

Clay County

Land Use Master Plan 2014



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Executive Summary

This Land Use Master Plan (LUMP) conveys information on Clay County's current demographic and geographic status. This plan will be used to evaluate the potential of post-mine sites for development, and evaluate Clay 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 Clay 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. Clay County has no post-mine development currently in place. This plan will help Clay take advantage of its post-mine sites in a varied and potentially lucrative manner.

Clay County has lost almost a fifth of its population since 1980. The county's median age and age distribution are average for the state, and indicate a population capable of productivity in the labor force. The population is also projected to decrease greatly past 2030.

Employment consists mainly of Government; Natural Resources and Mining; Education and Health Services; and Trade, Transportation, and Utilities. Government and Natural Resources and Mining are the major wage contributors: Government due to the size of the sector in Clay County, and Natural Resources and Mining likely because of the higher wages

per job offered. Clay County maintains a low, though close to average, labor force participation rate, and the fifth-highest ratio of government transfers to income (28 percent).

Clay County's total enrollment has been falling steadily as the County's Natural Resources sector has declined. However, the dropout rate is below average as the county emphasizes education and the returns for dropping out fall even further. Clay County also has a large percentage of high school dropouts among its adult population.

Utility prices are varied throughout the county, and this plan provides municipal and private rates for electricity, sewer, and water. Broadband infrastructure is sparse, reflecting a pattern among rural West Virginian counties.

Transportation is an important issue in any development strategy. Clay County has a small part of Interstate 79 running through its northern section, but no US routes and only three state routes. Clay County is relatively close in proximity to Yeager Airport, the largest airport in West Virginia, compared to other counties, and has a large rail system.

Clay County has only one site 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 Clay County. The environment of the county should be considered in an overall development strategy. Clay County is heavily forested but has only a few designated recreational areas. Clay County is not on the list of air pollution non-attainment areas, which is positive. Clay County has several oil fields and natural gas pipes, but little play in the Marcellus Shale. The County also has a large wood by-products industry, but appears to have very little potential in the most popular renewable energy resources: solar, wind, and geothermal.

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 Clay County. The researchers created a distance analysis using a scoring system based on distance to certain essential utilities and features, summed the scores, and plotted each score for each mine site. 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. In table A, and table B, distances and total scores are compared, providing an idea of the more suitable site under a considered criterion. For example, if we want to look for a site which is located closest to power lines, the answer is site ranking #3, permit ID S601387. However, if we wanted the site closest to Yeager Airport, the best site is site ranking #1, permit ID S600587.

Table C explains how each criterion contributes to the final total score and the importance of the weights. Because of the assumption that one criterion may be more important than others through differing weights, the site with higher absolute and relative scores is still able to receive a smaller total score than the others.

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

Suitability Ranking	1	2	3	4	5	Weight
Broadband	0.52	0.70	0.13	0.40	0.23	9
Gas Pipes	0.04	1.51	3.73	0.90	3.34	6
National Waterway Network	18.88	23.28	18.00	32.57	10.68	4
Oil Pipes	0.11	2.21	1.48	0.97	1.20	6
Power Lines	0.72	3.23	0.47	0.81	1.38	10
Railroad	0.38	0.04	3.16	2.37	0.90	5
Sewer Lines	9.92	0.65	4.51	7.69	5.20	8
Water Lines	0.47	0.09	0.30	0.81	0.75	10
Existing Highway	1.10	1.27	0.42	2.72	1.57	8
Intermodal Terminal Facilities	21.45	30.46	22.58	38.79	14.57	6
Interstate	6.48	10.52	14.51	3.61	22.18	8
National Waterway Network Ports	61.76	77.03	74.95	79.09	74.06	5
Solid Waste Treatment Facilities	22.16	23.77	23.91	17.50	15.89	8
Sewer Treatment Facilities	8.42	1.31	7.56	2.71	12.93	7
Tri-state Airport	69.65	84.92	82.83	86.98	81.93	3
Yeager Airport	20.73	36.00	33.59	38.56	33.01	3

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

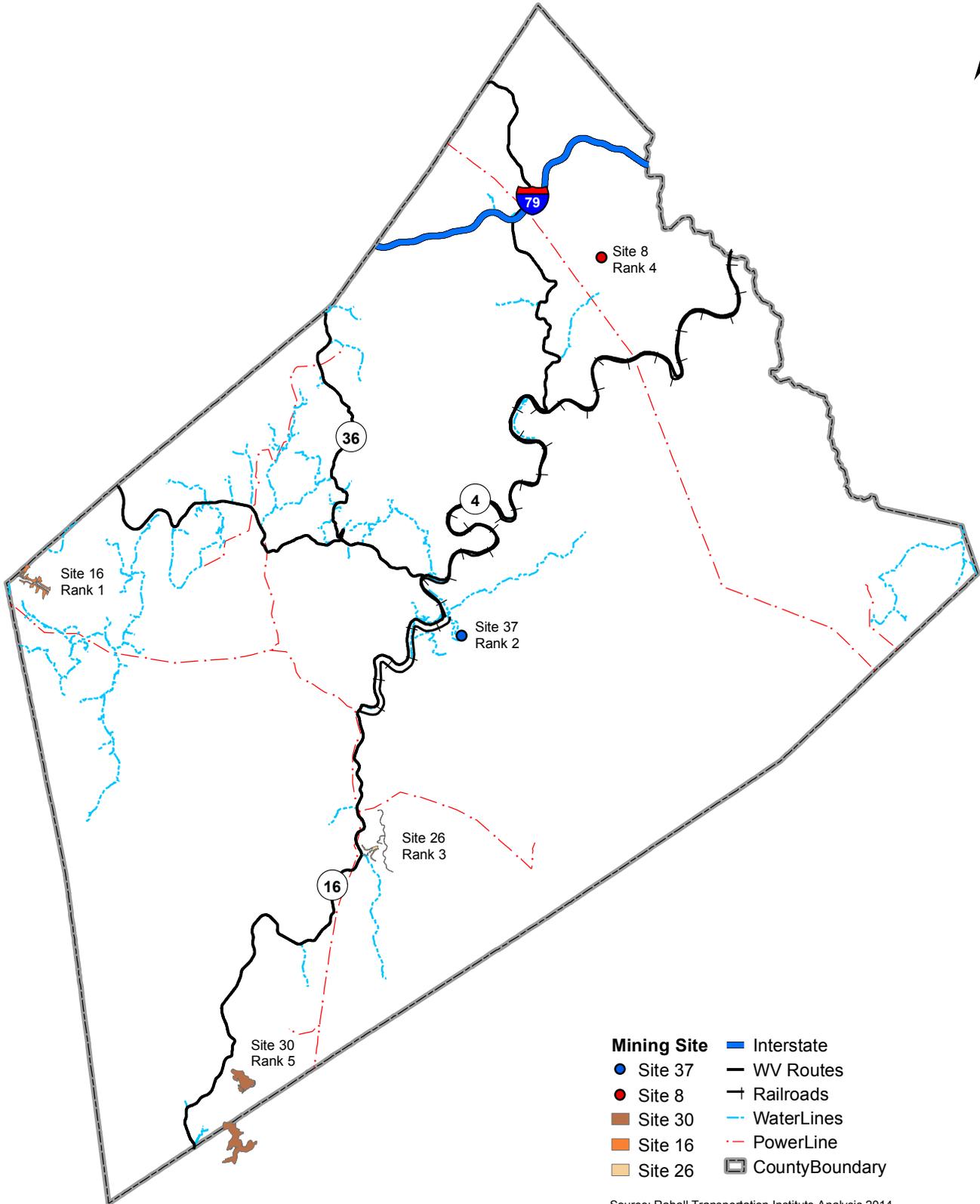
Suitability Ranking	1	2	3	4	5	Weight
Broadband	47.25	47.25	90	67.5	90	9
Gas Pipes	60	30	4.5	42	4.5	6
National Waterway Network	3	1	4	1	4	4
Oil Pipes	60	3	4.5	18	6	6
Power Lines	70	2.5	100	70	52.5	10
Railroad	50	50	18.75	26.25	50	5
Sewer Lines	2	80	18	2	6	8
Water Lines	70	100	70	30	50	10
Existing Highway	80	80	80	60	80	8
Intermodal Terminal Facilities	30	9	30	4.5	42	6
Interstate	56	56	30	80	6	8
National Waterway Network Ports	25	11.25	15	7.5	15	5
Solid Waste Treatment Facilities	24	24	24	40	40	8
Sewer Treatment Facilities	15.75	70	21	49	1.75	7
Tri-state Airport	15	6.75	9	4.5	9	3
Yeager Airport	30	15.75	21	10.5	21	3
Total Weighted Score	638	586.5	539.75	512.75	477.75	

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

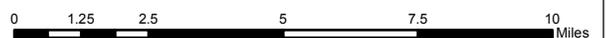
Suitability Ranking	1	2	3	4	5	Weight
Broadband	7	7	10	10	10	9
Gas Pipes	10	5	1	7	1	6
National Waterway Network	1	1	1	1	1	4
Oil Pipes	10	1	1	3	1	6
Power Lines	7	1	10	7	7	10
Railroad	10	10	5	7	10	5
Sewer Lines	1	10	3	1	1	8
Water Lines	7	10	7	3	5	10
Existing Highway	10	10	10	10	10	8
Intermodal Terminal Facilities	5	3	5	3	7	6
Interstate	7	7	5	10	3	8
National Waterway Network Ports	5	3	3	3	3	5
Solid Waste Treatment Facilities	3	3	3	5	5	8
Sewer Treatment Facilities	3	10	3	7	1	7
Tri-state Airport	5	3	3	3	3	3
Yeager Airport	10	7	7	7	7	3
Total Absolute Score	101	91	77	87	75	
Suitability Ranking	1	2	3	4	5	Weight
Broadband	7.5	7.5	10	7.5	10	9
Gas Pipes	10	10	7.5	10	7.5	6
National Waterway Network	7.5	2.5	10	7.5	10	4
Oil Pipes	10	5	7.5	10	10	6
Power Lines	10	2.5	10	10	7.5	10
Railroad	10	10	7.5	10	10	5
Sewer Lines	2.5	10	7.5	2.5	7.5	8
Water Lines	10	10	10	10	10	10
Existing Highway	10	10	10	10	10	8
Intermodal Terminal Facilities	10	5	10	10	10	6
Interstate	10	10	7.5	10	2.5	8
National Waterway Network Ports	10	7.5	10	10	10	5
Solid Waste Treatment Facilities	7.5	10	10	10	10	8
Sewer Treatment Facilities	10	10	10	7.5	2.5	7
Tri-state Airport	10	7.5	10	10	10	3
Yeager Airport	10	7.5	10	10	10	3
Total Relative Score	145	125	147.5	145	137.5	

Top Five Sites for Potential Development

Clay County



Source: Rahall Transportation Institute Analysis 2014



Site's General Info

Permittee	American Minerals Corp
Facility Name	NA
Permit ID	S600587
Issue Date	10/21/1987
Expiration Date	10/21/1992
Current Acres	90.2
Lat	38° 28'20.0000"
Long	81° 16'22.0000"
Nearest Post Office	

Site Number	16
Suitability Ranking	1
Total Score	638

Distance Analysis Results

Broadband	0.52
Gas Pipes	0.04
National Waterway Network	18.88
Oil Pipes	0.11
Power Lines	0.72
Railroad	0.38
Sewer Lines	9.92
Water Lines	0.47
Existing Highway	1.10
Intermodal Terminal Facilities	21.45
Interstate	6.48
National Waterway Network Ports	61.76
Solid Waste Treatment Facilities	22.16
Sewer Treatment Facilities	8.42
Tri-state Airport	69.65
Yeager Airport	20.73

Site number 16 should be the first choice for potential development. The site is located close to the major assets for development. This site may seem an odd choice for number 1, but is actually in a “Goldilocks” zone, being just the right distance away from the important factors for its score to be higher than all the others, despite almost never being the actual closest site.



Site's General Info.

Permittee	Zy Coal Co, Inc
Facility Name	NA
Permit ID	S007079
Issue Date	7/6/1979
Expiration Date	7/6/1992
Current Acres	NA
Lat	38° 27'20.0000"
Long	81° 3'55.0000"
Nearest Post Office	

Site Number	37
Suitability Ranking	2
Total Score	586.5

Distance Analysis Results

Broadband	0.70
Gas Pipes	1.51
National Waterway Network	23.28
Oil Pipes	2.21
Power Lines	3.23
Railroad	0.04
Sewer Lines	0.65
Water Lines	0.09
Existing Highway	1.27
Intermodal Terminal Facilities	30.46
Interstate	10.52
National Waterway Network Ports	77.03
Solid Waste Treatment Facilities	23.77
Sewer Treatment Facilities	1.31
Tri-state Airport	84.92
Yeager Airport	36.00

Site number 37 has the second highest score in the suitability model. The site is located closely to utility features such as water lines (0.09 miles), sewer lines (0.65 miles) and broadband (0.70 miles), as well as the Existing Highways (1.27 miles) and Interstate (10.52 miles). This makes the site a good selection for a future residency or retail area.



Site's General Info.

Permittee	X.W. Corp
Facility Name	NA
Permit ID	S601387
Issue Date	5/22/1987
Expiration Date	5/22/1992
Current Acres	NA
Lat	38° 23'2.0000"
Long	81° 6'21.0000"
Nearest Post Office	

Site Number	26
Suitability Ranking	3
Total Score	539.75

Distance Analysis Results

Broadband	0.13
Gas Pipes	3.73
National Waterway Network	18.00
Oil Pipes	1.48
Power Lines	0.47
Railroad	3.16
Sewer Lines	4.51
Water Lines	0.30
Existing Highway	0.42
Intermodal Terminal Facilities	22.58
Interstate	14.51
National Waterway Network Ports	74.95
Solid Waste Treatment Facilities	23.91
Sewer Treatment Facilities	7.56
Tri-state Airport	82.83
Yeager Airport	33.59

Site number 26 is listed as the third suitable site for post-mine land development. The site is fairly close to several important criteria. It is only 0.47 miles from a Power Line (10 pts. in the suitability model) and 0.13 miles from Broadband (also 10 pts.). Even the site is a little far from major transportation options, short distances to other factors still make it a good choice for development.



Site's General Info.

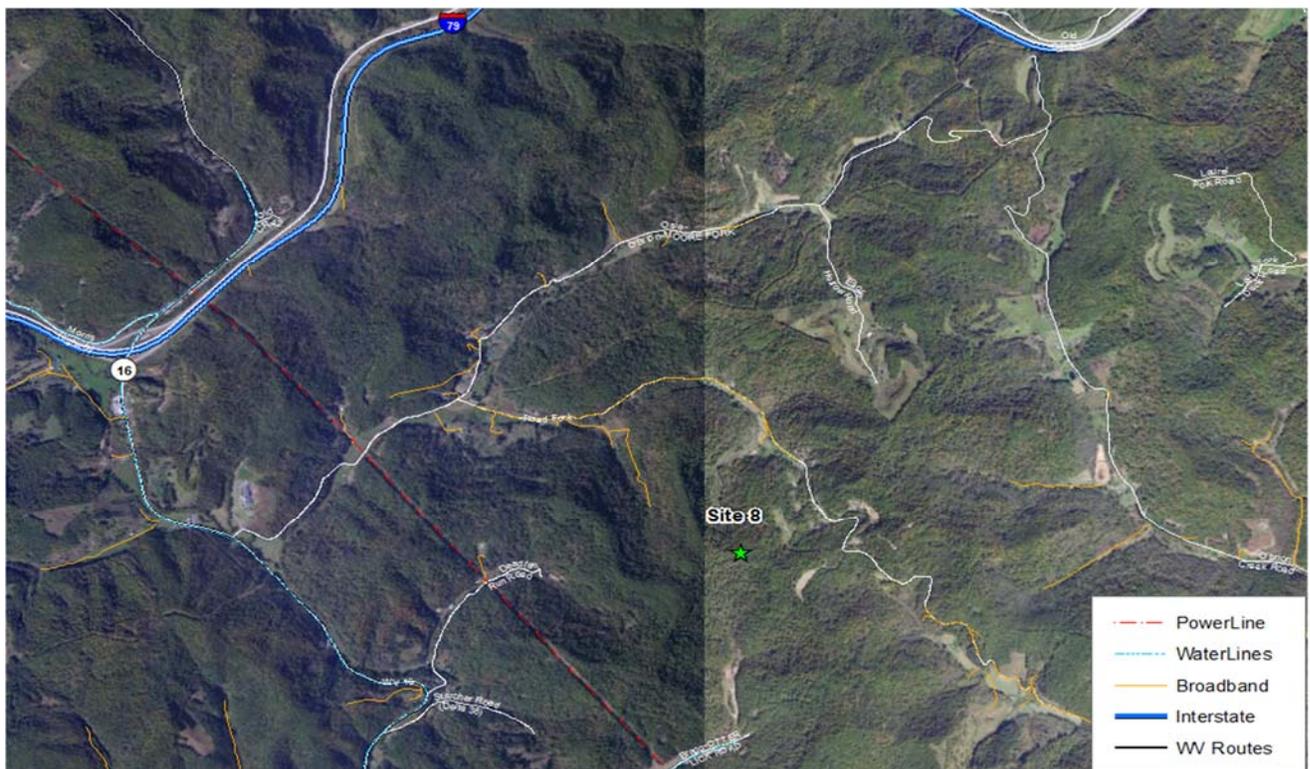
Permittee	Cravat Coal Co
Facility Name	NA
Permit ID	S601188
Issue Date	8/29/1989
Expiration Date	8/29/1994
Current Acres	NA
Lat	38° 35'0"
Long	81° 0'0"
Nearest Post Office	

Site Number	8
Suitability Ranking	4
Total Score	512.75

Distance Analysis Results

Broadband	0.40
Gas Pipes	0.90
National Waterway Network	32.57
Oil Pipes	0.97
Power Lines	0.81
Railroad	2.37
Sewer Lines	7.69
Water Lines	0.81
Existing Highway	2.72
Intermodal Terminal Facilities	38.79
Interstate	3.61
National Waterway Network Ports	79.09
Solid Waste Treatment Facilities	17.50
Sewer Treatment Facilities	2.71
Tri-state Airport	86.98
Yeager Airport	38.56

Site number 8 is ranked as the fourth suitable site for post-mine land development in the county. There are few advantages of the site including short distances to Interstate (3.61 miles), Broadband (0.40 miles) and Power Lines (0.81 miles). However, the Sewer Lines are a little far from the site (7.69 miles).



Site's General Info.

