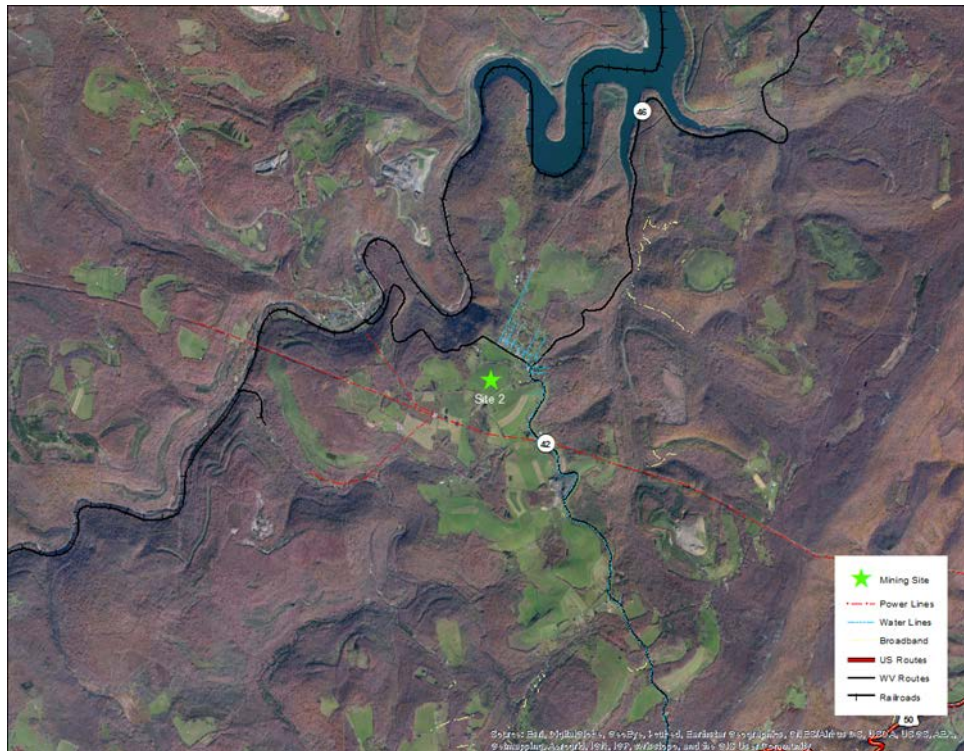
Permittee	D. & L. Coal Company, Inc.
Facility Name	Jones-Stullenbarger #2 Mine
Permit ID	S200788
Issue Date	5/20/1988
Expiration Date	5/20/1998
Current Acres	72
Lat	39° 22'45.0000"
Long	79° 9'30.0000"
Nearest Post Office	Kitzmiller

Site Number	2
Suitability Ranking	3
Total Score	491.5

Distance Analysis Results

Broadband	1.50
Gas Pipes	0.03
Pipe Lines	0.61
Power Lines	0.45
Railroads	0.60
Sewer Lines	0.29
Water Lines	0.29
Existing Highway	0.43
Interstate	45.51
Sewer Treatment Facilities	9.95
Solid Waste Treatment Facilities	27.69

Site number 2 is listed as the third suitable site for post-mine land development. The site is fairly close to several important criteria. It is close to Gas Pipes (0.03 mi.) and to both Sewer and Water Lines (0.29 mi.). Like the other sites, Site #2 is close to an Existing Highway (0.43 mi.) but far from an Interstate (45.51 mi.).



Site's General Info.

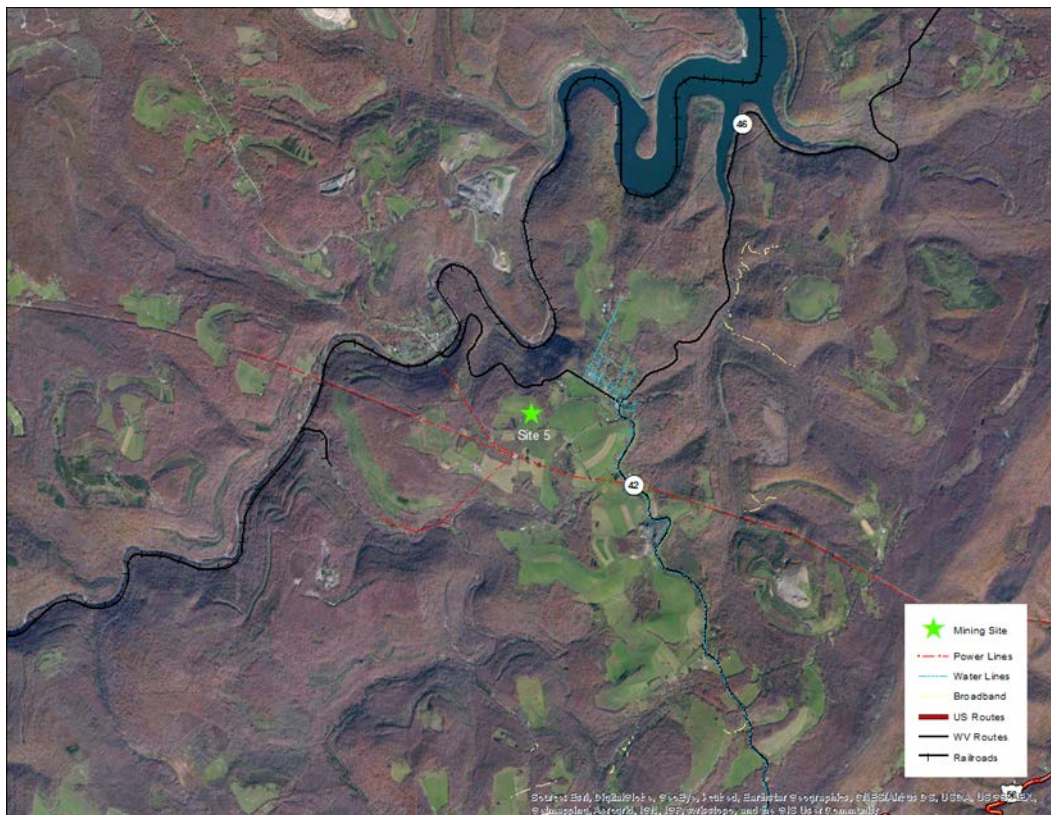
Permittee	D. & L. Coal Company, Inc.
Facility Name	N/A
Permit ID	S003484
Issue Date	6/8/1984
Expiration Date	6/8/1999
Current Acres	97
Lat	39° 22'47.0000"
Long	79° 9'56.0000"
Nearest Post Office	Kitzmiller

Site Number	5
Suitability Ranking	4
Total Score	458.5

Distance Analysis Results

Broadband	1.84
Gas Pipes	0.03
Pipe Lines	0.91
Power Lines	0.35
Railroads	0.47
Sewer Lines	0.52
Water Lines	0.53
Existing Highway	0.89
Interstate	45.71
Sewer Treatment Facilities	10.15
Solid Waste Treatment Facilities	27.88

Site number 5 is ranked as the fourth suitable site for post-mine land development in the county. The advantages of the site are its relative proximity to utilities, Gas Pipes (0.03 mi.) and Power Lines (0.35 mi.), and the close distance to Railroads (0.47 mi.) and Existing Highway (0.89 mi.). The main disadvantage is the great distance to Broadband (1.84 mi.).



Site's General Info.

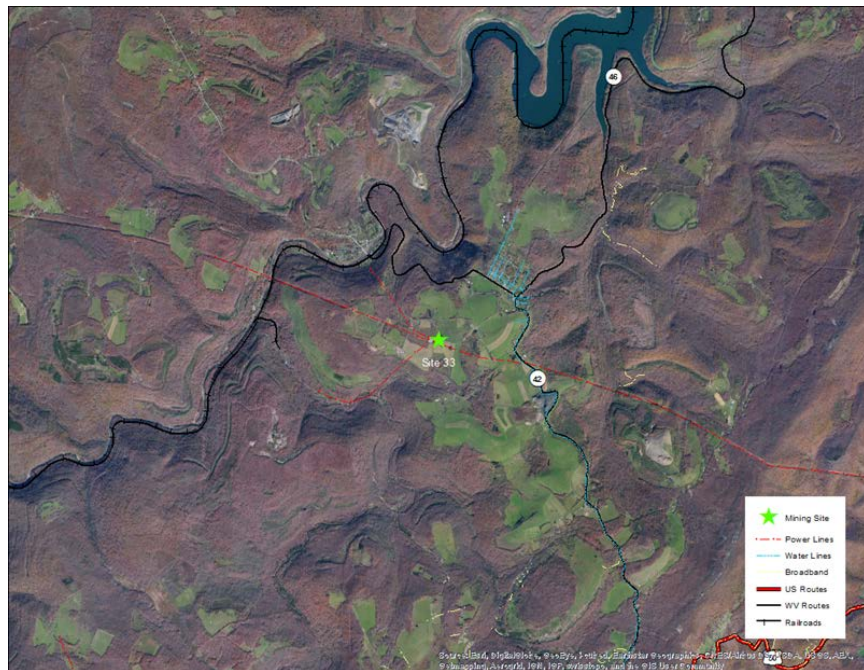
Permittee	D. & L. Coal Company, Inc.
Facility Name	N/A
Permit ID	S002974
Issue Date	3/1/1974
Expiration Date	9/24/1992
Current Acres	57.39
Lat	39° 22'30.0000"
Long	79° 10'0"
Nearest Post Office	Unknown

Site Number	33
Suitability Ranking	5
Total Score	440

Distance Analysis Results

Broadband	1.98
Gas Pipes	0.35
Pipe Lines	0.73
Power Lines	0.03
Railroads	0.80
Sewer Lines	0.77
Water Lines	0.79
Existing Highway	0.93
Interstate	45.80
Sewer Treatment Facilities	10.24
Solid Waste Treatment Facilities	27.97

Site number 33 has the fifth highest score in the suitability model for its close distance to Power Lines (0.03 mi.), a heavily weighted criteria. The distance from the site to other important criteria, such as Gas Pipes (0.35 mi.) and Railroad Facilities (0.80 mi.), are also below average adding to the sites overall score.



I. Introduction

Senate Bill (SB) 603, passed in the 2001 Legislative Session, mandates the development of a Land Use Master Plan (LUMP) by counties with surface mining operations. The creation of a LUMP would facilitate the development of economic or community assets, secure developable land and infrastructure, and ensure that post-mining land use proposed in any reclamation plan is in compliance with the specified land use in the approved LUMP. In order to promote acceptable principles of smart growth within the desired community it has become evident that a sustainable land use plan is needed to determine development needs within a community. The detailed document addresses the physical development needs of properties within the coalfield counties and provides guidelines, strategies, and a framework for future decisions relating to land use and projected community needs.

The 1977 Surface Mining Control and Reclamation Act established a program for the regulation of surface mining activities and the reclamation of coal-mined lands. The Act requires that coal operators minimize the disturbance and adverse impact on the environment and community in addition to restoring the mined property to its approximate original contour. Special provisions are granted for operators who offer development plans for post-mining land use, in which the coal operators (private sector) make capital investments towards land development that would benefit the community (public sector) affected by the mining operations. This unique opportunity, also known as Public-Private Partnership (P3), has far-reaching consequences on those communities with coal mining operations. The operators utilize the LUMP, created by the county officials with post-mine land use in mind, to gain insight into the land and infrastructure needs of the local community and then materialize the development opportunities described in the LUMP. The LUMP leverages private investment to facilitate public development, which is critical to the sustainability of counties and communities. Community sustainability requires a transition from poorly managed land to land-use planning practices that create and maintain efficient infrastructure, ensure close-knit neighborhoods and sense of community, and preserve natural systems.

RTI, a nationally recognized center of excellence for rural transportation research, was established through the Transportation Equity Act for the 21st Century passed by Congress in 1998 and is funded through a grant from the Research and Innovative Technology Administration (RITA) of the US Department of Transportation. As a University Transportation Center, RTI has cultivated relationships with private industry and public agencies to leverage resources, technology and strategic thinking to improve mobility and to stimulate economic development. RTI has taken the lead in conducting site-specific research, supporting multimodal planning and analysis to improve mobility and global connectivity for rural regions. The Office of Coalfield Community Development (OCCD) was created by the 1999 Legislative Session to assist communities affected by surface mining activity throughout the State. With the passage of SB 603 in 2001, the responsibilities of the OCCD changed to include working with local

economic development agencies to develop land use master plans and include the recommendations of local economic redevelopment authorities in the reclamation plans of surface mine permits. The OCCD established criteria to consider development of these sites, provided for certain land uses as post-mining land uses and stipulated that master plans must comport to environmental reclamation requirements. The office allows existing and future surface mining permits to include master plan criteria and reclamation standards.

This plan provides information and analysis specifically for Mineral County. Mineral County's economy is comprised mainly of employment and activities in the Manufacturing and Government. The resulting combination has led to a constant increase in total wages. However, this has not translated to a complete success, as the population continues to fluctuate (with expected declines in the next 15 years) and employment diversification is limited. This plan will put focus on these issues, encouraging an analysis of the range of options available to policymakers, including land use planning.

This plan, including both the demographic and post-mine site analysis, requires data gathered from professional, secondary sources. Every attempt has been made to verify the accuracy of this data. However, the datasets are subject to differing methodologies, third-party error, and changes in time. Any and all information should be verified for accuracy.

II. Planning Area

Mineral County was formed in 1866 following the Civil War, three years after West Virginia became a state. It is named for its abundance of mineral resources. Situated only a short distance from Maryland and a mere three hours from Washington, the county was a coal and railroad center at the beginning of the 1900s. Throughout the 19th century, many immigrants travelled through the coalfields of Pennsylvania, came through Maryland, and settled in Mineral County, leaving the area with a diverse population. The institution of the Baltimore and Ohio (B&O) Railroad, which reached the Northern part of part of present Mineral County in 1842, also had a tremendous impact. In fact, the resultant increase in population in Hampshire County heightened political differences actually led to the creation of the county. Mineral County is also home to Potomac State College, a two year branch of West Virginia University.¹

III. Existing Conditions

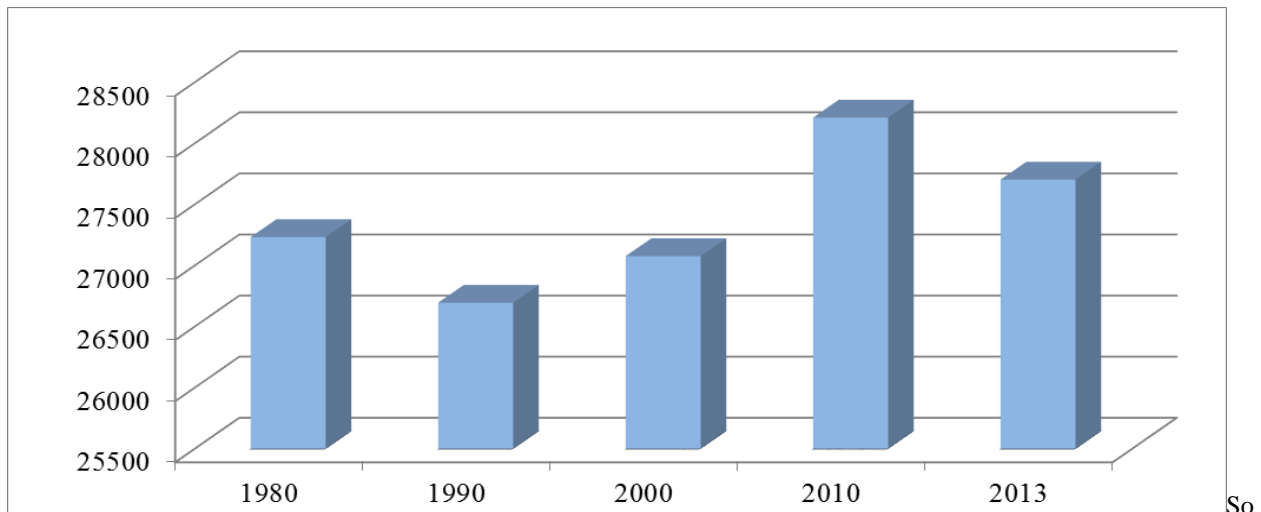
This information will provide a background understanding of the demographic trends in the County. This base information is meant to provide overall detail on Mineral County's status as it stands. Part IV will deal with possible future site development information, to be considered with the demographic data to target strategies for investment.

¹ Canfield, Jack "Mineral County." e-WV: The West Virginia Encyclopedia. 03 June 2013. Web. 11 March 2015.

Population

The population of Mineral County in 2013 was 27,704 according to Stats Indiana, ranking it 22nd in county population among the 55 counties in West Virginia.² The decennial censuses show that Mineral County lost population from 1980 to 1990, resumed growth through 2010, and has lost population into 2013.

Figure 1: Census Populations for Mineral County

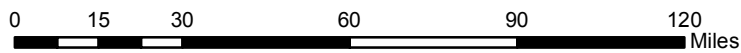
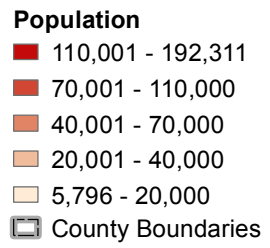
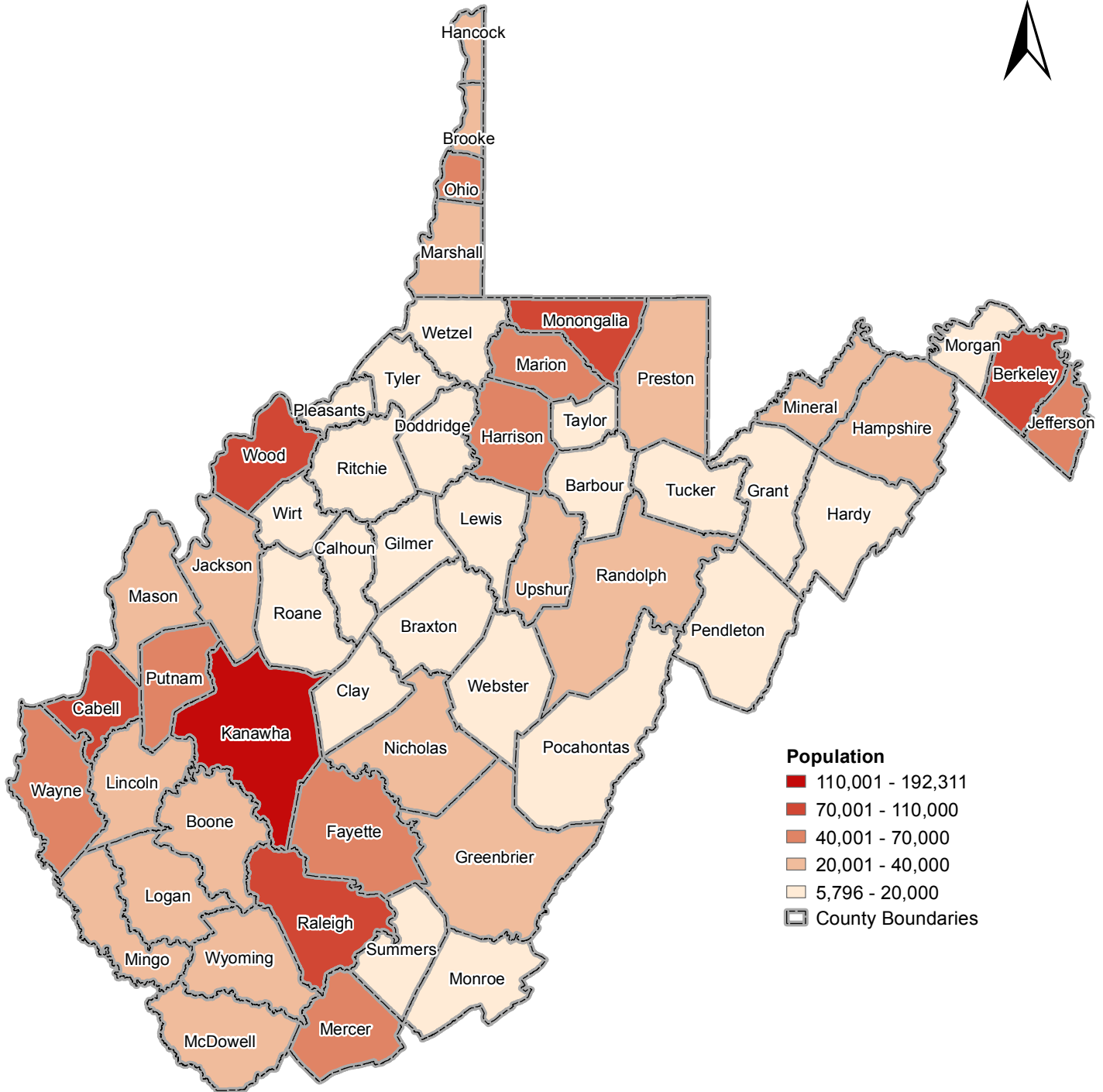


Source: Stats Indiana, USA Counties in Profile

Map 1 illustrates the Mineral County population compared to West Virginia overall. Mineral County has an average population compared to the rest of the State.

² U.S. Census Bureau, "2013 American Community Survey 5-year Estimates," Accessed January 19, 2015, www.factfinder2.census.gov

Demographic Population



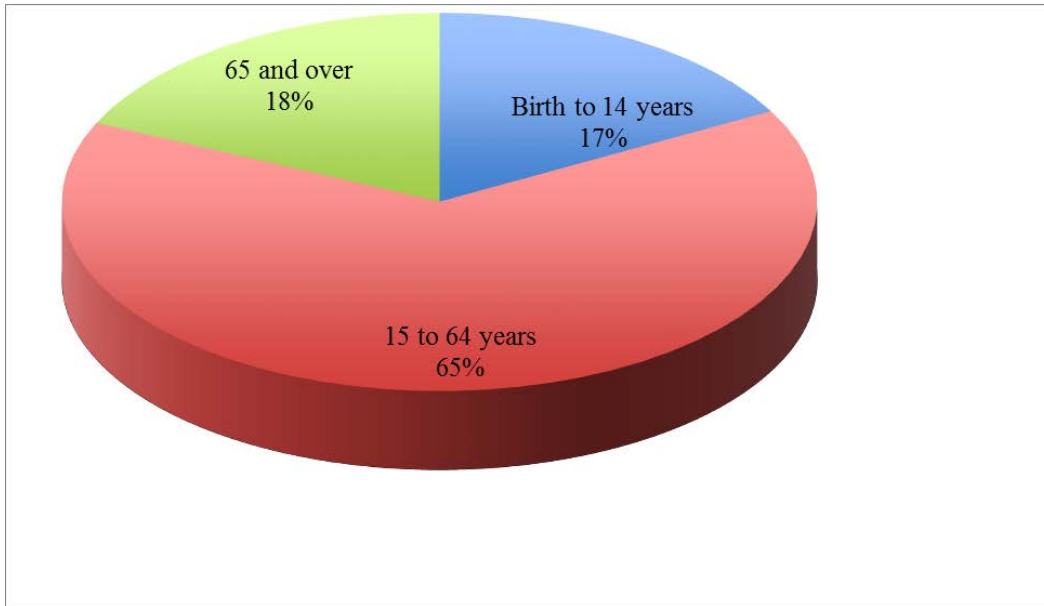
Source: U.S. Census Bureau, 2009-2013 American Community Survey

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahall Appalachian Transportation Institute is prohibited.



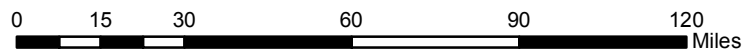
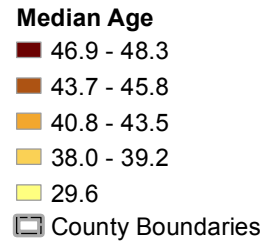
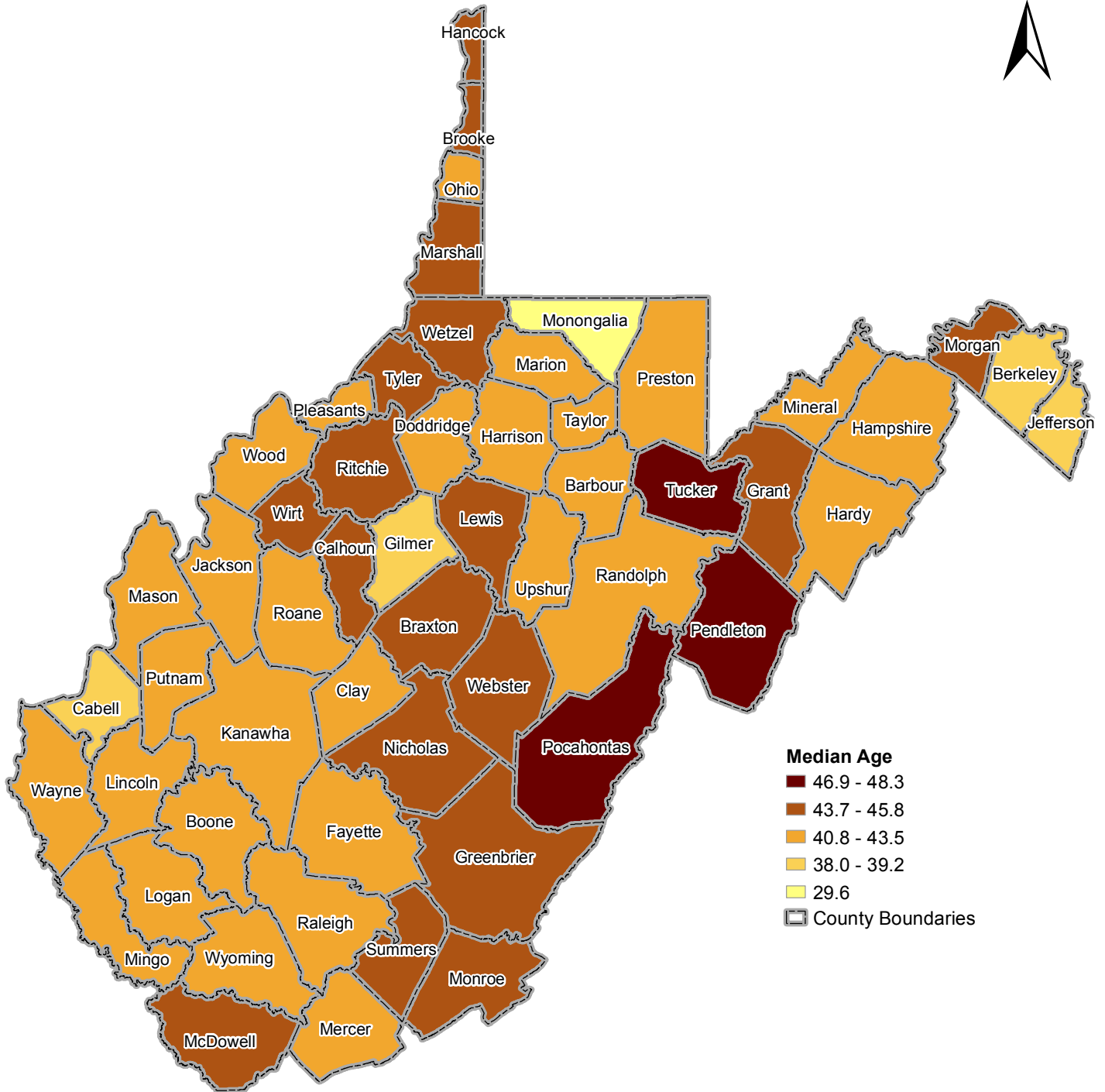
According to the ACS, nearly 28 percent of Mineral County residents are 60 years of age and over, while 15 percent are between 5 and 17 years of age and just over 5 percent are below the age of 5. Approximately 6,732 people (or 24 percent) are of retirement age. The median age in Mineral is 43, which is near the median age of the State (Map 2). The majority of the population is of prime working age, as denoted in Figure 2.

Figure 2: Mineral County Age Breakdown



Source: 2013 American Community Survey 5-Year Estimate Calculation

Demographic Median Age



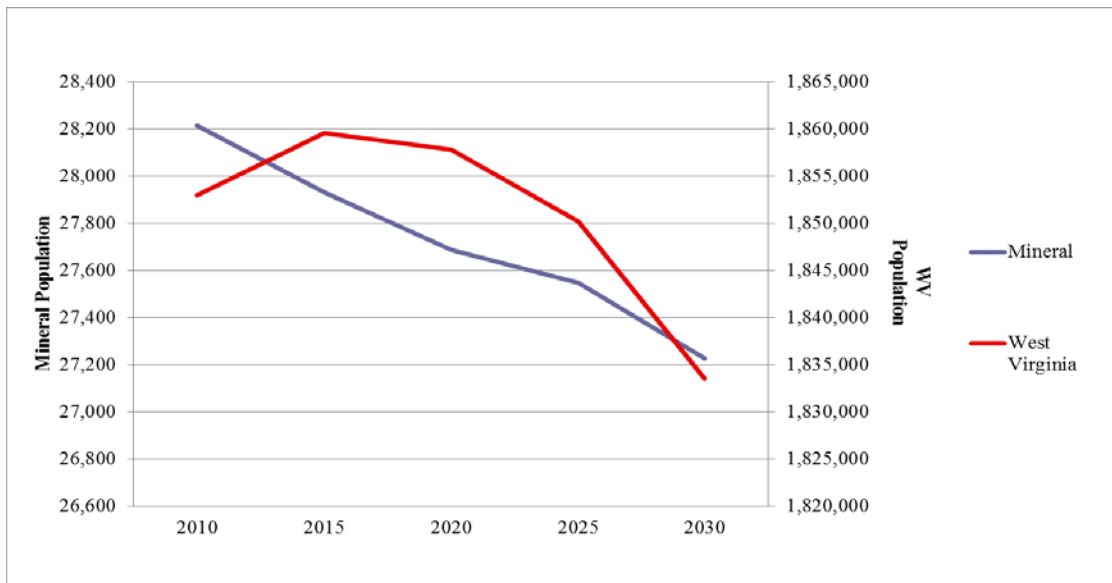
Source: U.S. Census Bureau, 2009-2013 American Community Survey

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahall Appalachian Transportation Institute is prohibited.



The Bureau of Business and Economic Research at West Virginia University projects a -3.6 percent decrease in the Mineral County population between 2010 and 2030, which is higher than the projected decline of the West Virginia population.³ The model for the projection is based on past population patterns and statistics, and should not be taken as permanent. The projected decrease follows a period of population volatility from the 1980s through 2013.

Figure 3: Population Projections



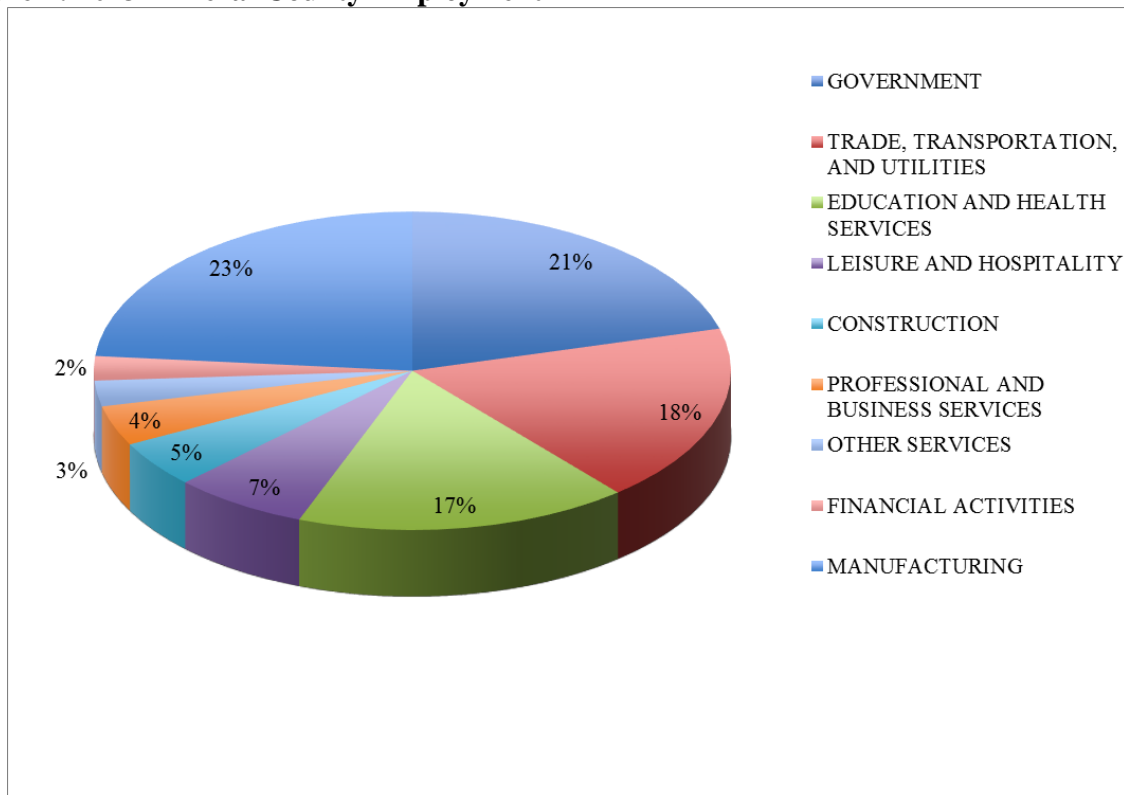
Source: WVU Bureau of Business and Economic Research

Employment

Workforce West Virginia has a complete dataset on employment numbers and wages. The total number of employed in 2013 was 7,648. Approximately 17 percent of wage earners in Mineral County worked in Education and Health Services and approximately 21 percent worked in Government. Along with Manufacturing (23 percent) these three industries comprise over half of Mineral County’s total employment, suggesting a less-diversified mix of industry employment.

³ Christiadi, Deskins, J. and Lego, B. “Population Trends in West Virginia through 2030.” Bureau of Business and Economic Research, College of Business and Economics, West Virginia University, Morgantown, WV (March 2014).

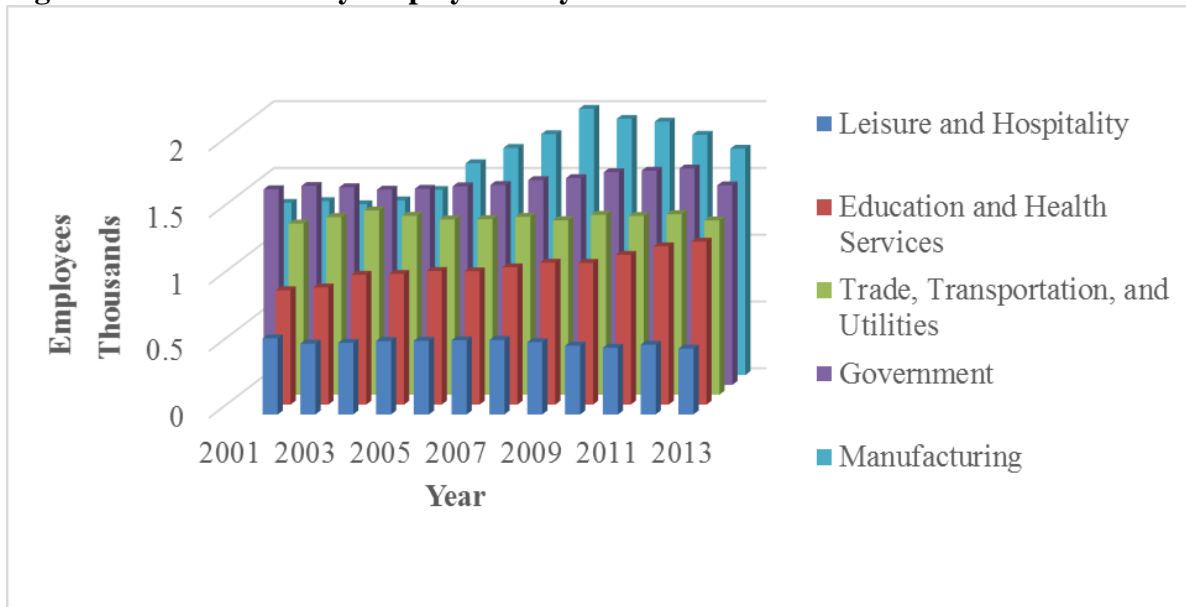
Figure 4: 2013 Mineral County Employment



Source: Workforce West Virginia

The current top five sectors have generally been the top five employers over the past decade in Mineral County. Education and Health Services has seen the largest growth (of approximately 43 percent since 2002). The Manufacturing sector experienced volatility in 2010 but overall exhibited similar growth to Education and Health Services (31 percent) during the same time period. Employment in Government and Trade, Transportation, and Utilities experienced slow growth of roughly 2 percent since 2001- 2002, and the Leisure and Hospitality sector declined by 14 percent during that time.