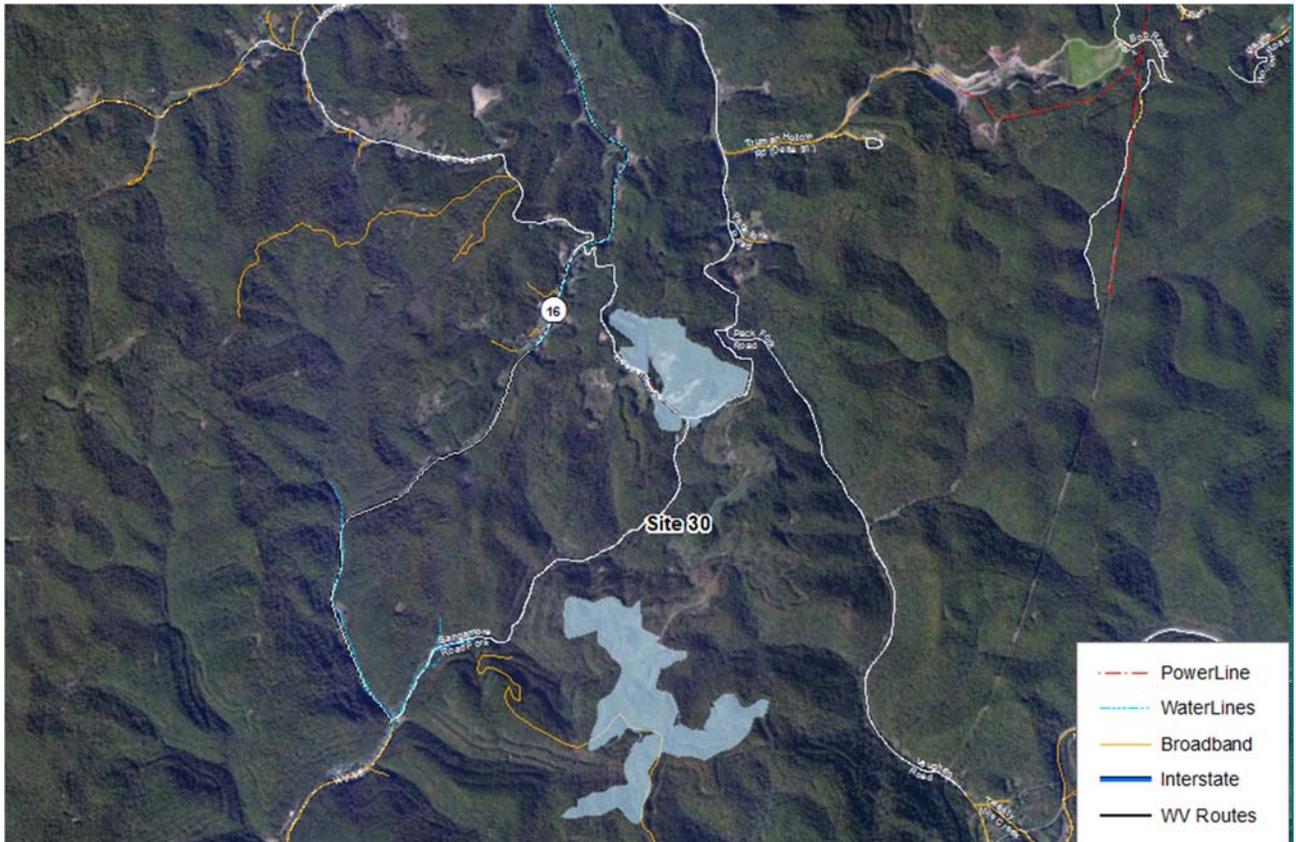
Permittee	Greendale Coals Inc
Facility Name	NA
Permit ID	S009385
Issue Date	9/18/1985
Expiration Date	9/18/1990
Current Acres	NA
Lat	38° 17'13.0000"
Long	81° 10'14.0000"
Nearest Post Office	

Site Number	30
Suitability Ranking	5
Total Score	477.75

Distance Analysis Results

Broadband	0.23
Gas Pipes	3.34
National Waterway Network	10.68
Oil Pipes	1.20
Power Lines	1.38
Railroad	0.90
Sewer Lines	5.20
Water Lines	0.75
Existing Highway	1.57
Intermodal Terminal Facilities	14.57
Interstate	22.18
National Waterway Network Ports	74.06
Solid Waste Treatment Facilities	15.89
Sewer Treatment Facilities	12.93
Tri-state Airport	81.93
Yeager Airport	33.01

Site number 30 has the fifth highest score in the suitability model for its relative close distances to several criteria including Broadband (0.23 miles), Water Lines (0.75 miles), and Existing Highways (1.57 miles). All of those criteria receive high absolute points.



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. This 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 Clay County. Like many coalfield counties, the economy depends primarily on natural resources and government services. This is not a stable economic mix. Furthermore, concerns about an aging and undereducated population are very relevant, and Clay County must utilize all of its resources in order to create sustainable, productive lives for its citizens.

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

Clay County was formed in 1858, five years before West Virginia became a state. It was formed from parts of Nicholas and Braxton Counties, and was named after Henry Clay, a United States Senator from Kentucky. The county had, and has, vast natural resources. As with many coalfield counties, the boom from natural resource extraction brought people and money to the area, but through the Great Depression and the withdrawal of many natural resource and industries, Clay began to decline. Several indications show that Clay County continues to be an underdeveloped county.¹

¹ Samples, Mack, "Clay County," *The West Virginia Encyclopedia*, Accessed March 24, 2014, <http://www.wvencyclopedia.org/articles/1277>.

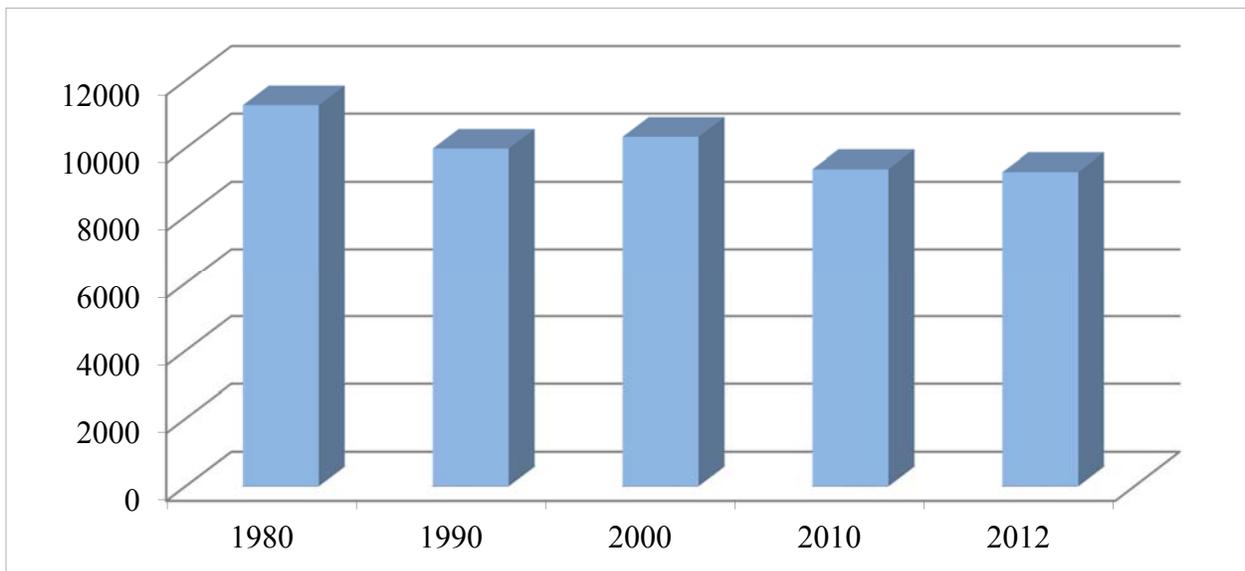
III. Existing Conditions

This information will provide a background understanding of the demographic trends in the county. This base information is meant to provide overall detail on Clay 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.

Population

The population of Clay County in 2012 was 9,297 according to the 2012 American Community Survey (ACS) 5-year estimates, ranking it 45th in county population among the 55 counties in West Virginia.² The decennial censuses show that Clay County has slowly but steadily lost population over the past 20 years. There was a small uptick between 1990 and 2000, but the population has since declined.

Figure 1: Census Populations for Clay County



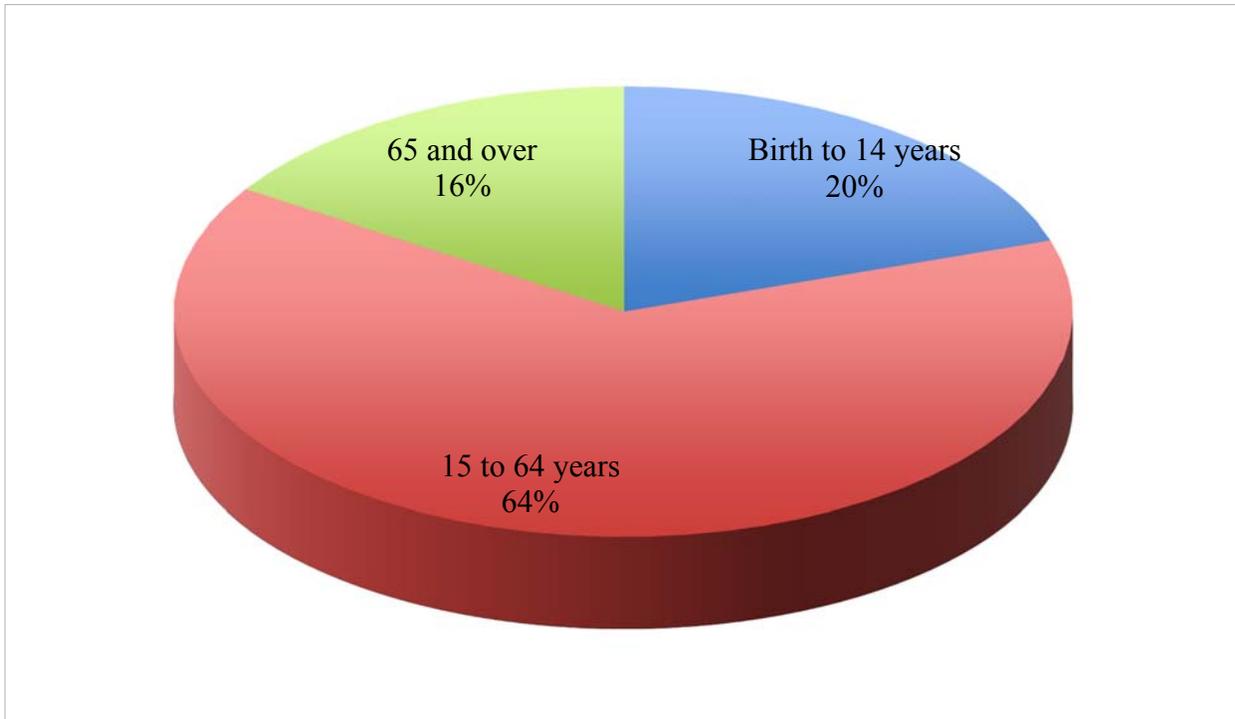
Source: Stats Indiana, USA Counties in Profile

Map 1 illustrates the Clay County population compared to West Virginia overall. Clay is in the middle of the spectrum, its population boosted by the city of Wheeling and the county's proximity to Pittsburgh, Pennsylvania.

² United States Census Bureau, "2012 American Community Survey 5-year Estimates," Accessed April 20, 2013, www.factfinder2.census.gov

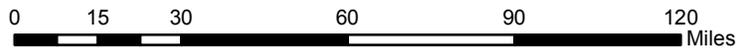
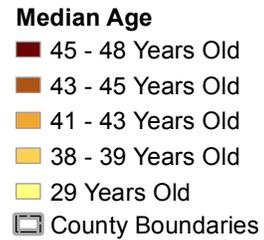
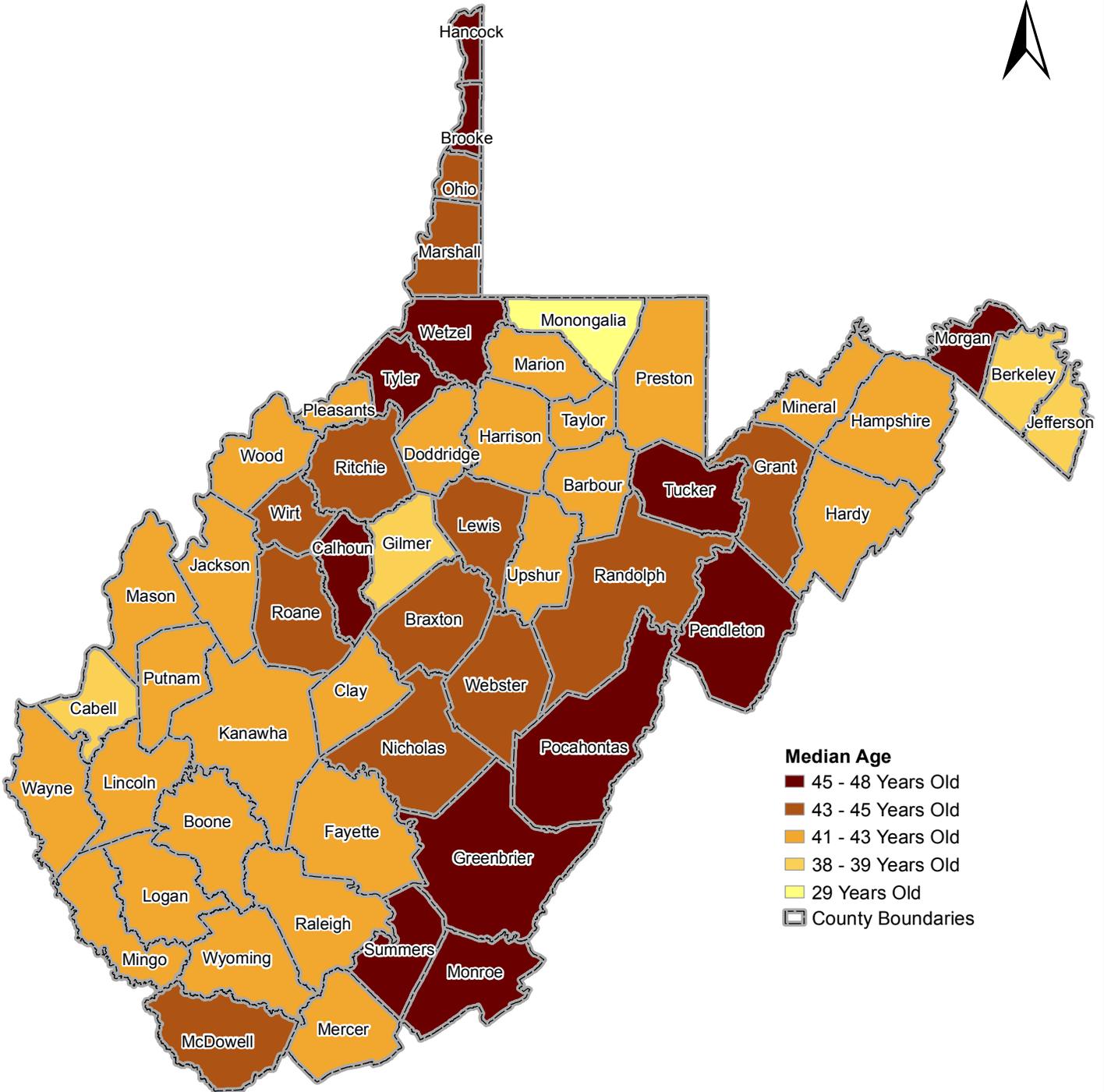
According to the ACS, about 19 percent of Clay County residents are 62 years of age and over, while 18 percent are between 5 and 17 years of age and just over six percent are below the age of 5. Approximately 1800 people are of retirement age. The median age in Clay is 41.9, which is very near the median age of the State (Map 2). The majority of the population is around working age, as denoted in Figure 2.

Figure 2: Clay County Age Breakdown



Source: 2012 American Community Survey 5-Year Estimate Calculation

Demographic Median Age



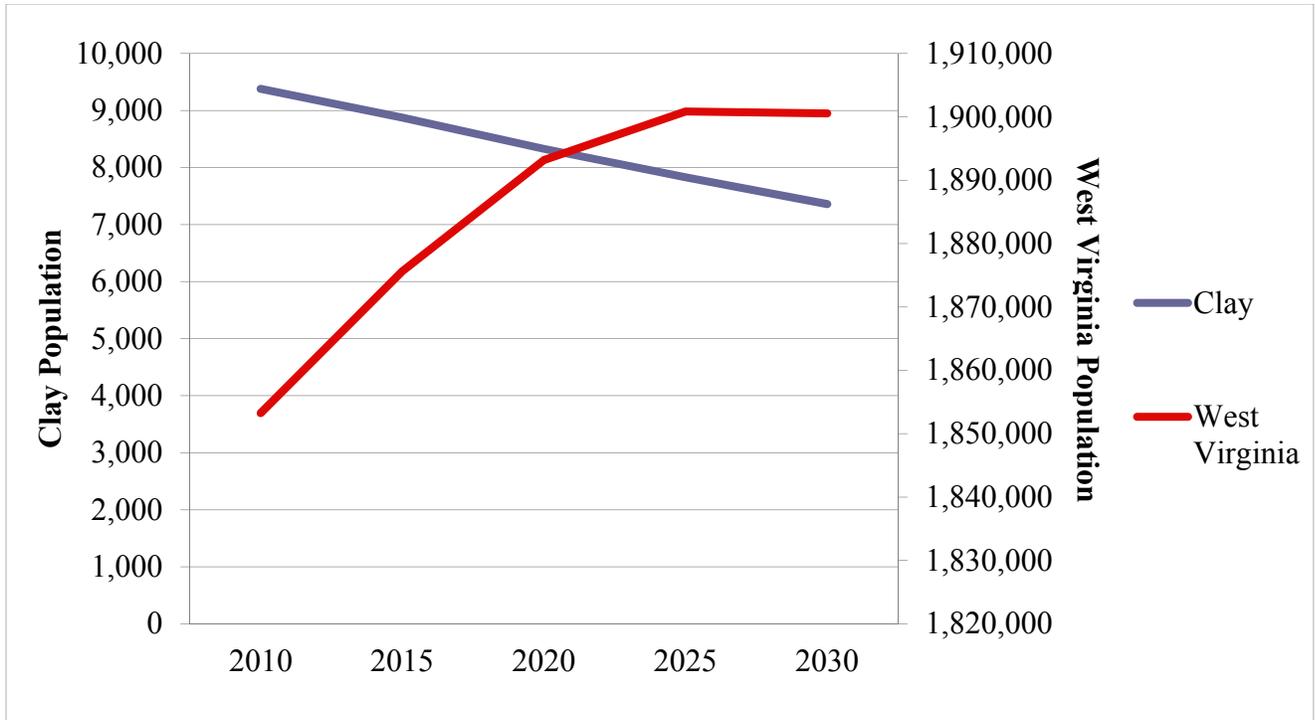
Source: U.S. Census Bureau, 2008-2012 American Community Survey

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The Bureau of Business and Economic Research at West Virginia University projects a 21.5 percent decrease in the Clay County population between 2010 and 2030, which is significantly different from the projected growth of West Virginia.³ The model for the projection is based on past population patterns and statistics, and should not be taken as permanent. The decrease is derived from a steady decrease in population over the past 20 years and few signs that the trend is reversing.

Figure 3: Population Projections



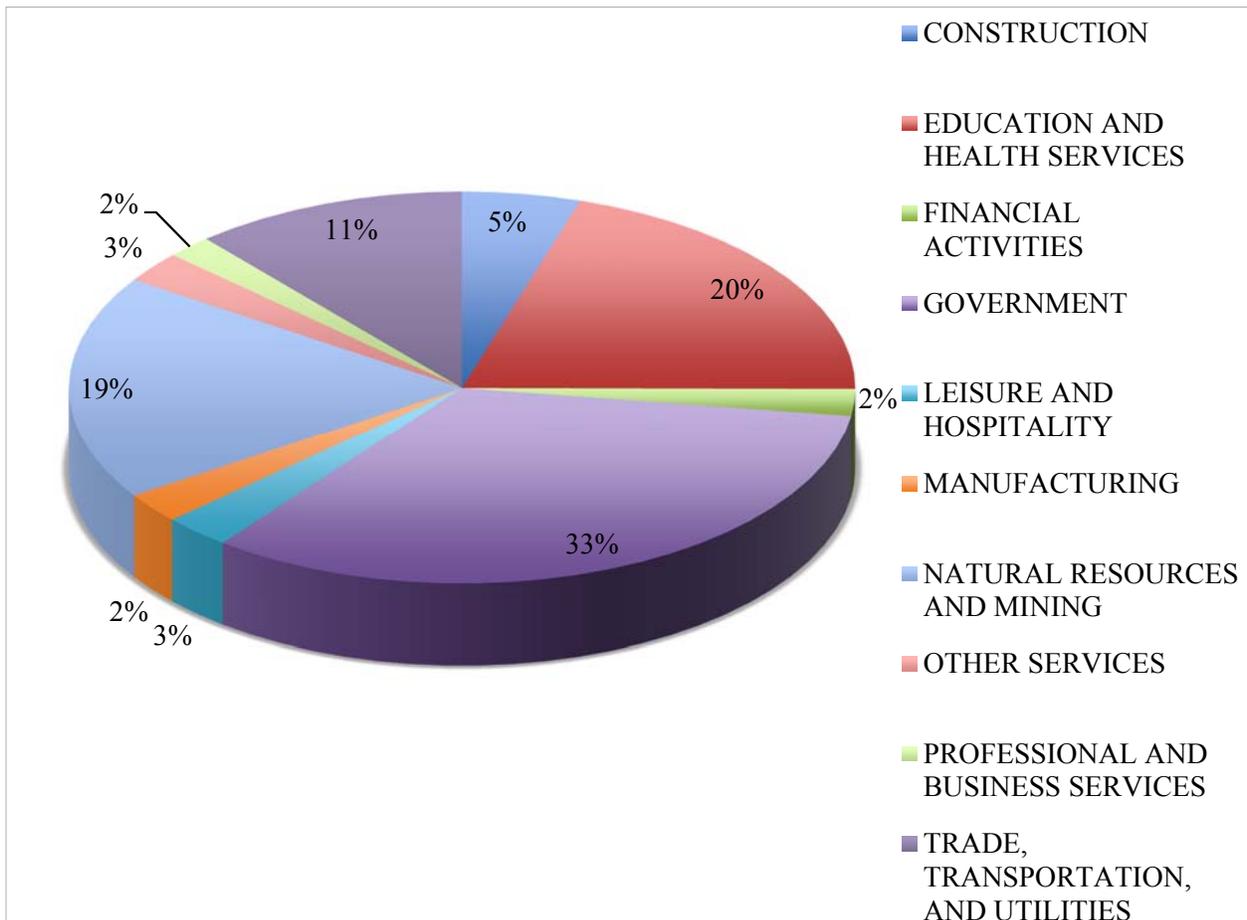
Source: WVU Bureau of Business and Economic Research

Employment

Workforce WV has a complete dataset on employment numbers and wages. The total number of employed in 2012 was 1,771. Approximately 33 percent of wage earners in Clay County worked in Government, a fifth worked in Education and Health Services, and almost another fifth worked in Natural Resources and Mining. Clay County’s employment mix is consistent with several other coalfield counties. This mix is not very diverse, putting the economy at risk under government budget or natural resource company cost cuts. Trade, Transportation, and Utilities is the only other sector that employs more than ten percent of Clay County residents.

³ Christiadi. “Population Projection for West Virginia Counties.” Bureau of Business and Economic Research, College of Business and Economics, West Virginia University, Morgantown, WV (August 2011).

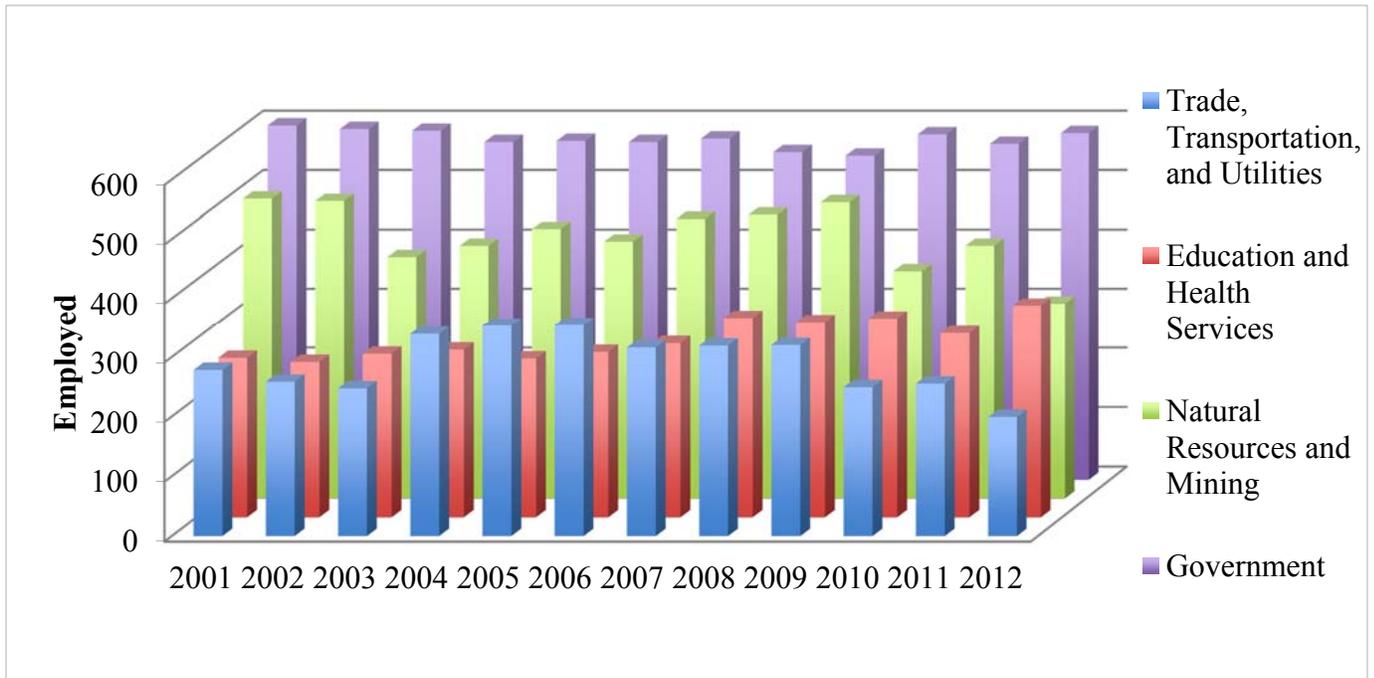
Figure 4: 2012 Clay County Employment



Source: Workforce WV

The four sectors identified above have been the major contributors to employment throughout the past decade. Government has consistently been the largest employer, with dips during some difficult budget years. Natural Resources and Mining was the second-largest until cost-cutting by natural resources firms caused them to layoff many employees. Education and Health Services employment has steadily risen as a renewed emphasis on health and education has been focused on by the county. Employment in Trade, Transportation, and Utilities has mostly followed general economic trends.

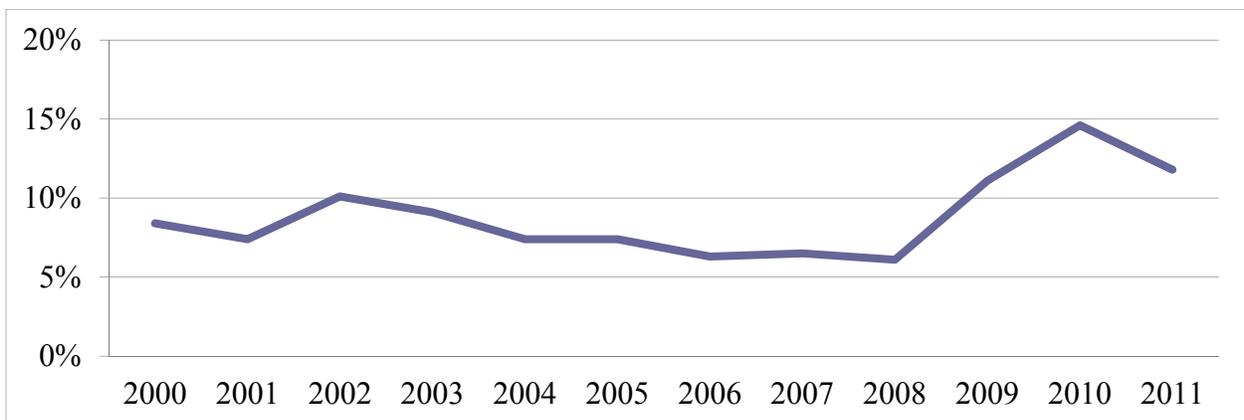
Figure 5: Clay County Employment by 4 Sectors 2001-2012



Source: Workforce WV

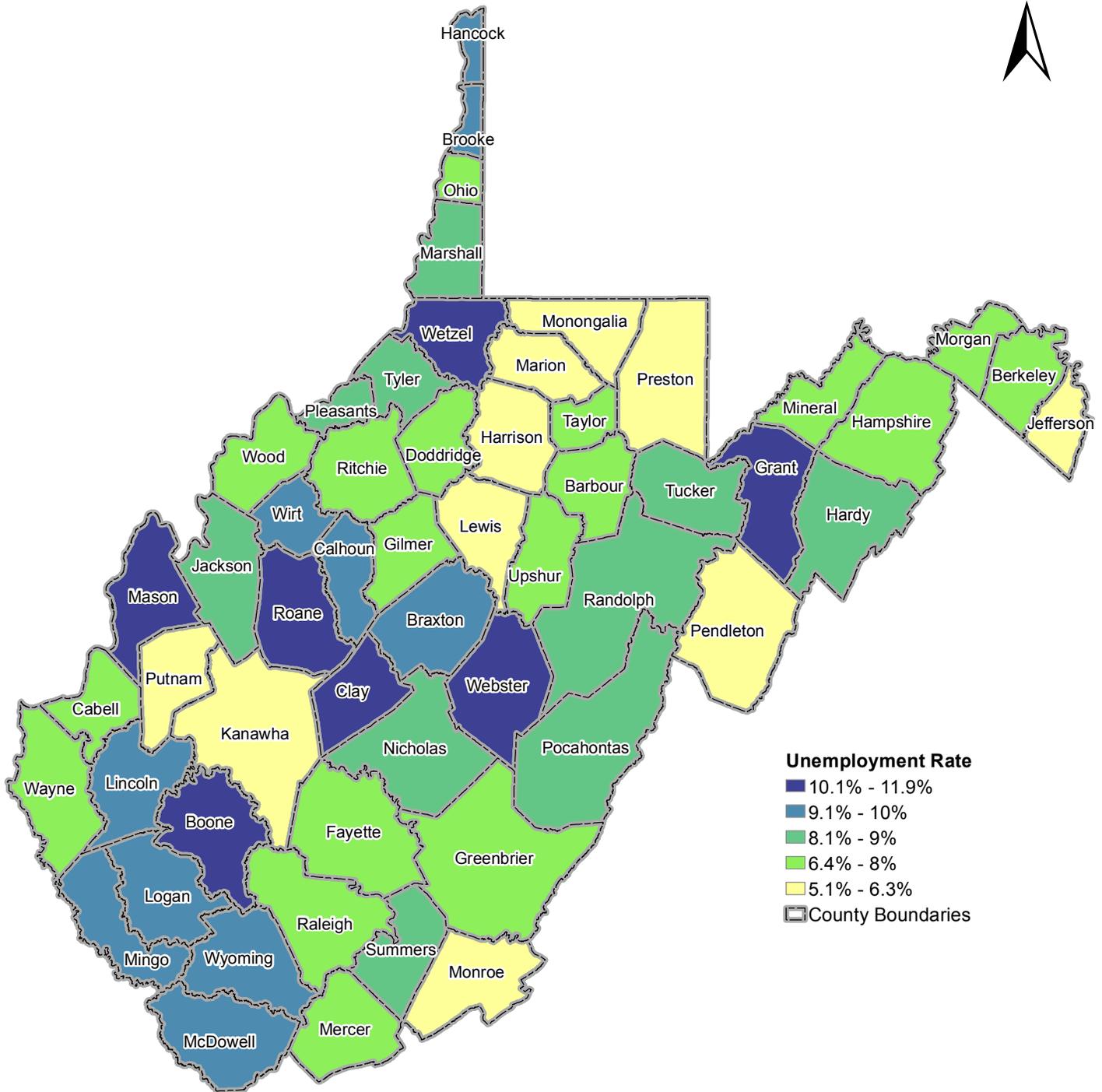
The civilian labor force in the county is one of the most interesting statistics when determining potential investors. As Map 3 shows, Clay’s participation rate is at the lower end of the scale. This is an obstacle many coalfield counties face. At 47.3 percent, the rate is very close to average, however. Despite a small rise from the national economic contraction in the early 2000s, unemployment was decreasing until the recession in 2008 and coal company cost-cutting around the same period. (Figure 6). Note that the data for both the figure and the map is for 2011, as statistics for the figure have not yet been seasonally adjusted.

Figure 6: Clay County Unemployment Rate



Source: Workforce WV

Demographic Unemployment Rate



Unemployment Rate
 ■ 10.1% - 11.9%
 ■ 9.1% - 10%
 ■ 8.1% - 9%
 ■ 6.4% - 8%
 ■ 5.1% - 6.3%
 □ County Boundaries



Source: United States Census Bureau, 2007-2011 American Community Survey

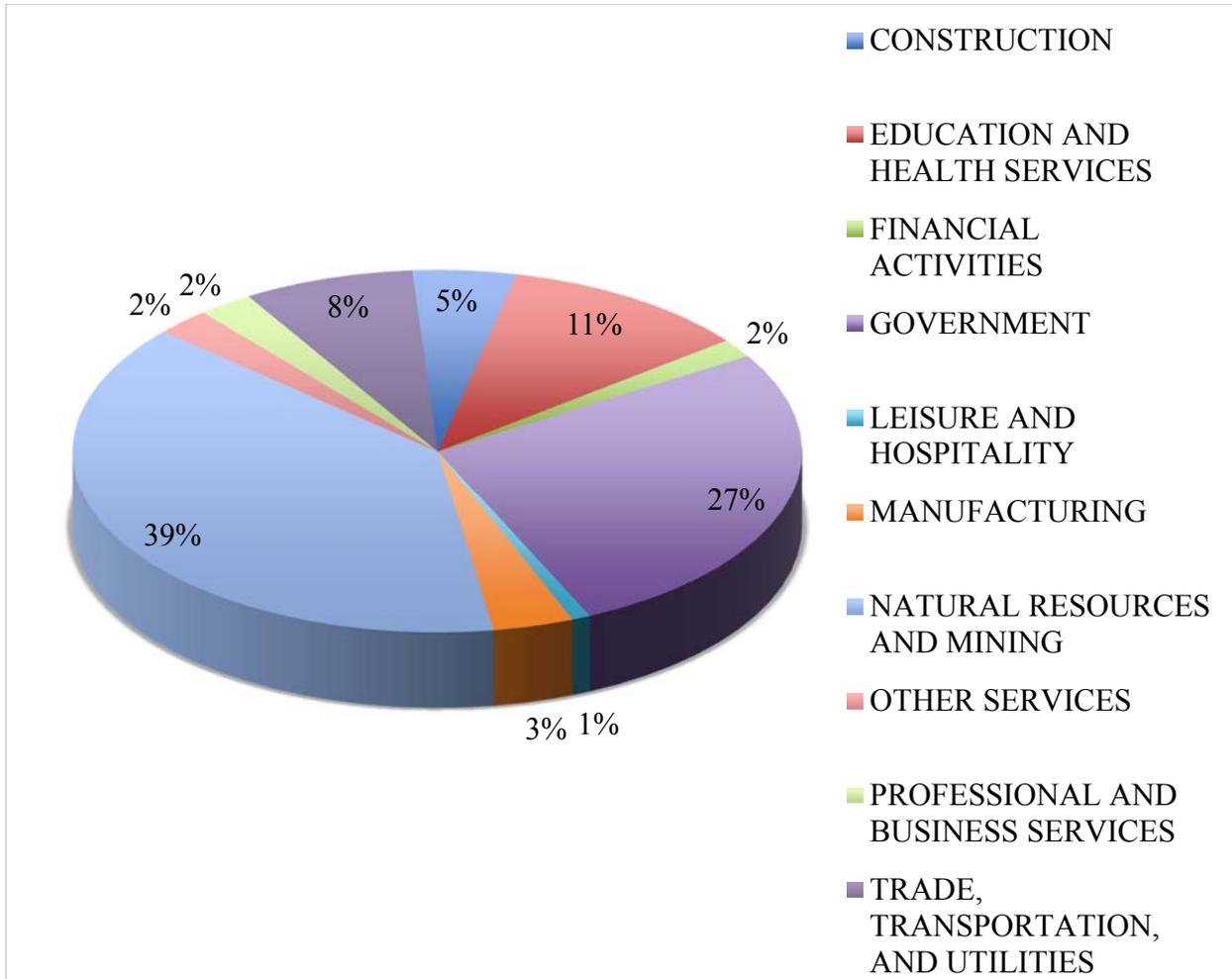
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Wages and Income

Clay County's main wage contributors are the same as its top four sectors of employment. Natural Resources and Mining, despite the decline in employment, is providing a large plurality of wages, as the jobs that are left are high paying ones. Government is next because of its sheer size, and Education and Health Services and Trade, Transportation, and Utilities follow far behind (Figure 7).

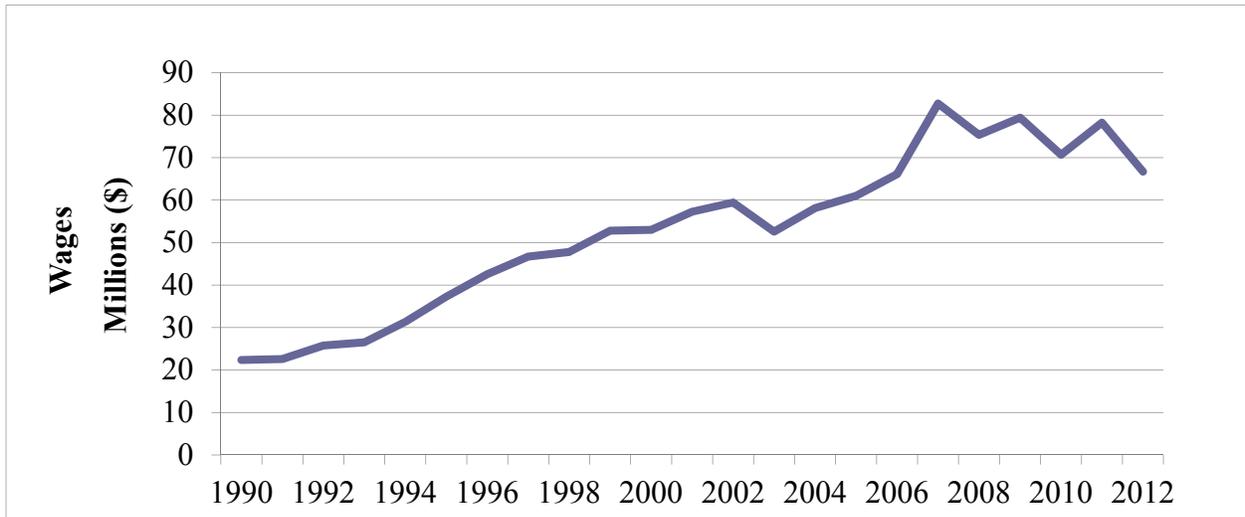
Figure 7: 2012 Clay County Total Wages



Source: Workforce WV

Historically, wages for Clay County have shown a tendency to rise, though somewhat erratically. Though wages have been buoyed by Government and Natural Resources and Mining, the weakness of this mix was exposed during the recession, as governments and mining companies began slashing budgets. The loss in employment, and subsequent outmigration, are reflected in the wage chart.