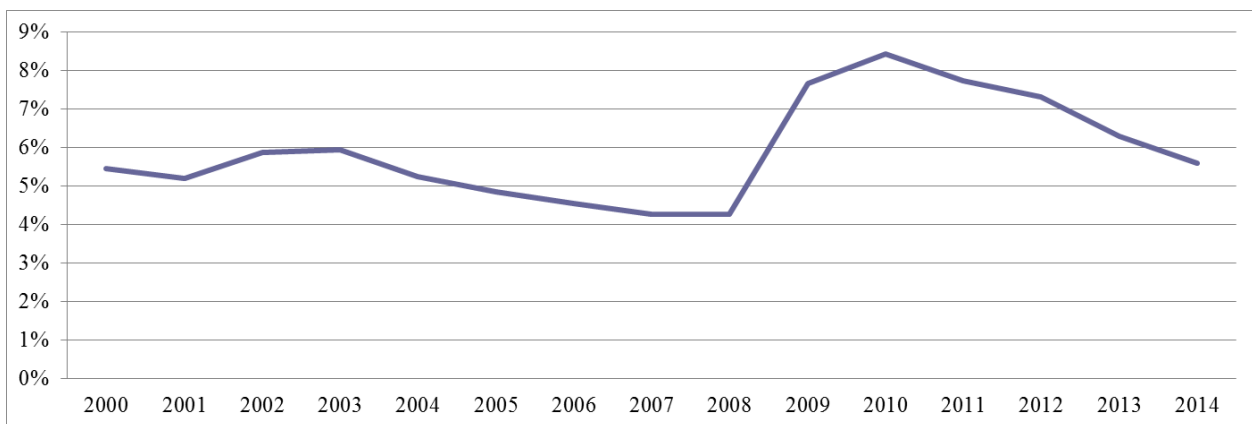
Figure 5: Mineral County Employment by 5 Sectors 2001-2012



Source: Workforce West Virginia

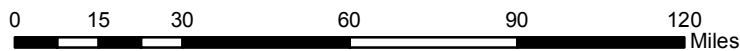
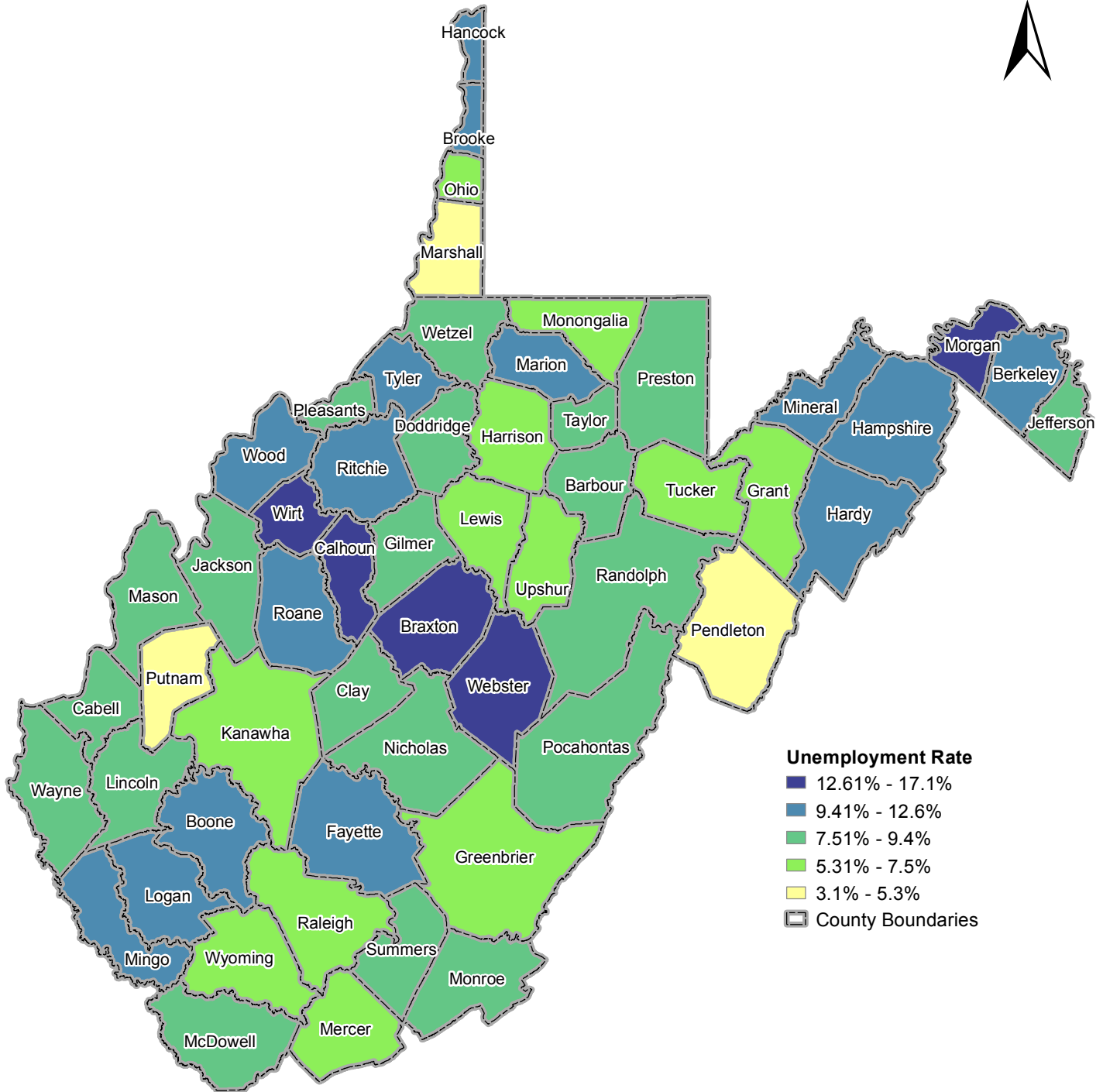
The civilian labor force in the County is one of the most interesting statistics when determining potential investors. As Map 3 shows, Mineral’s participation rate is about average compared to other counties in the State. One component of the labor force, the unemployment rate, shows a fairly steady decline from the early 2000s to 2008. As with most areas, Mineral experienced a sudden increase in the unemployment rate in 2008 (Figure 6). Unemployment has been slowly falling since peaking in 2010. Note that 2013 data is used for this graph and map, as the data for Workforce West Virginia and the Census Bureau did not match because the most recent data has not been seasonally adjusted.

Figure 6: Mineral County Unemployment Rate



Source: Workforce West Virginia

Demographic Unemployment Rate



Source: U.S. Census Bureau, 2009-2013 American Community Survey

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahall Appalachian Transportation Institute is prohibited.

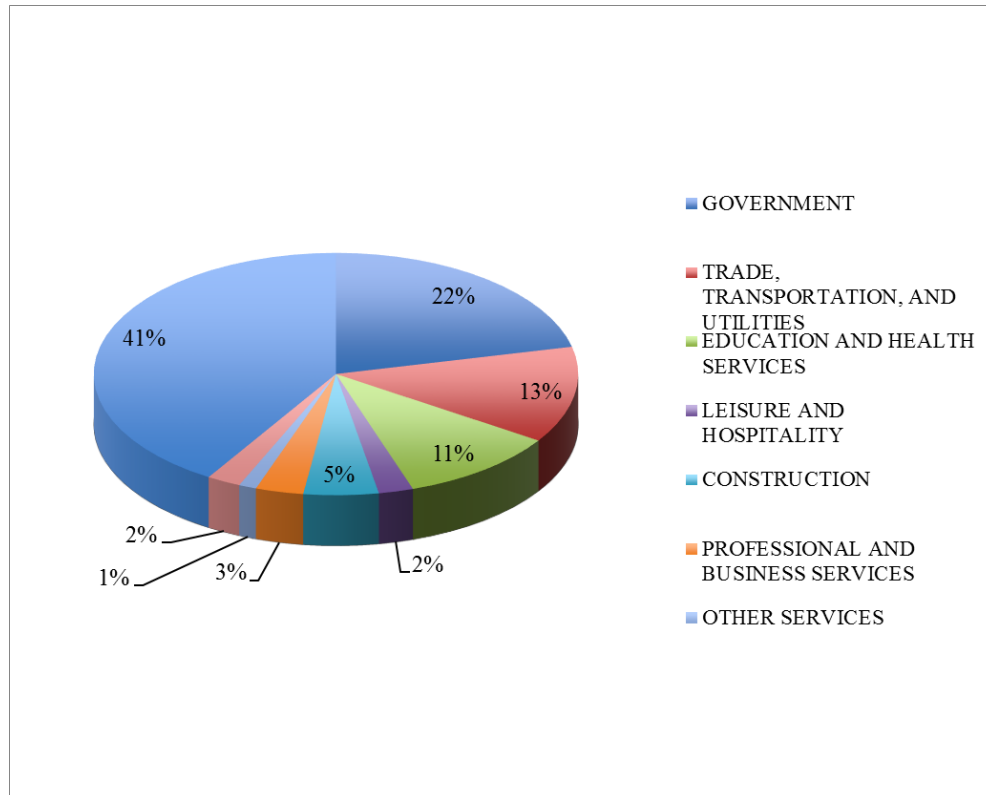
RAHALL APPALACHIAN
TRANSPORTATION INSTITUTE

www.njrati.org

Wages and Income

Mineral County's wage contributors vary widely in the level of contribution. The highest, Manufacturing, is because the sector is the highest paying sector in the County (Figure 7). Government is next because of the sheer size of the sector in the County, followed by Trade, Transportation, and Utilities and then by Education and Health Services. As with employment, wages in other sectors in Mineral County make up much smaller portions.

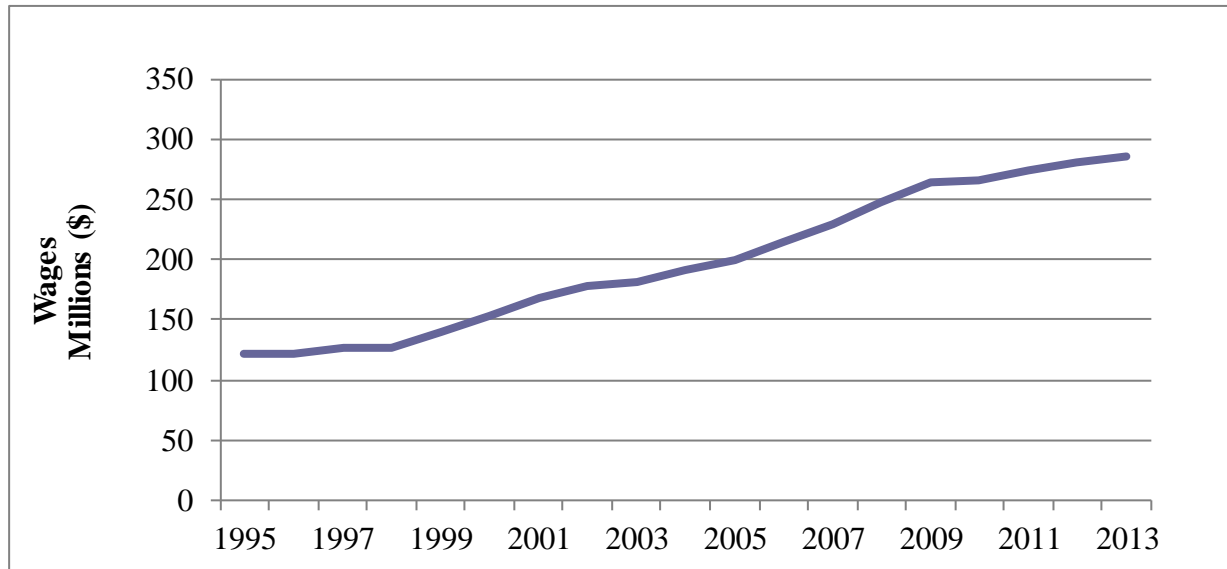
Figure 7: 2013 Mineral County Total Wages



Source: Workforce West Virginia

Historically, wages for Mineral County have shown a tendency to rise, though there was some stagnation in the mid to late 90s. Mineral County experienced relatively steady employment growth, allowing for wages to rise despite recession and cost-cutting factors that led to an increase in unemployment in other sectors. Figure 8 shows total wages for Mineral County, which have consistently experienced increase in the early 2000s.

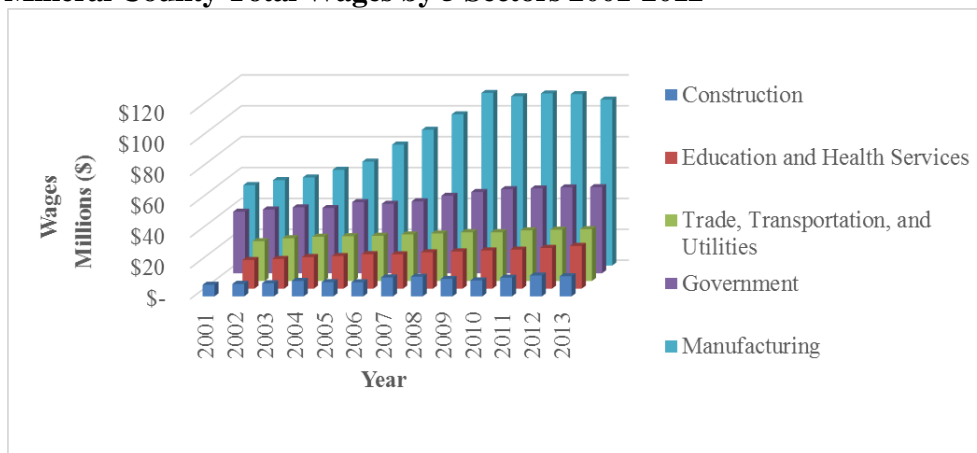
Figure 8: Mineral County Total Wages 1995-2013



Source: Workforce West Virginia

Figure 9 confirms the general trend in wages and that most of the top sectors grew throughout the decade. Wages in the Construction sector experienced some volatility, particularly around the time of the recessions in the early 2000s and in 2008-2009. Wages in the Government and Education and Health Services sectors experienced relatively steady growth during this time period, and Manufacturing wages grew significantly until reaching their peak slightly declining after 2010.

Figure 9: Mineral County Total Wages by 5 Sectors 2001-2012

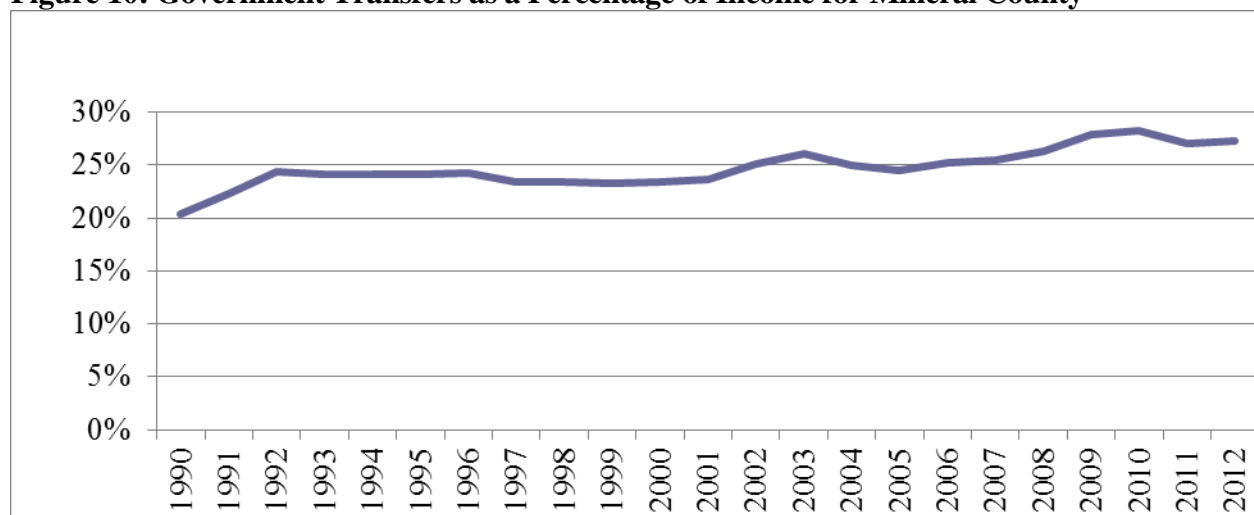


Source: Workforce West Virginia

In most American counties, one would find that the majority of income for people stems from wages. In West Virginia, however, an important distinction must be made between income and wages. Income is the total receipt of earnings resulting from any economic activity, while wages

are derived from actual work in an employed setting. Therefore, dividends from stockholdings are considered income, but not wages. In Mineral County, wages for all employment exceeded \$286 million.⁴ By comparison, income for the County was larger, exceeding \$968 million in 2013.⁵ Though there are many components to income other than work earnings, 27 percent of total Mineral County income is derived from government transfers. Government transfers accounted for about 98 percent of total transfers in Mineral County, dwarfing transfers from private institutions such as charities. Government transfers have consistently contributed between 19 and 28 percent of income over the past 20 years. This does not count the wages for government workers. This number is similar to many other counties in West Virginia, and is not the worst nor the best ratio in the State.

Figure 10: Government Transfers as a Percentage of Income for Mineral County



Source: U.S. Bureau of Economic Analysis

The total personal income of Mineral County is therefore made up of 27 percent government transfers. Compared to the State, Mineral County has an average ratio of government transfers to personal income. According to the BEA, per capita income was \$34,944 for Mineral County in 2013. Annual net earnings, or income from work, is displayed in Map 5, and Mineral is ranked among the second lowest tier in earned income in West Virginia.

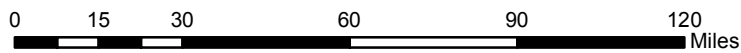
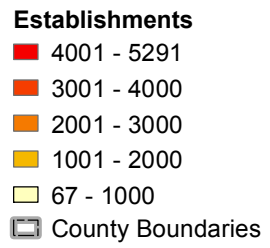
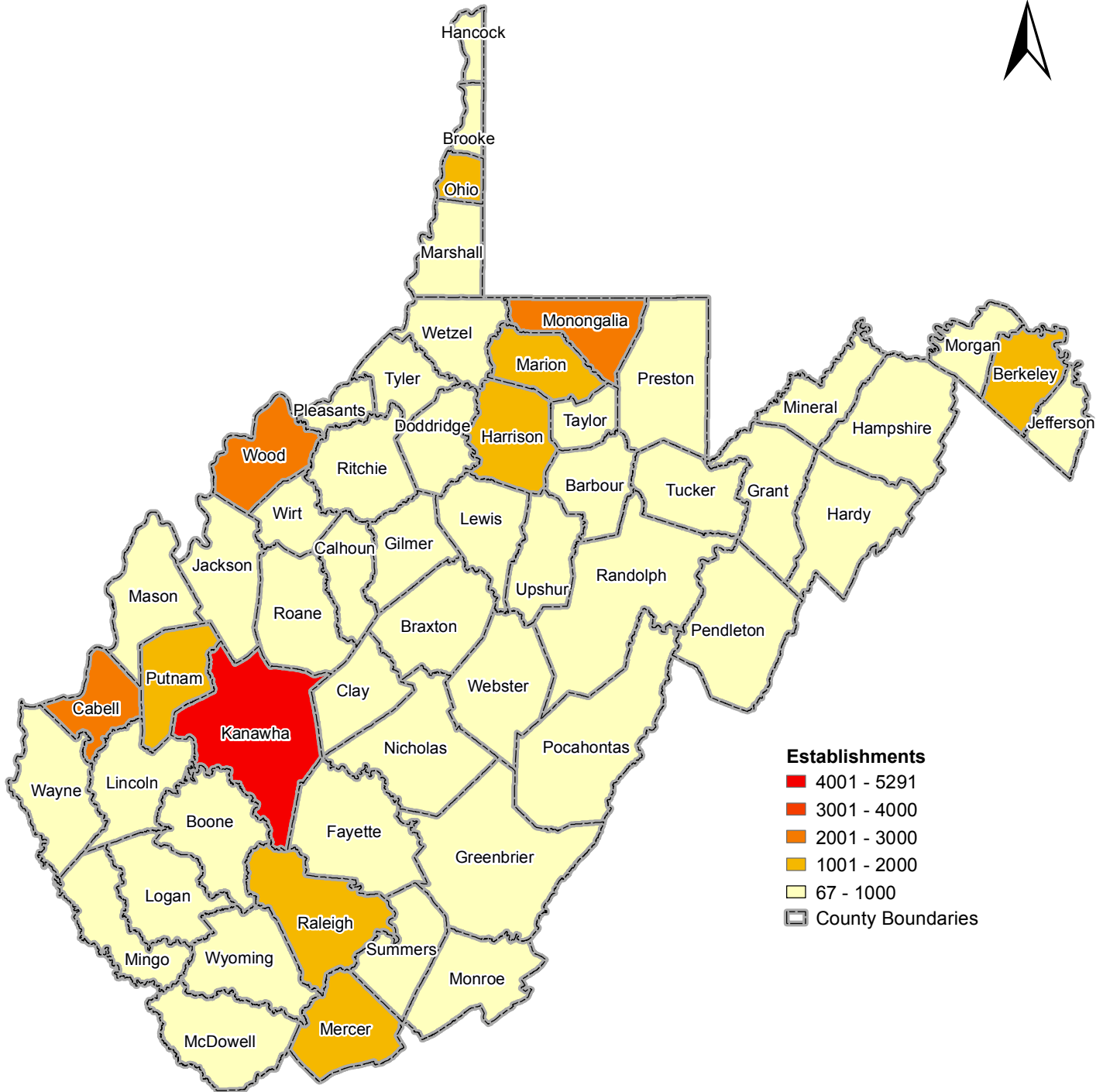
Another measure of economic health is the number of establishments that do business in the area. Map 6 shows the number of establishments in each county in West Virginia. Mineral County appears to be at the lowest end of the spectrum. The number of establishments may be misleading, as the Education and Health Services and Government sectors are typically characterized by a small number of firms.

⁴ “Employment and Wages – 2013, Mineral County,” Workforce West Virginia, Accessed January 18, 2015, <http://www.workforcewv.org/lmi/EW2011/ew11x059.htm>

⁵ “Tables CA 04 and CA 35 analysis,” Bureau of Economic Analysis, Regional Economic Accounts, Local Area Person Income and Employment, Accessed January 18, 2015, <http://www.bea.gov/regional/index.htm>.

Demographic

Number of Establishments



Source: U.S. Census Bureau, 2011

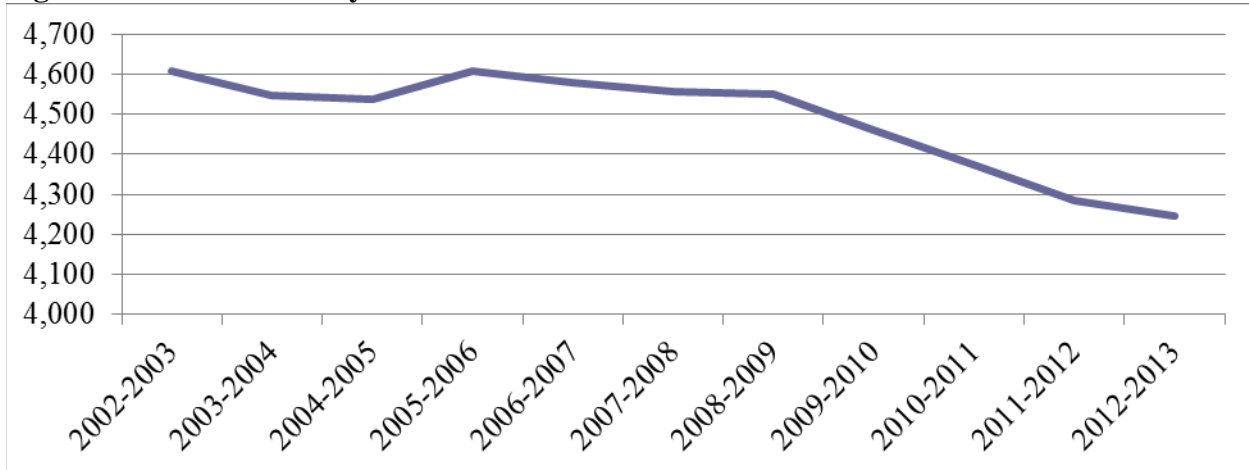
This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahall Appalachian Transportation Institute is prohibited.



Education

Mineral County has two high schools, three middle schools, and seven elementary schools for the 2013-2014 school year.⁶ Mineral County 2nd month school enrollment exhibited an overall decline from in the early 2000s, experiencing periods of volatility. Mineral County's 2nd month enrollment is in the median tier of enrollment for WV (Map 7).

Figure 11: Mineral County School Enrollment

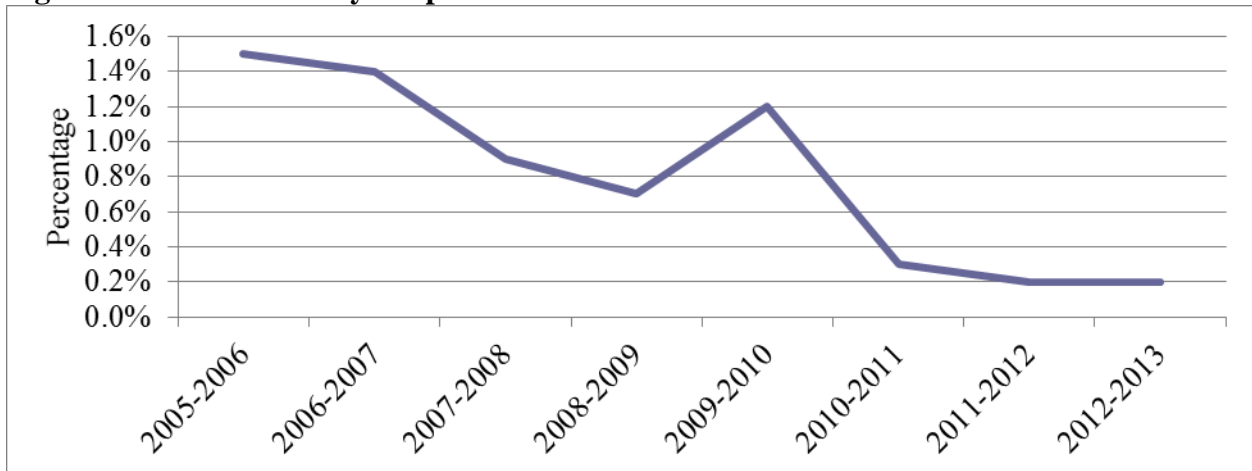


Source: WVEIS

The West Virginia Education Information System (WVEIS) also has dropout rates for the school years from 2005-2006 to 2012-2013. Dropout rates for grades 7-12, which showcase the most likely time for school dropouts, do not follow the total enrollment statistic, as total enrollment is computed with the grades below 7th grade as well. Dropout rates experienced a period of decline followed by a brief increase until the 2009-2010 school year, when dropouts fell consistently for the three subsequent time periods (Figure 12).

⁶ "School Profiles," West Virginia Education Information System, West Virginia Department of Education, Accessed March 9, 2015, <http://wveis.k12.wv.us/nclb/profiles/>.

Figure 12: Mineral County Dropout Rate

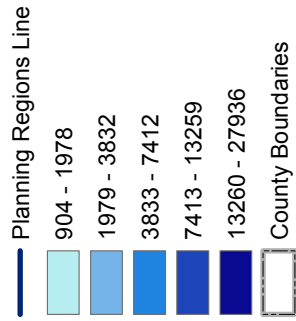
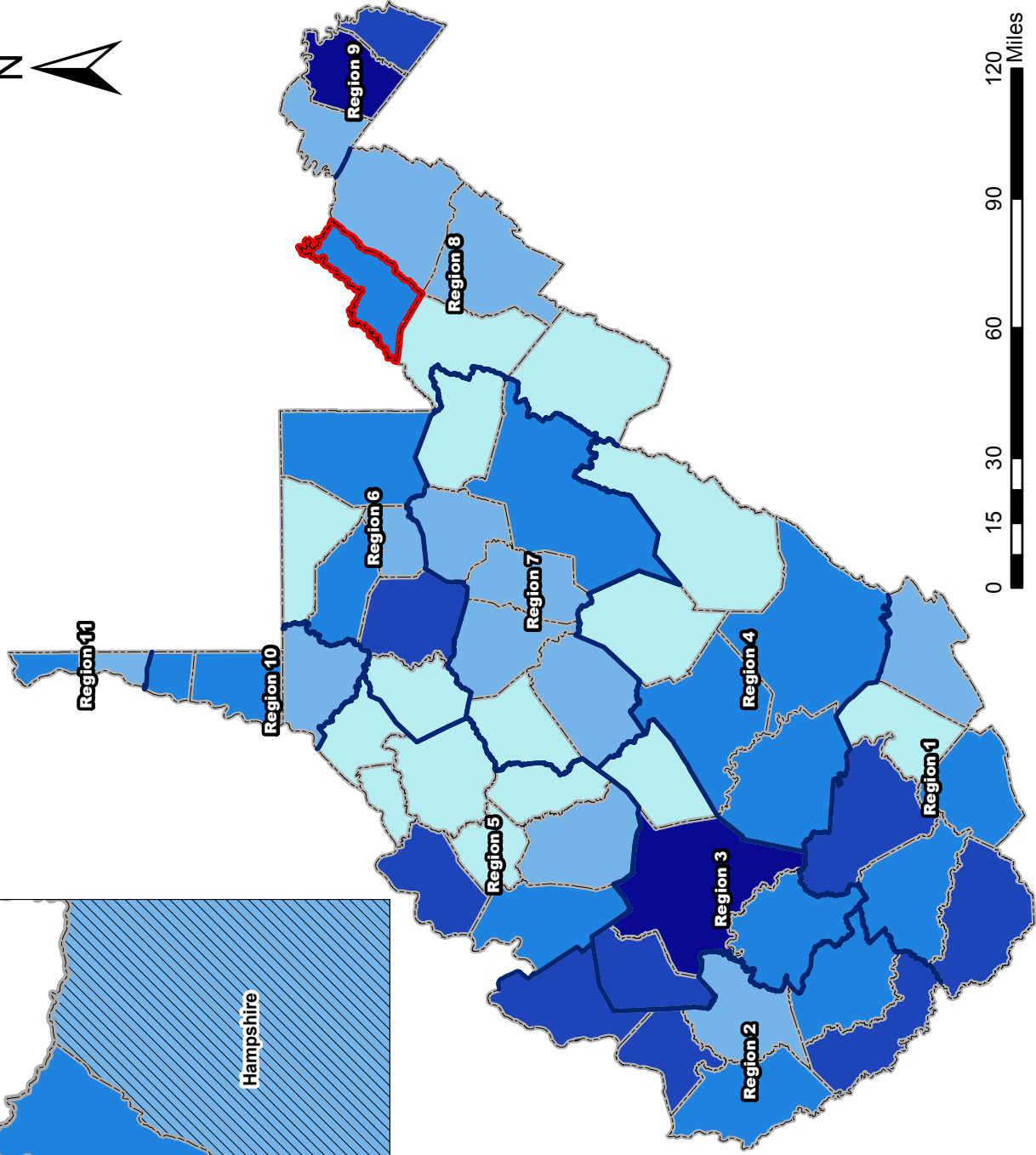
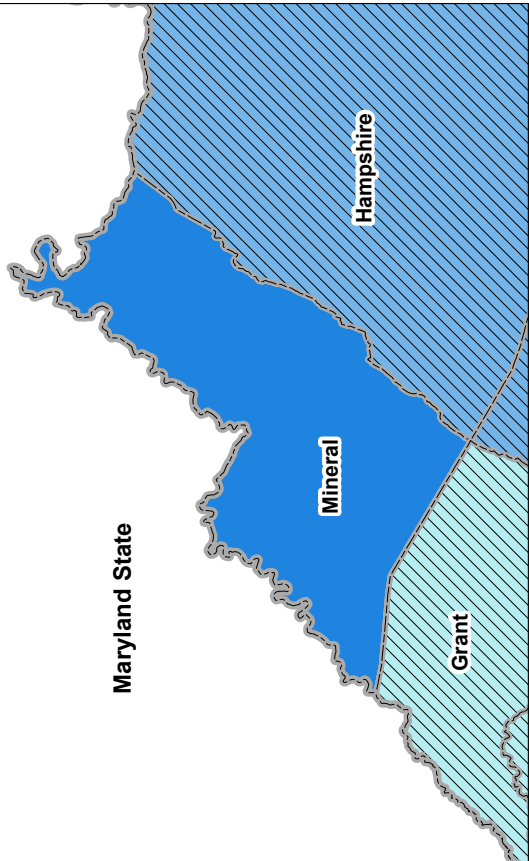


Source: WVEIS

Map 8 shows each county's dropout rate. Mineral County currently has a below average dropout rate. Maps 9 and 10 show the total graduates and the graduation rate by county. In Mineral, total graduates and graduation rates are below average for the State. Mineral County's twelve schools' locations are noted in Map 11. Not coincidentally, the major schools are located on the main roads in the County. The largest school by attendance in the County is Keyser High School. The significance of the locations of these schools is the access to major transportation routes. The schools appear to be built in order for parents and students to maintain steady access, which is important to discourage dropping out and to maintain attendance levels.

NCLB - Second Month Enrollment

Mineral County



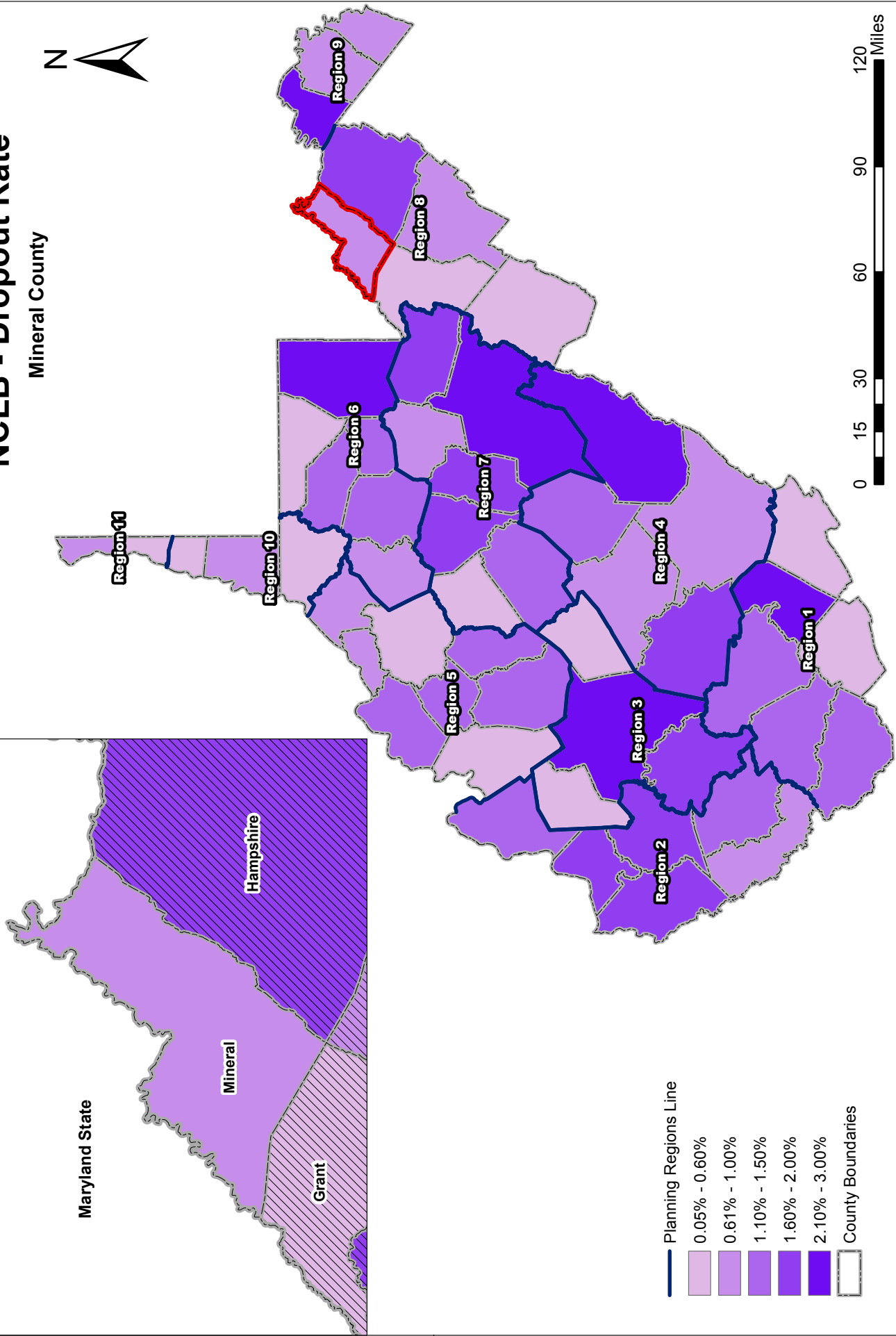
Source: West Virginia Department of Education 2015

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raheal Appalachian Transportation Institute is prohibited.



NCLB - Dropout Rate

Mineral County



- Planning Regions Line
- 0.05% - 0.60%
- 0.61% - 1.00%
- 1.10% - 1.50%
- 1.60% - 2.00%
- 2.10% - 3.00%
- County Boundaries

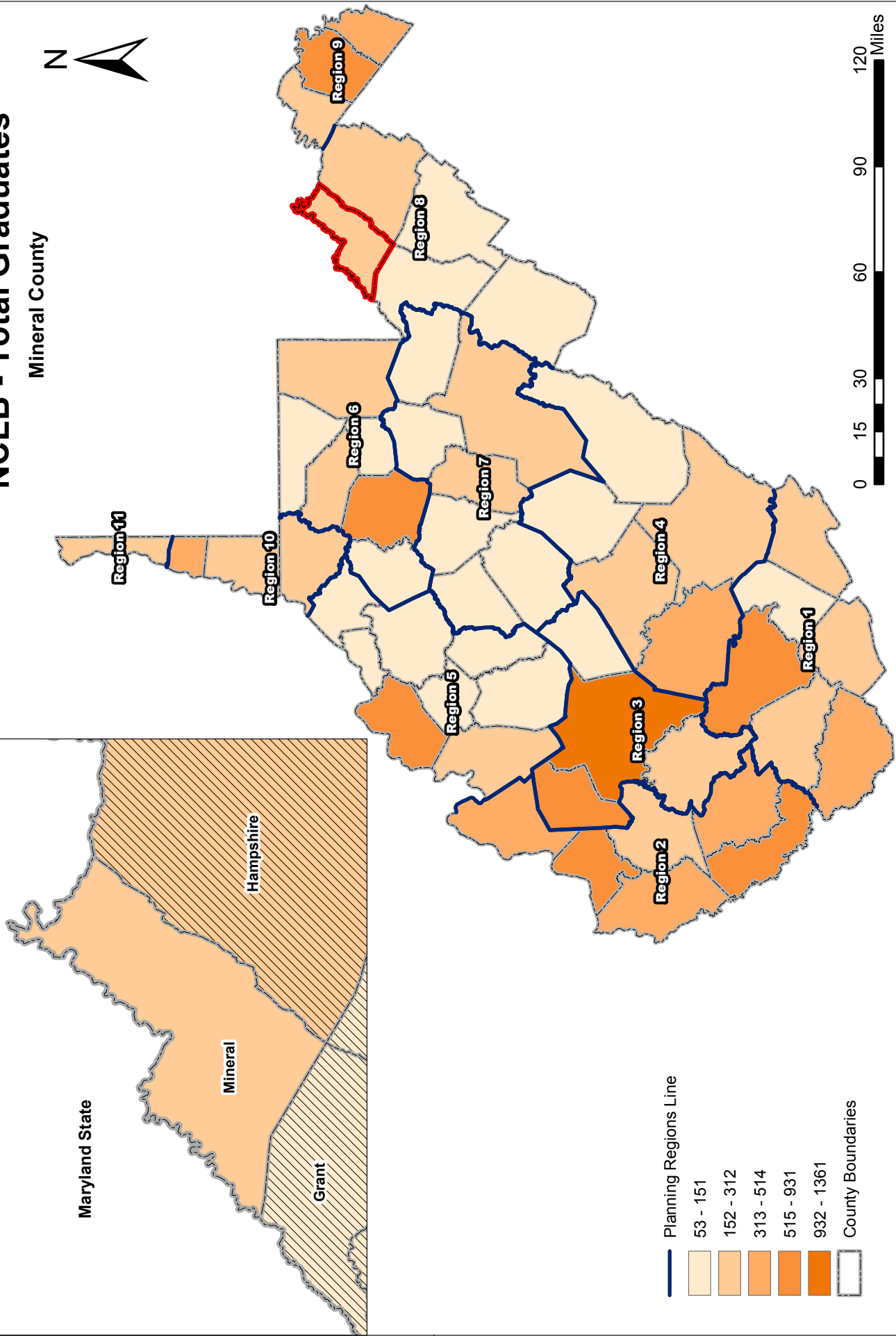


Source: West Virginia Department of Education 2015

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raahall Appalachian Transportation Institute is prohibited.