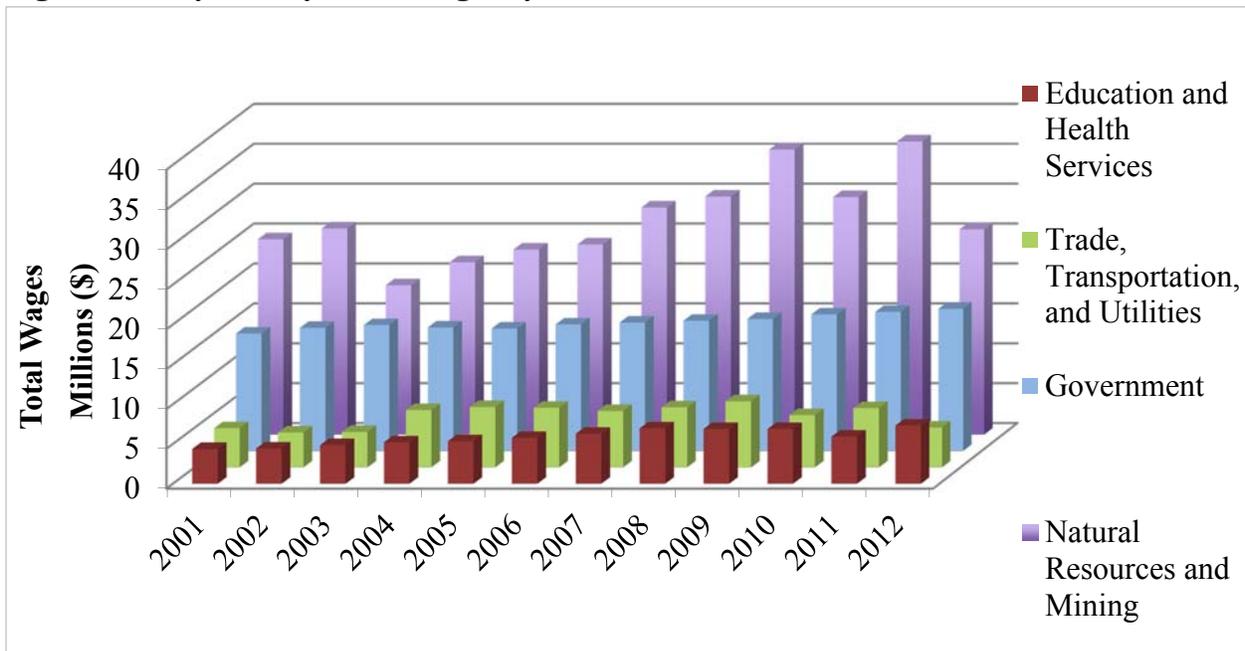
Figure 8: Clay County Total Wages 1990-2012



Source: Workforce WV

Figure 9 confirms the general trend in wages, also showcasing the dominance of two major sectors. Natural Resource and Mining cost cutting is showcased pretty clearly in the wages, but still is the dominant wage sector. Government wages have stayed fairly consistent over time.

Figure 9: Clay County Total Wages by 4 Sectors 2001-2012

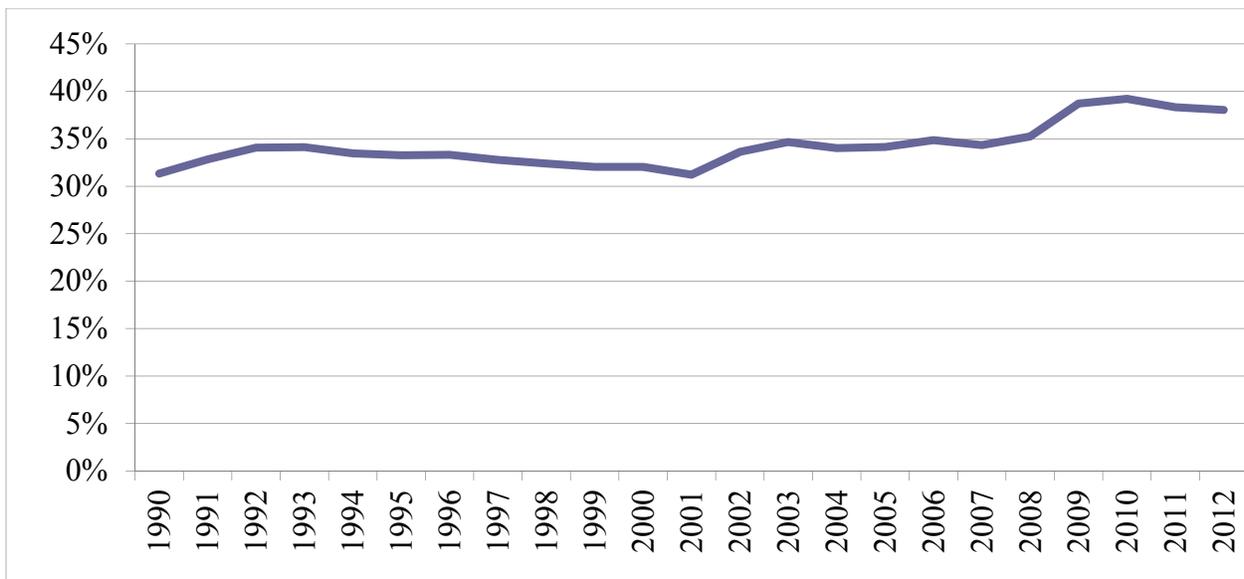


Source: Workforce WV

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. The distinction is necessary in the case of Clay County because in 2012, Clay County wages were \$66 million for all industries.⁴ Income for the County was larger (around \$230 million). Though there are many components to income other than work earnings, 38 percent of total Clay County income is derived from government transfers.⁵ Government transfers accounted for about 95 percent of total transfers to Clay County, dwarfing transfers from private institutions such as charities. Government transfers have consistently contributed between 30 to 40 percent of income over the past 20 years. This does not count the wages for government workers. This percentage is the fifth highest rate in the state.

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



Source: United States Bureau of Economic Analysis

The total personal income of Clay County is therefore made up of 38 percent government transfers and 44 percent earnings from work. Clay County has the fifth highest rate of transfer payments in West Virginia. According to the BEA, per capita income was \$24,668 for Clay County in 2012. Annual net earning, or income from work, is displayed in Map 5, and Clay is ranked below average in earned income in West Virginia.

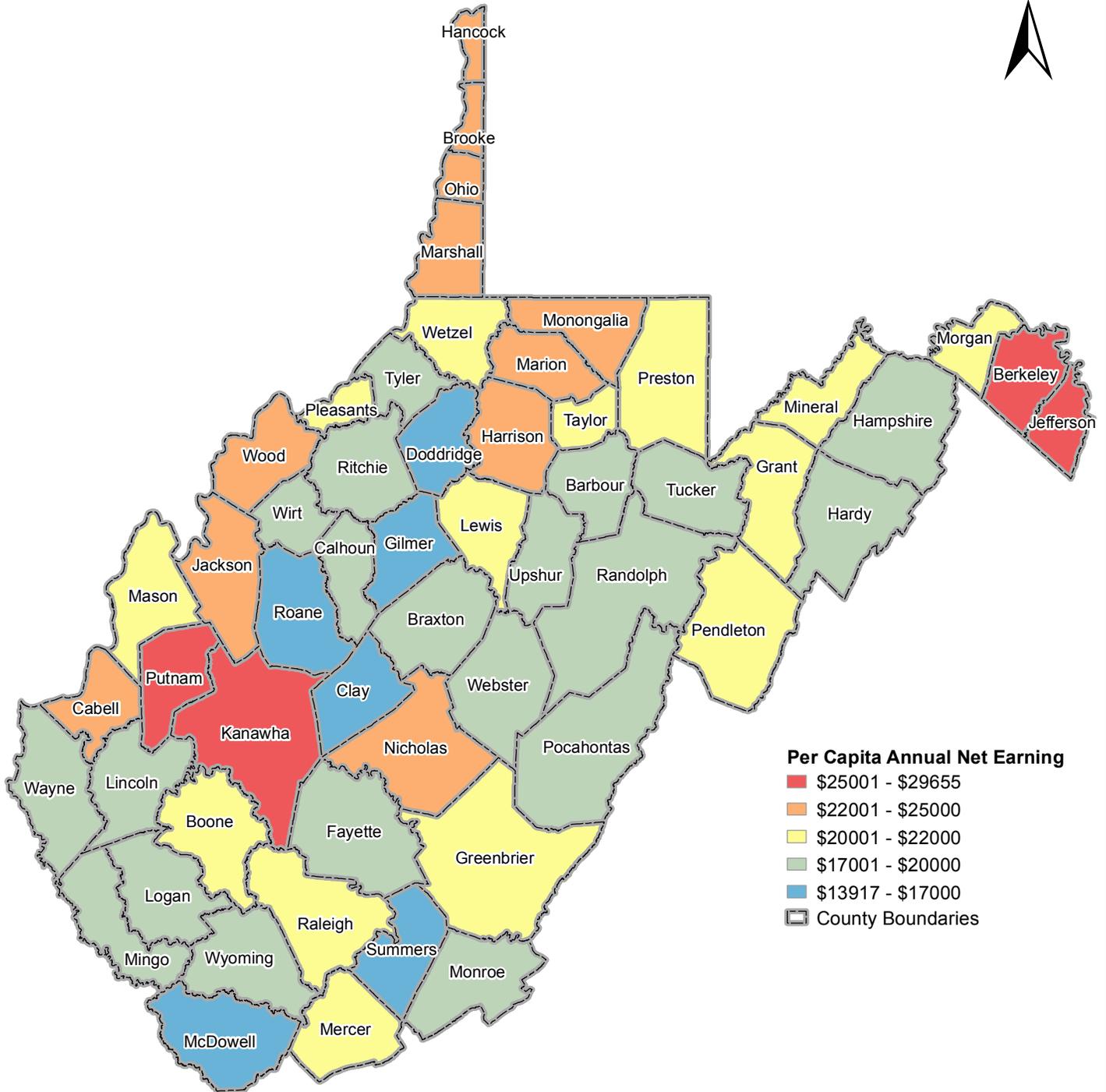
⁴ “Employment and Wages – 2012, Clay County,” Workforce WV, Accessed February 13, 2014, <http://www.workforcewv.org/lmi/EW2011/ew11x059.htm>

⁵ “Tables CA 04 and CA 35 analysis,” Bureau of Economic Analysis, Regional Economic Accounts, Local Area Person Income and Employment, Accessed February 13, 2014, <http://www.bea.gov/regional/index.htm>.

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. Clay County appears to be at the lowest end of the spectrum. The number of establishments may be misleading, as the Natural Resource and Mining and Government sectors are often characterized by a small number of firms.

Demographic

Per Capita Annual Net Earning



Per Capita Annual Net Earning

- \$25001 - \$29655
- \$22001 - \$25000
- \$20001 - \$22000
- \$17001 - \$20000
- \$13917 - \$17000
- County Boundaries



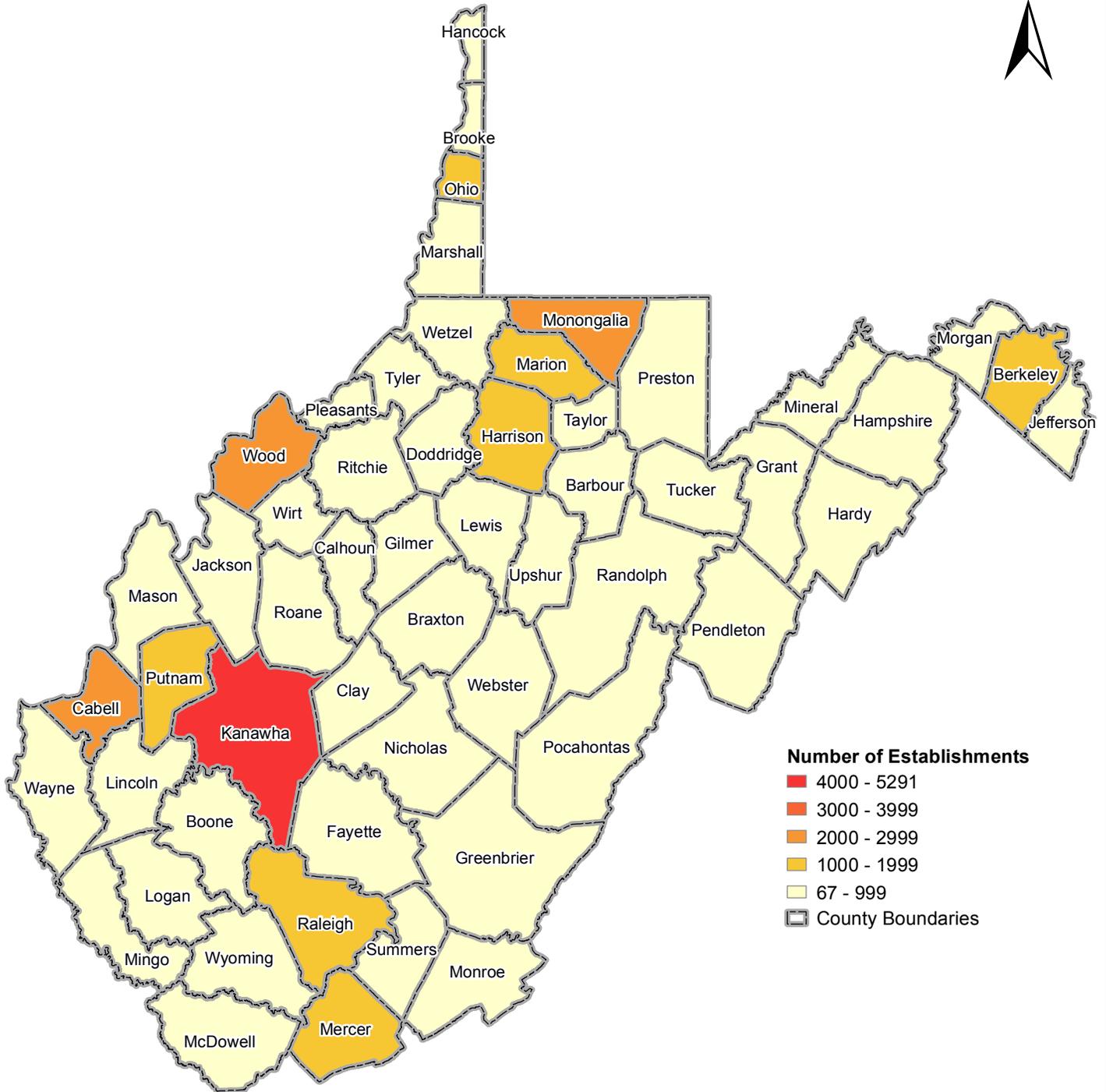
Source: U.S. Census Bureau, 2008-2012 American Community Survey

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Demographic

Number of Establishments



Number of Establishments

- 4000 - 5291
- 3000 - 3999
- 2000 - 2999
- 1000 - 1999
- 67 - 999
- County Boundaries



Source: U.S. Census Bureau, 2011

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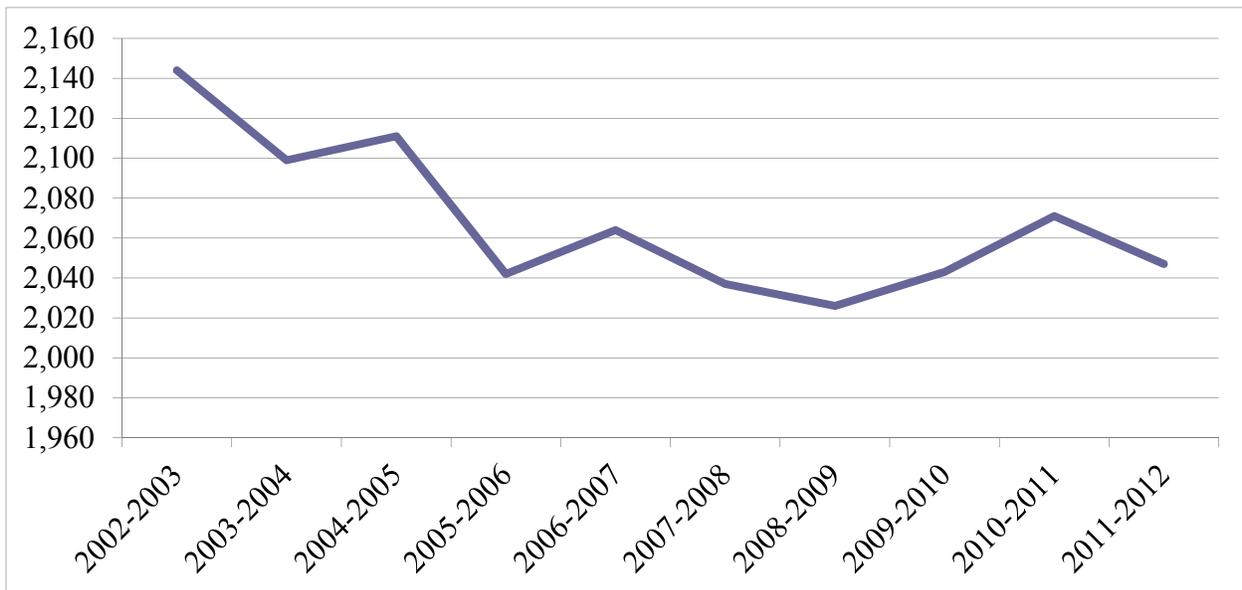


Education

Clay County has one high school, one middle school, and four elementary schools as of the 2012-2013 school year.⁶

Clay County 2nd month school enrollment has shown a general decline, most likely due to parents who have lost their jobs due to the decline of the Natural Resource and Mining sector moving out. However, the enrollment loss has been low as a percentage of total students, about 5 percent (Figure 11), though Clay County also has one of the smallest enrollment figures (Map 7).

Figure 11: Clay County School Enrollment

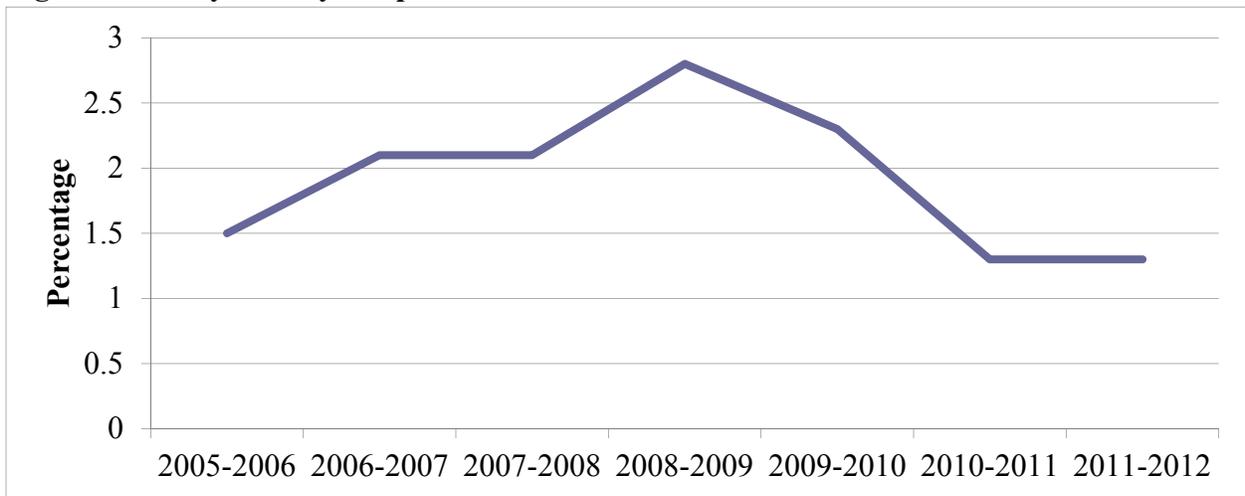


Source: WVEIS

The West Virginia Education Information System (WVEIS) also has dropout rates for the school years from 2005 to 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 were generally rising until the recession, as a combination of decreasing job opportunities for non-graduates and educational policies decreased that percentage (Figure 12).