NCLB - Total Graduates

Mineral County



Maryland State

Mineral

Hampshire

Grant

Planning Regions Line

- 53 - 151
- 152 - 312
- 313 - 514
- 515 - 931
- 932 - 1361

County Boundaries



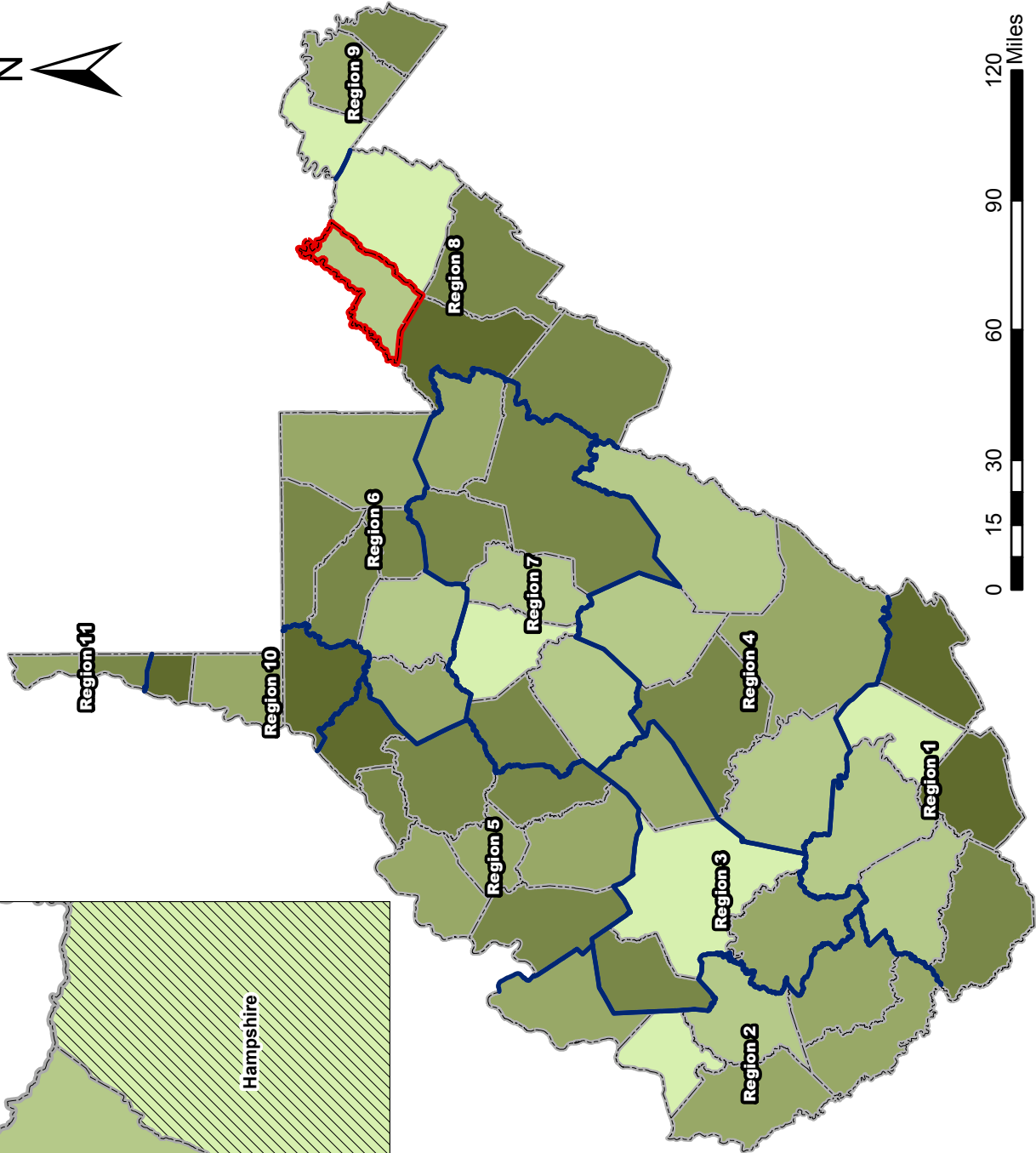
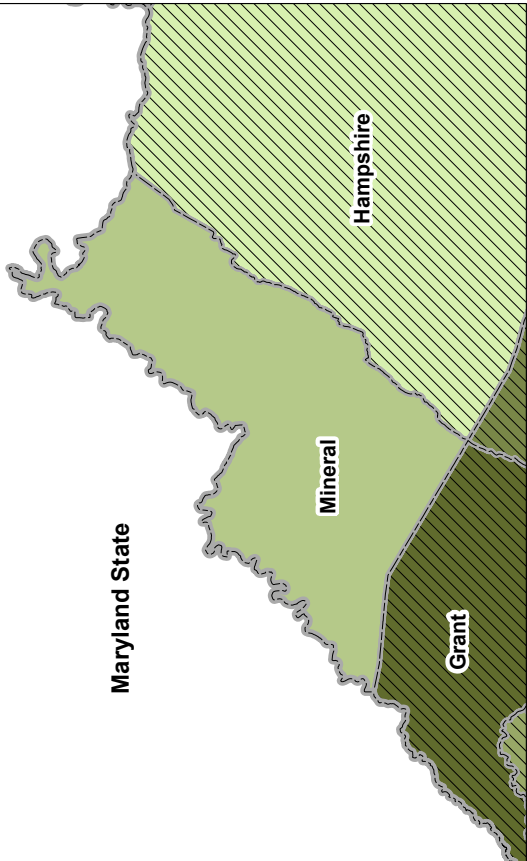
Source: West Virginia Department of Education 2014

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raahall Appalachian Transportation Institute is prohibited.



NCLB - Graduates Rate

Mineral County



- Planning Regions Line
- 74.75% - 78.70%
- 78.71% - 82.80%
- 82.81% - 87.16%
- 87.17% - 90.45%
- 90.46% - 96.11%
- County Boundaries



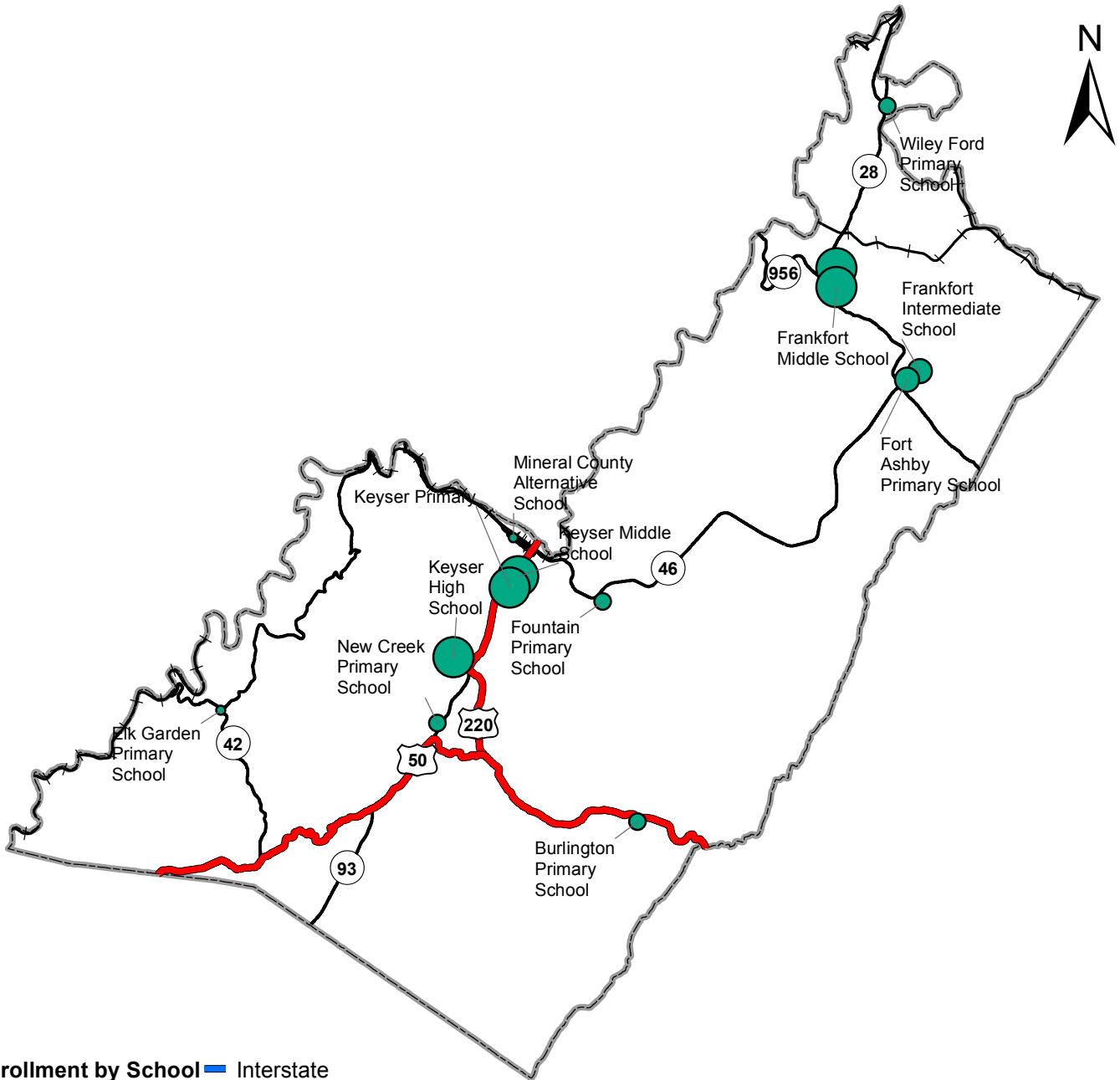
Source: West Virginia Department of Education 2015

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raahall Appalachian Transportation Institute is prohibited.



Total Attendance by School - 2015

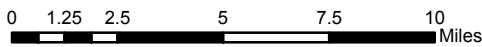
Mineral County



Enrollment by School

- 6 - 100
- 101 - 200
- 201 - 300
- 301 - 400
- 401 - 685

— Interstate
— US Routes
— WV Routes
+ Railroads
 County Boundary



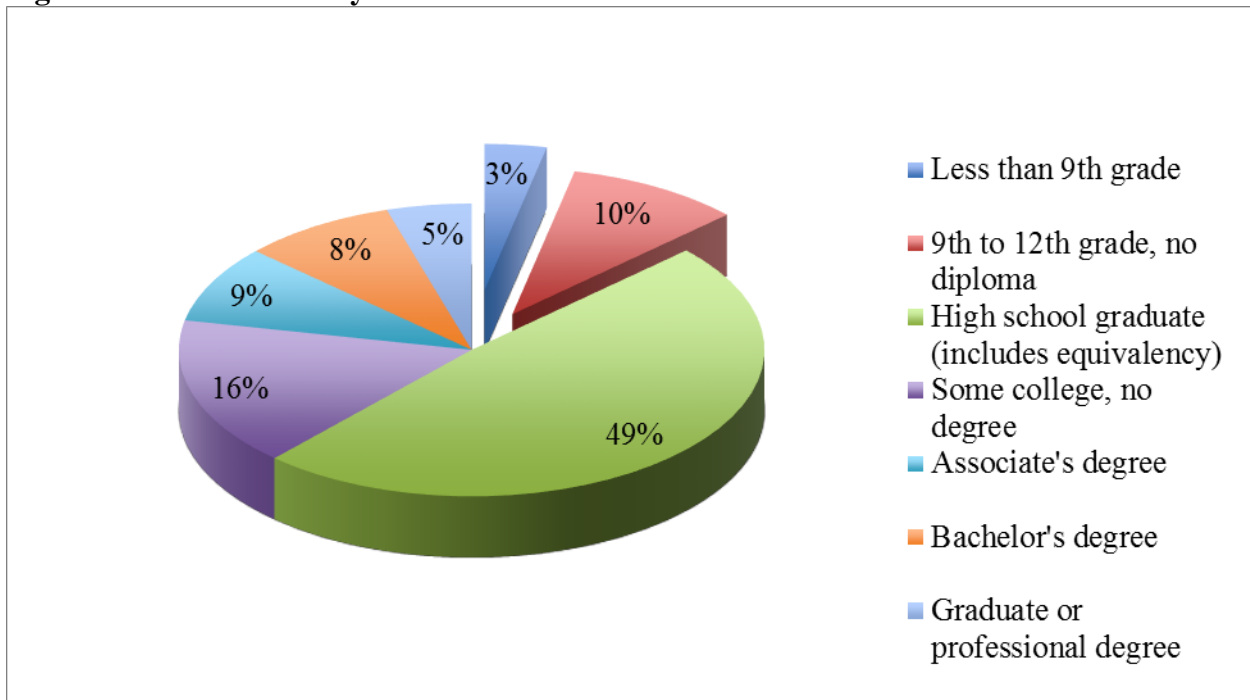
Source: West Virginia Department of Education 2015

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the RaHall Appalachian Transportation Institute is prohibited.

RTI
 RAHALL APPALACHIAN
 TRANSPORTATION INSTITUTE
www.njrati.org

The ACS also maintains data on the educational attainment of the population that is 25 years and over. In Mineral County, 49 percent of these residents have a high school diploma or equivalent. Approximately 13 percent have less than a high school diploma. This is particularly concerning when the relationship between education and jobs is considered.

Figure 13: Mineral County Educational Attainment



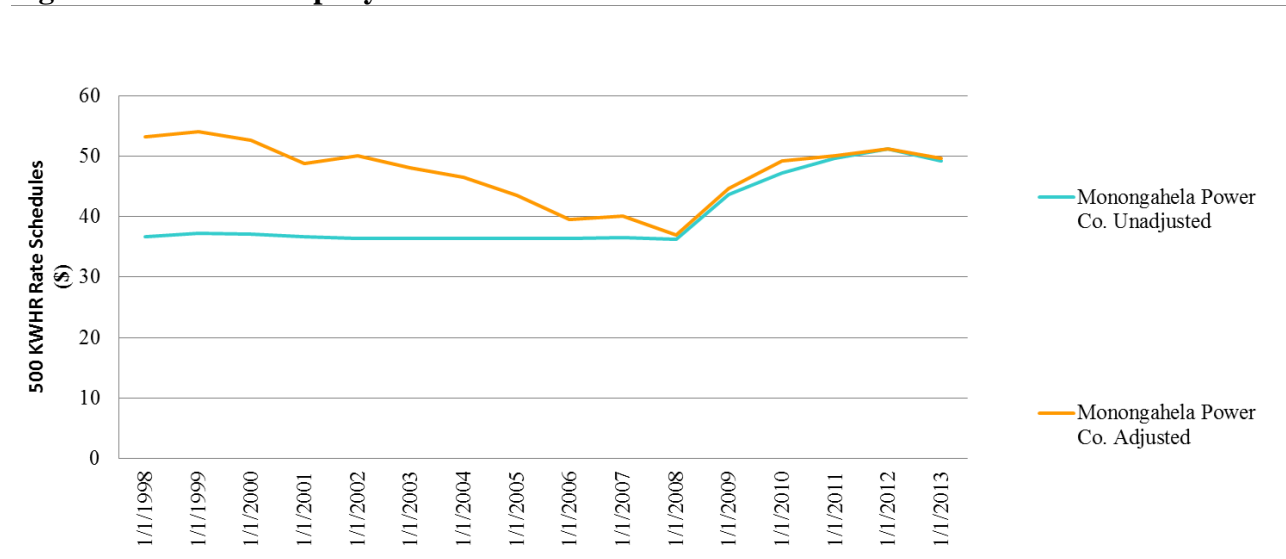
Source: 2013 American Community Survey 5-Year Estimates

Utilities and Infrastructure

Mineral County has 32 utility companies according to the West Virginia Public Service Commission (PSC). Economic development depends on infrastructure, and Mineral County has several providers of water and sewer, two major providers of electricity (Monongahela Power Company and Harrison Rural Electrification Association, Inc.), and one electric wholesaler (American Bituminous Power Partners, L.P.).

The West Virginia Public Service Commission maintains tariff rates for all companies involved in providing utilities. Of particular importance are electricity tariffs; the monitoring of these tariffs is an ongoing project. To that end, the PSC observes the growth rate of tariffs and possesses a 20-year comparison based on the average residential utility rate of the State. This provides a significant overview of how electric prices behave in West Virginia as a whole. As Figure 14 shows, if the tariffs are not adjusted by the Consumer Price Index (CPI), it would appear that rates are constantly increasing. Viewing rates in such a manner would be a misunderstanding, and would be incorrect in reference to a State with the highs and lows of West Virginia's past. The Bureau of Labor Statistics has a CPI for electricity prices dating from 1998 to 2013. The adjusted and unadjusted prices are provided in Figure 14.

Figure 14: Power Company Prices



Source: West Virginia Public Service Commission and U.S. Bureau of Labor Statistics

The graph shows that electricity rates steadily decreased in real terms through 2008 and remained fairly constant with adjustment. Both adjusted and unadjusted prices have increased since 2008. Many possible factors contributed to this rise, including the increased costs of energy and the increased demand. Map 12 also shows the distribution of power lines, plants, and substations within West Virginia and Mineral County.

The two other utilities of particular importance are water and sewer. Table 1 displays water and sewer metered rates for the providers of those services. They are all public services with varying rates and categories. Mineral County has 18 public sewer and water providers. Maps 13 and 14 show the water and sewer facilities and the served areas for each of these utilities, as well as the solid waste management facilities in West Virginia.

Table 1: Mineral County Water and Sewer Rates

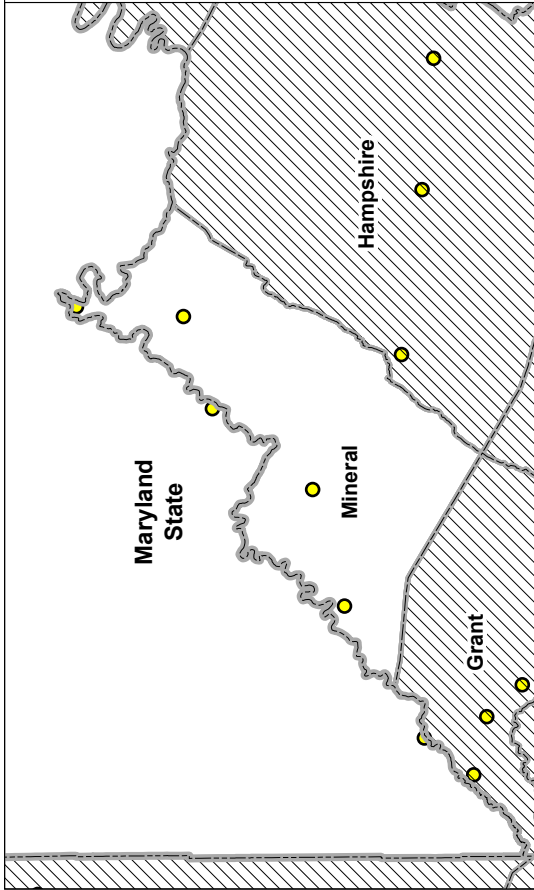
Fountain Public Service District	
Water Rates	
First 3,000 gallons used per month	\$10.00 per 1,000 gallons
All over 3,000 gallons used per month	\$4.95 per 1,000 gallons
Town of Carpendale (Water)	
Water Rates	
First 2,000 gallons used per month	\$8.40 per 1,000 gallons
Next 3,000 gallons used per month	\$7.00 per 1,000 gallons
All Over 5,000 gallons used per month	\$6.62 per 1,000 gallons
City of Piedmont Municipal Water Department	
Water Rates	
First 2,000 gallons used a month	\$13.85 per thousand gallons
Next 13,000 gallons used a month	\$ 5.87 per thousand gallons
Next 45,000 gallons used a month	\$ 5.87 per thousand gallons
All over 60,000 gallons used a month	\$ 5.87 per thousand gallons
Town of Ridgeley (Water Department)	
Water Rates	
First 2,000 gallons per month	\$33.60
2,000 - 10,000 gallons per month	\$14.14 per 1,000 gallons
All over 10,000 gallons per month	\$ 9.00 per 1,000 gallons
City of Keyser Water Department	
Water Rates	
First 2,000 gallons used per month	\$6.62 per 1,000 gallons
Next 5,000 gallons used per month	\$5.77 per 1,000 gallons
Next 50,000 gallons used per month	\$5.08 per 1,000 gallons
Next 50,000 gallons used per month	\$3.90 per 1,000 gallons
All over 107,000 gallons used per month \$2.97 per 1,000 gallons	\$2.97 per 1,000 gallons
Frankfort Public Service District	
Water Rates	
First 2,000 gallons used per month	\$9.96 per 1,000 gallons
All Over 2,000 gallons used per month	\$6.58 per 1,000 gallons
Mountain Top Public Service District	
Water Rates	
First 3,000 gallons used per month	\$9.29 per 1,000 gallons
Next 3,000 gallons used per month	\$8.39 per 1,000 gallons
Next 4,000 gallons used per month	\$7.78 per 1,000 gallons
Next 10,000 gallons used per month	\$6.45 per 1,000 gallons
Next 30,000 gallons used per month	\$5.18 per 11,000 gallons
Next 50,000 gallons used per month	\$4.22 per 1,000 gallons
All over 100,000 gallons used per month	\$3.56 per 1,000 gallons

Mountain View Water System LLC	
Water Rates	
Flat Rate Charge	\$34.50
City of Piedmont (Sewer)	
Sewer Rates	
First 2,000 gallons used per month	\$9.75 per 1,000 gallons
Next 3,000 gallons used per month	\$4.14 per 1,000 gallons
Next 10,000 gallons used per month	\$4.14 per 1,000 gallons
Next 20,000 gallons used per month	\$4.14 per 1,000 gallons
Next 25,000 gallons used per month	\$4.14 per 1,000 gallons
All over 50,000 gallons used per month	\$4.14 per 1,000 gallons
Town of Carpendale (Sewer)	
Water Rates	
First 2,000 gallons used per month	\$14.70 per 1,000 gallons
Next 3,000 gallons used per month	\$ 5.60 per 1,000 gallons
All Over 5,000 gallons used per month	\$ 4.92 per 1,000 gallons
City of Keyser Sewer Department	
Sewer Rates	
A customer service charge of \$1.59 per month shall be made to each customer connected to the system	
First 500,000 gallons used per month	\$5.99 per 1,000 gallons
Over 500,000 gallons used per month	\$4.97 per 1,000 gallons
Mountain Top Public Service District	
Sewer Rates	
\$10.02 per thousand gallons of water usage per month.	
New Creek Public Service District	
Sewer Rates	
Customer service charge:	Customer service charge
Usage charge:	\$4.93 per thousand gallons of water used per month
Town of Ridgeley	
Sewer Rates	
First 2,000 gallons per month	\$20.00
Next 2,500 gallons per month	\$ 8.55 per 1,000 gallons
All over 4,500 gallons per month	\$ 5.25 per 1,000 gallons
Lakewood Utilities, Inc.	
Water Rates	
There is no tarrif available, only details	
Lakewood Utilities, Inc.	
Sewer Rates	
There is no tarrif available, only details	

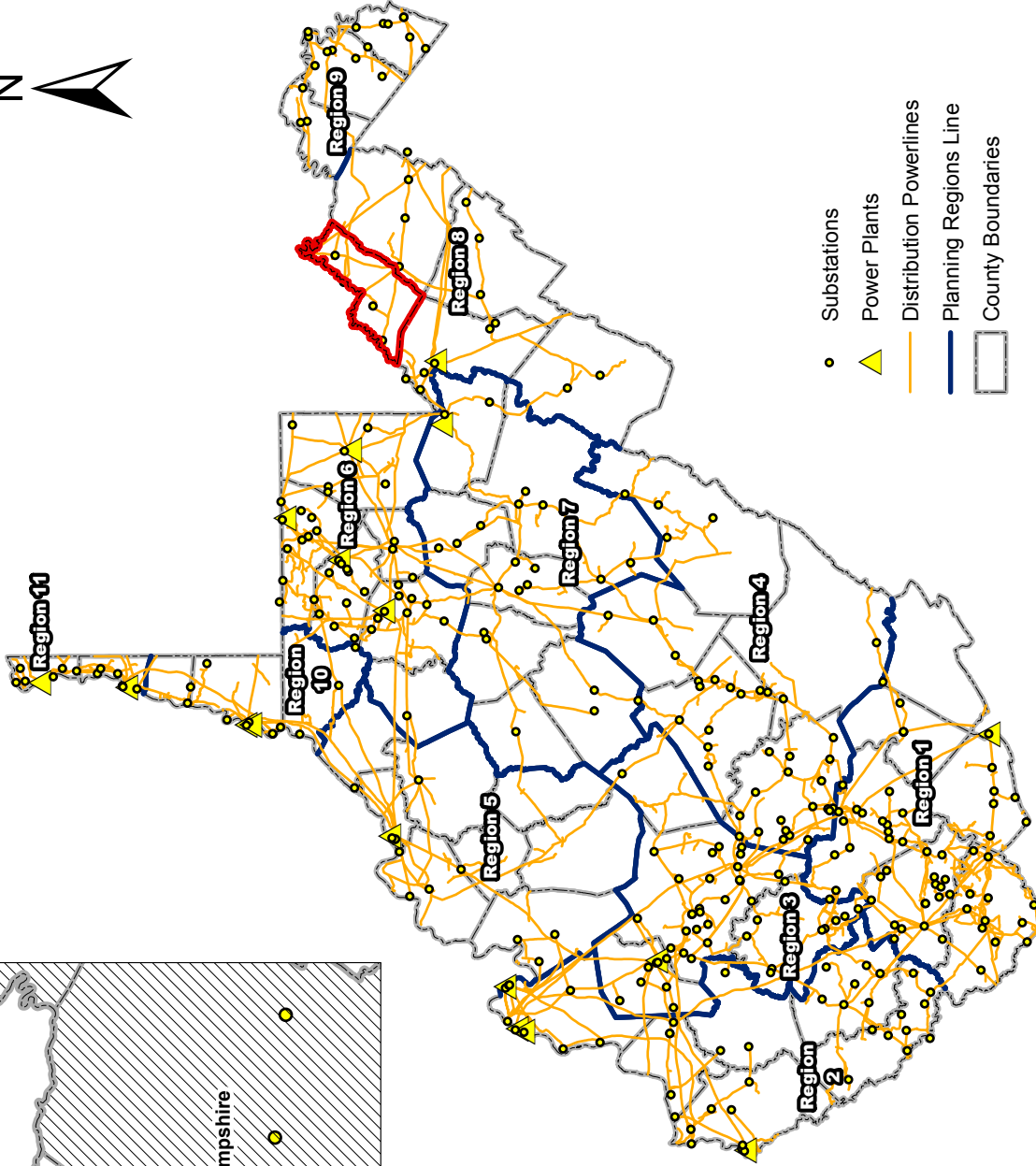
New Creek Water Association, Inc.	
Water Rates	
First 3,000 gallons used per month	\$6.91 per 1,000 gallons
Next 3,000 gallons used per month	\$6.20 per 1,000 gallons
Next 4,000 gallons used per month	\$5.92 per 1,000 gallons
Next 10,000 gallons used per month	\$5.21 per 1,000 gallons
All over 20,000 gallons used per month	\$4.78 per 1,000 gallons
Mountaineer Village	
Sewer Rates	
First 2,000 gallons of water used per month	\$9.59 per 1,000 gallons
All Over 2,000 gallons of water used per month	\$5.99 per 1,000 gallons

Utilities - Electricity

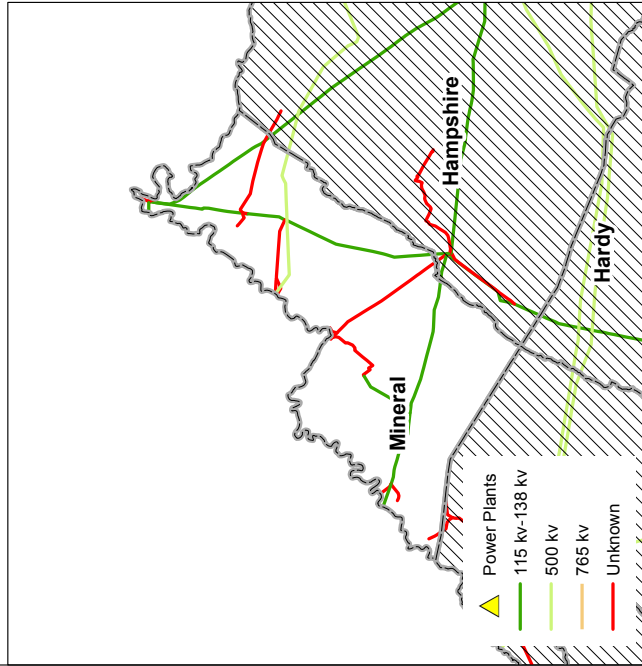
Mineral County



● Electricity Substations



- Substations
- ▲ Power Plants
- Distribution Powerlines
- Planning Regions Line
- County Boundaries



- ▲ Power Plants
- 115 kv-138 kv
- 500 kv
- 765 kv
- Unknown

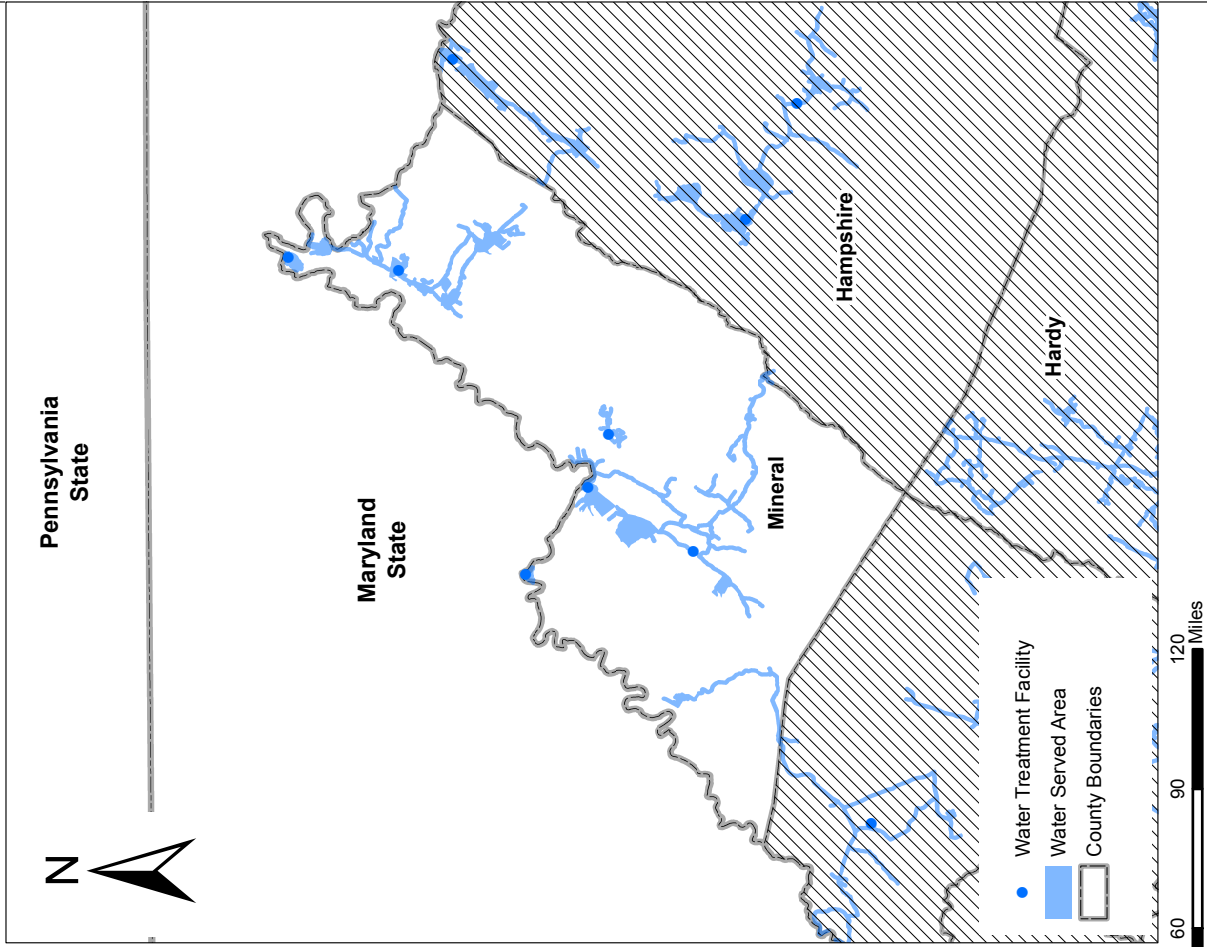
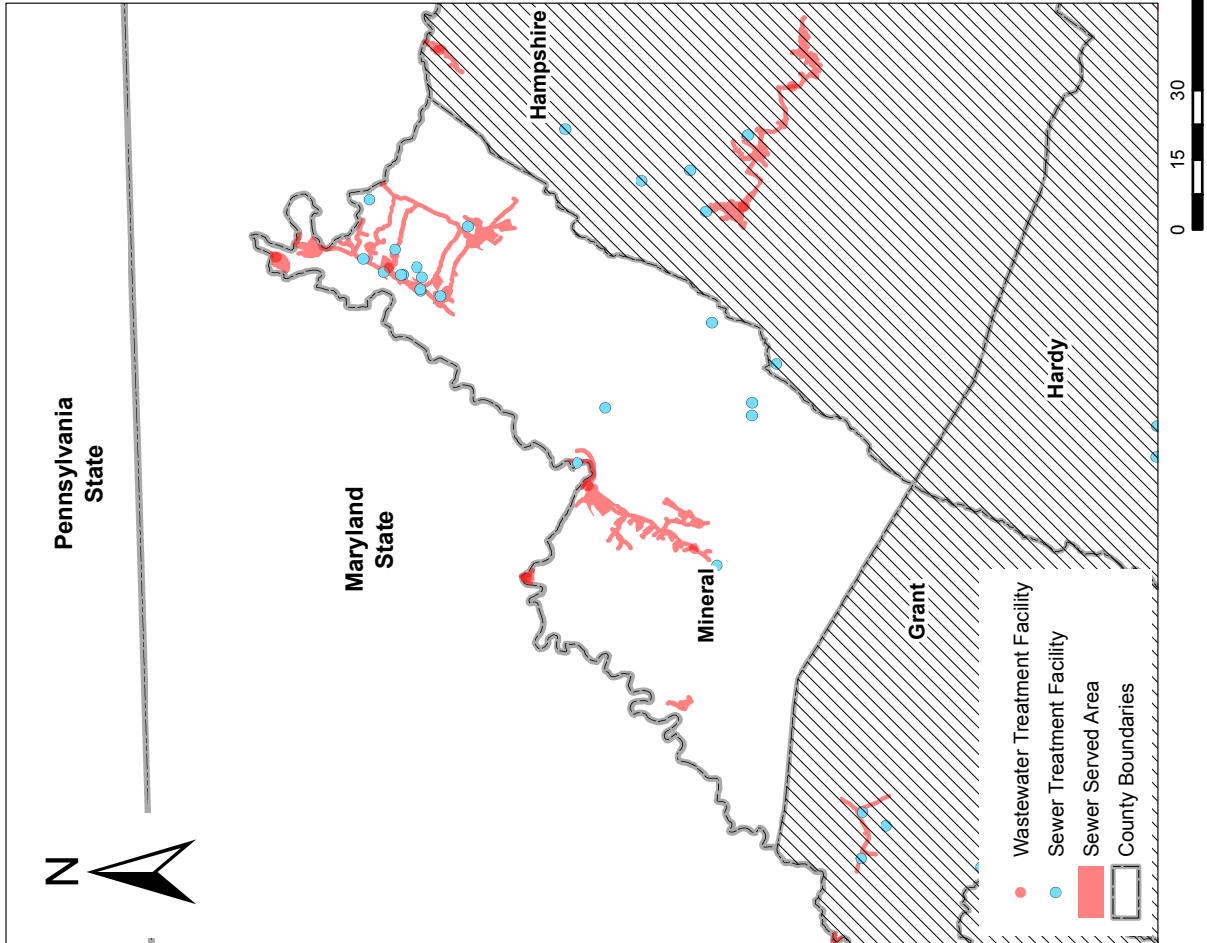
Source: West Virginia Division of Natural Resources, Statewide Addressing and Mapping 2008

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raleigh Appalachian Transportation Institute is prohibited.



Utilities - Water and Sewer

Mineral County



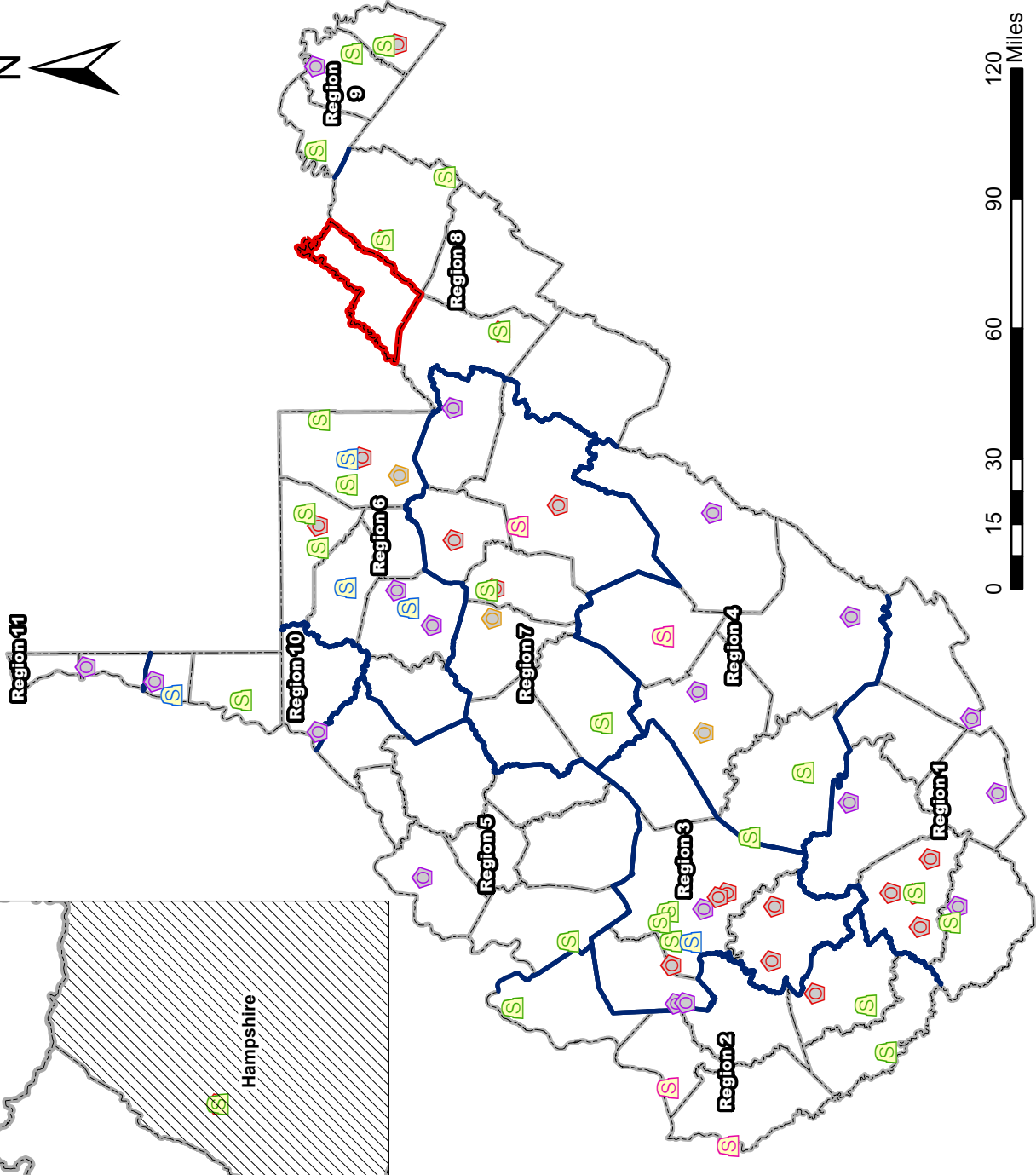
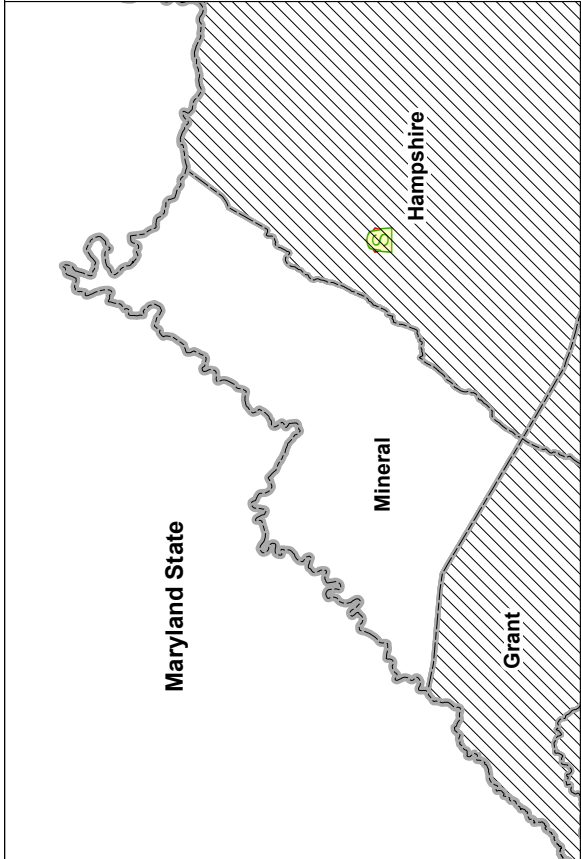
Source: West Virginia Infrastructure and Jobs Development Council N.A.

This product is for informational purposes and may not have been prepared for or be suitable for legal engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raahl Appalachian Transportation Institute is prohibited.



Utility - Solid Waste Facility

Mineral County



Non Operational Facility

- Post-closure status
- Closure status
- A non LCAP** facility

Operational Facility

- Operational landfill
- Solid waste transfer station
- Operational tire monofill
- Planning Regions Line
- County Boundaries

** Landfill Closure Assistance Program



Source: West Virginia Solid Waste Management Board 2012

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the RaHall Appalachian Transportation Institute is prohibited.

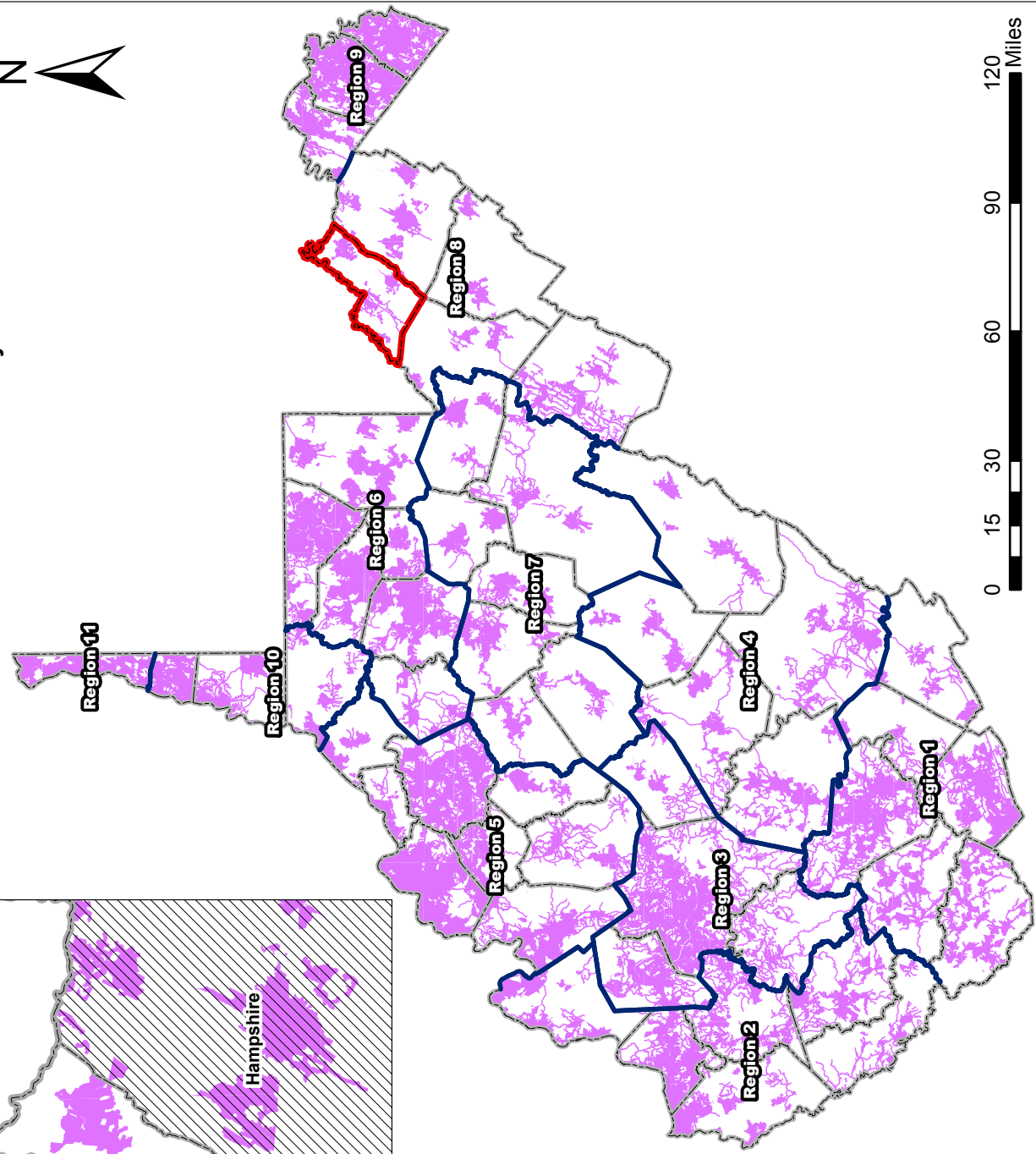
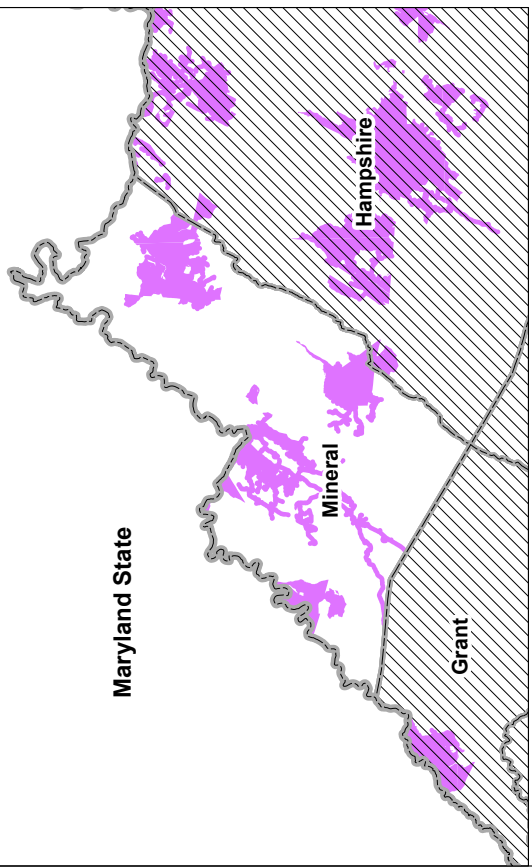
One essential modern convenience, now widely understood as an essential utility in a globalized world, is broadband access. The following 11 maps demonstrate Mineral County's broadband infrastructure in relation to the State's. The largest number of providers in Mineral County is five, which are most densely concentrated in the center and northern areas of the County. Mineral County broadband infrastructure closely resembles neighboring Hampshire County. Of particular note is the lack of fixed wireless, the presence of greater than 10 mbps of wireless speed across most of the County, mostly contiguous mobile wireless coverage, and limited areas where no broadband coverage is reported.

Map 15 shows physical cable infrastructure running from ISPs to other structures. DSL, BPL, and other copper represent the transferal system of broadband (Map 16). Map 17 shows the entire wire system, represented by physical wires, while Maps 18 and 19 show the maximum uploading and downloading speeds for the system. Map 20 shows the total number of providers, which is denser in the more economically developed areas of the State. Map 21 has fixed wireless coverage, or the connection between two fixed points wirelessly by radio or other links, and the next two maps show the maximum uploading and downloading speeds in a given area (22 and 23). Map 24 shows the location of mobile wireless coverage, including for smartphones and tablets, and Map 25 shows areas where no broadband coverage is reported in any way.

Each of these maps shows the same pattern in Mineral County internet service as exhibited by West Virginia. Internet service, specifically broadband, is non-existent in many rural areas, and instead focuses on population centers. While this may be financially wise, it deprives rural areas of an increasingly integral link to a globalized economy and society. All areas now need broadband service, and a complete inventory of these services is needed to plan for future investment in any given area. Note also that the map data is for 2014, the most recent map available. Changes have been made in recent years, thanks to broadband expansion programs encouraged by the State.

Broadband - Internet Cable and FTTP Coverage

Mineral County



- Planning Regions Line
- Cable and FTTP
- County Boundaries



Source: West Virginia Broadband Mapping Program 2014

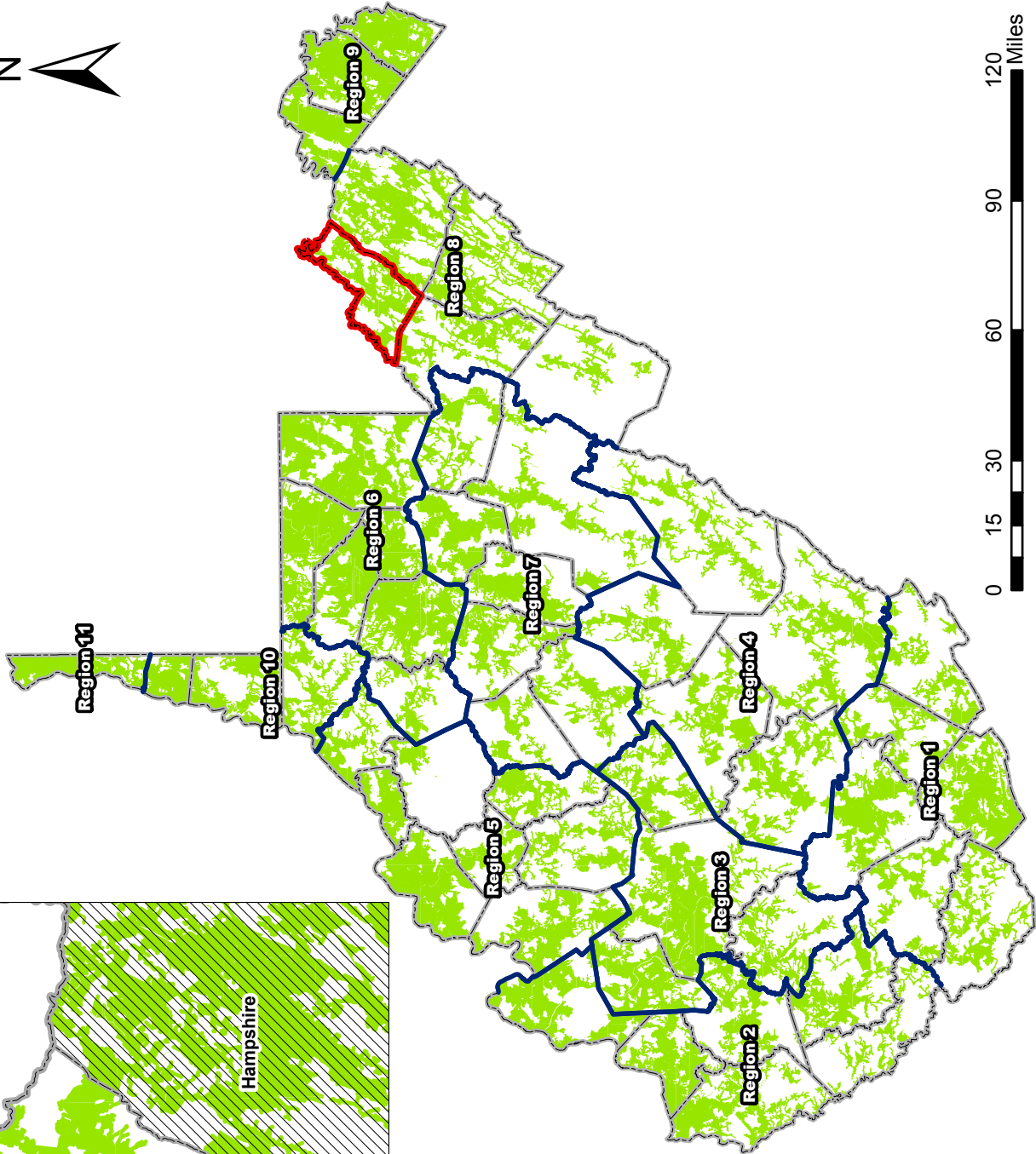
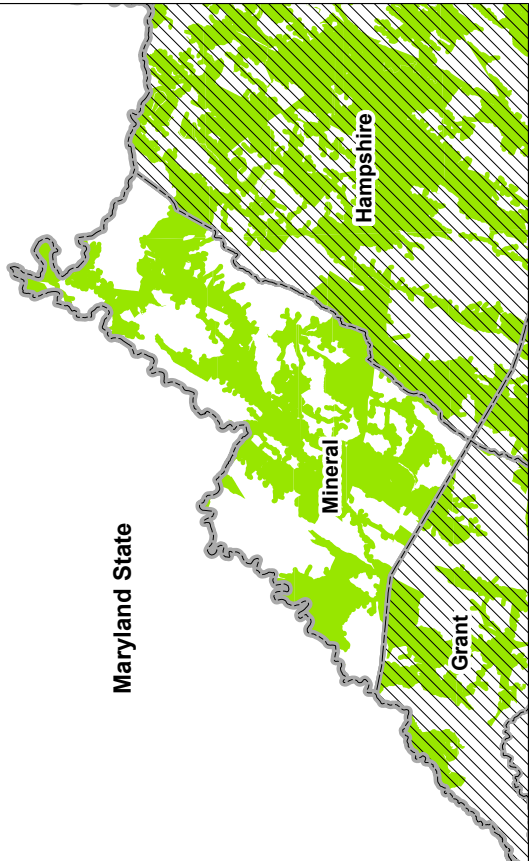
This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahtall Appalachian Transportation Institute is prohibited.



www.rahtall.org

Broadband - Internet DSL, BPL, Other Copper

Mineral County



- Planning Regions Line
- DSL, BPL, Other Copper
- County Boundaries



Source: West Virginia Broadband Mapping Program 2014

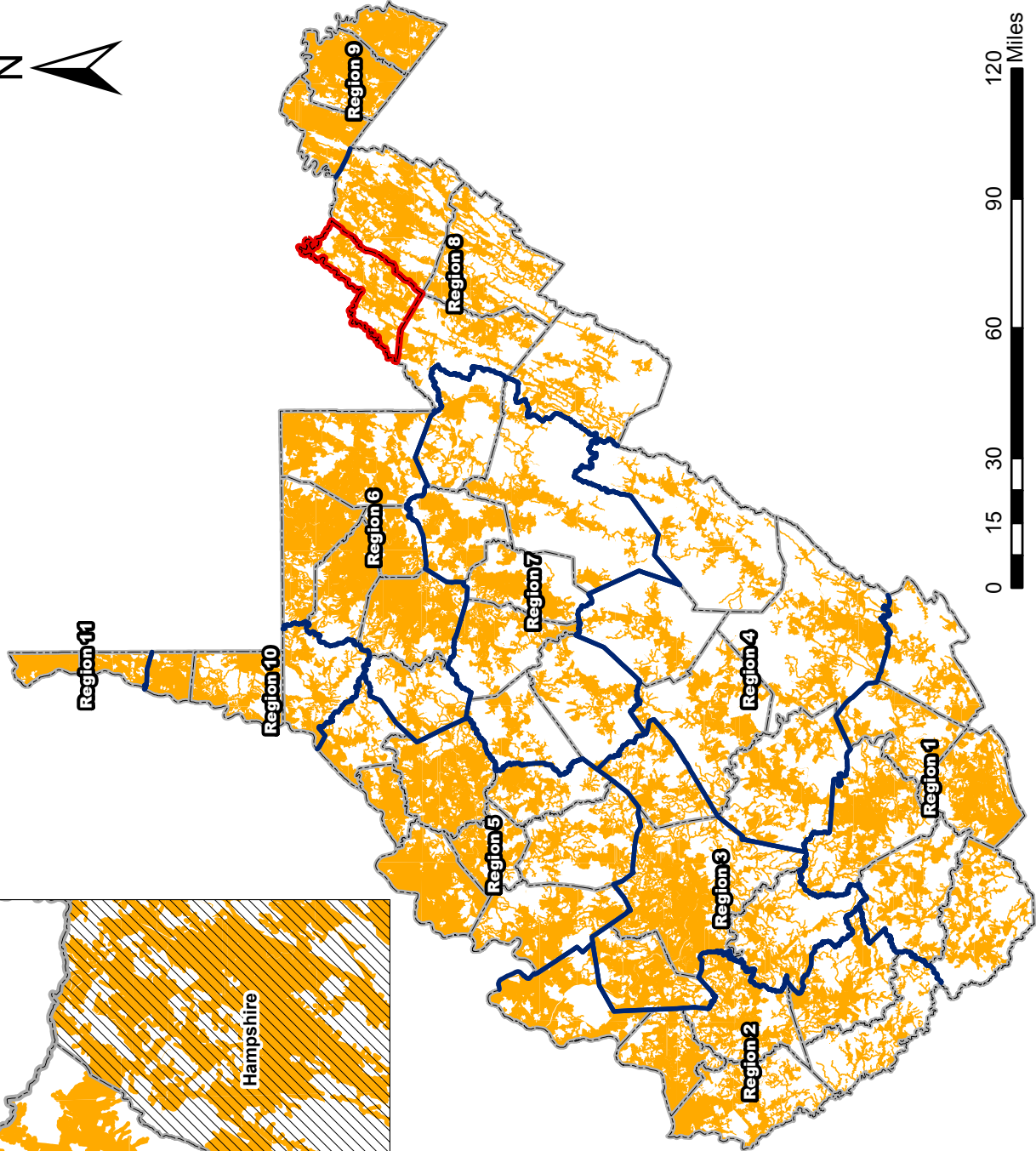
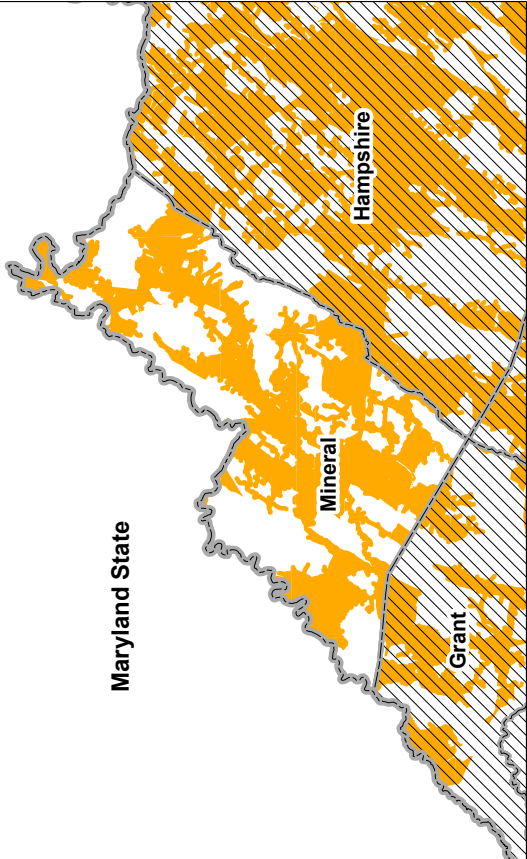
This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raleigh Appalachian Transportation Institute is prohibited.



www.rtiappi.org

Broadband - Internet Wireline Coverage

Mineral County



- Planning Regions Line
- Wireline Coverage
- County Boundaries



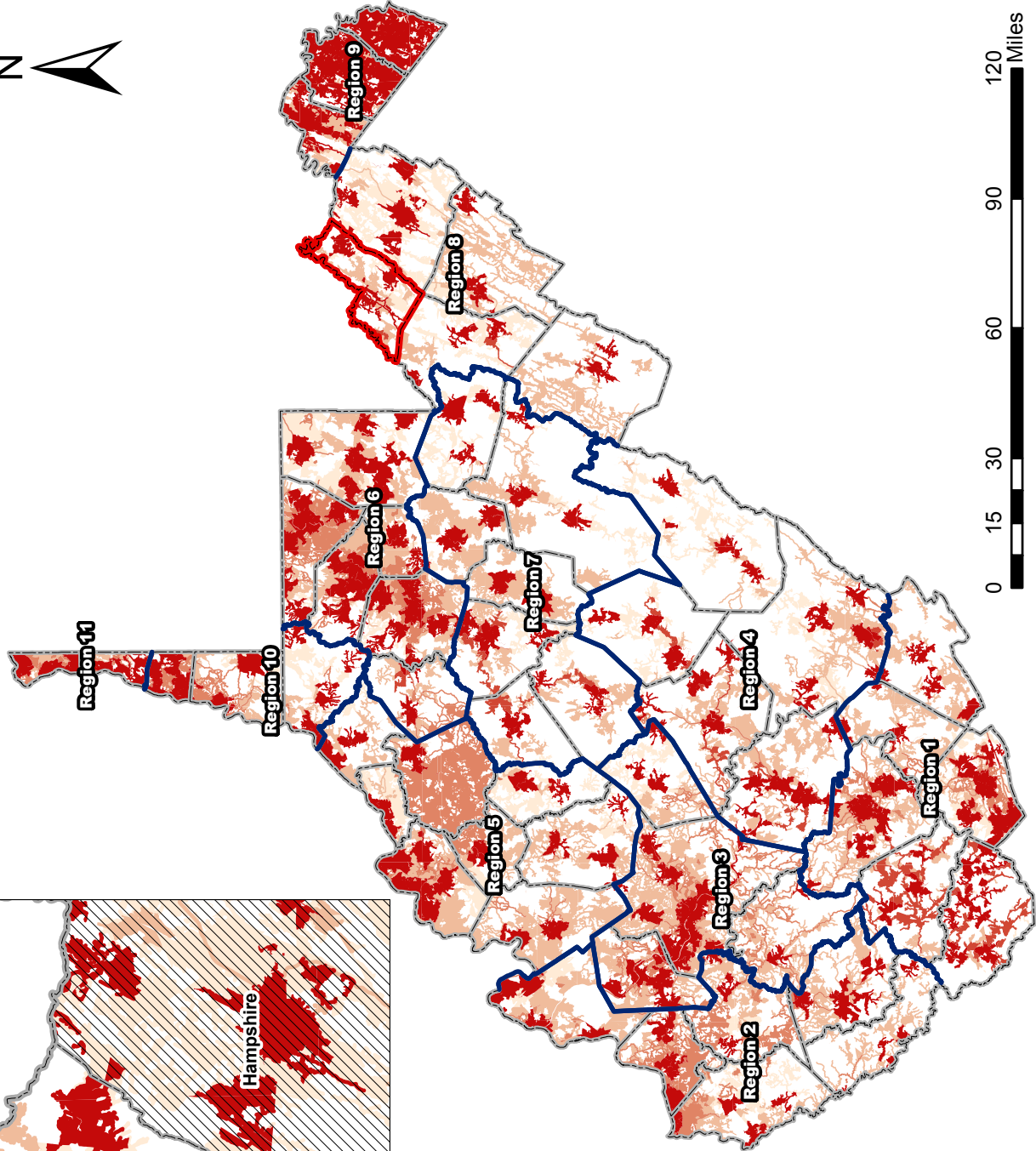
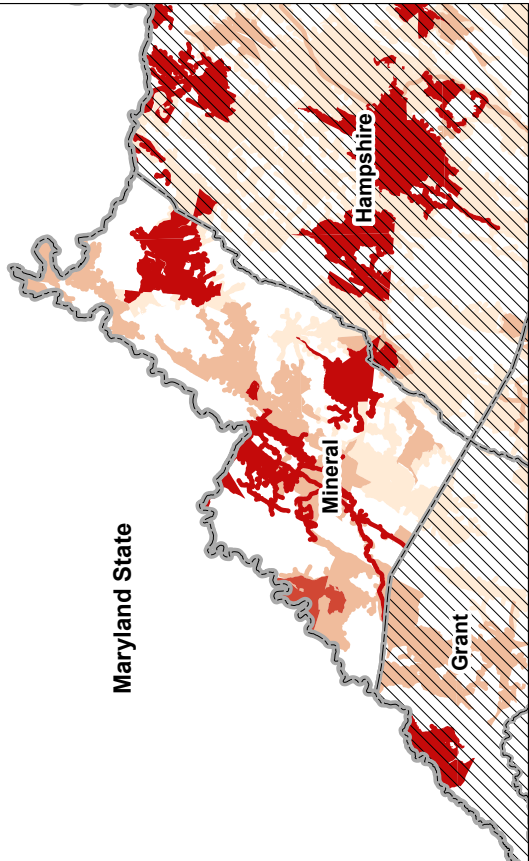
Source: West Virginia Broadband Mapping Program 2014

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raleigh Appalachian Transportation Institute is prohibited.



Broadband - Internet MaxUp Speed Wireline

Mineral County



- Planning Regions Line
- 200 - 768 kbps
- 768 kbps - 3 mbps
- 3 - 10 mbps
- 10 - 25 mbps
- Greater than 25 mbps
- County Boundaries



Source: West Virginia Broadband Mapping Program 2014

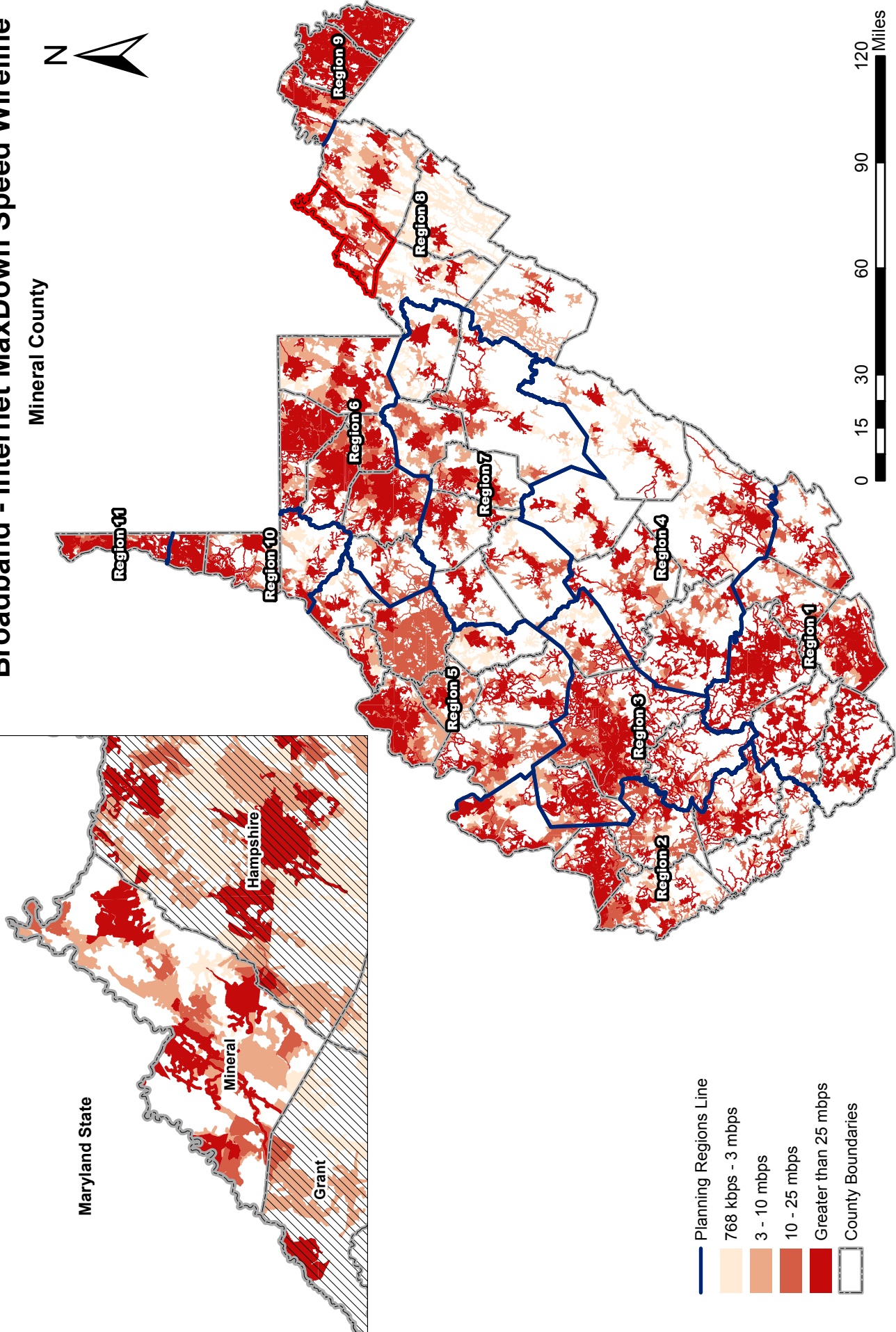
This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahtall Appalachian Transportation Institute is prohibited.









www.rahtall.org

Broadband - Internet MaxDown Speed Wireline

Mineral County



-  Planning Regions Line
-  768 kbps - 3 mbps
-  3 - 10 mbps
-  10 - 25 mbps
-  Greater than 25 mbps
-  County Boundaries



Source: West Virginia Broadband Mapping Program 2014

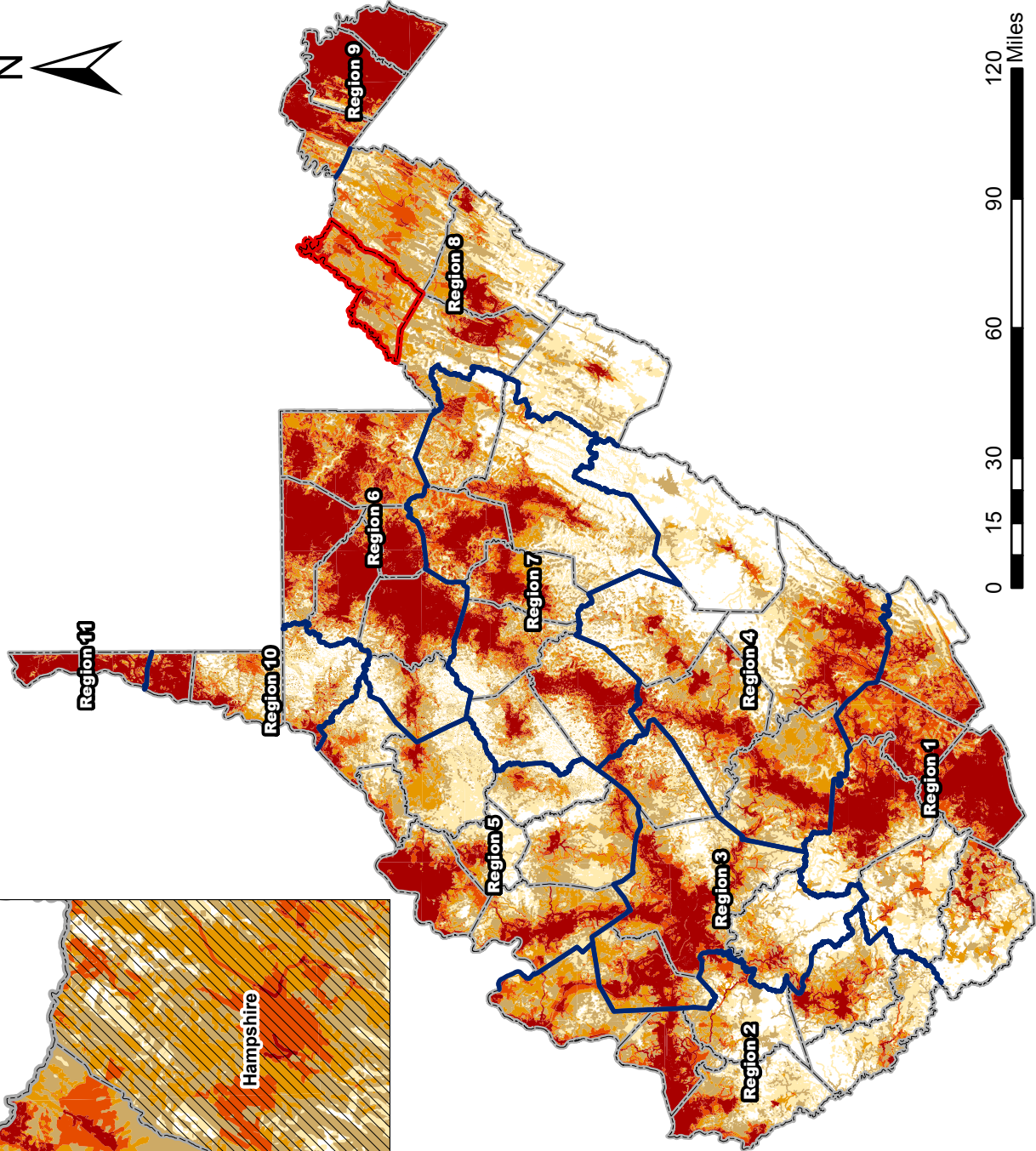
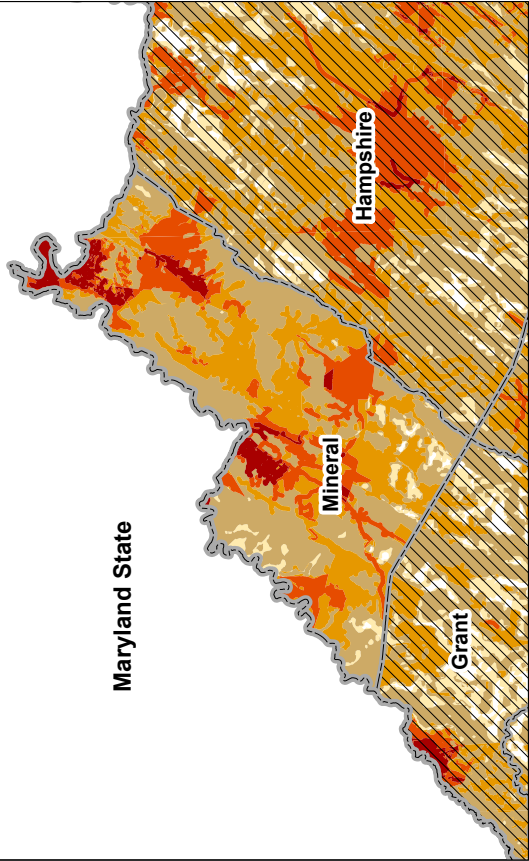
This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahtall Appalachian Transportation Institute is prohibited.