⁶ “School Profiles,” West Virginia Education Information System, West Virginia Department of Education, Accessed February 13, 2014, http://wveis.k12.wv.us/nclb/profiles/c_profile.cfm?cn=043.

Figure 12: Clay County Dropout Rate

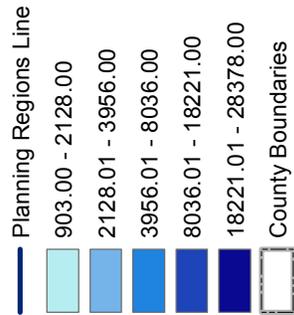
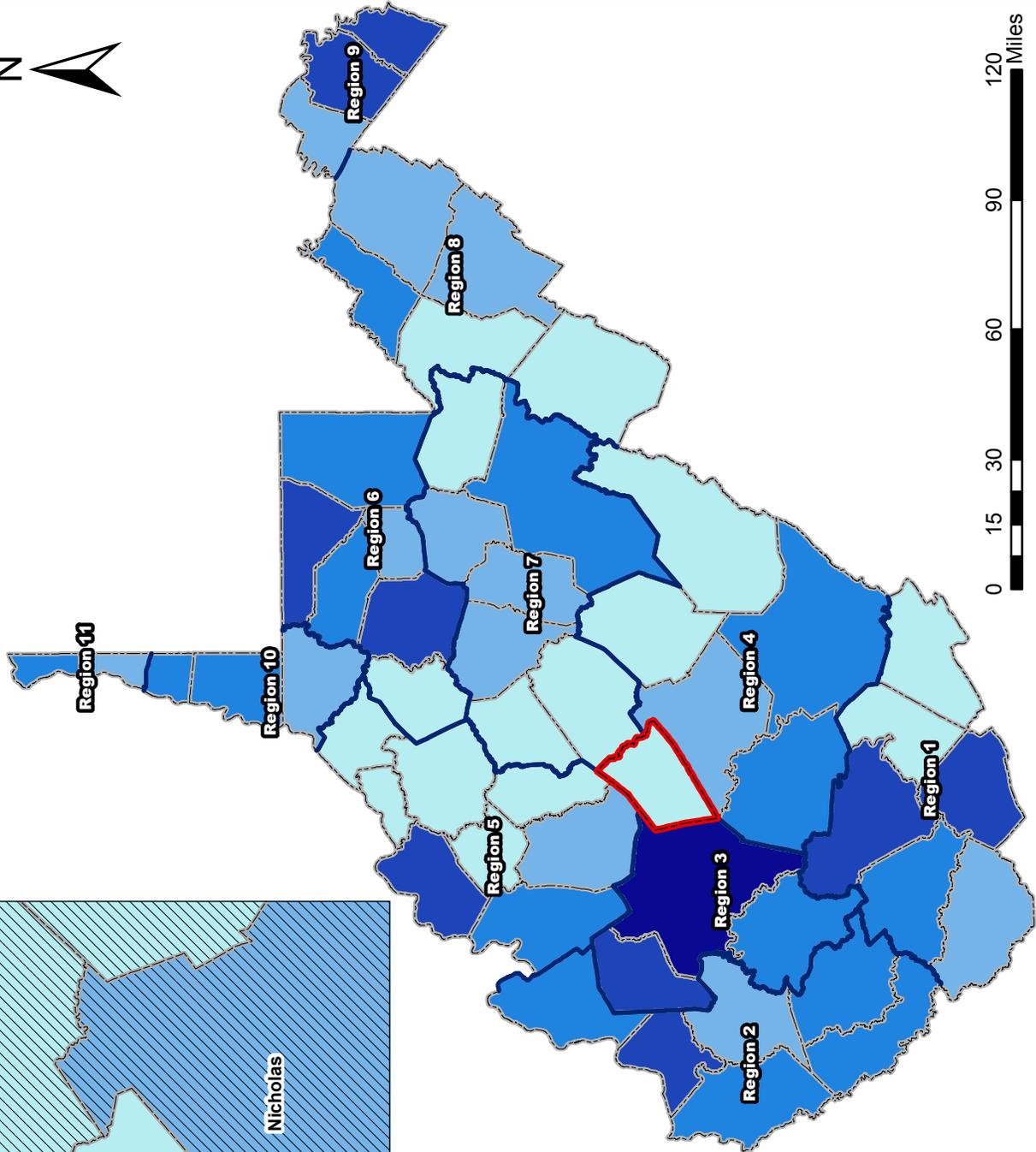
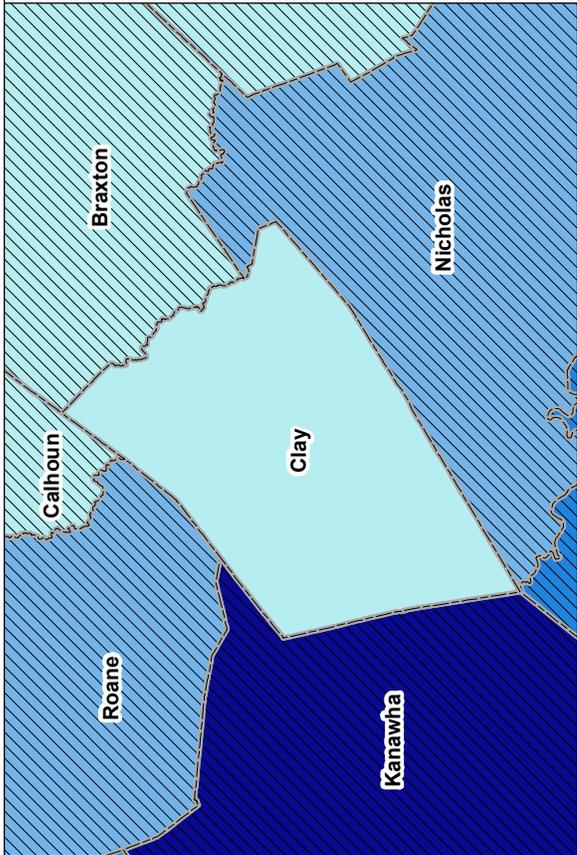


Source: WVEIS

Map 8 shows each county's dropout rate. Clay County currently has a below average dropout rate, resulting from a combination of education services and the lack of value in dropping out of high school. Maps 9 and 10 show the total graduates and the graduation rate by county, both of which are just below average for the state. Clay County's six 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 is Clay High School, which is the county's only high school. The significance of the locations of these schools is the access to major transportation routes. Five of 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

Clay County



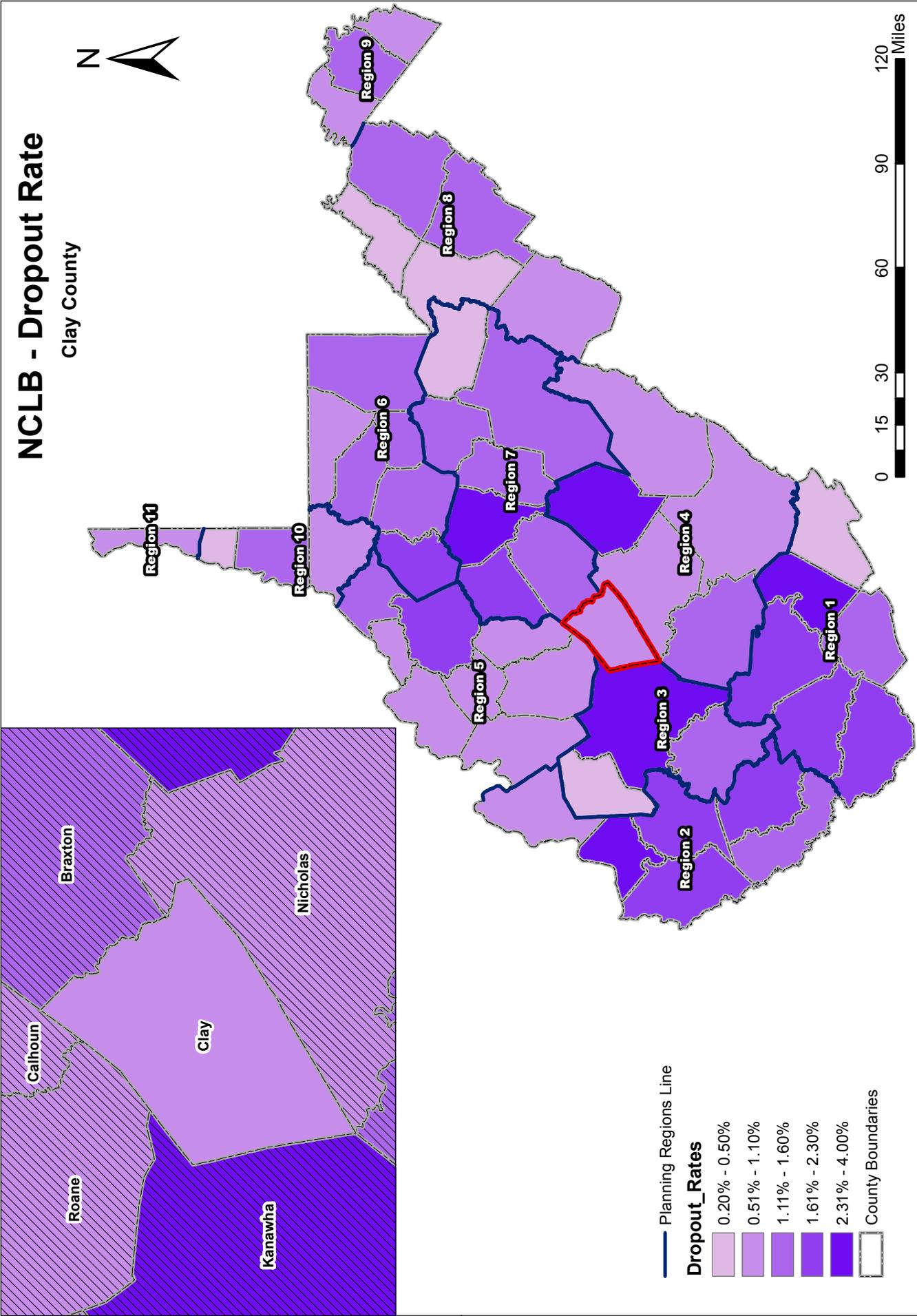
RTI
RAHALL APPLACHIAN
TRANSPORTATION INSTITUTE
www.rti.org

Source: West Virginia Department of Education 2014

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NCLB - Dropout Rate

Clay County



— Planning Regions Line

Dropout_Rates

- 0.20% - 0.50%
- 0.51% - 1.10%
- 1.11% - 1.60%
- 1.61% - 2.30%
- 2.31% - 4.00%

County Boundaries

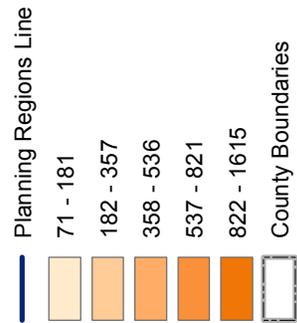
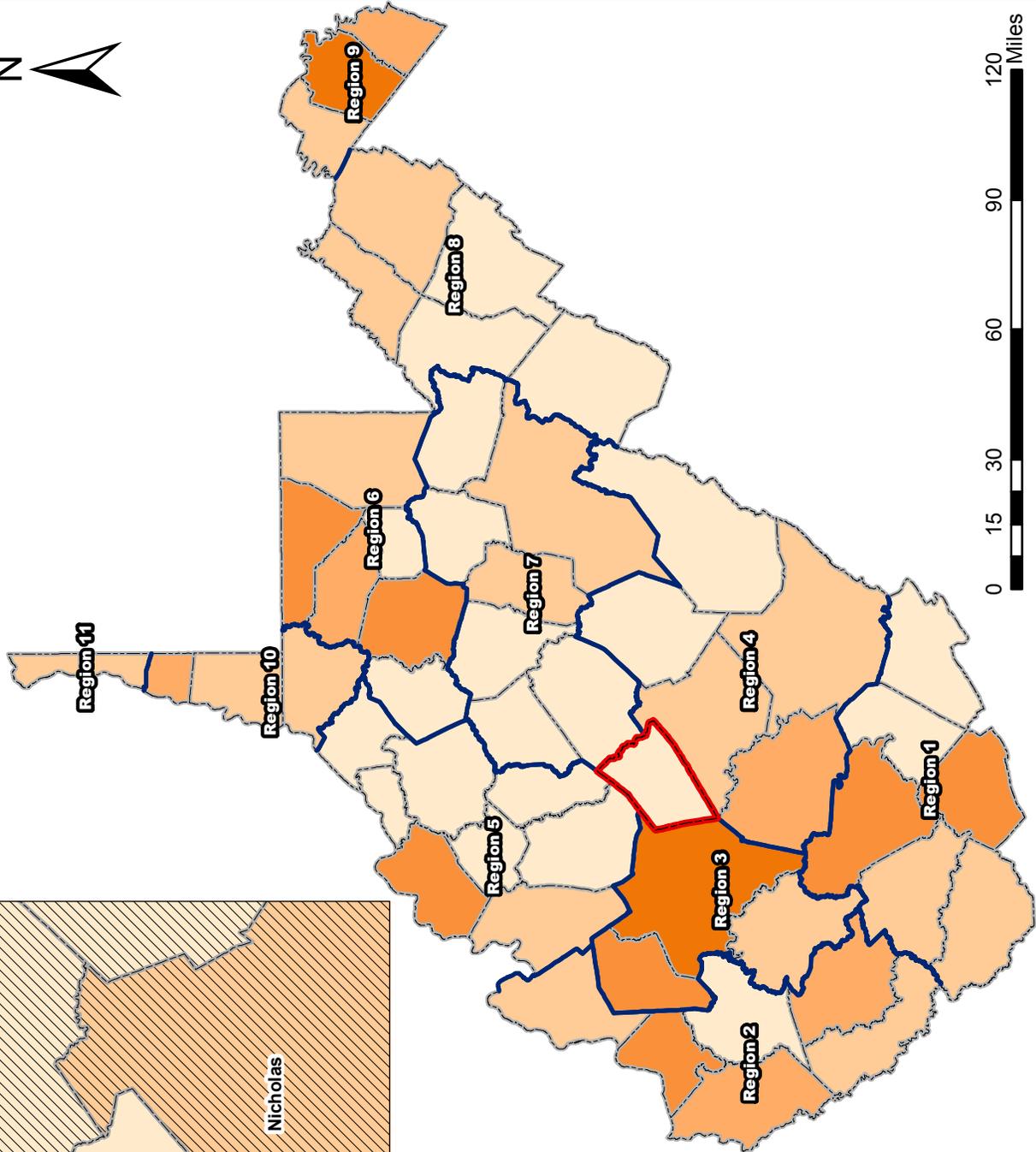
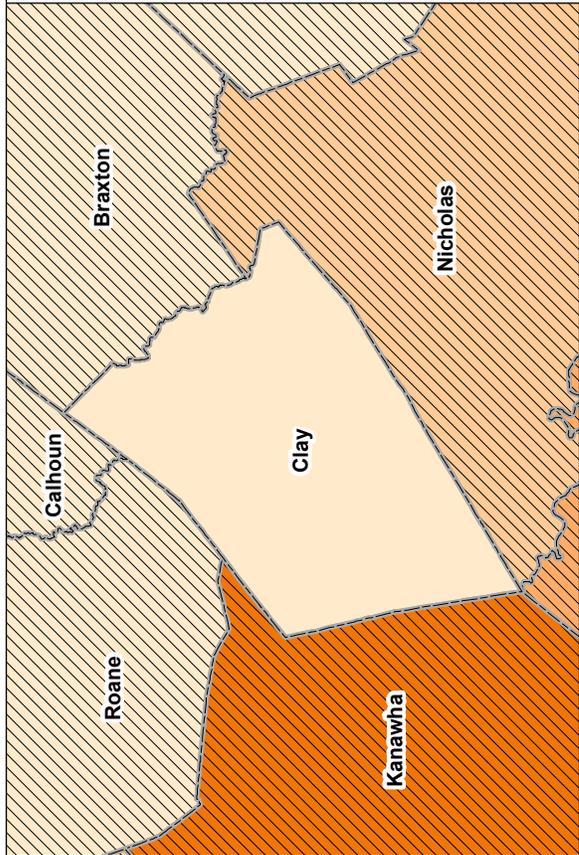