www.rtiappi.org

Broadband - Internet Total Number of Providers

Mineral County



- Planning Regions Line
- 1 Provider
- 2 Providers
- 3 Providers
- 4 Providers
- 5 Providers
- County Boundaries



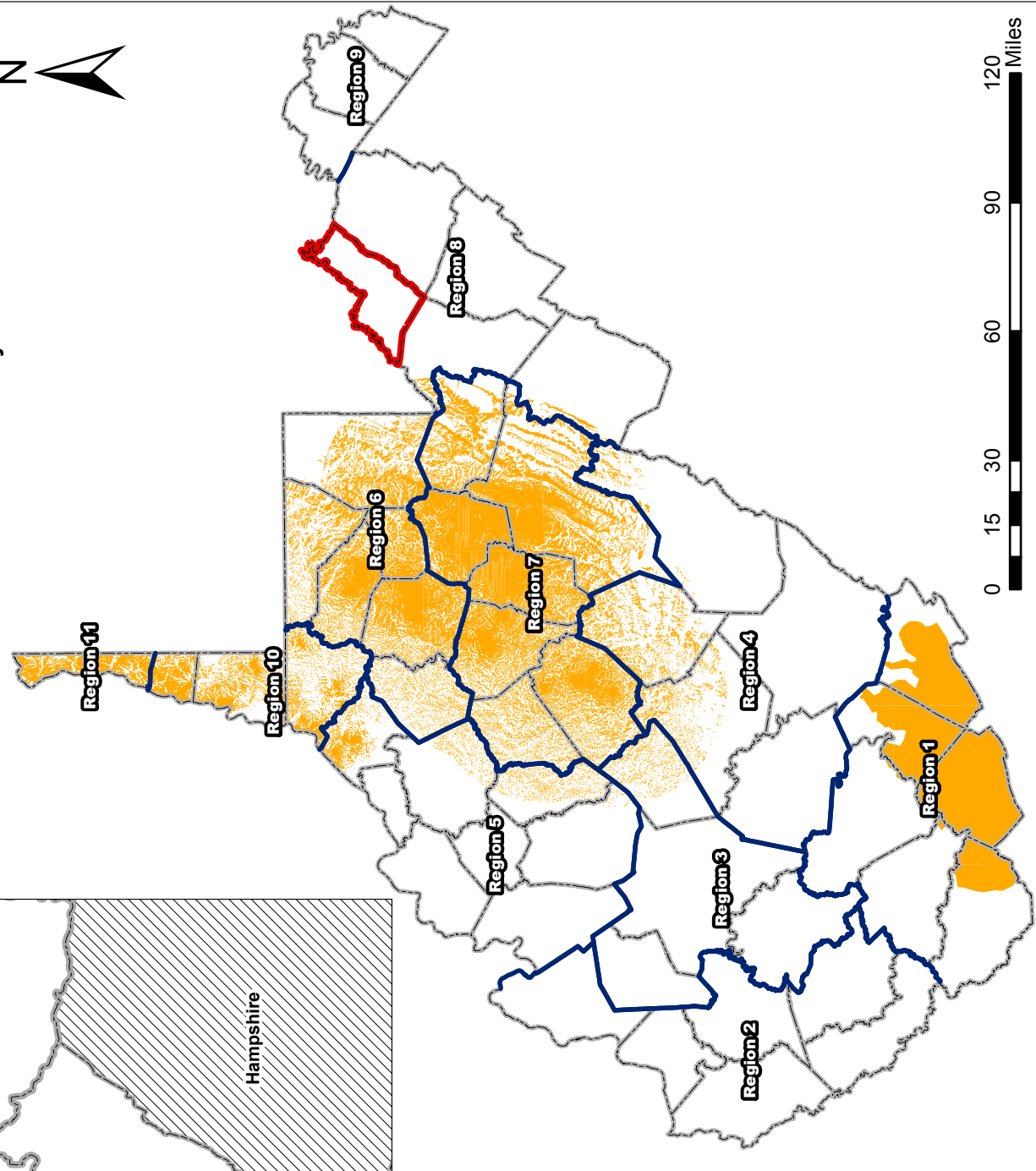
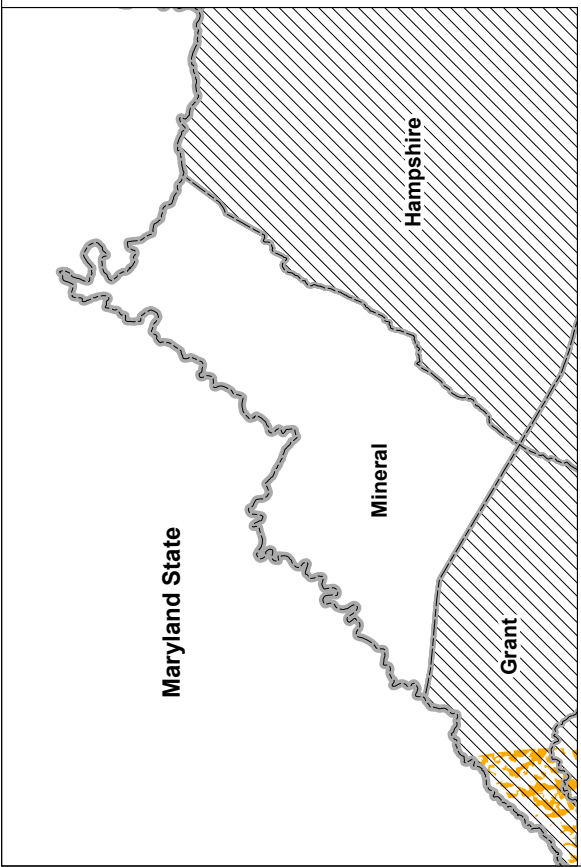
Source: West Virginia Broadband Mapping Program 2014

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahtall Appalachian Transportation Institute is prohibited.



Broadband - Internet Fixed Wireless Coverage

Mineral County



- Planning Regions Line
- Fixed Wireless
- County Boundaries

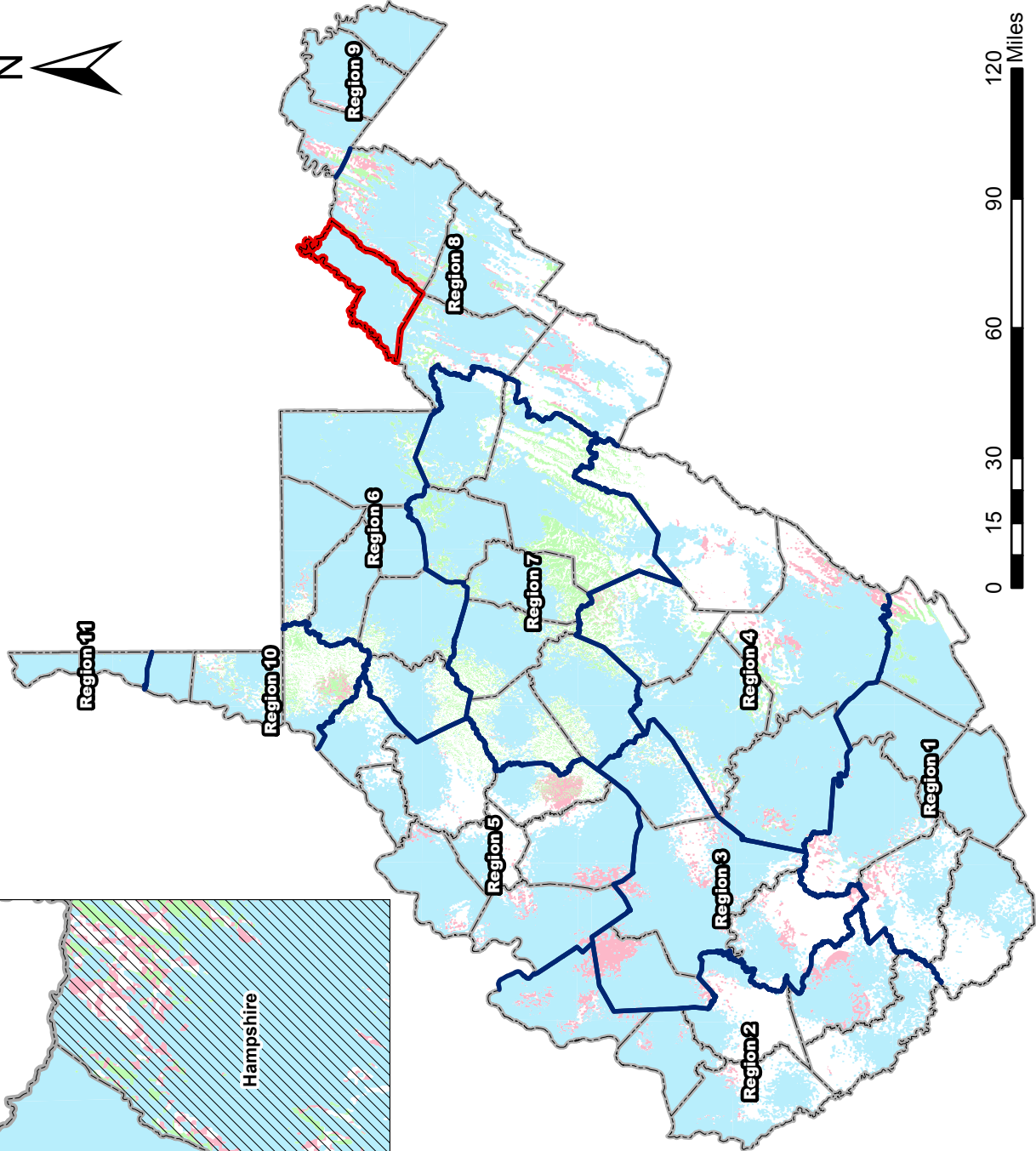
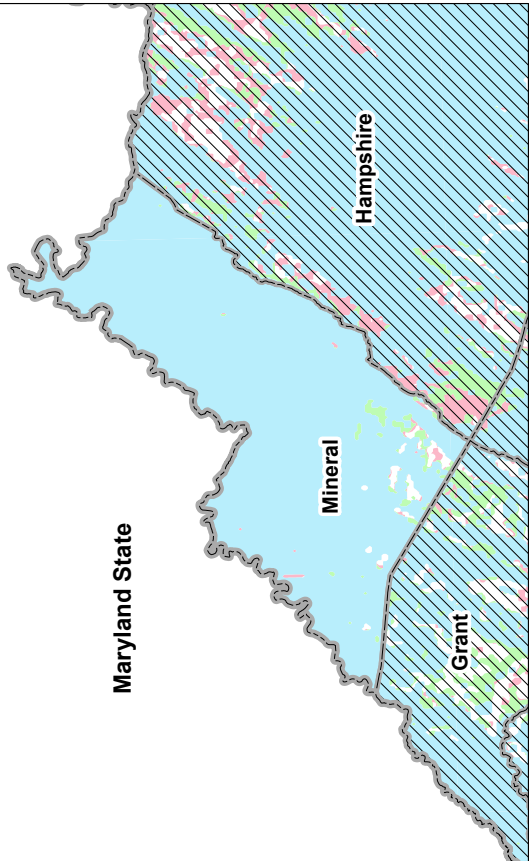
Source: West Virginia Broadband Mapping Program 2014

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahtall Appalachian Transportation Institute is prohibited.



Broadband - Internet MaxDown Speed Wireless

Mineral County



- Planning Regions Line
- 768 kbps - 3 mbps
- 3 - 10 mbps
- > 10 mbps
- County Boundaries



Source: West Virginia Broadband Mapping Program 2014

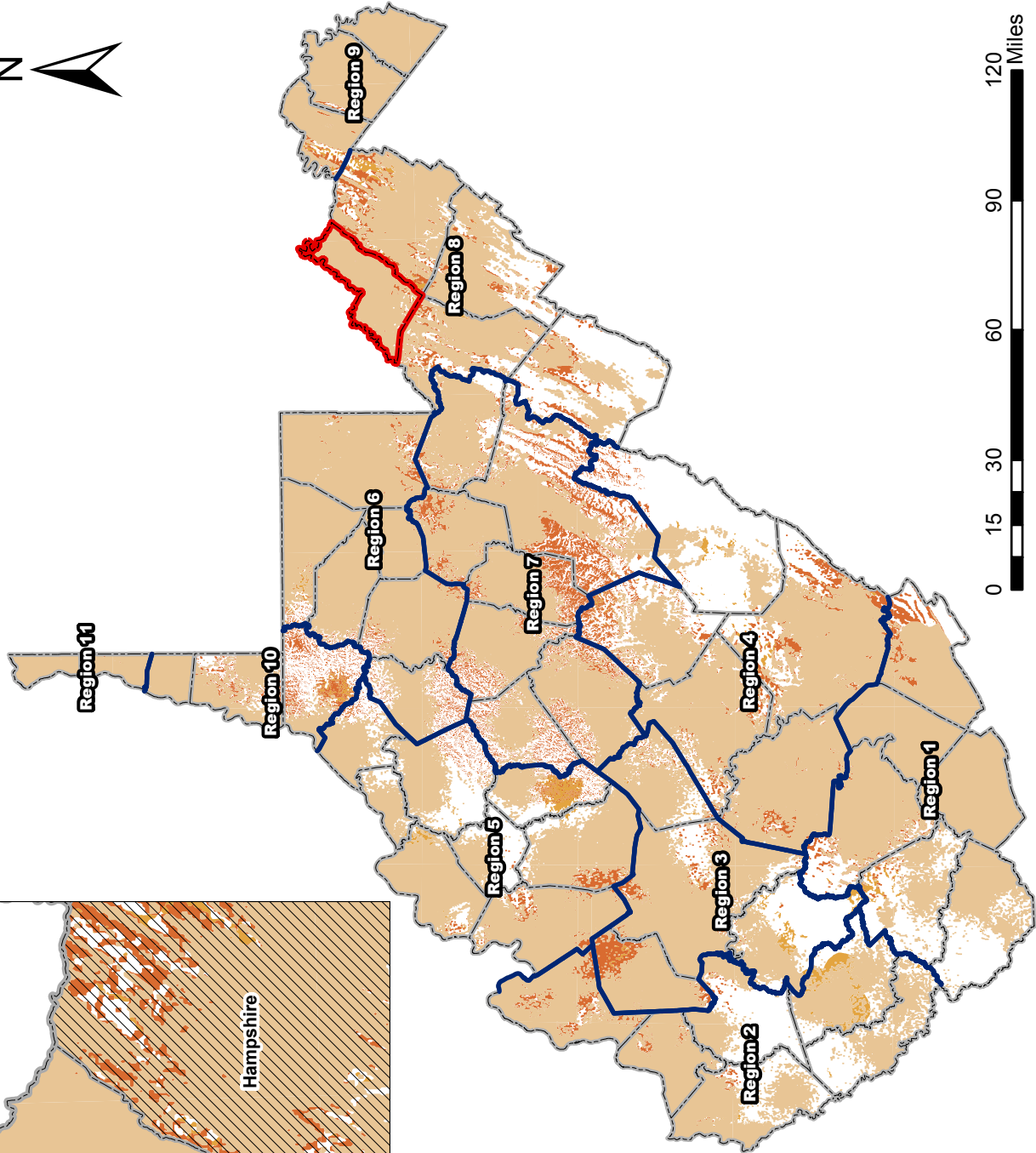
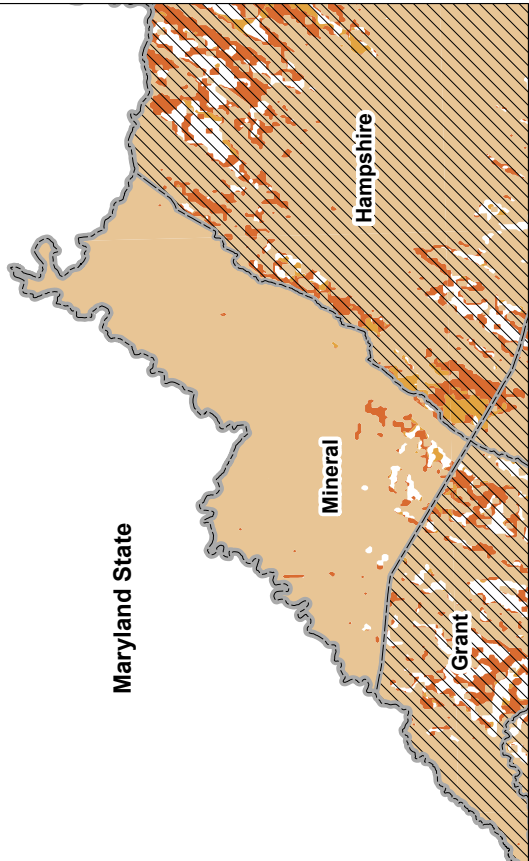
This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahtall Appalachian Transportation Institute is prohibited.








www.rahtall.org

Broadband - Internet MaxUp Speed Wireless

Mineral County



-  Planning Regions Line
-  200 - 768 kbps
-  768 kbps - 3 mbps
-  > 3 mbps
-  County Boundaries

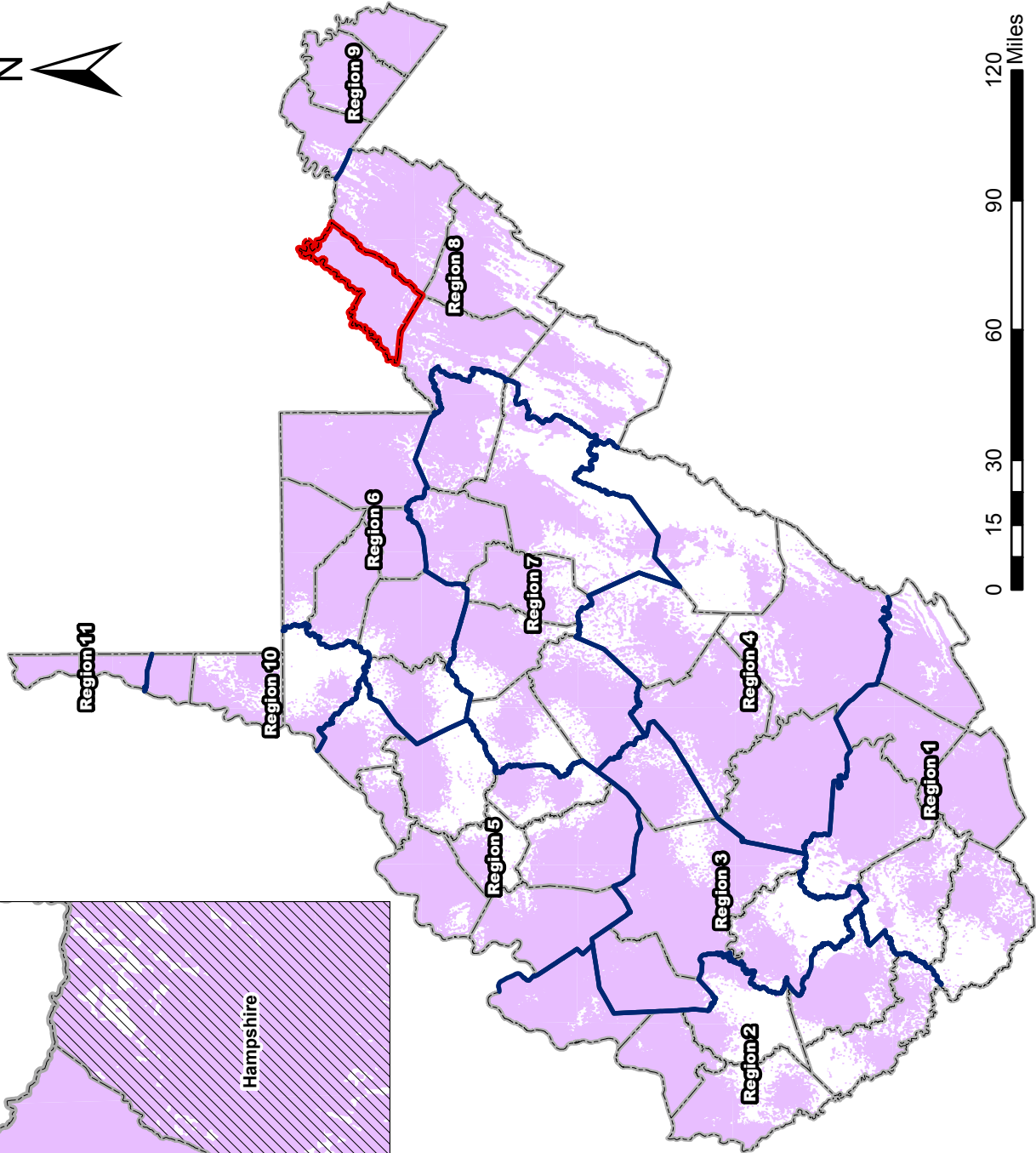
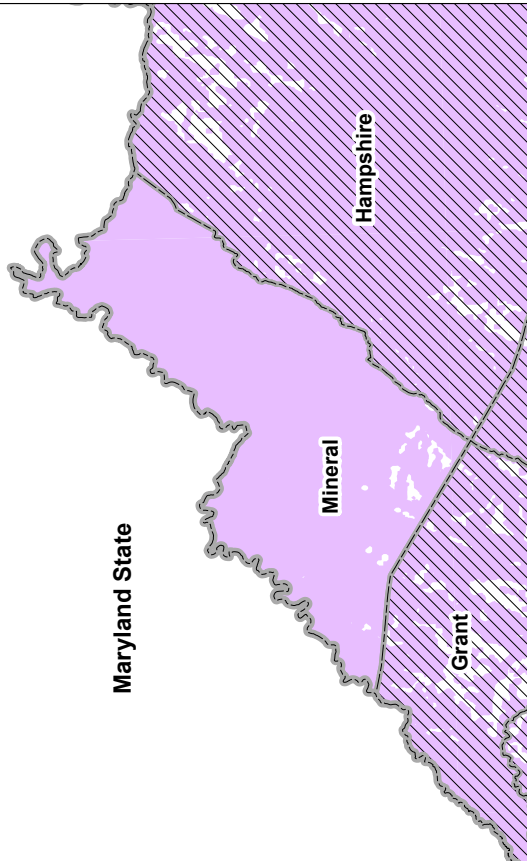
Source: West Virginia Broadband Mapping Program 2014

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahtall Appalachian Transportation Institute is prohibited.



Broadband - Internet Mobile Wireless Coverage

Mineral County



- Planning Regions Line
- Mobile Wireless
- County Boundaries



Source: West Virginia Broadband Mapping Program 2014

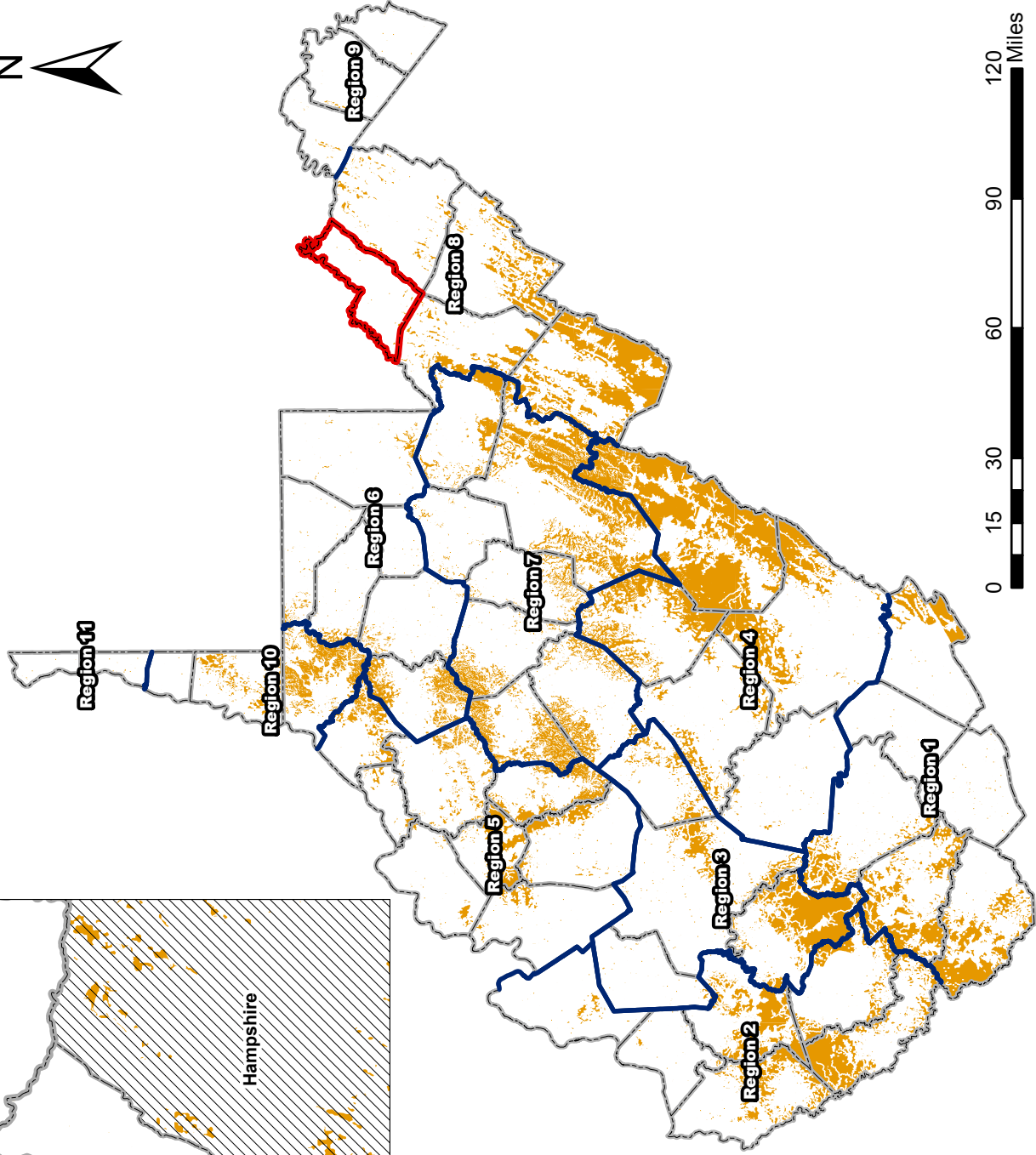
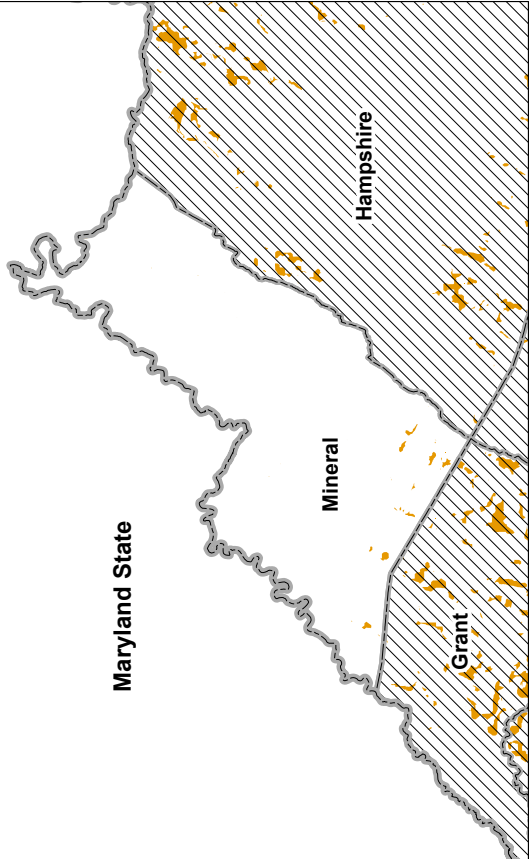
This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahtall Appalachian Transportation Institute is prohibited.



www.rahtali.org

Broadband - No Broadband Coverage

Mineral County



- Planning Regions Line
- No Coverage Reported
- County Boundaries

Source: West Virginia Broadband Mapping Program 2014

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahtall Appalachian Transportation Institute is prohibited.



www.rahtall.org

Transportation

Highways

Mineral County has no interstate presence, two U.S. routes—Route 270 and Route 50, and State Routes 28, 42, 46, 93, 956, and 972 (Map 26).

Rail

Mineral County has a rail system present in the western and northern portions of the County.






Air

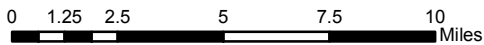
Mineral County has one airport, the Greater Cumberland Regional Airport located in Wiley Ford, WV.

Transportation

Mineral County



-  Airports
-  US Routes
-  WV Routes
-  Railroads
-  County Boundary



Source: Airports; United States Department of Transportation 2012, West Virginia GIS Technical Center; US Routes, West Virginia Routes; West Virginia Department of Transportation 2012; Railroads; Rahall Transportation Institute 2012

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahall Appalachian Transportation Institute is prohibited.



Current Post-Mine Economic Development Sites

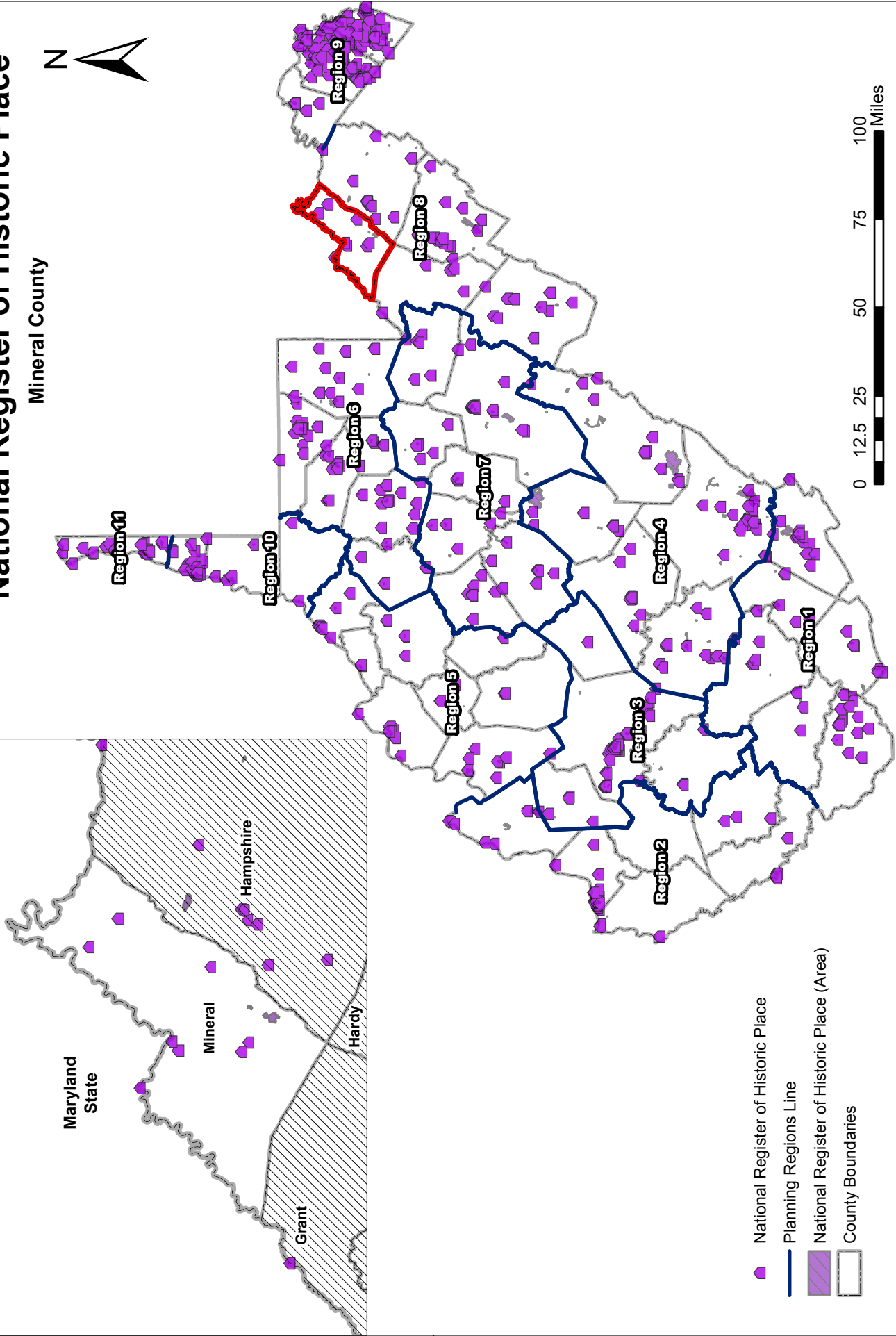
Mineral County has no major developments on its post-mine sites.





Historic Preservation

Historic preservation will be essential in a county steeped in coal mining history. Mineral County has 8 listings in the National Register of Historic Places. Other historic areas have been designated by West Virginia. Map 28 gives a spatial position to each designated State historic piece of architecture.

National Register of Historic Place

Mineral County



-  National Register of Historic Place
-  Planning Regions Line
-  National Register of Historic Place (Area)
-  County Boundaries



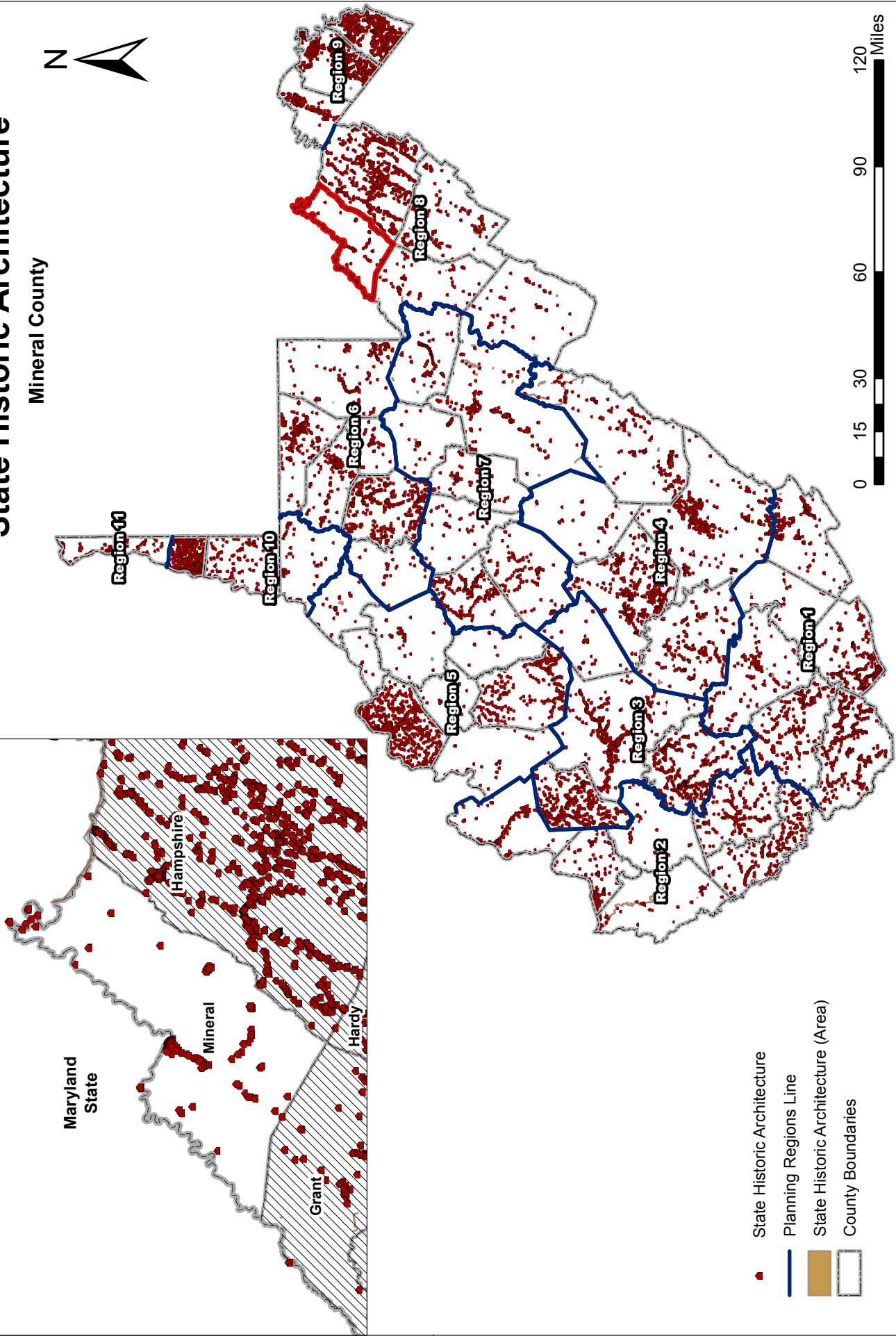
Source: West Virginia State Historic Preservation Office 2014

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raleigh Appalachian Transportation Institute is prohibited.



State Historic Architecture

Mineral County



- State Historic Architecture
- Planning Regions Line
- State Historic Architecture (Area)
- County Boundaries



RTI
 RAHALL APPALACHIAN
 TRANSPORTATION INSTITUTE
www.rti.tti.org

Source: West Virginia State Historic Preservation Office 2012

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raahall Appalachian Transportation Institute is prohibited.

Natural Resources, Environment, and Energy

Particular importance should be given to the spatial positions of natural resource areas, geographic environments, and potential energy resources in a county. This serves to inform potential investors about what possibilities the land provides for production of resources and energy. Mineral County has several advantages in these areas that can be utilized to the advantage of the citizens.

West Virginia has an extensive wetlands inventory, because of its extensive system of lakes, streams, and rivers. Wetlands provide many environmental benefits, including housing fish, replenishing groundwater, and relaying nutrients. Mineral's wetland inventory is sporadic throughout the County (Map 29).

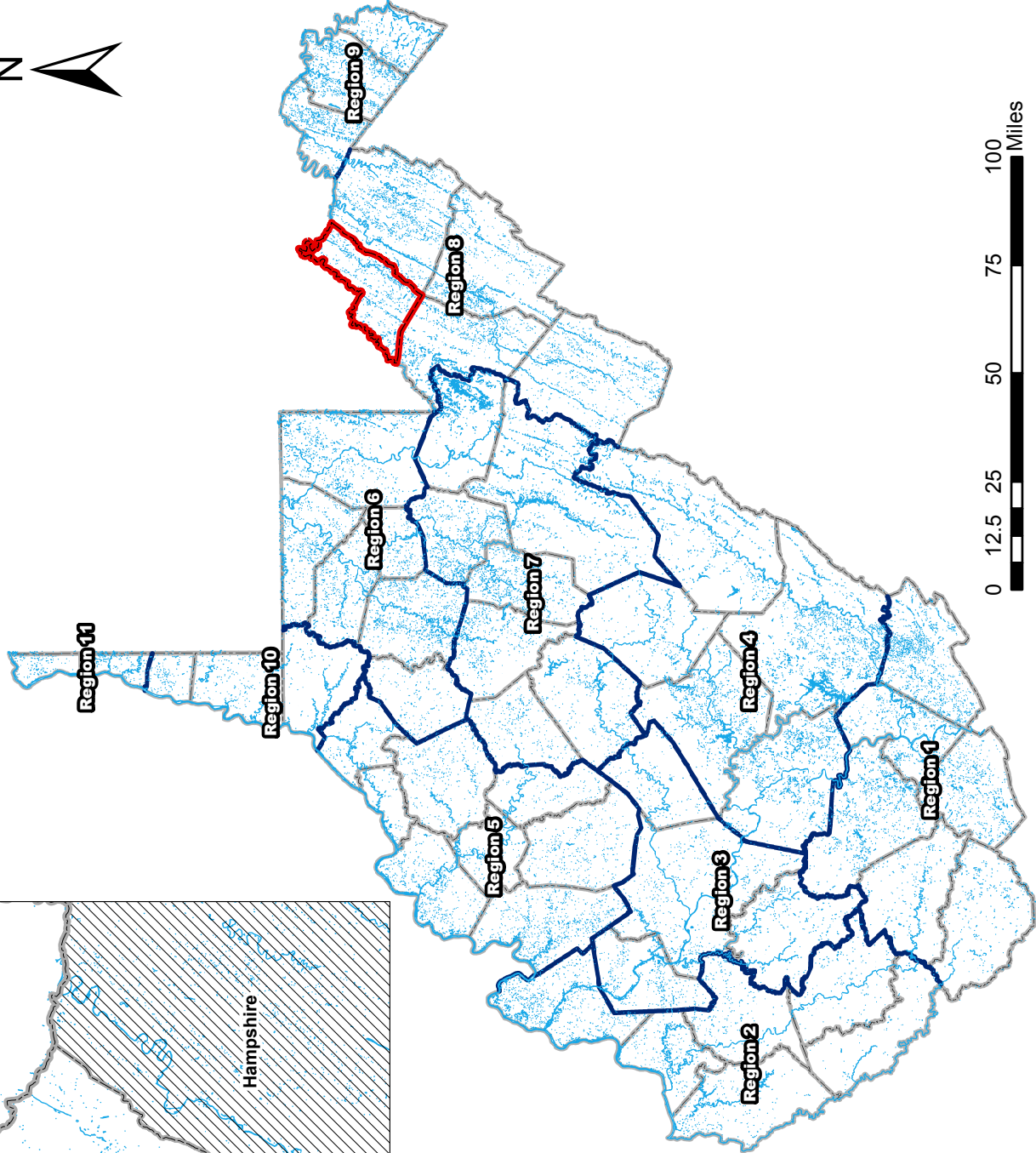
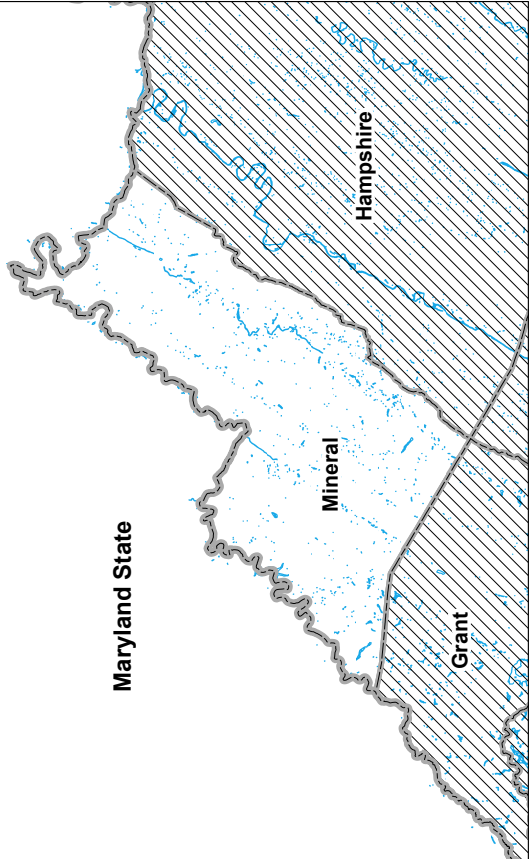
The State also possesses a respectable amount of park and forest land. Most of this land is located in the eastern portion of the State, the area that contains the main part of the Appalachian Mountain range. Mineral County contains a few small areas wildlife management areas (Map 30).




Air quality is a necessary environmental health benchmark that can determine the health and vitality of an area's residents. The air pollution non-attainment areas are "areas of the country where air pollution levels persistently exceed the national ambient air quality standards."⁷ There are six full counties in West Virginia that are designated air pollution non-attainment areas, either in annual or 2006 24-hour standards as of the publication of this plan; Mineral County is not among them (Map 31).

⁷ "The Green Book Nonattainment Areas for Criteria Pollutants," Environmental Protection Agency, Accessed March 1, 2013, <http://www.epa.gov/oaqps001/greenbk/>.

Hydrology - National Wetlands Inventory

Mineral County



-  Planning Regions Line
-  National Wetlands Inventory
-  County Boundaries



Source: United States Fish and Wildlife Service 1996

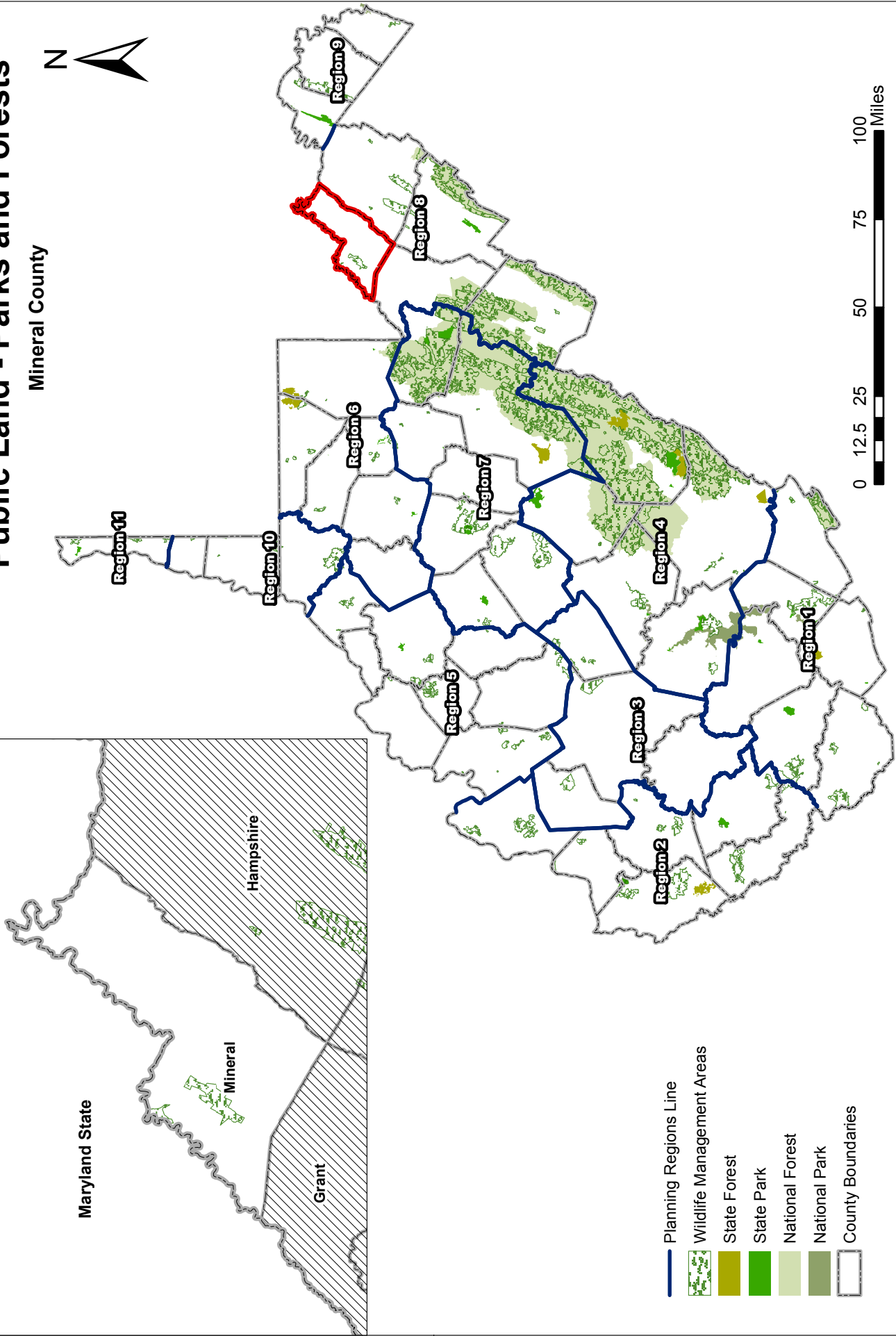
This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raleigh Appalachian Transportation Institute is prohibited.










www.rjtati.org

Public Land - Parks and Forests

Mineral County



-  Planning Regions Line
-  Wildlife Management Areas
-  State Forest
-  State Park
-  National Forest
-  National Park
-  County Boundaries

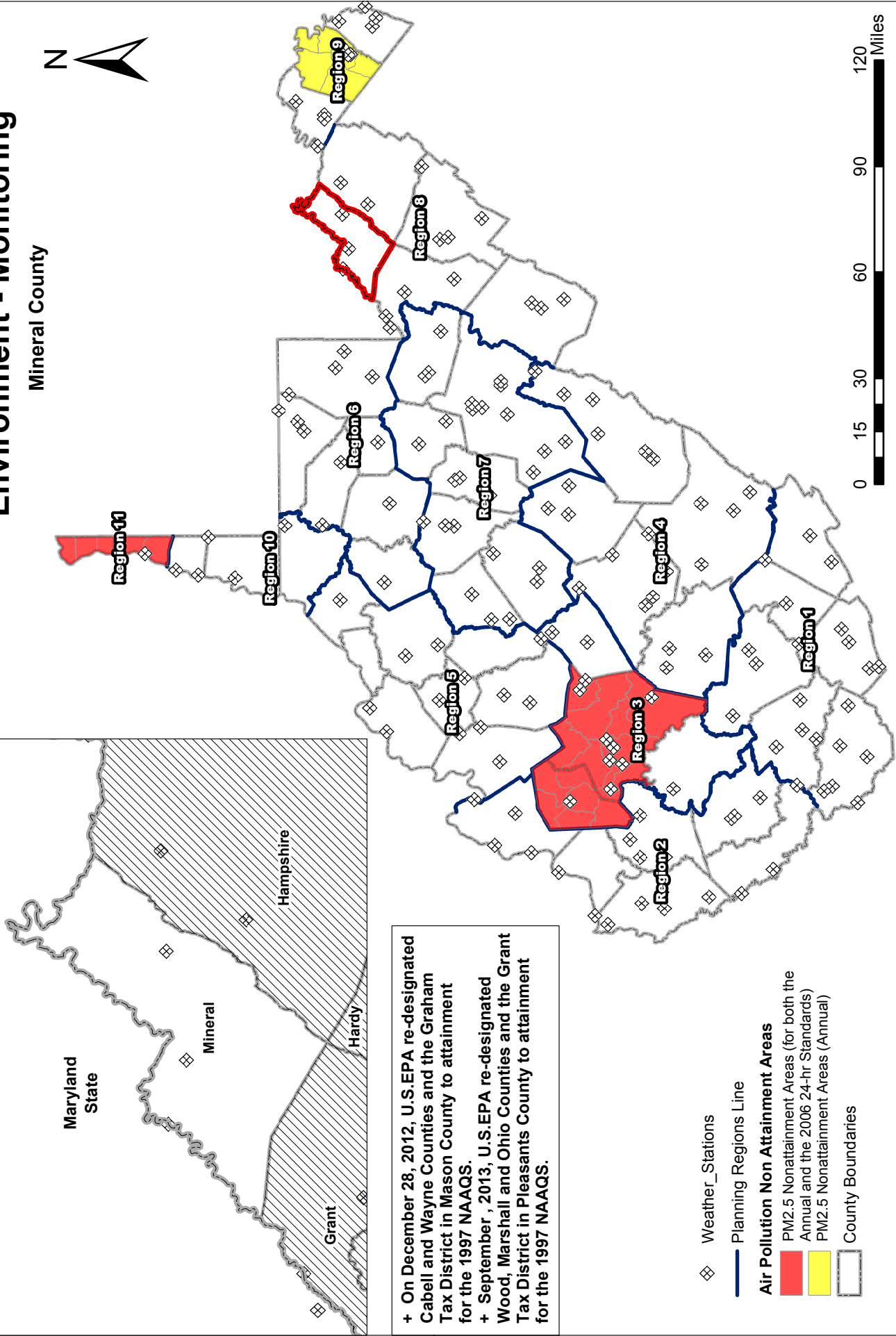
Source: Wildlife Management Areas: West Virginia Division of Natural Resources 2002; State Forest: West Virginia Division of Forestry 2004; State Park: West Virginia Division of Natural Resources; National Resource Analysis Center 2000; National Forest: United States Forest Service 2005; National Park: United States National Park Service 2003

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raleigh Appalachian Transportation Institute is prohibited.



Environment - Monitoring

Mineral County



+ On December 28, 2012, U.S.EPA re-designated Cabell and Wayne Counties and the Graham Tax District in Mason County to attainment for the 1997 NAAQS.
 + September, 2013, U.S.EPA re-designated Wood, Marshall and Ohio Counties and the Grant Tax District in Pleasants County to attainment for the 1997 NAAQS.

- ◇ Weather_ Stations
- Planning Regions Line
- Air Pollution Non Attainment Areas**
 - PM2.5 Nonattainment Areas (for both the Annual and the 2006 24-hr Standards)
 - PM2.5 Nonattainment Areas (Annual)
- County Boundaries

Source: Weather Stations: National Oceanic and Atmospheric Administration 1999; Air Pollution Non Attainment Areas: West Virginia Department of Environmental Protection and United States Environmental Protection Agency, 2013

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raleigh Appalachian Transportation Institute is prohibited.



West Virginia's past and most likely its future are defined by energy. Besides coal, other options for energy have been investigated in the State. Gas and oil are of course the main energy staples in the nation, and West Virginia has access to this energy in a number of ways. Mineral County has gas pipelines that run through the County, but no oil or oil pipeline presence (Map 32). Mineral County does have play in the Marcellus shale, with one completed well (Map 33). The Marcellus Shale will continue to be a major player in West Virginia's energy layout for the foreseeable future, and as technology improves recoverability may also.

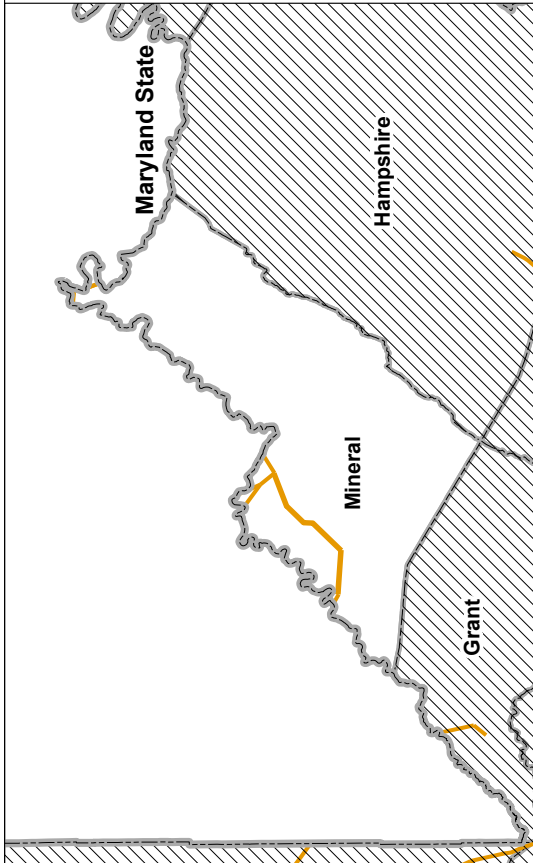
Potential renewable energy sources were also examined. Wood by-products are a potential energy source classified as biomass energy. Naturally it is most useful in areas with a great deal of wood products. West Virginia is one of the most forested States in the country. Mineral County appears to have average forest coverage compared to the rest of the counties in West Virginia (Map 34), however the County has no current activity in the production of wood by-products (Maps 35 and 36). Other potential renewable energy sources include geothermal (Map 37), solar (Map 38), and wind (Map 39). Each of these resources was examined in a recent report from the Center of Business and Economic Research at Marshall University.⁸ None of these sources was "likely to provide fuel or electricity at a lower cost" than coal and oil. Subsidizing these resources appears to be the only way to encourage faster growth in consumption, and in some cases they still have very limited potential in West Virginia. Geothermal energy appears to have great potential in certain parts of the State, as shown in Map 37, however Mineral appears to have less favorable potential for enhanced geothermal systems. The potential for wind and solar development in the County is less favorable. Still, technology is not predictable, and improvements could occur in each of these resource areas that will make generation more feasible. Efforts to monitor research in all these areas should be undertaken to make use of any potential developments.⁹

⁸ Kent, Calvin, Risch, Christine, and Pardue, Elizabeth. *Renewable Energy Policy: Opportunities for West Virginia*. Center for Business and Economic Research, Huntington, WV (2012).

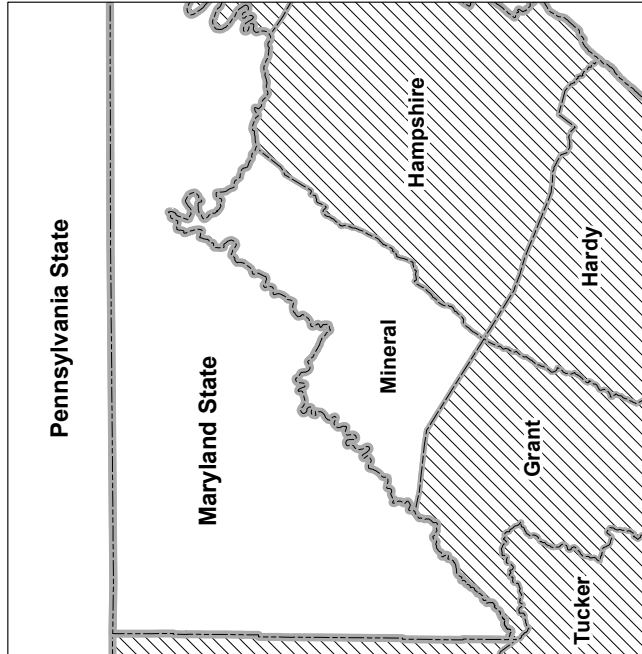
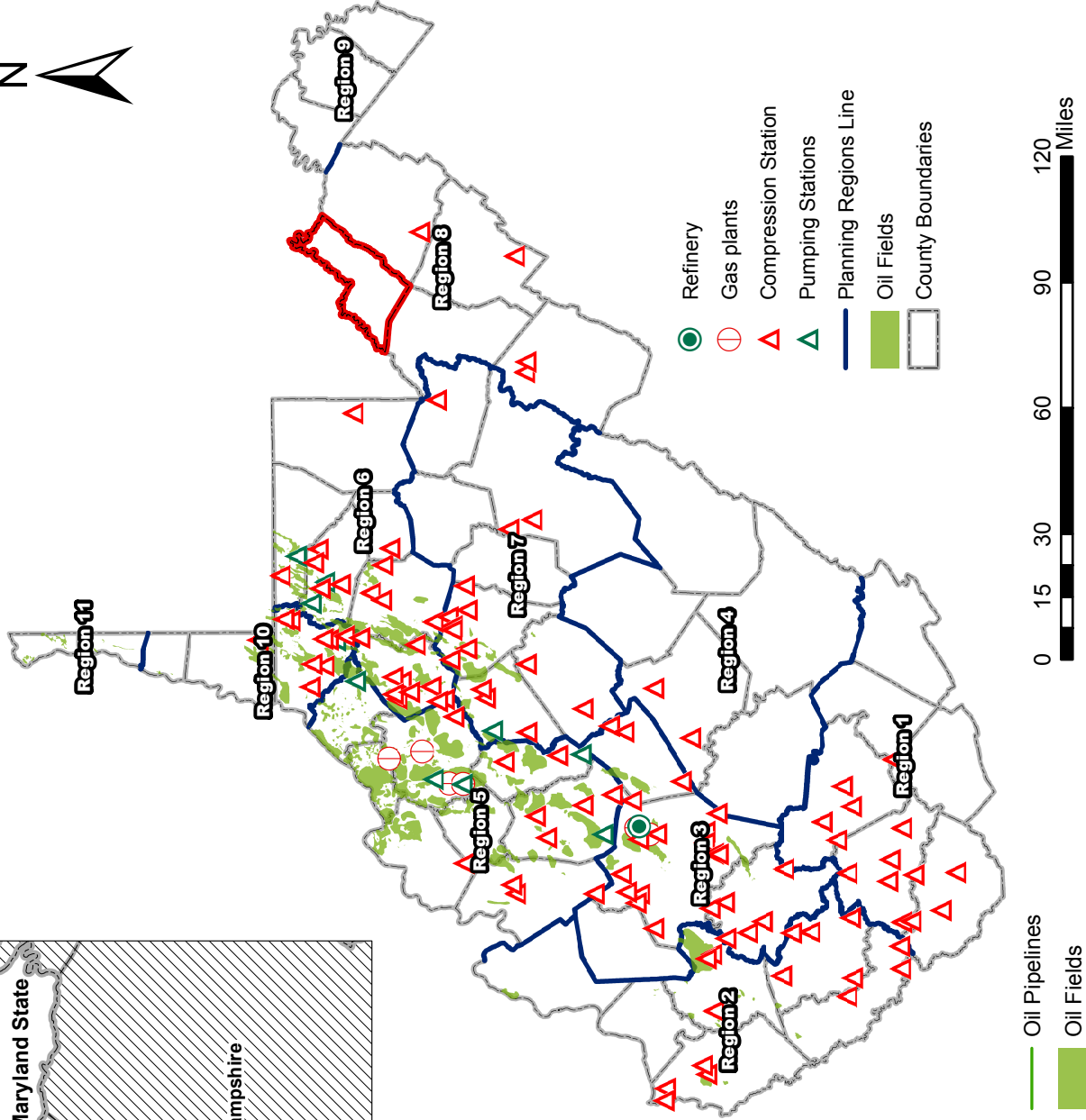
⁹ *Ibid.*

Energy - Gas and Oil

Mineral County



Gas Pipe



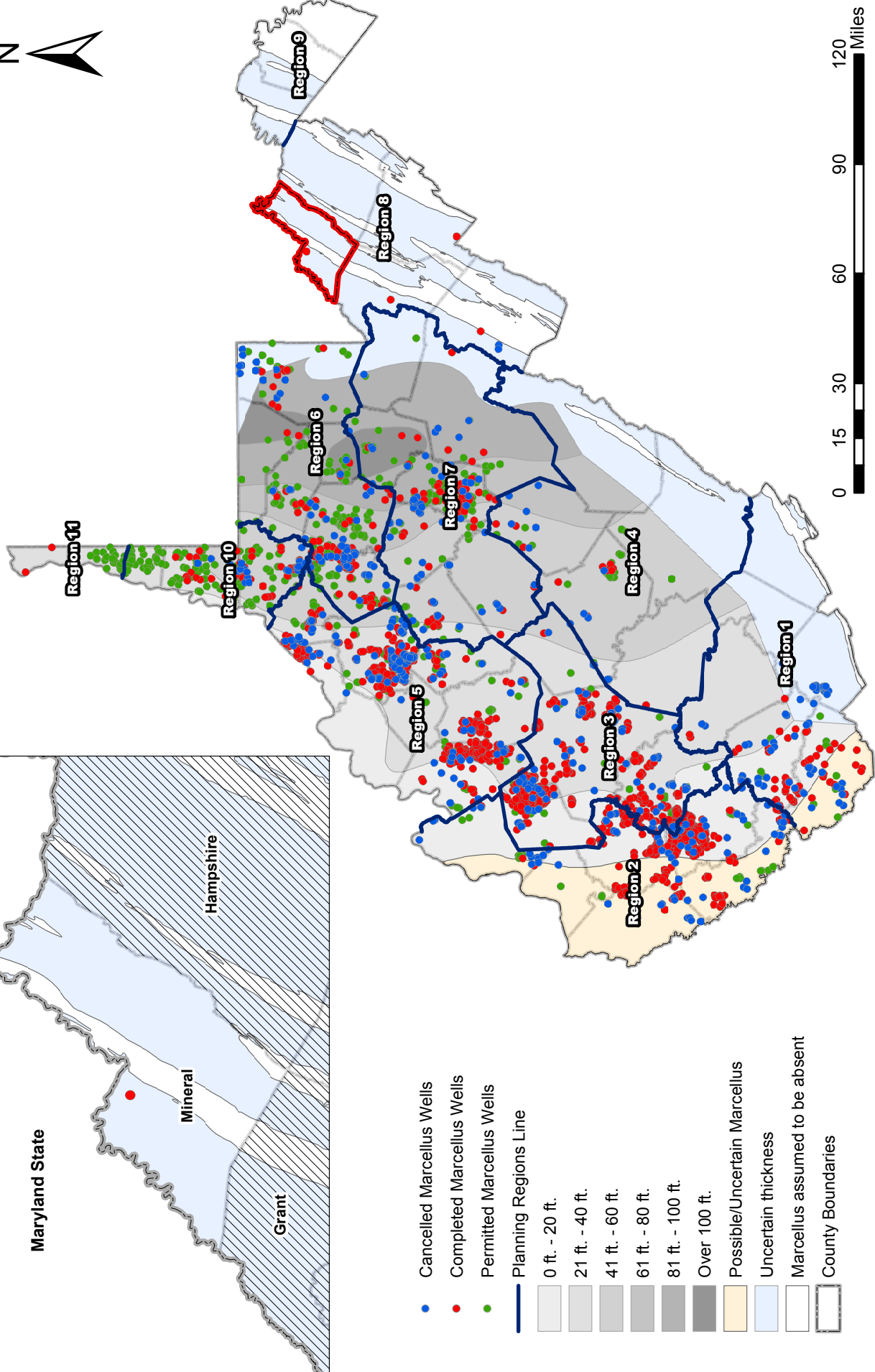
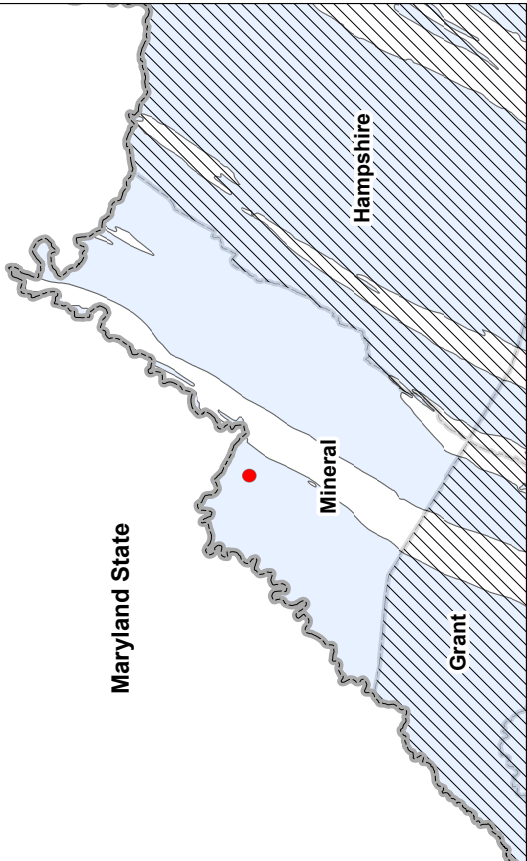
Source: West Virginia Geological and Economic Survey 2007

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raahall Appalachian Transportation Institute is prohibited.



Energy - Marcellus Wells

Mineral County



- Cancelled Marcellus Wells
- Completed Marcellus Wells
- Permitted Marcellus Wells
- Planning Regions Line
- 0 ft. - 20 ft.
- 21 ft. - 40 ft.
- 41 ft. - 60 ft.
- 61 ft. - 80 ft.
- 81 ft. - 100 ft.
- Over 100 ft.
- Possible/Uncertain Marcellus
- Uncertain thickness
- Marcellus assumed to be absent
- County Boundaries

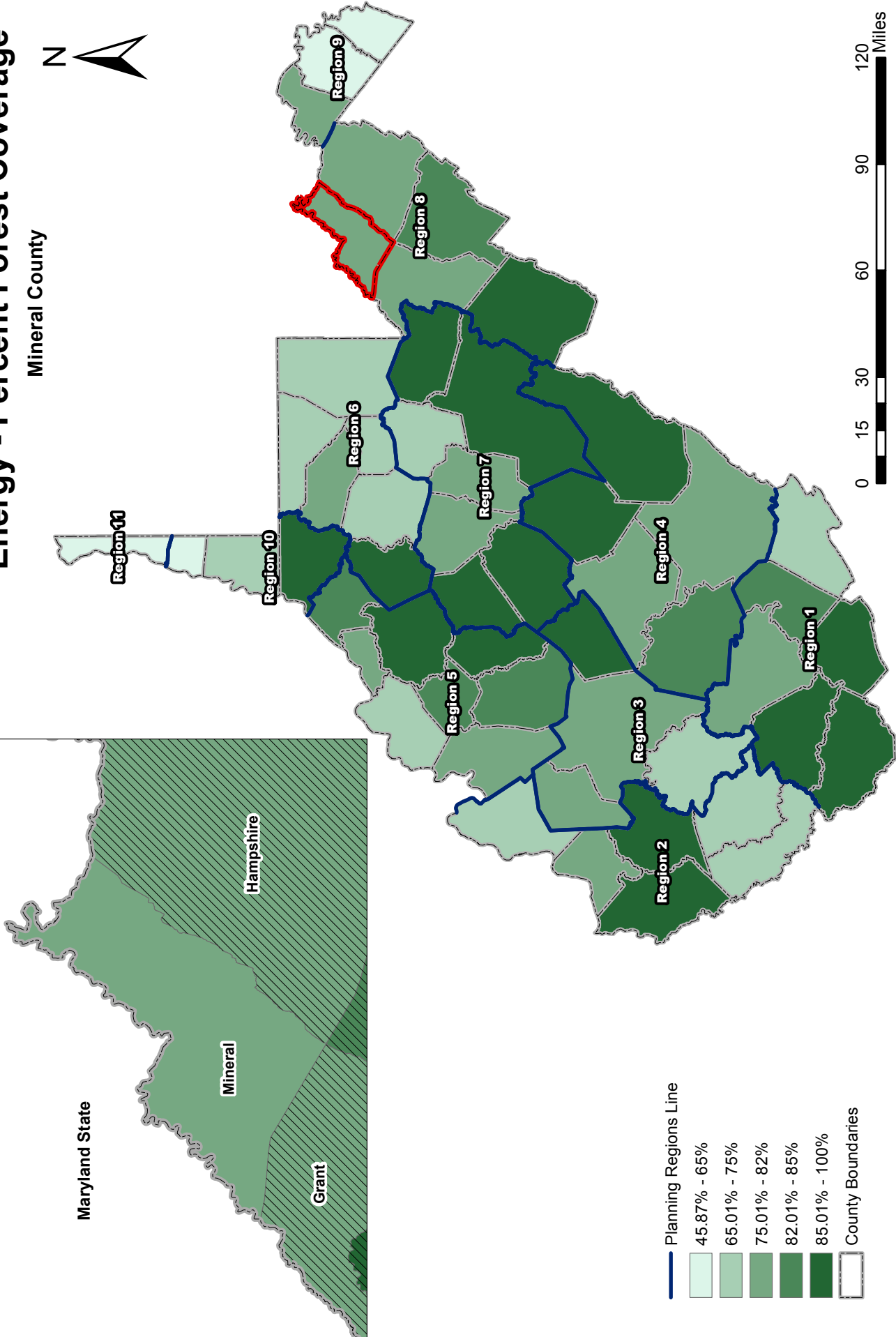
Source: West Virginia Geological and Economic Survey 2014

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raleigh Appalachian Transportation Institute is prohibited.



Energy - Percent Forest Coverage

Mineral County



- Planning Regions Line
- 45.87% - 65%
- 65.01% - 75%
- 75.01% - 82%
- 82.01% - 85%
- 85.01% - 100%
- County Boundaries

Source: Rahall Transportation Institute 2013

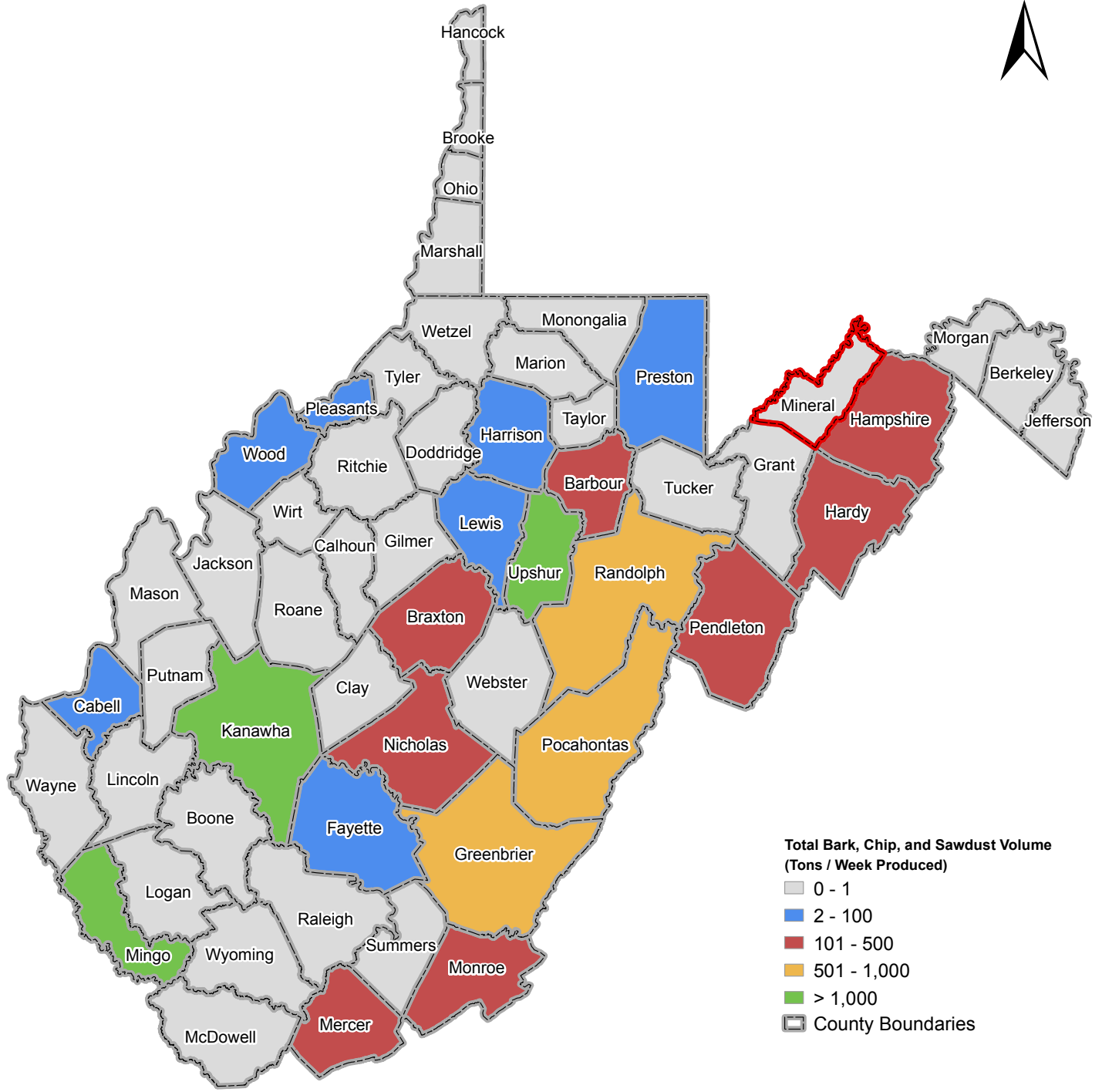
This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahall Appalachian Transportation Institute is prohibited.



www.rtiappalachian.org

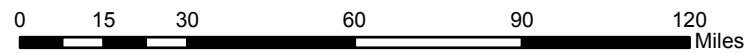
Renewable Energy - Wood By Products

Bark, Chip, and Sawdust Volume Produced - Mineral County



Total Bark, Chip, and Sawdust Volume (Tons / Week Produced)

- 0 - 1
- 2 - 100
- 101 - 500
- 501 - 1,000
- > 1,000
- County Boundaries

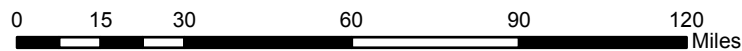
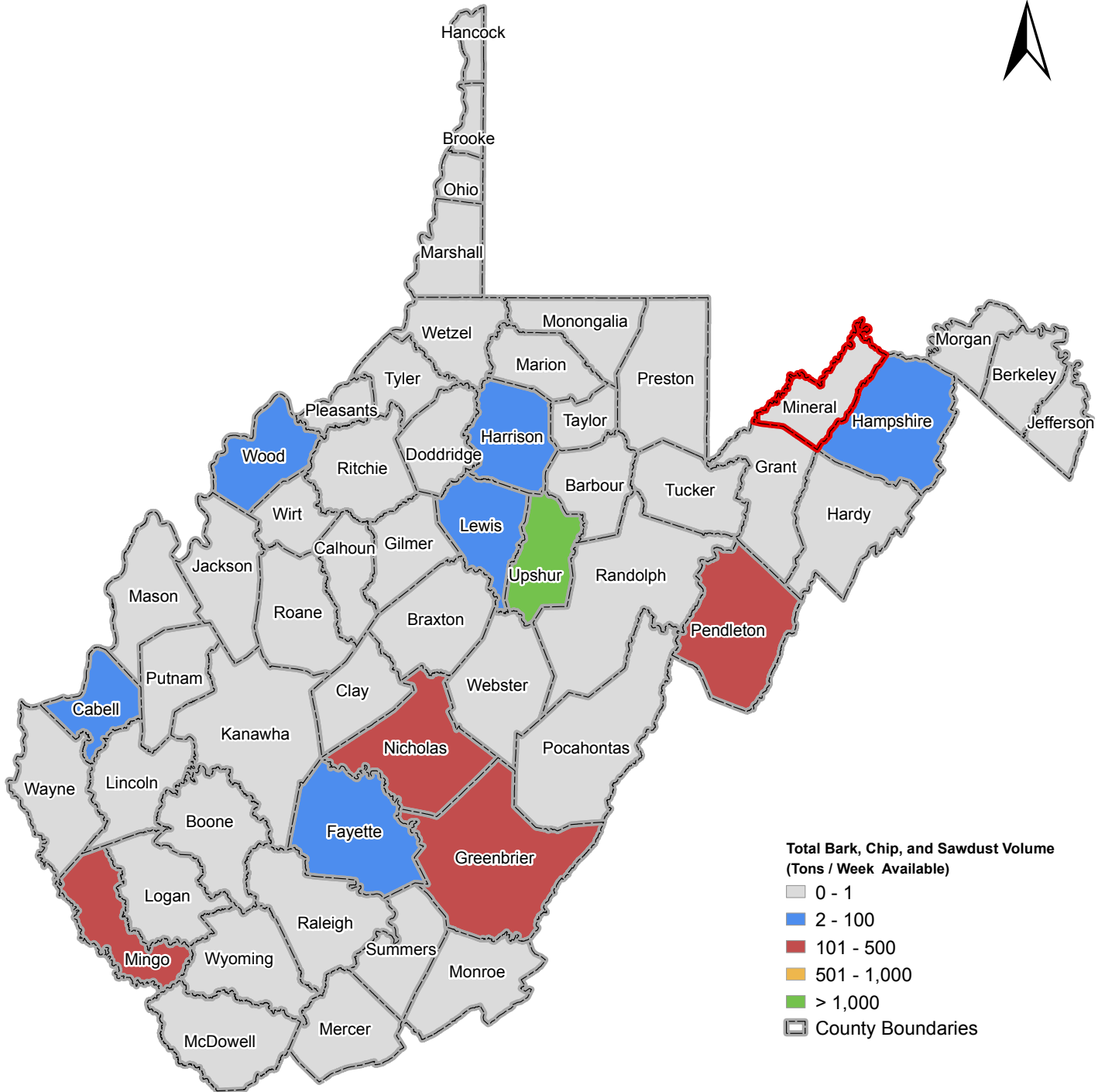


Source: West Virginia Division of Forestry 2014

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahall Appalachian Transportation Institute is prohibited.