Source: West Virginia Department of Education 2014

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NCLB - Total Graduates

Clay County



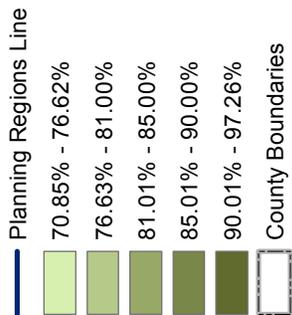
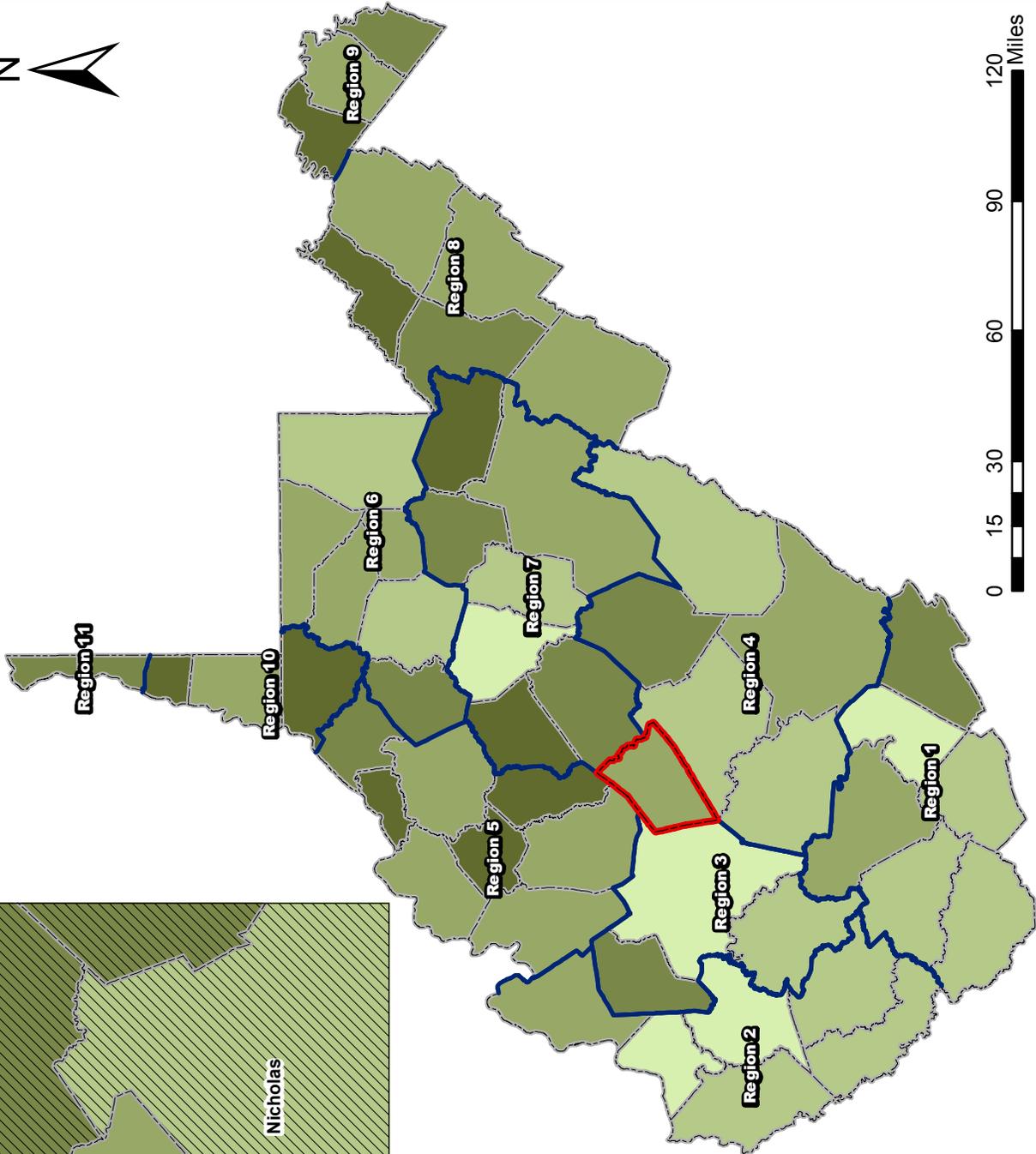
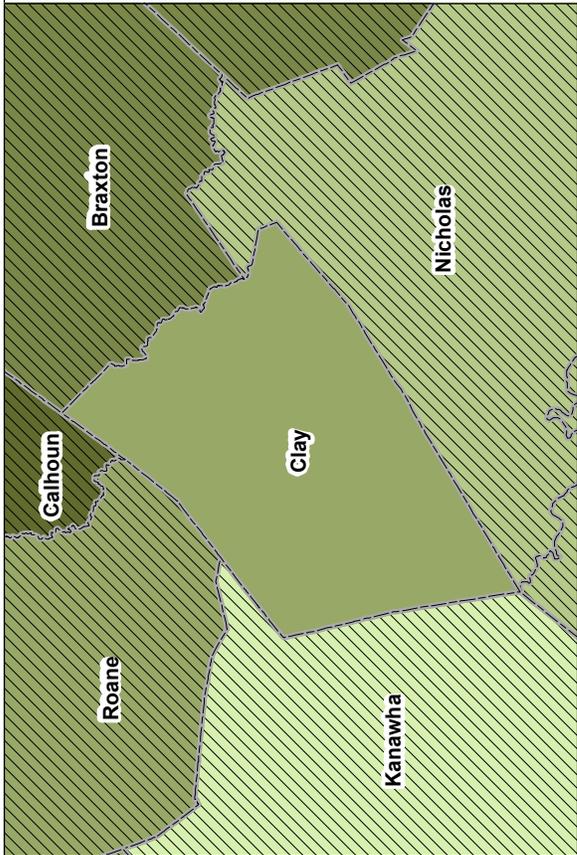
Source: West Virginia Department of Education 2013

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NCLB - Graduates Rate

Clay County

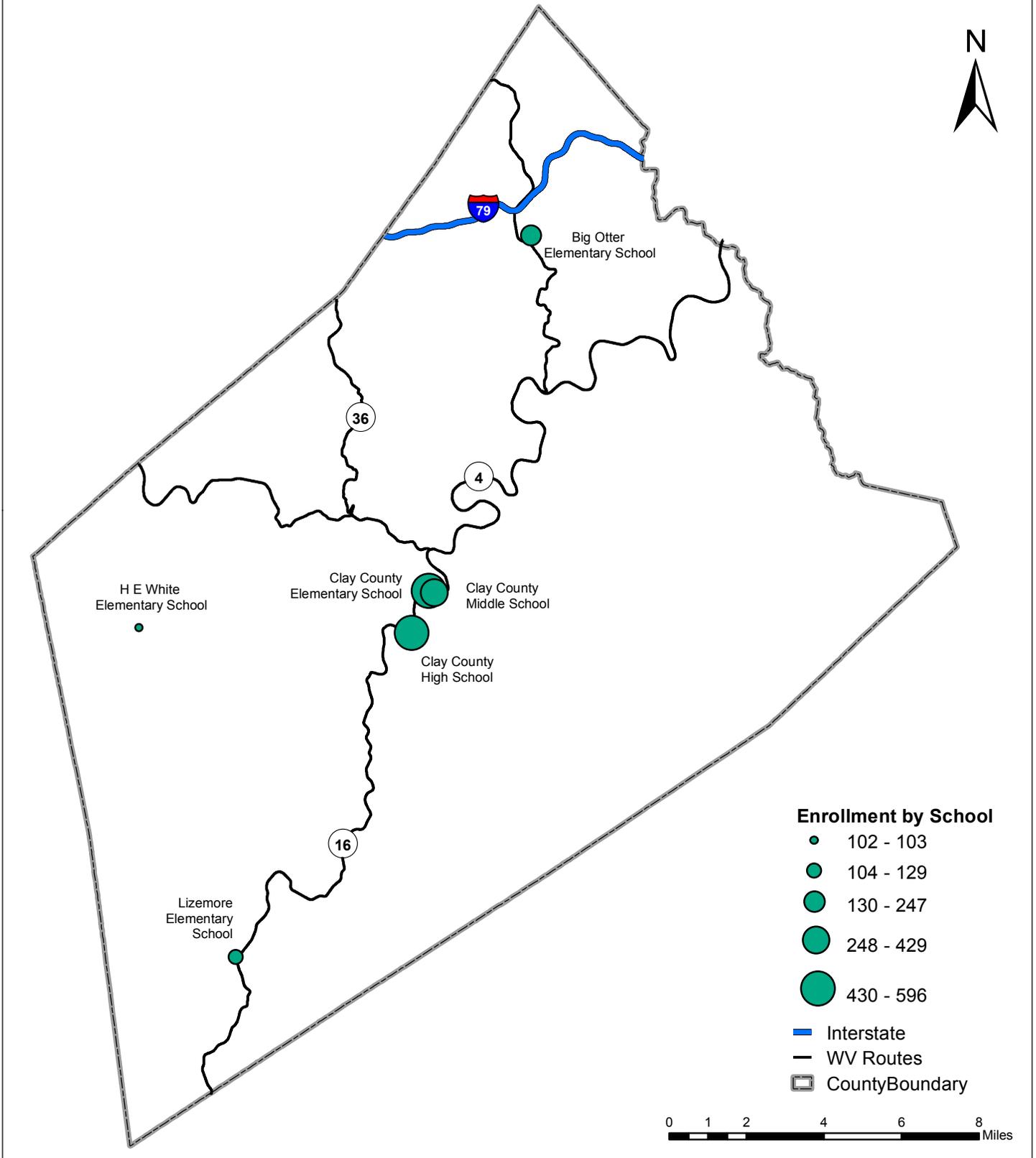


Source: West Virginia Department of Education 2014

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Total Attendance by School - 2014

Clay County



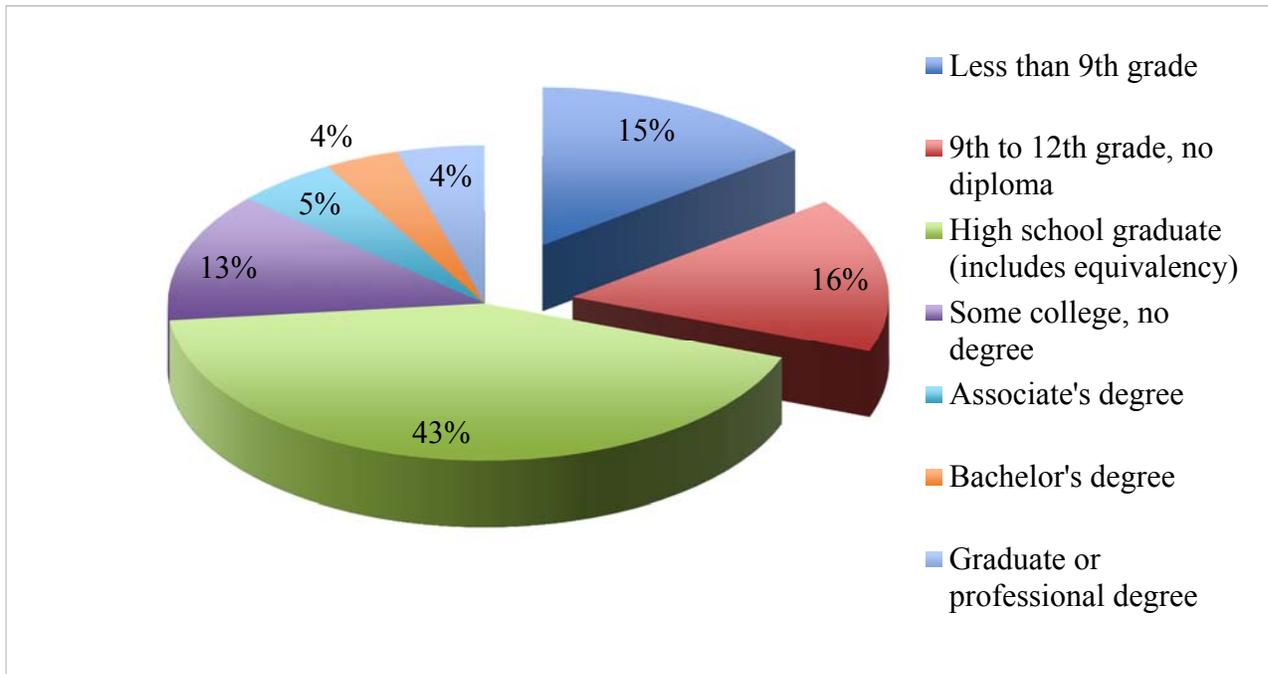
Source: West Virginia Department of Education 2014

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The ACS also maintains data on the educational attainment of the population that is 25 years and over. Forty-three percent of these residents have terminated at a high school diploma or equivalent. Thirty-one percent have less than a high school diploma. This number is very disturbing when the connection between education, employment, and wages is considered.

Figure 13: Clay County Educational Attainment



Source: 2012 American Community Survey 5-Year Estimates

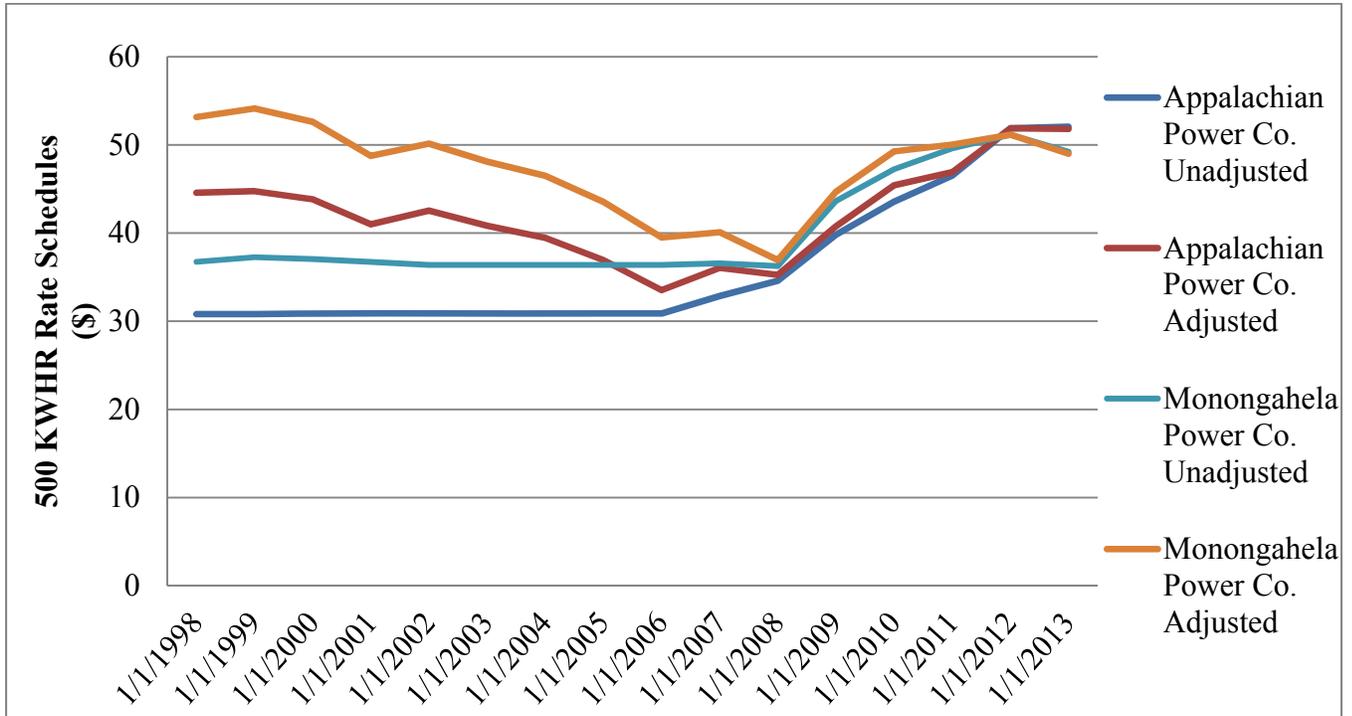
Utilities and Infrastructure

Clay County has 17 utility companies according to the West Virginia Public Service Commission (PSC). Economic development depends on infrastructure, and Clay County has several providers of water and sewer, and three providers of electricity. Appalachian Power, Black Diamond Power, and Monongahela Power Companies all provide electricity to Clay County.

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 for Appalachian and Monongahela Power Companies. 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 2012. The adjusted and unadjusted prices are provided in Figure 14.

Figure 14: Power Company Prices



Source: WV Public Service Commission and United States Bureau of Labor Statistics

The graph shows that electricity rates steadily decreased in real terms through 2006 and remained fairly constant with adjustment. Both adjusted and unadjusted prices have increased since 2006. 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 Clay 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. Clay County has 6 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, of which Clay County has none.

Table 1: Clay County Water and Sewer Rates

Clay County Public Service District	
Water Rates	
First 3,000 gallons used per month	13.70 per 1,000 gallons
Next 3,000 gallons used per month	13.09 per 1,000 gallons

Next 4,000 gallons used per month	12.52 per 1,000 gallons
Next 10,000 gallons used per month	11.93 per 1,000 gallons
All Over 20,000 gallons used per month	11.36 per 1,000 gallons
Clay-Roane Public Service District	
Water Rates	
First 10,000 gallons used per month	16.85 per 1,000 gallons
All Over 10,000 gallons used per month	10.84 per 1,000 gallons
Birch River Public Service District	
Water Rates	
All gallons used per month	15.34 per 1,000 gallons
Gauley River Public Service District	
Water Rates	
First 3,000 gallons used per month	12.46 per 1,000 gallons
Next 3,000 gallons used per month	11.68 per 1,000 gallons
Next 4,000 gallons used per month	10.91 per 1,000 gallons
Next 10,000 gallons used per month	10.14 per 1,000 gallons
All Over 20,000 gallons used per month	9.35 per 1,000 gallons
Queen Shoals Public Service District	
Water Rates	
First 3,000 gallons used per month	11.64 per 1,000 gallons
Next 3,000 gallons used per month	11.44 per 1,000 gallons
Next 4,000 gallons used per month	11.24 per 1,000 gallons
All Over 10,000 gallons used per month	10.84 per 1,000 gallons
Town of Clay	
Water Rates (Clay Municipal Water Works)	
First 2,000 gallons used per month	6.51 per 1,000 gallons
Next 18,000 gallons used per month	5.05 per 1,000 gallons
All Over 20,000 gallons used per month	3.48 per 1,000 gallons
Sewer Rates (Town of Clay)	
First 2,000 gallons	11.31 per 1,000 gallons
All over 2,000 gallons	11.31 per 1,000 gallons

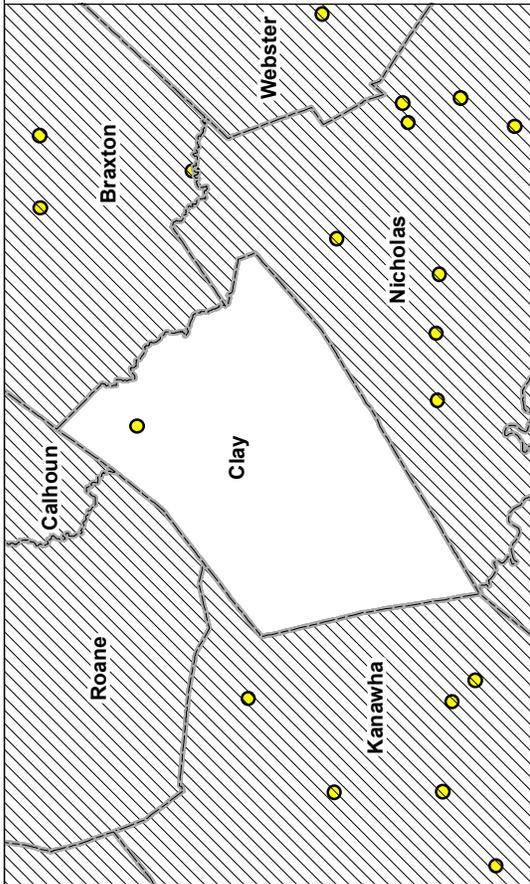
A private water company, West Virginia American Water Company, also services Boone County. The general service rates are listed in the table below, and are rounded to the nearest cent.