Renewable Energy - Wood By Products

Bark, Chip, and Sawdust Volume Available - Mineral County

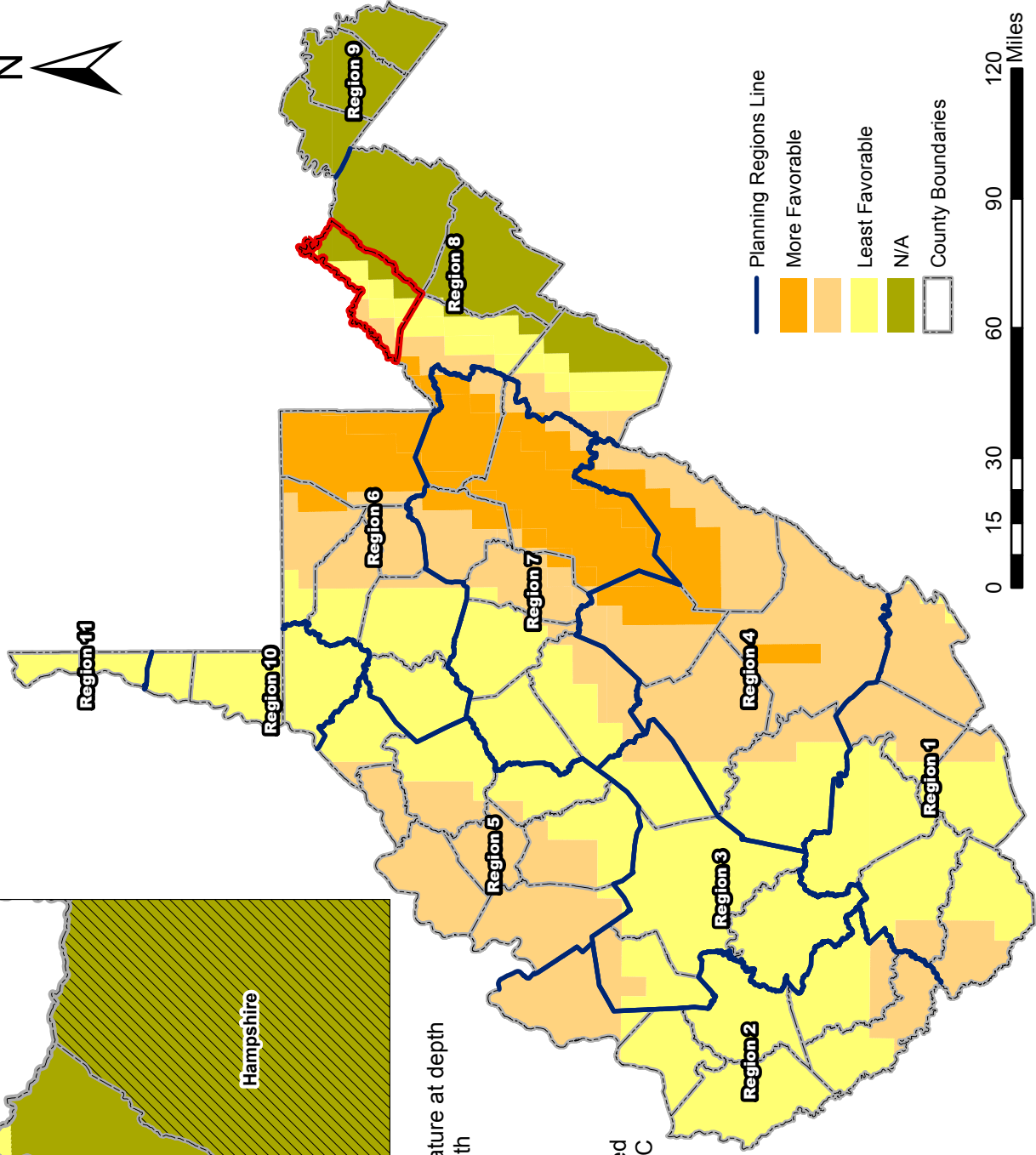
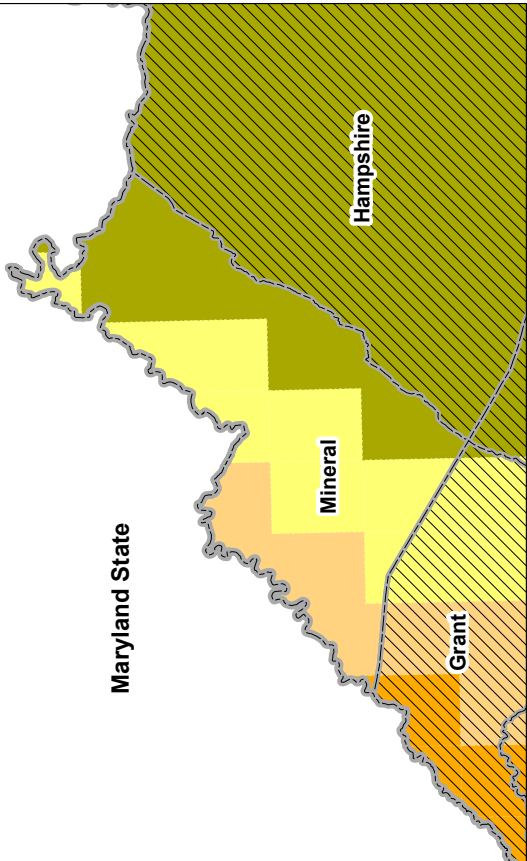


Source: West Virginia Division of Forestry 2014

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahall Appalachian Transportation Institute is prohibited.



Energy - Geothermal Resource of Mineral County Favorability of Deep Enhanced Geothermal Systems



— Source data for deep EGS includes temperature at depth from 3 to 10 km and analyses (for regions with temperatures ≥ 150 degrees C).

— Class values reflect relative favorability, with 1 being more favorable, 3 being least favorable, and "N/A" regions not having been assessed due to temperatures less than 150 degrees C at 10 km depth.

- Planning Regions Line
- More Favorable
- Least Favorable
- N/A
- County Boundaries

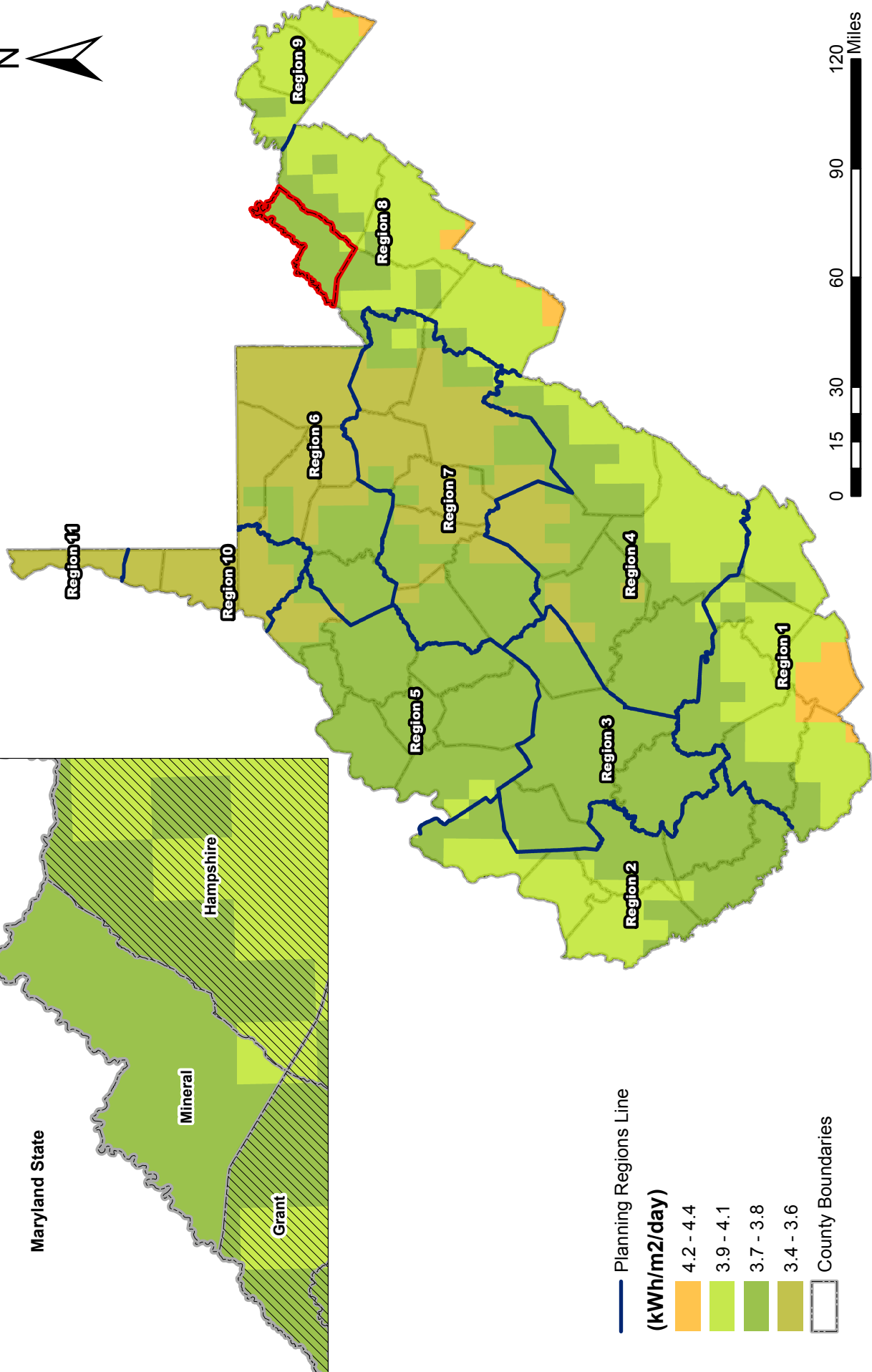
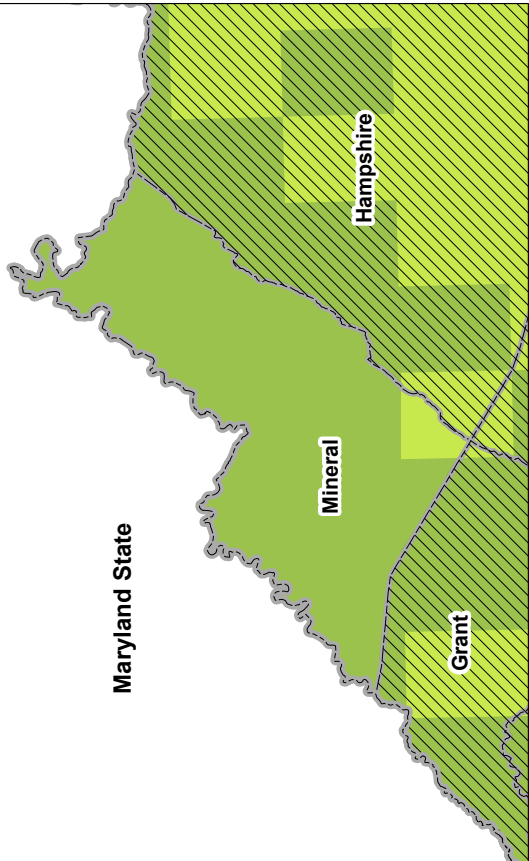


Source: National Renewable Energy Laboratory 2009

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raleigh Appalachian Transportation Institute is prohibited.

Solar - Renewable Energy

Mineral County



- Planning Regions Line
- (kWh/m²/day)
- 4.2 - 4.4
- 3.9 - 4.1
- 3.7 - 3.8
- 3.4 - 3.6
- County Boundaries

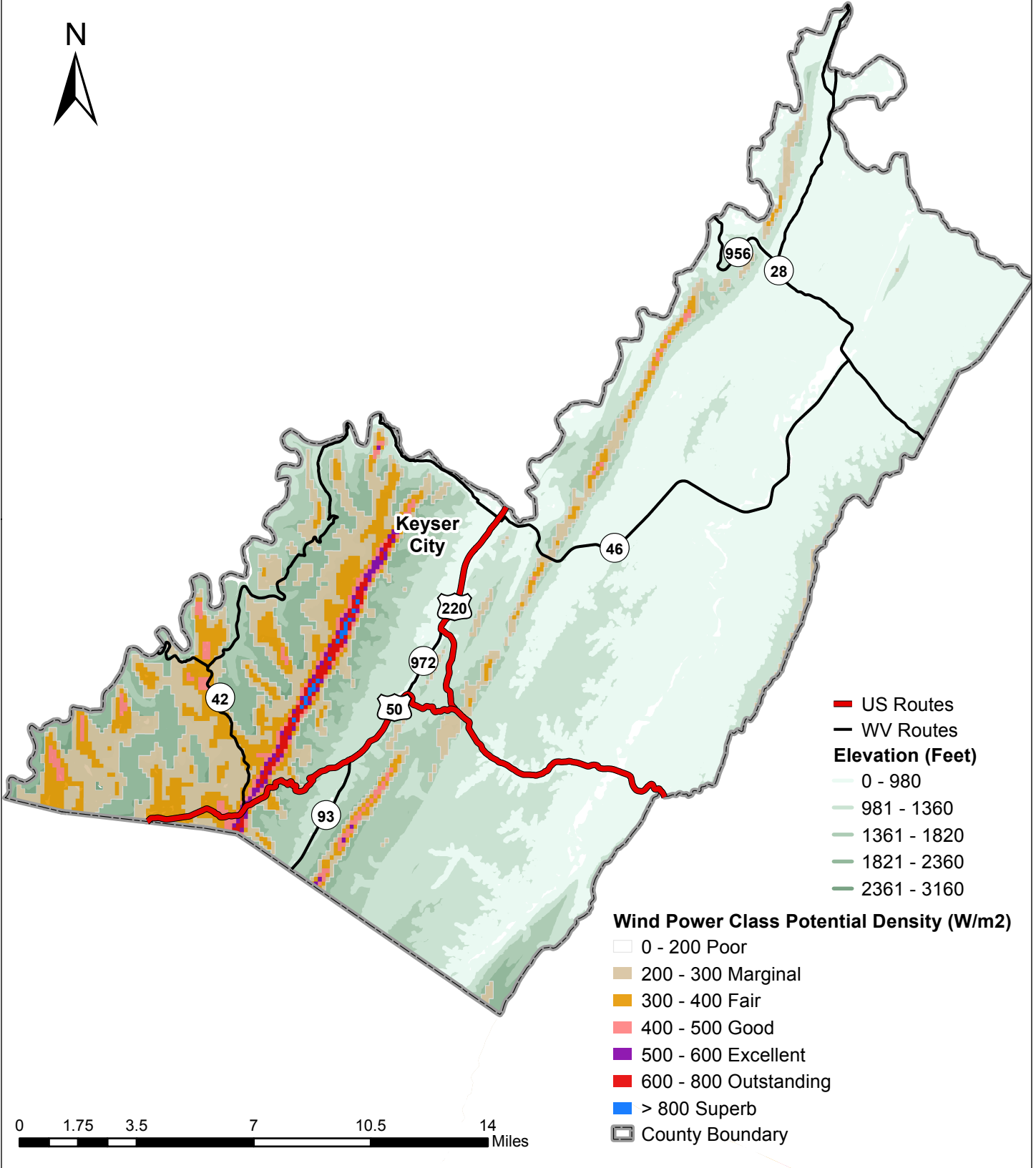
Source: National Renewable Energy Laboratory 2012

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Raheal Appalachian Transportation Institute is prohibited.



Renewable Energy-Wind

Mineral County



Source: National Renewable Energy Laboratory 2006, United States Geological Survey n.d., ESRI, 2013

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahall Appalachian Transportation Institute is prohibited.



IV. Land Use Smart Planning

The research team constructed a smart planning criterion that would apply to each mine site in Mineral. Tax Districts were utilized and labeled based on a particular land use practice that has previously been incorporated into the site. This criterion allows researchers and policymakers to determine suitability after weighing all the factors mentioned in the plan. A range of potential utilizations is given to give optimal control to policymakers and investors.

The table below (Table 2) provides the categories and their areas. The Smart Planning Map (Map 40) showcases the geographies separated by utilization.

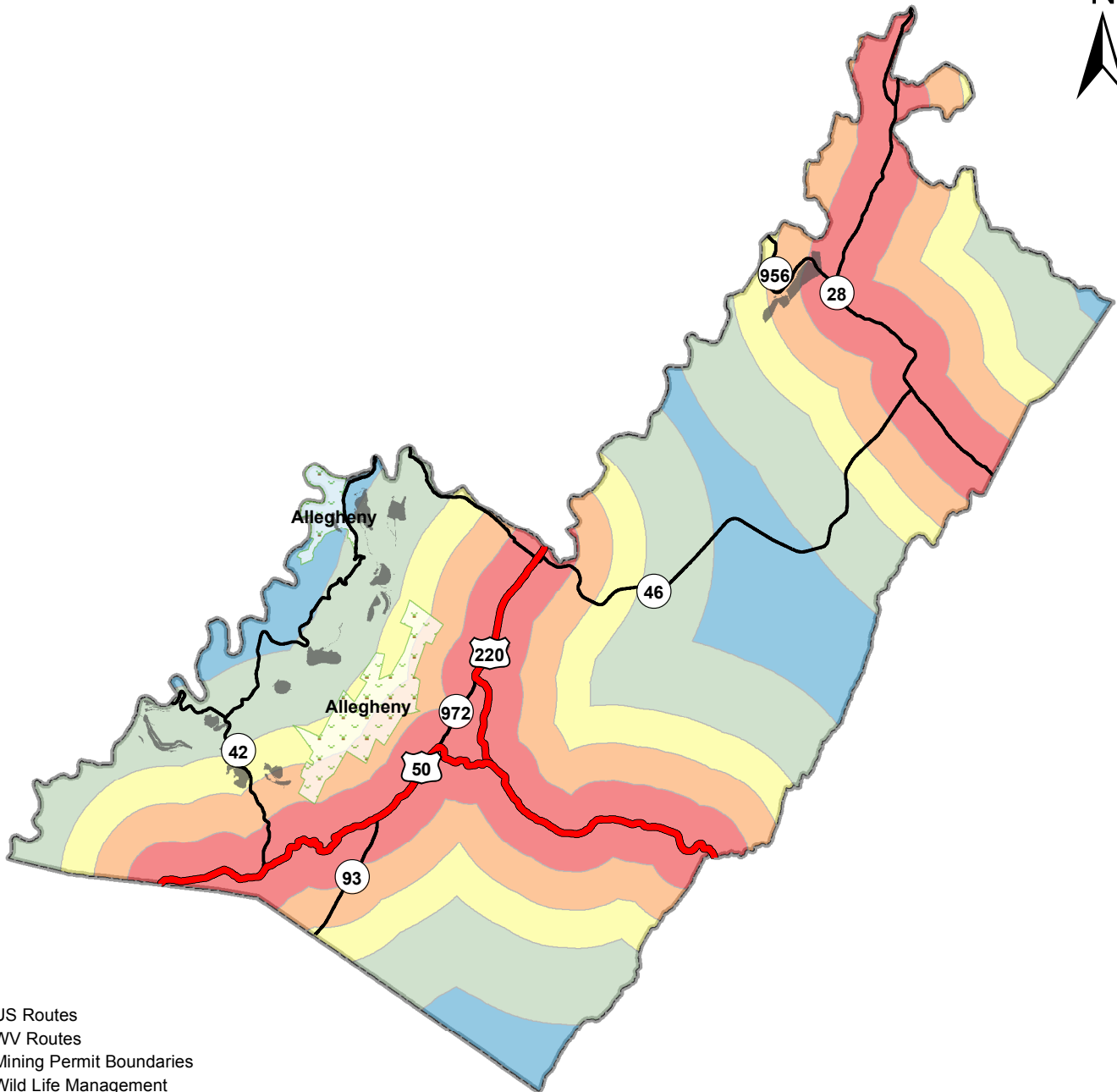
Table 2: Smart Planning Utilizations

Name	Smart Planning Criteria
Utilization Area 0-1 mile	Industrial, Commercial/Retail, Residential, Public Facility, Recreational
Utilization Area 1-2 miles	Industrial, Commercial/Retail, Residential, Public Facilities
Utilization Area 2-3 miles	Industrial, Commercial/Retail, Residential, Recreation
Utilization Area 3-5 miles	Industrial, Residential, Recreation, Agriculture, Forestland
Utilization Area 5-10 miles	Industrial, Residential, Agriculture, Forest Land
Utilization Area 10 miles +	Industrial, Residential, Agriculture, Forest Land

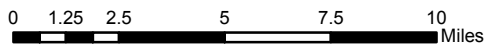
Land development or redevelopment options are determined through a review of the redevelopment authority's anticipated needs. The required infrastructure component standards are determined on a site by site basis by the county economic development authority as designated by West Virginia Code Chapter 05B Article 2A.

Landuse Criteria

Mineral County



- █ US Routes
- WV Routes
- Mining Permit Boundaries
- Wild Life Management
- 0 to 1 Mile (Industrial; Commercial/Retail; Residential; Public Facilities; Recreation)
- 1 to 2 Miles (Industrial; Commercial/Retail, Residential; Public Facilities)
- 2 to 3 Miles (Industrial; Commercial/Retail, Residential; Recreation)
- 3 to 5 Miles (Industrial; Residential; Receration; Agriculture; Forestland)
- 5 to 10 Miles (Industrial; Residential; Agriculture; Forest Land)
- CountyBoundary



Source: Rahall Transportation Institute 2015

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahall Appalachian Transportation Institute is prohibited.

V. Site Evaluation

Once the smart planning buffers have been created, the sites available for analysis are confirmed. This evaluation provides the County with an inventory of post mine sites that are suitable for development. The evaluation consists of existing infrastructure availability, which gives the most accurate assessment of a site's physical capabilities for investment purposes. This will encourage strategic development and evaluation.

Initial Data Collection:

The consulting team collected all available data on surface mines sites located in Mineral County to produce an inventory of sites for analysis. The source for site information was primarily the West Virginia Department of Environment Protection (WV DEP) website, which allows permit searches by geographic location and mining type. The information provided by this source was used to develop a preliminary property database of all surface mines as well as general mapping.

The WV DEP permit database acts as a general clearinghouse for information, but is not infallible. The data is often updated by third-party sources, which increases the margin of error for site location. Because of this, the actual attributes being measured may not be at the distance stated because the mine site is not actually in the location given. The WV DEP has sought to minimize those errors, and RTI attempts to maintain the reliability of the measurements by observing their locations when mapping. RTI does not ensure the reliability of the site location or distances to the attributes. Any and all information should be verified for accuracy.

The initial data collection revealed all the mine sites in the County. Together, the team put together 41 sites for analysis. All of the sites and their distance attributes are listed below.

Table 3: Mineral County Potential Surface Mine Sites for Development

Site No	Permitee	Permit ID	Facility Name	Acres	Issue Date	Expiration Date
1	D. & L. COAL COMPANY, INC.	S008085	NA	23	8/23/1985	8/23/2000
2	D. & L. COAL COMPANY, INC.	S200788	JONES-STULLENBARGER #2 MINE	72	5/20/1988	5/20/1998
3	D. & L. COAL COMPANY, INC.	S200906	Jones Remine	115	7/30/2007	7/30/2017
4	MASTELLER COAL COMPANY (THE)	S001085	NALLY STRIP	142	2/18/1985	2/18/2005
5	D. & L. COAL COMPANY, INC.	S003484	NA	97	6/8/1984	6/8/1999
6	ALLEGHENY MINING CORPORATION	S009277	NA	54.76	6/28/1977	6/28/1982
7	D. & L. COAL COMPANY, INC.	S004479	NA	97.64	4/15/1979	5/24/1997
8	ALLEGHENY MINING CORPORATION	S019376	NA	33	9/9/1976	6/9/1986
9	ROSTOSKY MINING	S003375	NA	0	2/7/1975	2/7/1980
10	D. & L. COAL COMPANY, INC.	I059300	NA	2.5	1/18/1981	7/23/2017
11	NEW ALLEGHENY, INC.	S000882	NA	10	1/22/1982	7/13/1992
12	ROSTOSKY MINING	S000883	NA	0	1/24/1983	1/24/1993
13	D. & L. COAL COMPANY, INC.	S200398	ROSTOSKY-BAKERSTOWN MINE	38	5/26/1998	5/26/2008
14	NEW ALLEGHENY, INC.	S016076	NA	120	7/20/1976	5/18/1992
15	D. & L. COAL COMPANY, INC.	S009479	ROSTOSKY MINE	23	8/15/1979	8/5/1998
16	D. & L. COAL COMPANY, INC.	S200188	NA	112.8	5/3/1988	5/3/2008
17	CHESTNUT RIDGE COAL CORP	Z004481	NA	0	1/26/1981	1/26/1993
18	D. & L. COAL COMPANY, INC.	S200297	MASON REMINE	15	3/2/1998	3/2/2008
19	CHESTNUT RIDGE COAL CORP	S002883	NA	20	4/11/1983	4/11/1993

Site No	Permitee	Permit ID	Facility Name	Acres	Issue Date	Expiration Date
20	D. & L. COAL COMPANY, INC.	S200794	ROSTOSKY #2 MINE	61	8/10/1995	8/10/2010
21	D. & L. COAL COMPANY, INC.	S200792	ATLANTIC HILL MINE	90	8/31/1992	8/31/2007
22	D. & L. COAL COMPANY, INC.	S200497	JONES MINE	12	2/6/1998	2/6/2008
23	D. & L. COAL COMPANY, INC.	I059800	NA	5.9	1/18/1981	7/23/2007
24	D. & L. COAL COMPANY, INC.	S005980	NA	61	6/24/1980	5/24/1997
25	MASTELLER COAL COMPANY (THE)	S204986	NA	85.4	2/2/1987	2/2/1997
26	D. & L. COAL COMPANY, INC.	S200490	NA	184	7/19/1990	7/19/2000
27	LUKE PAPER COMPANY	S018976	HAMPSHIRE HILL MINES	86	9/9/1976	7/30/2017
28	D. & L. COAL COMPANY, INC.	S203386	NA	71.8	9/30/1986	9/30/2001
29	LUKE PAPER COMPANY	Z003681	HAMPSHIRE HILL MINES	101	1/18/1981	7/30/2017
30	D. & L. COAL COMPANY, INC.	S008175	NA	0	3/21/1975	3/21/1980
31	D. & L. COAL COMPANY, INC.	S015773	NA	9.6	8/27/1973	5/24/1987
32	D. & L. COAL COMPANY, INC.	S002974	NA	57.39	3/1/1974	9/24/1992
33	D. & L. COAL COMPANY, INC.	S201389	NA	24	9/11/1989	9/11/1999
34	LUKE PAPER COMPANY	S008480	HAMPSHIRE HILL MINES	38.5	9/8/1980	7/30/2017
35	MASTELLER COAL COMPANY (THE)	S012582	REFUSE SITE #1	49	12/17/1982	12/17/1992
36	DUCKWORTH COAL, INC.	S200506	Piedmont Mine	134	11/28/2006	11/28/2016
37	NEW ALLEGHENY, INC.	S024774	NA	134	12/18/1974	8/2/1997
38	D. & L. COAL COMPANY, INC.	S200407	Howell Run Mine	246	7/23/2008	7/23/2018
39	D. & L. COAL COMPANY, INC.	S000376	NA	190.76	1/9/1976	5/24/1997
40	D. & L. COAL COMPANY, INC.	S105491	NA	16	4/10/1992	4/10/1997
41	NEW ALLEGHENY, INC.	I058200	POTOMAC MANOR NO. 1	24	1/16/1981	1/26/1998

Site Analysis (Distance Analysis)

Once the surface mining sites in the County were identified each of the sites were evaluated by estimating the shortest distance from the site to a specified criteria (features which are important to development). There are two types of distance calculation in this analysis: road-path and Euclidean distance. Road-path distance is the distance when travelling on an actual roadway from the site to the feature; Euclidean distance is when the distance is a straight line from the site to the feature, without the necessity of following a roadway. Following are lists of criteria used in the analysis:

- Road-path Distances:
 - Distance to nearest roadway (Interstate and Existing Highway)
 - Distance to nearest Sewer/ Solid Waste Treatment Facility
- Euclidean Distances:
 - Distance to Water Lines, Sewer Lines, Power Lines and Broadband
 - Distance to Gas Pipe and Oil Pipe
 - Distance to Railroad

The following tables illustrate the results of road-path and Euclidean distance assessments for all of the identified sites for given criteria. All distances were recorded in miles.

Table 4: Assessment of Distances

Site No	Permit ID	Interstate (IS)	Sign - IS	Existing Highway (EH)	Sign - EH	Paved Road	Paved Road Name
1	S008085	44.42	I68	0.579125486	S42	0.493445596	WV 42
2	S200788	45.51	I68	0.432193178	S42	0.105768883	Cemetery
3	S200906	44.53	I68	0.21262342	S42	0.19199648	WV 42
4	S001085	52.03	I68	7.152130607	S46	0.310441377	Old WV 46
5	S003484	45.71	I68	0.893393551	S42	0.115404387	Stullenbarger
6	S009277	42.64	I68	0.010491308	S42	0.010491308	WV 42
7	S004479	51.74	I68	7.076927539	S42	0.123187311	Sinclair Road
8	S019376	42.64	I68	0.010491308	S42	0.010491308	WV 42
9	S003375	44.59	I68	1.491078597	S42	0.392231343	Sulphur - Nethkin
10	I059300	54.66	I68	10.00333747	S42	0.012079564	Part of Old WV 46
11	S000882	48.07	I68	4.903526624	S42	0.138022698	Pinnacle
12	S000883	44.45	I68	1.276261281	S42	0.182606864	Pinnacle
13	S200398	44.19	I68	1.021295957	S42	0.351106946	Pinnacle
14	S016076	49.54	I68	4.666789361	S46	0.052163847	Pinnacle
15	S009479	44.59	I68	1.491078597	S42	0.392231343	Sulphur - Nethkin
16	S200188	44.15	I68	0.517651767	S42	0.357295647	WV 42
17	Z004481	47.74	I68	0.556461435	S42	0.512487727	WV 42
18	S200297	44.16	I68	0.325352847	S42	0.236475838	WV 42
19	S002883	46.23	I68	0.647068656	S42	0.2373912	Stullenbarger
20	S200794	44.56	I68	1.391386197	S42	0.405079369	Pinnacle
21	S200792	47.47	I68	3.21819526	S42	0.155885043	Bosley
22	S200497	44.14	I68	0.033614066	S42	0.041613953	WV 42
23	I059800	45.21	I68	2.493549235	S42	0.005245654	Oakmont
24	S005980	45.51	I68	1.02898395	S42	0.371610862	Hartmansville
25	S204986	51.53	I68	3.527031292	S46	0.526846876	Green Mountain Road
26	S200490	44.85	I68	2.132468409	S42	0.434615819	Oakmont

Site No	Permit ID	Interstate (IS)	Sign - IS	Existing Highway (EH)	Sign - EH	Paved Road	Paved Road Name
27	S018976	53.03	I68	8.368494146	S42	0.40059765	WV 46
28	S203386	45.26	I68	2.543071568	S42	0.166957832	Oakmont
29	Z003681	52.82	I68	8.156143651	S42	0.31157595	WV 46
30	S008175	45.55	I68	1.061293924	S42	0.412079425	Hartmansville
31	S015773	44.96	I68	1.031521983	S42	0.099667426	Hartmansville
32	S002974	45.80	I68	0.930662446	S42	0.157369619	Stullenbarger
33	S201389	42.80	I68	0.005245654	S42	0.010491308	WV 42
34	S008480	52.76	I68	8.102420882	S42	0.2077173	WV 46
35	S012582	51.75	I68	7.087579306	S42	0.090773881	Sinclair Road
36	S200506	59.13	I68	1.420348868	S46	0.834666301	Old WV 46
37	S024774	42.79	I68	1.264494543	S42	0.48961935	Sulphur - Hartmons ville
38	S200407	48.90	I68	4.236487288	S42	0.531776454	WV 46
39	S000376	43.34	I68	0.032679308	S42	0.031473924	WV 42
40	S105491	44.85	I68	1.313754528	S42	0.188843543	Hartmansville
41	I058200	46.00	I68	3.283304662	S42	0.28190205	Oakmont

Table 5: Shortest Distances from Sites to Other Transportation Methods

Site No	Permit ID	Railroad
1	S008085	1.93
2	S200788	0.60
3	S200906	1.57
4	S001085	2.51
5	S003484	0.47
6	S009277	4.34
7	S004479	1.52
8	S019376	4.34
9	S003375	2.48
10	I059300	0.05
11	S000882	4.57
12	S000883	3.15
13	S200398	2.92
14	S016076	3.50
15	S009479	2.48
16	S200188	2.27
17	Z004481	0.34
18	S200297	1.83
19	S002883	0.70
20	S200794	2.85
21	S200792	2.25
22	S200497	1.73
23	I059800	0.54
24	S005980	1.76
25	S204986	1.85
26	S200490	0.68

Site No	Permit ID	Railroad
27	S018976	1.00
28	S203386	0.69
29	Z003681	1.18
30	S008175	1.84
31	S015773	1.37
32	S002974	0.80
33	S201389	4.21
34	S008480	1.23
35	S012582	1.58
36	S200506	0.58
37	S024774	3.59
38	S200407	3.46
39	S000376	3.78
40	S105491	1.02
41	I058200	0.02

Table 6: Shortest Distances from Sites to Sewer Lines (SL) and Water Lines (WL)

Site No	Permit ID	Dist - SL	Utility (SL)	Dist - WL	Utility (WL)
1	S008085	1.37	Mountain Top Public Service District	0.54	Mountain Top Public Service District
2	S200788	0.29	Mountain Top Public Service District	0.29	Mountain Top Public Service District
3	S200906	0.88	Mountain Top Public Service District	0.21	Mountain Top Public Service District
4	S001085	2.30	New Creek Public Service District	3.00	City of Piedmont Municipal Water Department
5	S003484	0.52	Mountain Top Public Service District	0.53	Mountain Top Public Service District
6	S009277	3.62	Mountain Top Public Service District	0.00	Mountain Top Public Service District
7	S004479	2.45	City of Piedmont (Sewer)	2.30	City of Piedmont Municipal Water Department
8	S019376	3.62	Mountain Top Public Service District	0.00	Mountain Top Public Service District
9	S003375	1.55	Mountain Top Public Service District	0.88	Mountain Top Public Service District
10	I059300	0.78	City of Piedmont (Sewer)	0.71	City of Piedmont Municipal Water Department
11	S000882	2.62	New Creek Public Service District	2.85	New Creek Water Association, Inc.
12	S000883	2.25	Mountain Top Public Service District	0.92	Mountain Top Public Service District
13	S200398	2.04	Mountain Top Public Service District	0.66	Mountain Top Public Service District
14	S016076	1.88	New Creek Public Service District	2.59	New Creek Water Association, Inc.
15	S009479	1.55	Mountain Top Public Service District	0.88	Mountain Top Public Service District
16	S200188	1.58	Mountain Top Public Service District	0.39	Mountain Top Public Service District
17	Z004481	1.63	Mountain Top Public Service District	1.64	Mountain Top Public Service District
18	S200297	1.17	Mountain Top Public Service District	0.26	Mountain Top Public Service District
19	S002883	1.22	Mountain Top Public Service District	1.23	Mountain Top Public Service District
20	S200794	1.97	Mountain Top Public Service District	0.66	Mountain Top Public Service District
21	S200792	1.67	Mountain Top Public Service District	1.63	Mountain Top Public Service District
22	S200497	0.94	Mountain Top Public Service District	0.04	Mountain Top Public Service District
23	I059800	2.26	Mountain Top Public Service District	2.27	Mountain Top Public Service District
24	S005980	1.26	Mountain Top Public Service District	0.62	Mountain Top Public Service District
25	S204986	1.54	New Creek Public Service District	2.43	New Creek Water Association, Inc.

Site No	Permit ID	Dist - SL	Utility (SL)	Dist - WL	Utility (WL)
26	S200490	1.52	Mountain Top Public Service District	1.53	Mountain Top Public Service District
27	S018976	1.82	City of Piedmont (Sewer)	1.67	City of Piedmont Municipal Water Department
28	S203386	2.03	Mountain Top Public Service District	2.04	Mountain Top Public Service District
29	Z003681	1.96	City of Piedmont (Sewer)	1.81	City of Piedmont Municipal Water Department
30	S008175	1.43	Mountain Top Public Service District	0.84	Mountain Top Public Service District
31	S015773	1.22	Mountain Top Public Service District	0.93	Mountain Top Public Service District
32	S002974	0.77	Mountain Top Public Service District	0.79	Mountain Top Public Service District
33	S201389	3.48	Mountain Top Public Service District	0.01	Mountain Top Public Service District
34	S008480	2.07	City of Piedmont (Sewer)	1.92	City of Piedmont Municipal Water Department
35	S012582	2.58	City of Piedmont (Sewer)	2.43	City of Piedmont Municipal Water Department
36	S200506	1.12	City of Piedmont (Sewer)	1.01	City of Piedmont Municipal Water Department
37	S024774	2.93	Mountain Top Public Service District	0.71	Mountain Top Public Service District
38	S200407	3.06	Mountain Top Public Service District	3.06	Mountain Top Public Service District
39	S000376	3.00	Mountain Top Public Service District	0.04	Mountain Top Public Service District
40	S105491	1.06	Mountain Top Public Service District	1.03	Mountain Top Public Service District
41	I058200	2.71	Mountain Top Public Service District	2.72	Mountain Top Public Service District

Table 7: Shortest Distances from Sites to Broadband (BB) and Power Lines (PL)

Site No	Permit ID	Dist - BB	Provider (BB)	Dist - PL	Type (PL)	Size_kV
1	S008085	1.14	Frontier West Virginia, Inc.	0.85	Transmission	115-138
2	S200788	1.50	Frontier West Virginia, Inc.	0.45	Transmission	115-138
3	S200906	1.04	Frontier West Virginia, Inc.	0.34	Transmission	115-138
4	S001085	1.27	Comcast Cable Communications, LLC	3.09	Transmission	115-138
5	S003484	1.84	Frontier West Virginia, Inc.	0.35	Sub-Transmission	Unknown
6	S009277	0.14	Frontier West Virginia, Inc.	2.46	Transmission	115-138
7	S004479	2.76	Comcast Cable Communications, LLC	4.61	Transmission	115-138
8	S019376	0.14	Frontier West Virginia, Inc.	2.46	Transmission	115-138
9	S003375	0.23	Frontier West Virginia, Inc.	0.02	Transmission	115-138
10	I059300	3.28	Comcast Cable Communications, LLC	5.79	Sub-Transmission	Unknown
11	S000882	0.86	Comcast Cable Communications, LLC	2.02	Transmission	115-138
12	S000883	0.98	Frontier West Virginia, Inc.	0.51	Transmission	115-138
13	S200398	0.84	Frontier West Virginia, Inc.	0.61	Transmission	115-138
14	S016076	0.40	Comcast Cable Communications, LLC	2.08	Transmission	115-138
15	S009479	0.23	Frontier West Virginia, Inc.	0.02	Transmission	115-138
16	S200188	0.92	Frontier West Virginia, Inc.	0.96	Transmission	115-138
17	Z004481	2.84	Frontier West Virginia, Inc.	0.03	Transmission	115-138
18	S200297	1.12	Frontier West Virginia, Inc.	0.63	Transmission	115-138
19	S002883	2.41	Frontier West Virginia, Inc.	0.11	Transmission	115-138
20	S200794	0.75	Frontier West Virginia, Inc.	0.52	Transmission	115-138
21	S200792	0.51	Frontier West Virginia, Inc.	1.77	Transmission	115-138
22	S200497	0.75	Frontier West Virginia, Inc.	0.27	Transmission	115-138
23	I059800	2.61	Frontier West Virginia, Inc.	0.36	Sub-Transmission	Unknown
24	S005980	1.31	Frontier West Virginia, Inc.	0.73	Transmission	115-138
25	S204986	0.60	Comcast Cable Communications, LLC	2.82	Sub-Transmission	Unknown
26	S200490	2.46	Frontier West Virginia, Inc.	0.26	Transmission	115-138

Site No	Permit ID	Dist - BB	Provider (BB)	Dist - PL	Type (PL)	Size_kV
27	S018976	2.63	Comcast Cable Communications, LLC	4.74	Transmission	115-138
28	S203386	2.52	Frontier West Virginia, Inc.	0.29	Sub-Transmission	Unknown
29	Z003681	2.53	Comcast Cable Communications, LLC	4.58	Transmission	115-138
30	S008175	1.25	Frontier West Virginia, Inc.	0.87	Transmission	115-138
31	S015773	1.69	Frontier West Virginia, Inc.	0.51	Transmission	115-138
32	S002974	1.98	Frontier West Virginia, Inc.	0.03	Transmission	115-138
33	S201389	0.02	Frontier West Virginia, Inc.	2.28	Transmission	115-138
34	S008480	2.60	Comcast Cable Communications, LLC	4.61	Transmission	115-138
35	S012582	2.91	Comcast Cable Communications, LLC	4.72	Transmission	115-138
36	S200506	1.93	Comcast Cable Communications, LLC	4.39	Sub-Transmission	Unknown
37	S024774	0.50	Frontier West Virginia, Inc.	2.16	Transmission	115-138
38	S200407	1.62	Frontier West Virginia, Inc.	3.01	Transmission	115-138
39	S000376	0.37	Frontier West Virginia, Inc.	1.70	Transmission	115-138
40	S105491	2.09	Frontier West Virginia, Inc.	0.08	Sub-Transmission	Unknown
41	I058200	3.13	Frontier West Virginia, Inc.	0.71	Transmission	115-138

Table 8: Shortest Distances from Sites to Sewer (SW) and Solid Waste (SD) Treatment Facilities

Site No	Permit ID	Dist - SW	Facility (SW)	Dist - SD	Facility (SD)
1	S008085	8.86	NEW CREEK INVESTMENTS	26.59	Tucker Co. Landfill
2	S200788	9.95	NEW CREEK INVESTMENTS	27.69	Tucker Co. Landfill
3	S200906	8.97	NEW CREEK INVESTMENTS	26.70	Tucker Co. Landfill
4	S001085	9.30	KEYSER CITY OF	24.10	Region 8, Romney
5	S003484	10.15	NEW CREEK INVESTMENTS	27.88	Tucker Co. Landfill
6	S009277	5.92	NEW CREEK INVESTMENTS	23.74	Region 8, Romney
7	S004479	10.80	KEYSER CITY OF	25.61	Region 8, Romney
8	S019376	5.92	NEW CREEK INVESTMENTS	23.74	Region 8, Romney
9	S003375	9.02	NEW CREEK INVESTMENTS	26.77	Tucker Co. Landfill
10	I059300	12.67	KEYSER CITY OF	27.48	Region 8, Romney
11	S000882	8.35	KEYSER CITY OF	23.16	Region 8, Romney
12	S000883	8.70	NEW CREEK INVESTMENTS	26.52	Region 8, Romney
13	S200398	8.45	NEW CREEK INVESTMENTS	26.26	Region 8, Romney
14	S016076	6.81	KEYSER CITY OF	21.62	Region 8, Romney
15	S009479	9.02	NEW CREEK INVESTMENTS	26.77	Tucker Co. Landfill
16	S200188	8.60	NEW CREEK INVESTMENTS	26.33	Tucker Co. Landfill
17	Z004481	12.18	NEW CREEK INVESTMENTS	29.91	Tucker Co. Landfill
18	S200297	8.60	NEW CREEK INVESTMENTS	26.33	Tucker Co. Landfill
19	S002883	10.67	NEW CREEK INVESTMENTS	28.40	Tucker Co. Landfill
20	S200794	8.82	NEW CREEK INVESTMENTS	26.63	Region 8, Romney
21	S200792	11.72	NEW CREEK INVESTMENTS	26.58	Region 8, Romney
22	S200497	8.58	NEW CREEK INVESTMENTS	26.31	Tucker Co. Landfill
23	I059800	9.88	MOUNT STORM VILLAGE	27.38	Tucker Co. Landfill
24	S005980	10.20	MOUNT STORM VILLAGE	27.70	Tucker Co. Landfill
25	S204986	5.68	KEYSER CITY OF	20.48	Region 8, Romney

Site No	Permit ID	Dist - SW	Facility (SW)	Dist - SD	Facility (SD)
26	S200490	9.53	MOUNT STORM VILLAGE	27.02	Tucker Co. Landfill
27	S018976	11.04	KEYSER CITY OF	25.85	Region 8, Romney
28	S203386	9.94	MOUNT STORM VILLAGE	27.43	Tucker Co. Landfill
29	Z003681	10.83	KEYSER CITY OF	25.64	Region 8, Romney
30	S008175	10.23	MOUNT STORM VILLAGE	27.73	Tucker Co. Landfill
31	S015773	9.64	MOUNT STORM VILLAGE	27.15	Tucker Co. Landfill
32	S002974	10.24	NEW CREEK INVESTMENTS	27.97	Tucker Co. Landfill
33	S201389	6.08	NEW CREEK INVESTMENTS	23.90	Region 8, Romney
34	S008480	10.77	KEYSER CITY OF	25.59	Region 8, Romney
35	S012582	10.80	KEYSER CITY OF	25.62	Region 8, Romney
36	S200506	7.40	KEYSER CITY OF	22.21	Region 8, Romney
37	S024774	7.46	MOUNT STORM VILLAGE	24.97	Tucker Co. Landfill
38	S200407	11.25	KEYSER CITY OF	26.06	Region 8, Romney
39	S000376	6.63	NEW CREEK INVESTMENTS	24.44	Region 8, Romney
40	S105491	9.53	MOUNT STORM VILLAGE	27.04	Tucker Co. Landfill
41	I058200	10.67	MOUNT STORM VILLAGE	28.17	Tucker Co. Landfill

Table 9: Shortest Distances from Sites to Gas Pipe (GP) and Oil Pipe (OP)

Site No	Permit ID	Dist - GP	Company Gas Pipe	Dist - OP	Company Oil Pipeline
1	S008085	1.35	Columbia Gas Transmission Corp.	0.50	CL
2	S200788	0.03	Columbia Gas Transmission Corp.	0.61	CL
3	S200906	0.85	Columbia Gas Transmission Corp.	0.32	CL
4	S001085	0.54	Columbia Gas Transmission Corp.	0.37	CL
5	S003484	0.03	Columbia Gas Transmission Corp.	0.91	CL
6	S009277	3.33	Columbia Gas Transmission Corp.	0.78	Unknown
7	S004479	1.94	Columbia Gas Transmission Corp.	1.15	CL
8	S019376	3.33	Columbia Gas Transmission Corp.	0.78	Unknown
9	S003375	0.73	Columbia Gas Transmission Corp.	1.34	CL
10	I059300	0.37	Columbia Gas Transmission Corp.	1.08	CL
11	S000882	0.28	Columbia Gas Transmission Corp.	1.74	CL
12	S000883	1.41	Columbia Gas Transmission Corp.	1.99	CL
13	S200398	1.40	Columbia Gas Transmission Corp.	1.74	CL
14	S016076	0.31	Columbia Gas Transmission Corp.	1.40	CL
15	S009479	0.73	Columbia Gas Transmission Corp.	1.34	CL
16	S200188	1.52	Columbia Gas Transmission Corp.	0.91	CL
17	Z004481	0.52	Columbia Gas Transmission Corp.	1.62	CL
18	S200297	1.13	Columbia Gas Transmission Corp.	0.51	CL
19	S002883	0.48	Columbia Gas Transmission Corp.	1.12	CL
20	S200794	1.30	Columbia Gas Transmission Corp.	1.68	CL
21	S200792	0.84	Columbia Gas Transmission Corp.	0.54	CL
22	S200497	0.82	Columbia Gas Transmission Corp.	0.51	CL
23	I059800	1.27	Columbia Gas Transmission Corp.	1.39	CL
24	S005980	1.22	Columbia Gas Transmission Corp.	0.31	CL
25	S204986	0.40	Columbia Gas Transmission Corp.	0.50	CL
26	S200490	0.68	Columbia Gas Transmission Corp.	1.24	CL

Site No	Permit ID	Dist - GP	Company Gas Pipe	Dist - OP	Company Oil Pipeline
27	S018976	1.31	Columbia Gas Transmission Corp.	1.13	CL
28	S203386	1.09	Columbia Gas Transmission Corp.	1.33	CL
29	Z003681	1.46	Columbia Gas Transmission Corp.	1.10	CL
30	S008175	1.36	Columbia Gas Transmission Corp.	0.30	CL
31	S015773	0.93	Columbia Gas Transmission Corp.	0.27	CL
32	S002974	0.35	Columbia Gas Transmission Corp.	0.73	CL
33	S201389	3.15	Columbia Gas Transmission Corp.	0.91	Unknown
34	S008480	1.56	Columbia Gas Transmission Corp.	1.13	CL
35	S012582	2.07	Columbia Gas Transmission Corp.	1.26	CL
36	S200506	0.44	Columbia Gas Transmission Corp.	0.09	CL
37	S024774	2.81	Columbia Gas Transmission Corp.	1.59	Unknown
38	S200407	0.56	Columbia Gas Transmission Corp.	0.89	CL
39	S000376	2.57	Columbia Gas Transmission Corp.	1.44	Unknown
40	S105491	0.57	Columbia Gas Transmission Corp.	0.71	CL
41	I058200	1.57	Columbia Gas Transmission Corp.	1.84	CL

Suitability Model

The suitability model for Mineral County is created with a weighted scoring method. The method scores options against a prioritized requirements list to determine which option best fits the selection criteria. Using a consistent list of criteria, weighted according to the importance or priority of the criteria to the researcher, a comparison of similar “products” can be completed. If numerical values are assigned to the criteria priorities (**weighting**) and the ability of the product to meet a specific criterion (**scoring**), a “score” can be derived. By summing the score (**total score**), the product most closely meeting the criteria can be determined.

Criteria are chosen and weighted based on published Land Use Master Plans (LUMPs) for several counties in West Virginia, RTI’s own research on the existing conditions in Mineral County and expert advice about important factors to site development.¹⁰ Then, scores for each site are given by comparing the closest distance from the site to all factors within given distance thresholds. There are four sets of scores in this suitability model: **absolute scores**, **relative scores**, and the **total score**.

Absolute scores are given by comparing certain distance thresholds with the results of GIS Distance Analysis. Thresholds are determined mainly based on the researcher’s experience, characteristics of the considered criteria and the priority given to the criteria. For example, if the closest distance from a site to an existing highway ranges from 2.5 to 5 miles, the site will be given 7 points for the Existing Highways Criteria. Absolute scores will directly affect the site selection. Different score categories may result in significant change in the cost of investment, and will thus impact the County’s decisions.

Relative scores, on the other hand, depend solely on the closest distances of sites to relative criteria features. Initially, statistical values will be computed according to distance values from all sites to a certain factor (criteria), including min, quartile 1 – Q1, quartile 2 – Q2, quartile 3 – Q3, and max. Then, distance values will be classified into four groups and given the scores shown in Table 12 (below). This score set is used to sharpen differences between all sites in a certain category and therefore aid the decision maker. For example, two sites may have the same absolute score (in the same range of miles) but may fall in different statistical groups. Then the two sites will have different relative scores.

The total score is a combination of weights, absolute scores, and relative scores. The following equation is used to calculate the total score of a certain studied site:

$$\text{Total score of site A} = \sum (\text{absolute score} \times \text{relative score} \times \text{weight})_{ci} / 10 \quad (\text{ci: criteria i})$$

¹⁰ Joseph, M. A *Decision-Support Model of Land Suitability Analysis for the Ohio Lake Erie Balanced Growth Program*. EcoCity Cleveland. (2006).

Sites with higher total scores reveal a higher chance of being developed. Total scores will vary according to a combination of four components: weights, absolute scores, and relative scores.

1. Weighting

Table 10 prioritizes post-mining land-use criteria for surface coal mining site selection in Mineral County. Criteria weights are assigned on a one-to-ten scale. According to Joseph, utilities (power, water, and sewer) and road networks are considered more important factors to development. Therefore, those factors receive higher weights (7-10) in the suitability model. On the other hand, decision-makers are less affected by factors such as airports, national waterways, and ports. Those factors may be good supplements but do not critically change the investments.

Table 10: Weighting Sites Selection Criteria

No	Criteria	Weight
1	Broadband	9
2	Gas Pipes	6
3	Oil Pipelines	6
4	Power Lines	10
5	Railroads	5
6	Sewer Lines	8
7	Water Lines	10
8	Existing Highway	8
9	Interstate	8
10	Sewer Treatment Facilities	7
11	Solid Waste Treatment Facilities	8

2. Scoring

2.1 Absolute Scores:

The shorter the distance to a feature from a site, the higher absolute score the site receives. Table 11 describes the thresholds and score categories for each criterion, ranging from 1 to 10. In order to achieve a better comparison between sites, the score scale is evenly distributed between five distance groups (1-3-5-7-10).

As mentioned previously, thresholds are mainly defined based on researcher experience, traveling method from a site to the features (road-path vs. Euclidean), and characteristic of criteria (type of feature, priority, and density). For example, distance thresholds for “Existing Highway” are much smaller than ones for “Solid Waste Treatment Facilities”. This is because highways are denser than solid waste treatment facilities. Both, however, have the same weights.

Table 11: Absolute Scoring System

Absolute Score		10	7	5	3	1
Criteria (Miles)	Broadband	0 - 0.5	0.5 - 2	2 - 3	3 - 4	> 4
	Gas Pipes	0 - 0.5	0.5 - 1.5	1.5 - 2	2 - 2.5	> 2.5
	Oil Pipelines	0 - 0.25	0.25 - 0.5	0.5 - 0.75	0.75 - 1	> 1
	Power Lines	0 - 0.5	0.5 - 1.5	1.5 - 2	2 - 2.5	> 2.5
	Railroads	0 - 1	1 - 3	3 - 4	4 - 5	> 5
	Sewer Lines	0 - 1	1 - 3	3 - 4	4 - 5	> 5
	Water Lines	0 - 0.25	0.25 - 0.5	0.5 - 0.75	0.75 - 1	> 1
	Existing Highway	0 - 5	5 - 10	10 - 15	15 - 20	> 20
	Interstate	0 - 5	5 - 14	14 - 22	22 - 30	> 30
	Sewer Treatment Facilities	0 - 2.5	2.5 - 5	5 - 7.5	7.5 - 10	> 10
	Solid Waste Treatment Facilities	0 - 5	5 - 14	14 - 22	22 - 30	> 30

2.2 Relative Scores:

Table 12 shows four statistical groups and their relative scores in the Mineral County land suitability model. The total number of coal mining sites will be equally distributed in each group. The relative score differs from the absolute score in two ways. First, thresholds for relative scores are derived only from real distances from the sites to the features (criteria). Second, it is not affected by personal opinion and does not consider either traveling method or nature of criteria.

Table 12: Relative Scoring System

		Threshold (Distances in miles)	Min - Q1	Q1 - Q2	Q2 - Q3	Q3 – Max
		Relative Score	10	7.5	5	2.5
No.	Criteria	Min	Q1	Q2	Q3	Max
1	Broadband	0.02	0.75	1.27	2.46	3.28
2	Gas Pipes	0.03	0.54	1.09	1.46	3.33
3	Oil Pipelines	0.09	0.54	1.08	1.34	1.99
4	Power Lines	0.02	0.35	0.85	2.46	5.79
5	Railroads	0.02	0.80	1.76	2.85	4.57
6	Sewer Lines	0.29	1.22	1.67	2.30	3.62
7	Water Lines	0.00	0.54	0.92	1.92	3.06
8	Existing Highway	0.01	0.58	1.31	3.53	10.00
9	Interstate	42.64	44.45	45.51	48.90	59.13
10	Sewer Treatment Facilities	5.68	8.58	9.53	10.67	12.67
11	Solid Waste Treatment Facilities	20.48	25.59	26.52	27.38	29.91

3. Mineral County’s Suitability Model:

Table 13 shows the total scores of all studied sites in Mineral County. Site 22 (Permit ID = S200497) has the highest score of 557.75. The sites with higher total scores suggest better opportunities for development. Results in Table 13 are also plotted in the bar chart (Figure 15) for better visualization. Among 43 analyzed potential development sites of Mineral County, it is easy to notice the top five sites and determine the most suitable sites for investment.

Certainly, any change in weight values or the scoring system will result in different output and may change the decision. For better analysis and decision-making, the dynamic suitability model, which allows modification in criteria’s weights, thresholds and scores is available for distribution through RTI’s Geospatial Program.

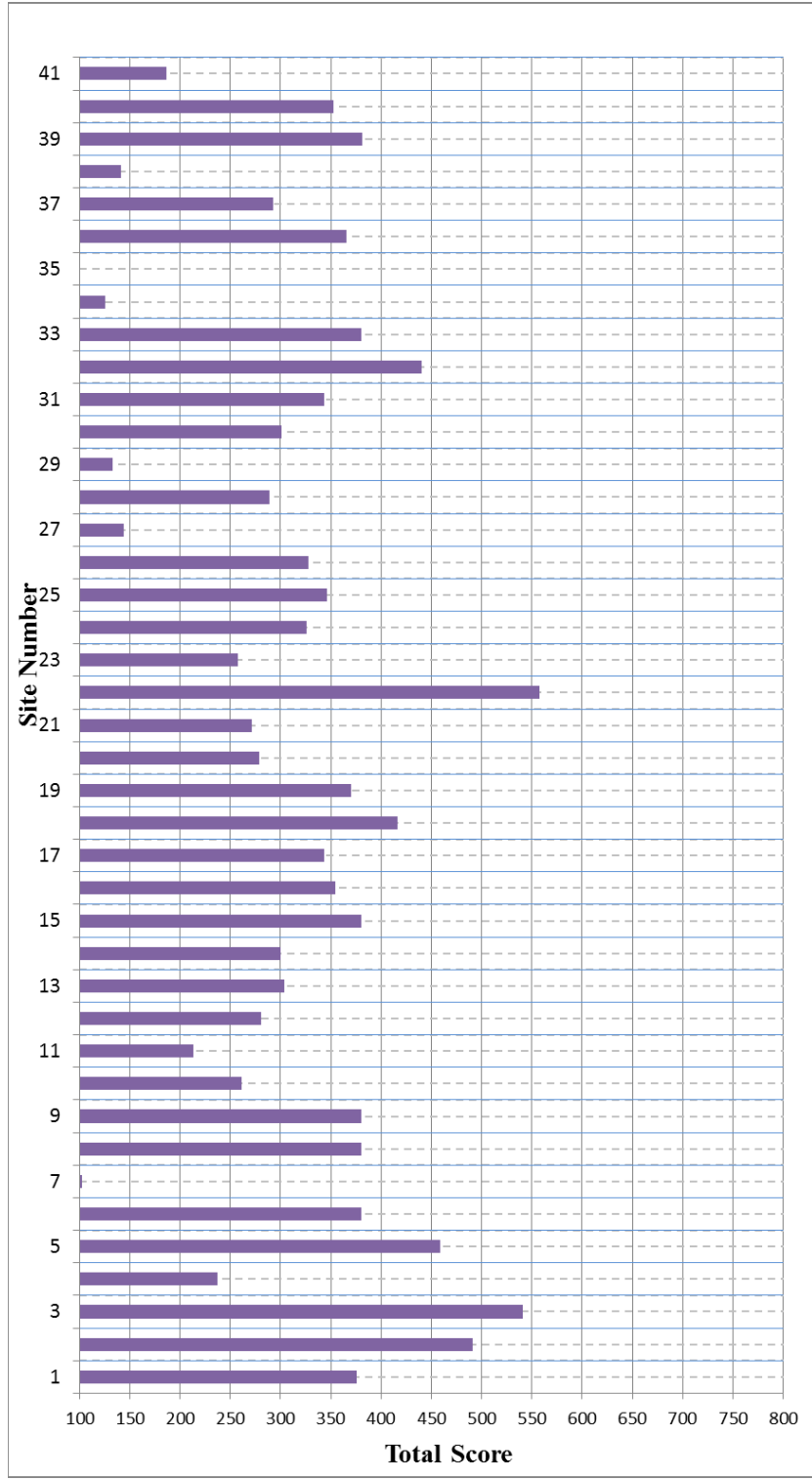
Besides a distance analysis, a suitability model for Mineral is supported by demographic data as well as two additional analyses, which are workforce analysis and retail location density (shown on Table 14 and Map 41 below). The best decision will be made with careful consideration of the suitability analysis as well as the demographic and economic information.

Table 13: Total Score of Mine Sites in Mineral County

Site No	Permitee	PermitID	Score
1	D. & L. COAL COMPANY, INC.	S008085	376
2	D. & L. COAL COMPANY, INC.	S200788	491.5
3	D. & L. COAL COMPANY, INC.	S200906	540.75
4	MASTELLER COAL COMPANY (THE)	S001085	237.5
5	D. & L. COAL COMPANY, INC.	S003484	458.5
6	ALLEGHENY MINING CORPORATION	S009277	380.75
7	D. & L. COAL COMPANY, INC.	S004479	102.75
8	ALLEGHENY MINING CORPORATION	S019376	380.75
9	ROSTOSKY MINING	S003375	380.25
10	D. & L. COAL COMPANY, INC.	I059300	261
11	NEW ALLEGHENY, INC.	S000882	213
12	ROSTOSKY MINING	S000883	280.75
13	D. & L. COAL COMPANY, INC.	S200398	303.5
14	NEW ALLEGHENY, INC.	S016076	300.25
15	D. & L. COAL COMPANY, INC.	S009479	380.25
16	D. & L. COAL COMPANY, INC.	S200188	354.5
17	CHESTNUT RIDGE COAL CORP	Z004481	343.5
18	D. & L. COAL COMPANY, INC.	S200297	416
19	CHESTNUT RIDGE COAL CORP	S002883	370
20	D. & L. COAL COMPANY, INC.	S200794	279
21	D. & L. COAL COMPANY, INC.	S200792	271.75
22	D. & L. COAL COMPANY, INC.	S200497	557.75
23	D. & L. COAL COMPANY, INC.	I059800	257.75
24	D. & L. COAL COMPANY, INC.	S005980	326.25
25	MASTELLER COAL COMPANY (THE)	S204986	346.5
26	D. & L. COAL COMPANY, INC.	S200490	327.75
27	LUKE PAPER COMPANY	S018976	144
28	D. & L. COAL COMPANY, INC.	S203386	288.75
29	LUKE PAPER COMPANY	Z003681	132.75
31	D. & L. COAL COMPANY, INC.	S008175	300.75
32	D. & L. COAL COMPANY, INC.	S015773	343.25
33	D. & L. COAL COMPANY, INC.	S002974	440
34	D. & L. COAL COMPANY, INC.	S201389	380.75
35	LUKE PAPER COMPANY	S008480	125.25
36	MASTELLER COAL COMPANY (THE)	S012582	99.75
37	DUCKWORTH COAL, INC.	S200506	366

Site No	Permitee	PermitID	Score
38	NEW ALLEGHENY, INC.	S024774	292.75
39	D. & L. COAL COMPANY, INC.	S200407	141.5
40	D. & L. COAL COMPANY, INC.	S000376	381.25
42	D. & L. COAL COMPANY, INC.	S105491	352.25
43	NEW ALLEGHENY, INC.	I058200	186.5

Figure 15: Mineral County’s Suitability Model (Total Score of Each Surface Coal Mining Site)



Work Force Analysis

A work force analysis estimates total employment and unemployment within a certain distance, providing potential labor sources if an investment is made on the site. According to Gary Langer, the average one-way commute time is 26 minutes or 16 miles.¹¹ It is reasonable to consider unemployment within 15 miles of the site as an upper limit for a potential employer. This data set does not provide a skill set analysis however; therefore employers may not find the labor skills they need. This dataset provides the pool of labor resources from which to choose.

Table 14: Employment and Unemployment within 5-, 10- and 15-mile Radii from the Site

Site No	Permit ID	Emp_05	Unemp_05	Emp_10	Unemp_10	Emp_15	Unemp_15
1	S008085	931	129	3,980	720	5,643	999
2	S200788	802	126	4,157	780	5,660	999
3	S200906	958	132	4,255	790	5,711	1,006
4	S001085	2,847	676	5,118	911	7,496	1,180
5	S003484	724	122	3,903	724	5,582	989
6	S009277	1,118	119	3,957	678	5,728	1,012
7	S004479	2,152	556	4,616	851	7,210	1,166
8	S019376	1,118	119	3,957	678	5,728	1,012
9	S003375	1,260	144	4,790	891	5,990	1,042
10	I059300	1,672	459	4,179	805	7,529	1,174
11	S000882	3,007	626	5,330	948	7,129	1,155
12	S000883	1,352	143	4,872	903	5,991	1,043
13	S200398	1,284	142	4,792	891	5,935	1,036
14	S016076	3,146	693	5,358	947	7,473	1,178
15	S009479	1,260	144	4,790	891	5,990	1,042
16	S200188	1,020	132	4,177	761	5,709	1,007
17	Z004481	526	107	3,007	515	5,302	954
18	S200297	972	132	4,182	769	5,697	1,004
19	S002883	630	115	3,379	600	5,428	970

¹¹ Gary Langer, "Poll: Traffic in the United States," ABC News Online, February 13, 2005, Accessed March 1, 2013, <http://abcnews.com/Technology/Traffic/story?id=485098&page=1>.

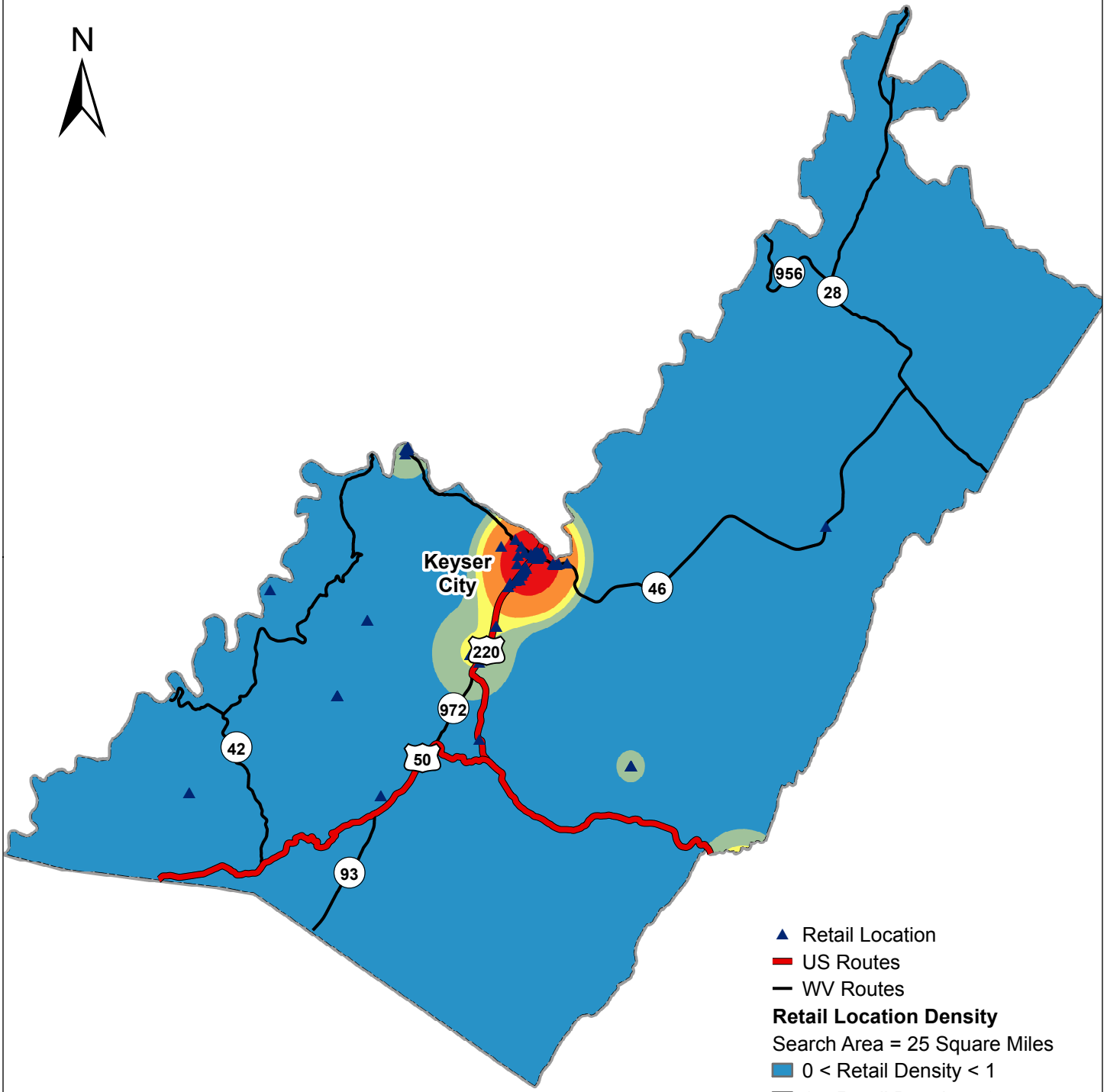
Site No	Permit ID	Emp_05	Unemp_05	Emp_10	Unemp_10	Emp_15	Unemp_15
20	S200794	1,282	142	4,799	892	5,943	1,037
21	S200792	1,269	188	4,782	885	6,224	1,068
22	S200497	1,022	135	4,430	828	5,768	1,014
23	I059800	486	100	2,409	358	5,178	939
24	S005980	900	128	3,931	711	5,624	995
25	S204986	2,893	668	5,332	936	7,920	1,201
26	S200490	581	111	3,119	537	5,354	961
27	S018976	2,268	598	4,554	845	7,431	1,178
28	S203386	516	104	2,629	415	5,232	946
29	Z003681	2,351	614	4,614	851	7,427	1,178
30	S008175	865	126	3,766	671	5,579	990
31	S015773	778	123	3,660	655	5,534	984
32	S002974	741	123	3,797	695	5,559	986
33	S201389	1,150	122	4,082	708	5,758	1,015
34	S008480	2,300	601	4,603	850	7,373	1,177
35	S012582	1,988	511	4,583	845	7,121	1,157
36	S200506	2,476	643	4,752	867	7,892	1,201
37	S024774	1,052	124	3,847	664	5,664	1,004
38	S200407	2,219	451	5,034	914	6,701	1,119
39	S000376	1,232	131	4,422	795	5,833	1,024
40	S105491	715	121	3,600	647	5,504	980
41	I058200	425	90	2,030	279	5,034	921

Retail Location Analysis

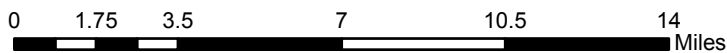
A retail location analysis is a hot spot analysis that depicts a number of retailers within 25 square miles of any certain location in the County (Map 41). The result, as shown on the map, is displayed in blue-to-red color for retail's density from low to high. Normally, the area with a high density of retailers indicates an already developed and populated community, which possibly has the highest opportunity as well as the heaviest competition. The areas with low retail density showcase where population is lowest, but also where competition is lowest and which may provide retail opportunities.

Retail Location Density

Mineral County



- ▲ Retail Location
- US Routes
- WV Routes
- Retail Location Density**
Search Area = 25 Square Miles
- 0 < Retail Density < 1
- 1 < Retail Density < 2
- 2 < Retail Density < 3
- 3 < Retail Density < 6
- 6 < Retail Density < 9
- County Boundary



This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Reproduction, copying, distribution, sale, or lease of this map without the written permission of the Rahall Appalachian Transportation Institute is prohibited.

VI. Conclusion

Although among the smaller and more-rural counties in West Virginia, Mineral County is well-positioned for economic stability. Several sectors, including Manufacturing, have proven to be progressive for the County in recent years in terms of employment and wages. However, a large portion of Mineral County's total personal income is derived from government transfers. Coupled with limited diversification among its sectors and an aging population, attention is needed to ensure that the County will grow and thrive. This plan could be useful in that respect by assisting Mineral County in creating a development plan using their post-mine sites.

This plan has identified and displayed the five post-mine sites that are most suitable for development. These sites have the integral tools that researchers have shown can assist in spatial development. Though success is not guaranteed, this overview combined with careful strategic planning can bring about the changes in the trends that are necessary for Mineral County to thrive.

Through a site distance analysis and complete demographic calculation, this plan provides the most comprehensive understanding of the economic state of Mineral County and the potential of its land. By analyzing specific infrastructures and demographics, policymakers can begin attracting investors to post-mine sites, and continue the process of developing the economy. This plan provides strategic information; the choice as to how to utilize this information belongs with the administrators and people of the County.