West Virginia American Water Company	
First 1500 gallons used per month	Minimum charge based on meter size
Next 28500 gallons used per month	9.61 per 1000 gallons

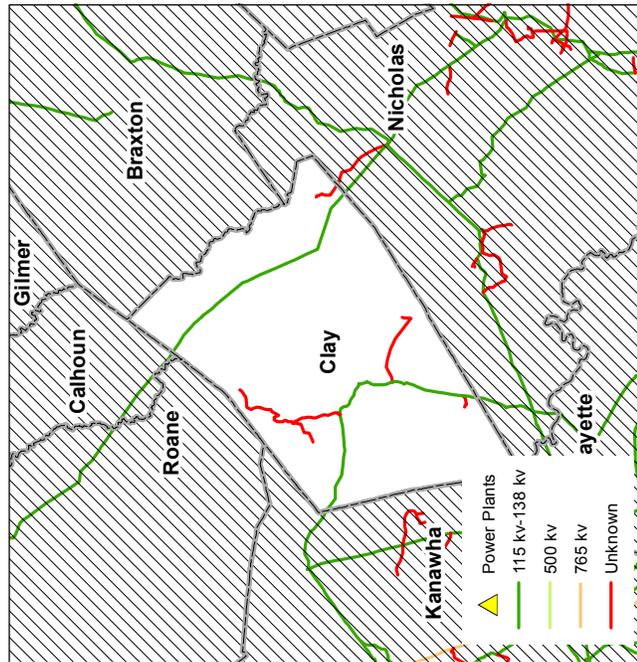
Next 870000 gallons used per month	6.33 per 1000 gallons
Next 81000000 gallons used per month	4.61 per 1000 gallons
All Over 9000000 gallons used per month	3.00 per 1000 gallons

Utilities - Electricity

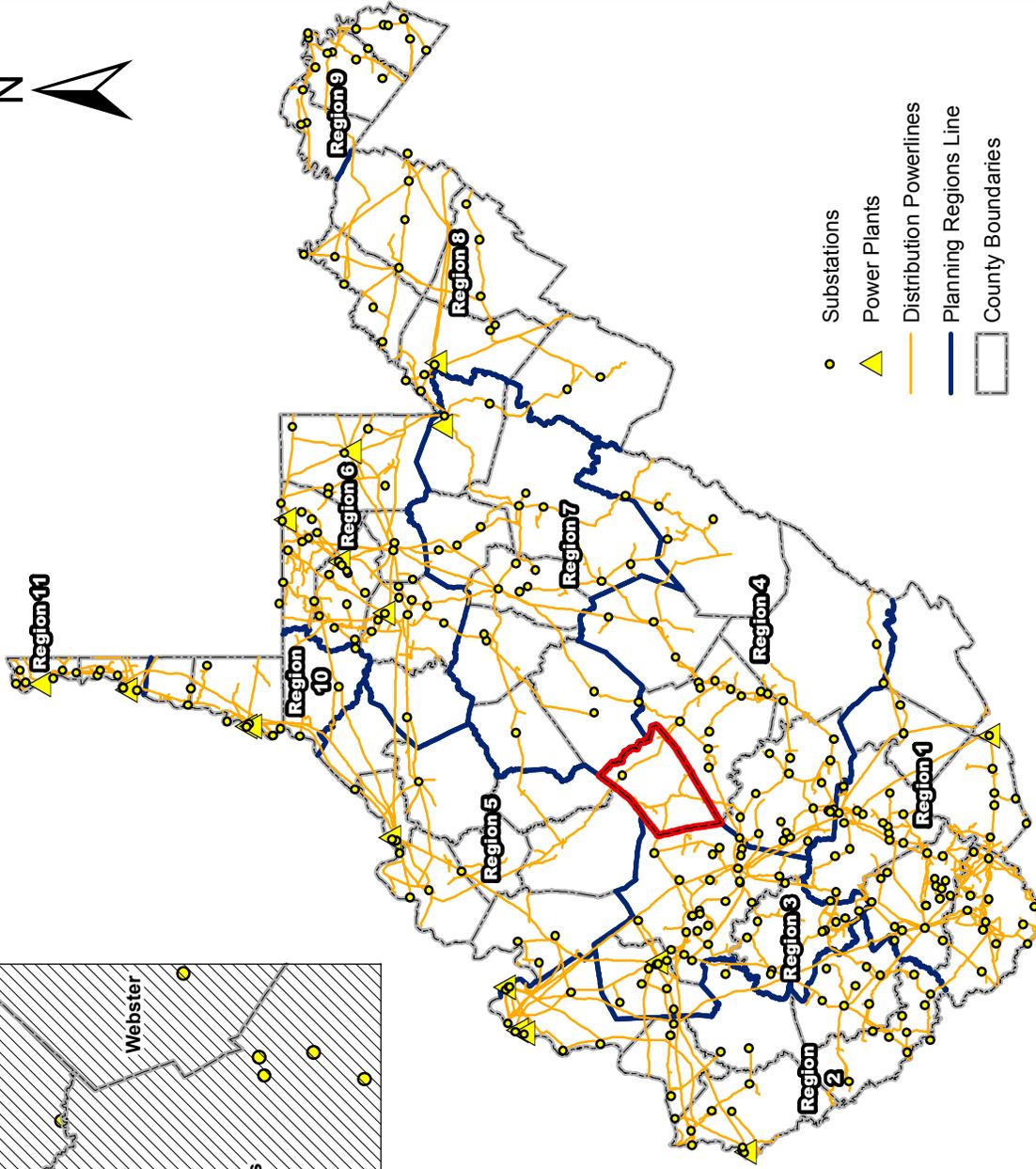
Clay County



● Electricity Substations



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



● Substations
 ▲ Power Plants
 — Distribution Powerlines
 — Planning Regions Line
 □ County Boundaries



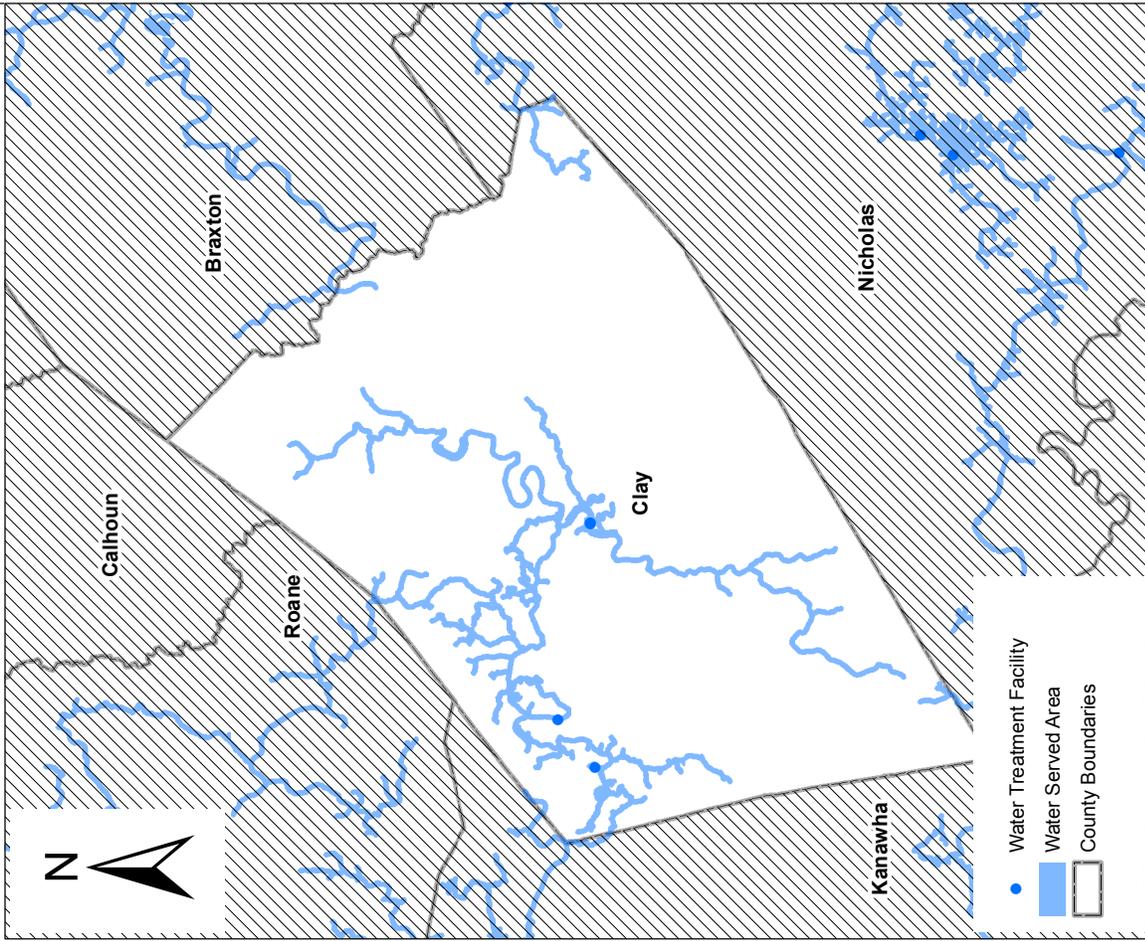
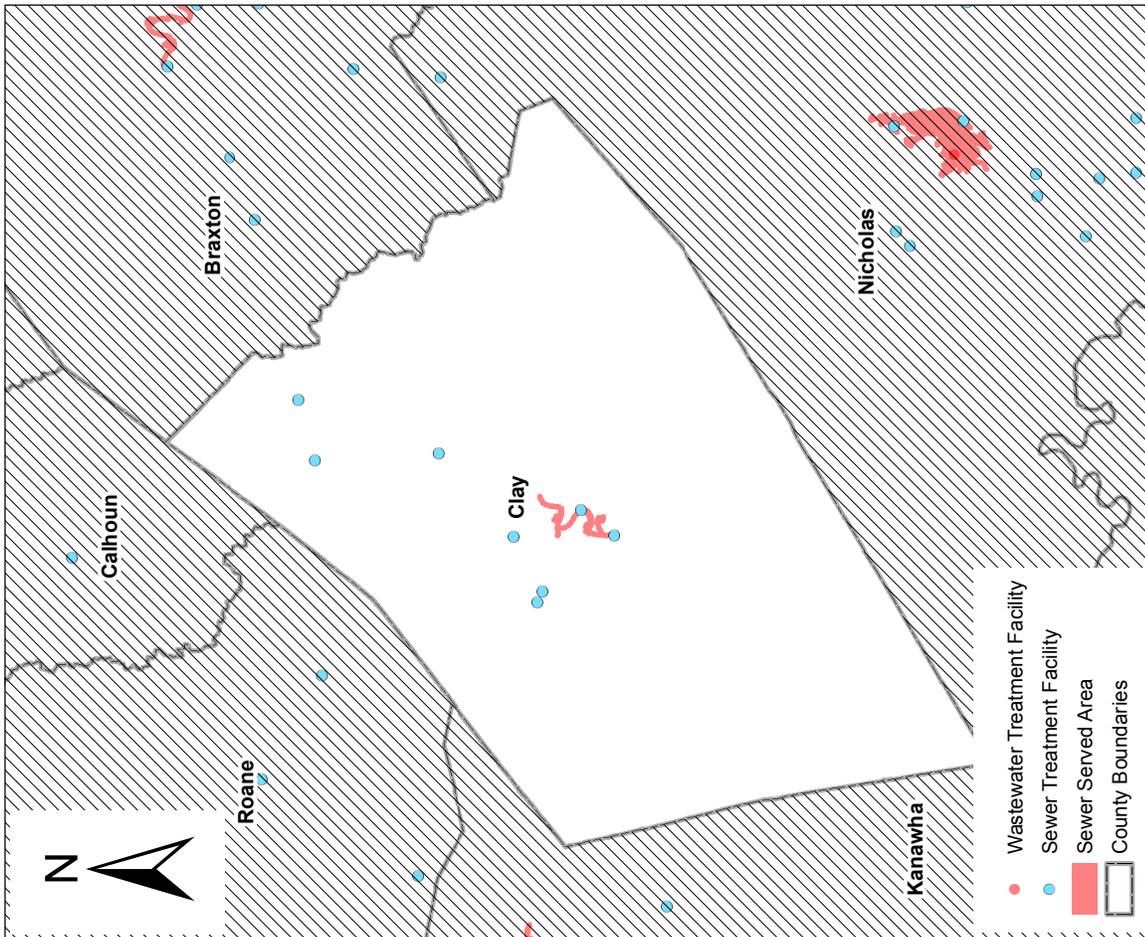
Source: West Virginia Division of Natural Resources, Statewide Addressing and Mapping 2008

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Utilities - Water and Sewer

Clay County



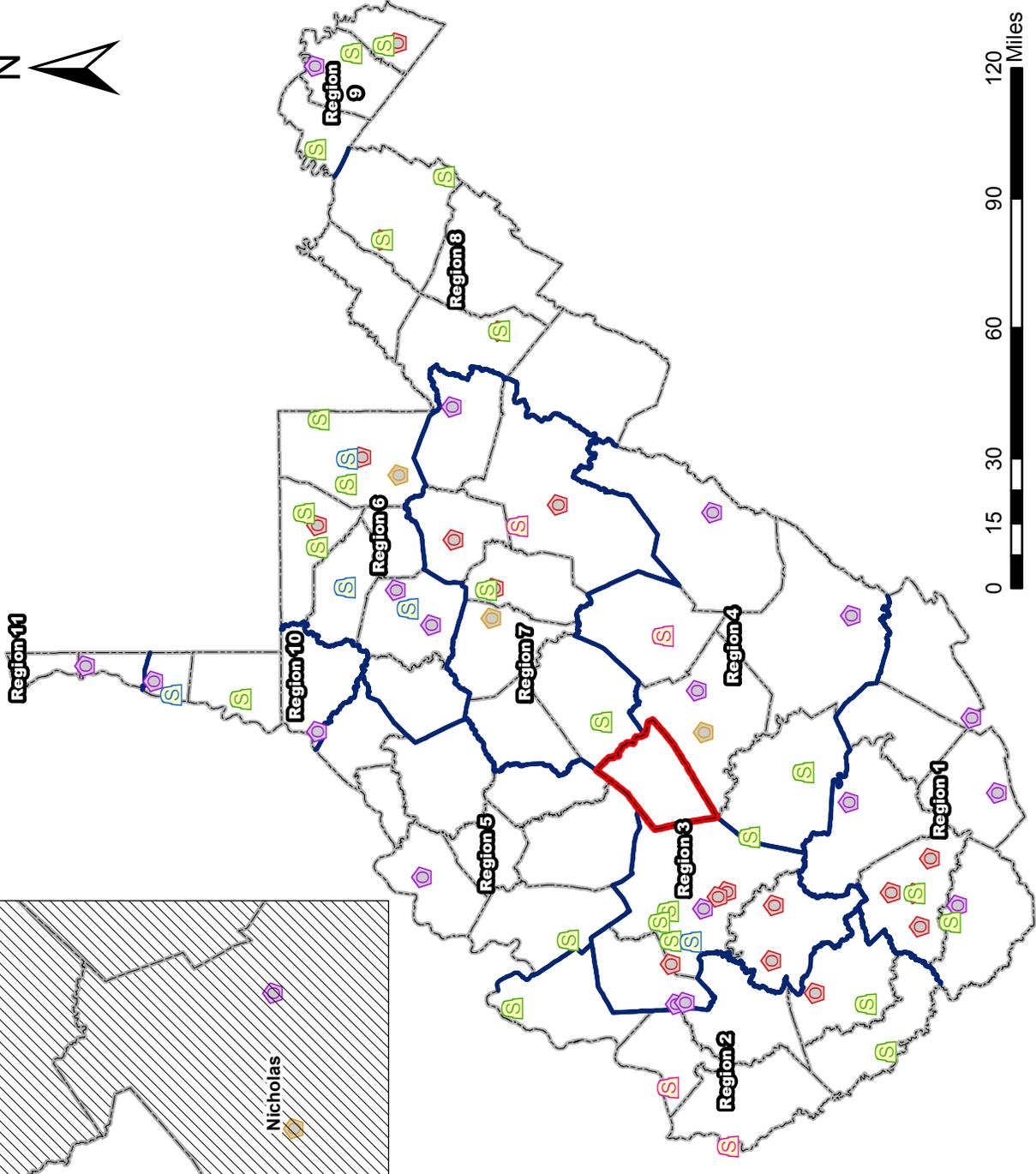
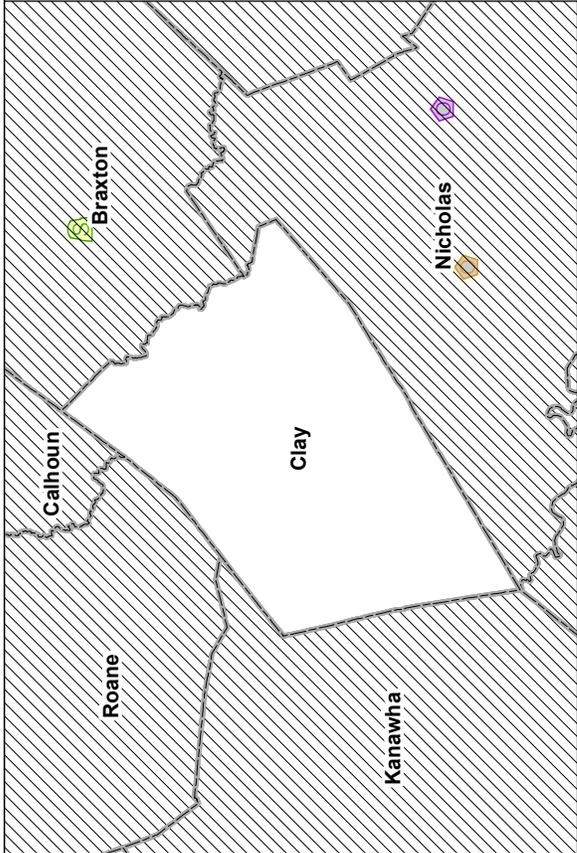
Source: West Virginia Infrastructure and Jobs Development Council N.A.

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Utility - Solid Waste Facility

Clay 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

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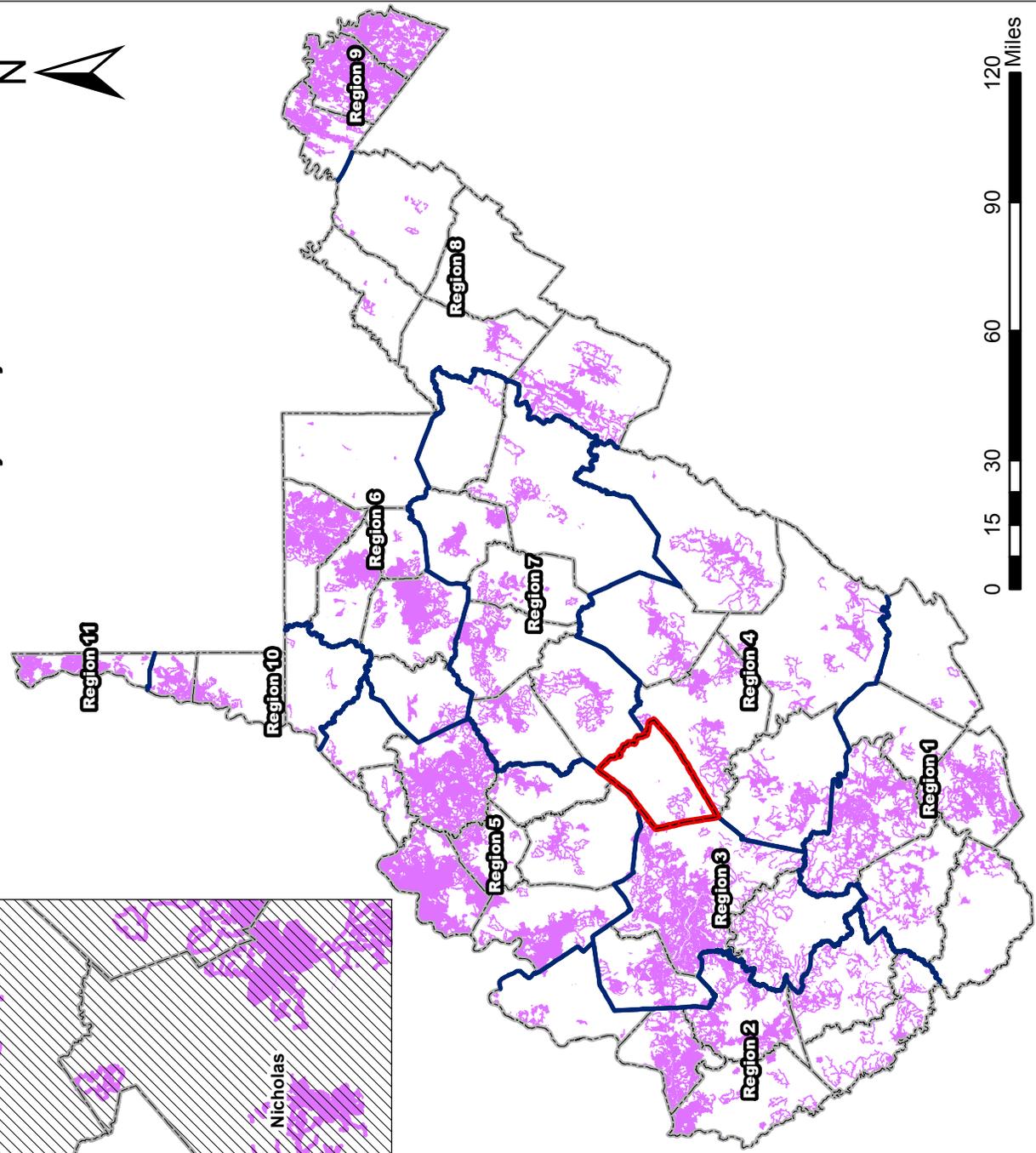
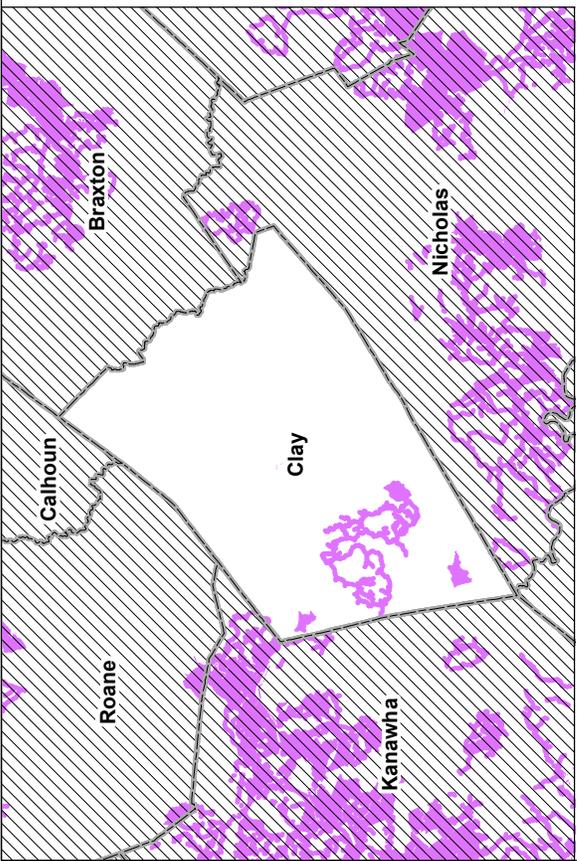
One essential modern convenience, now widely understood as an essential utility in a globalized world, is broadband access. The following 11 maps demonstrate Clay County's broadband infrastructure in relation to the State's. The largest number of providers in Clay County is three near the area of the interstate. Clay County broadband infrastructure resembles those of other coalfield counties. Of particular note is the spottiness of fixed wireless, the connection of two fixed points wirelessly by radio or other links, and the large areas without broadband.

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 Clay 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 2012, the most recent map available. Changes have been made since that time, thanks to broadband expansion programs encouraged by the state.

Broadband - Internet Cable and FTTP Coverage

Clay County



-  Planning Regions Line
-  Cable and FTTP
-  County Boundaries



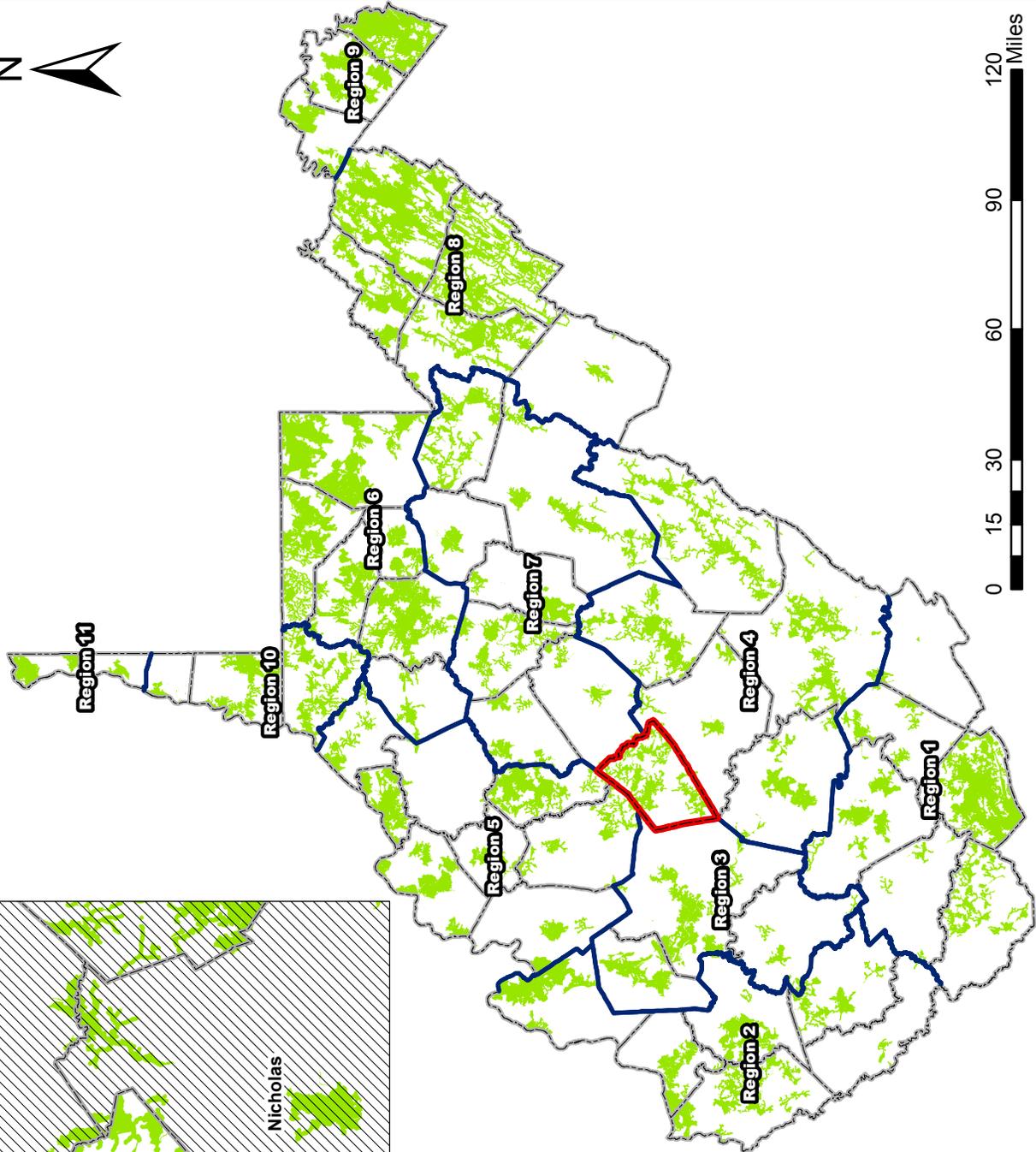
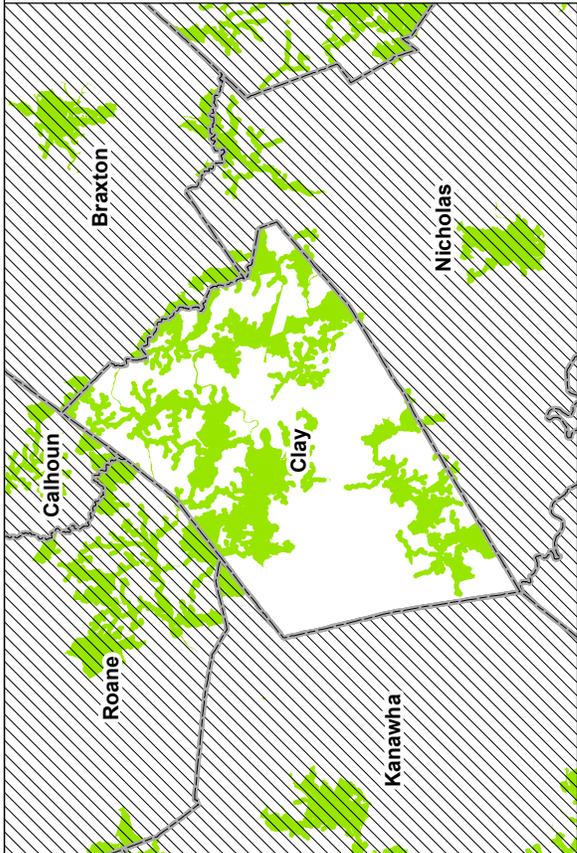
Source: West Virginia Broadband Mapping Program 2012

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Broadband - Internet DSL, BPL, Other Copper

Clay County



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

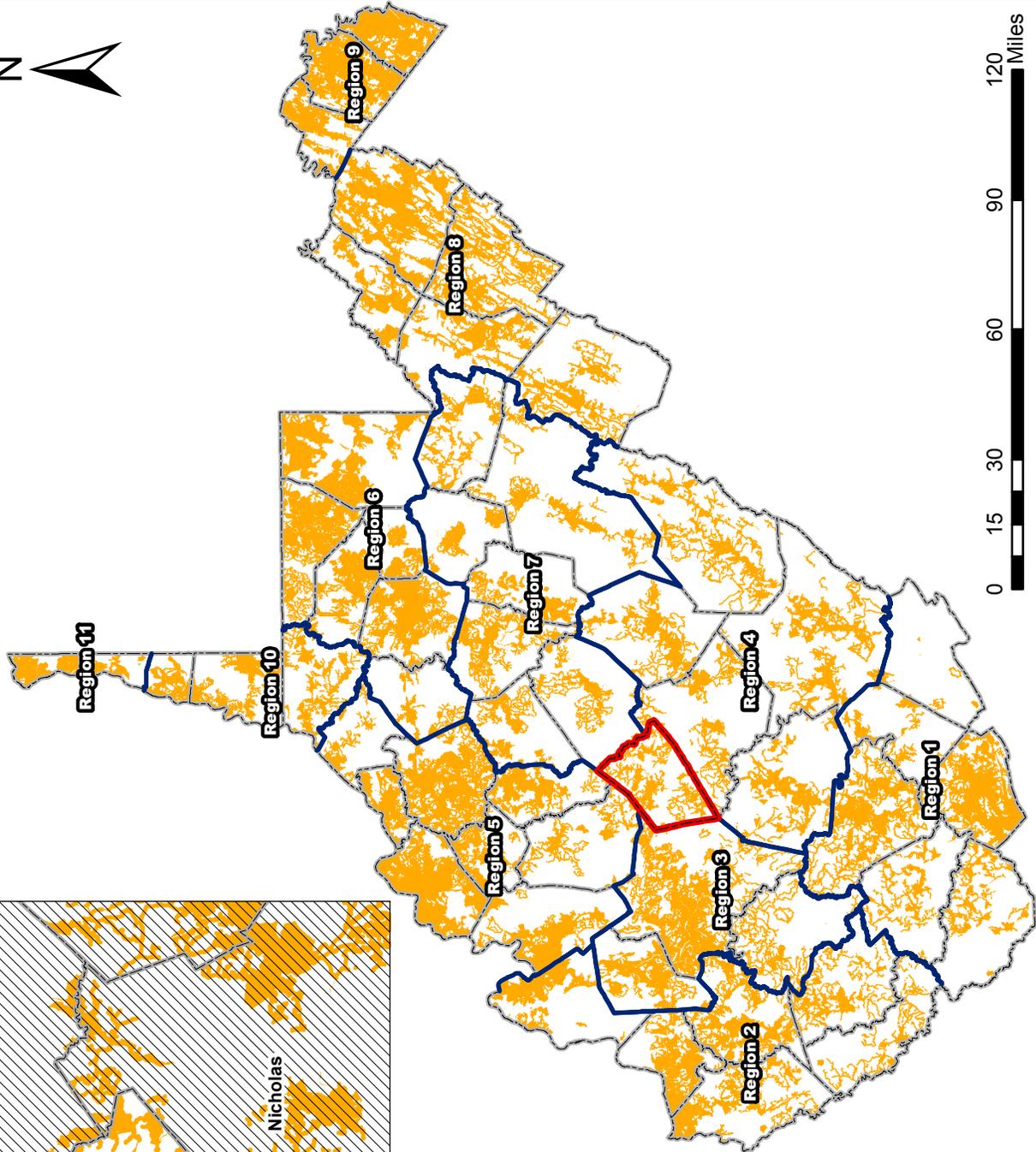
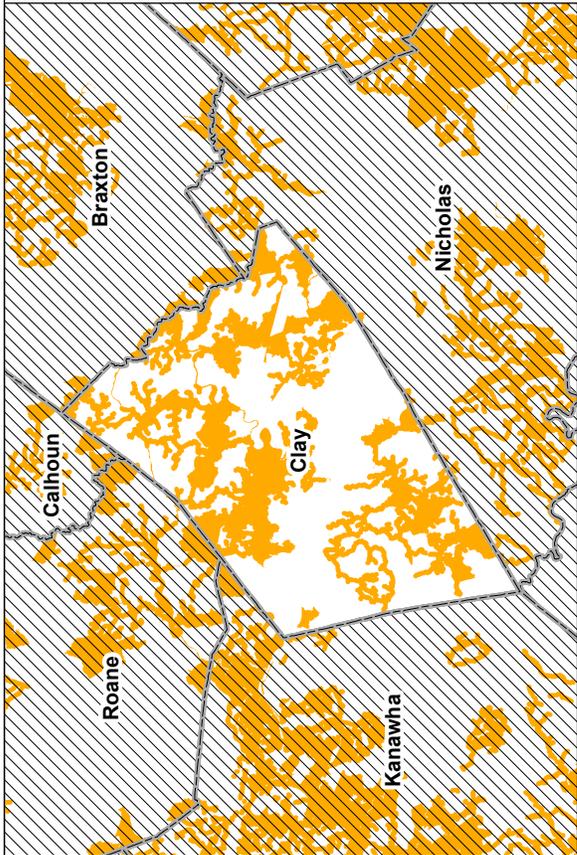
Source: West Virginia Broadband Mapping Program 2012

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Broadband - Internet Wireline Coverage

Clay County



-  Planning Regions Line
-  Wireline Coverage
-  County Boundaries

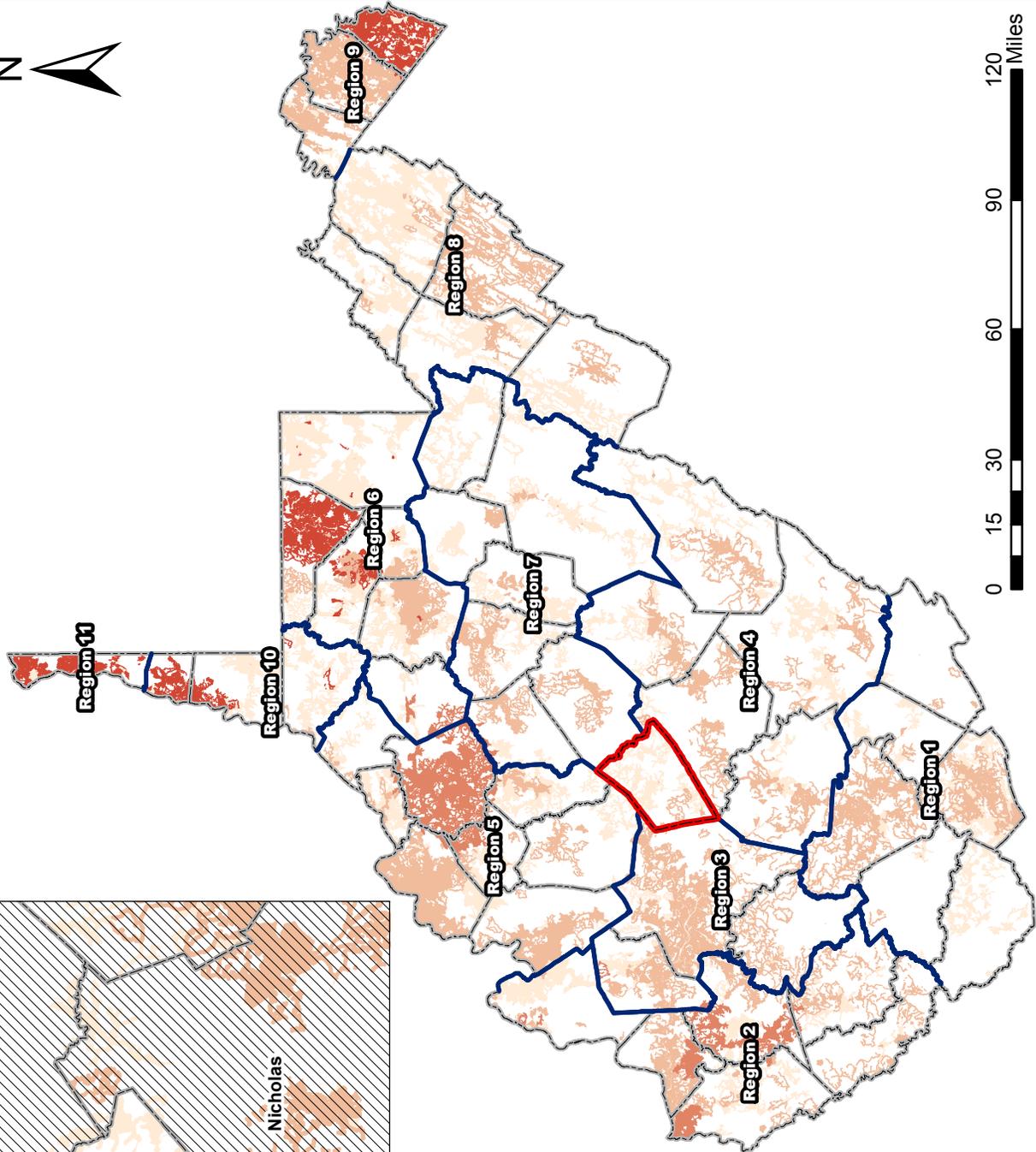
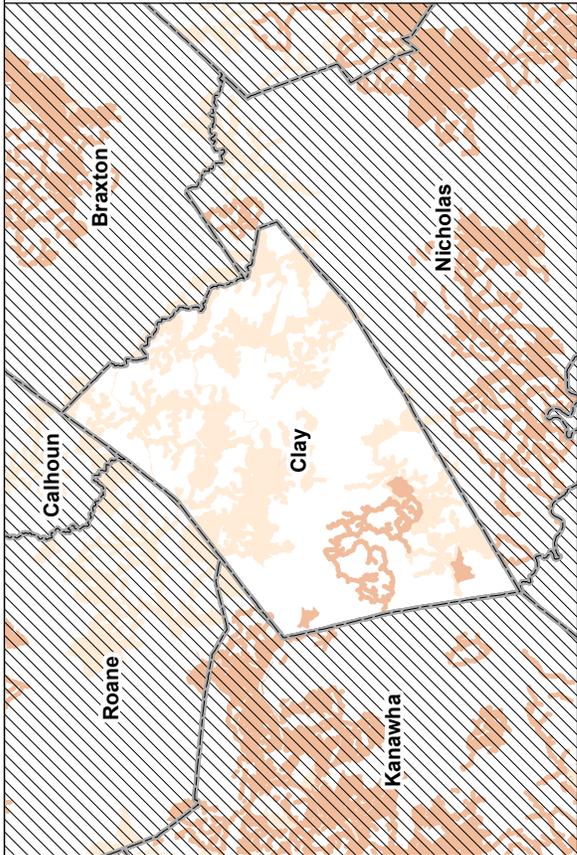
Source: West Virginia Broadband Mapping Program 2012

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Broadband - Internet MaxUp Speed Wireline

Clay 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 2012

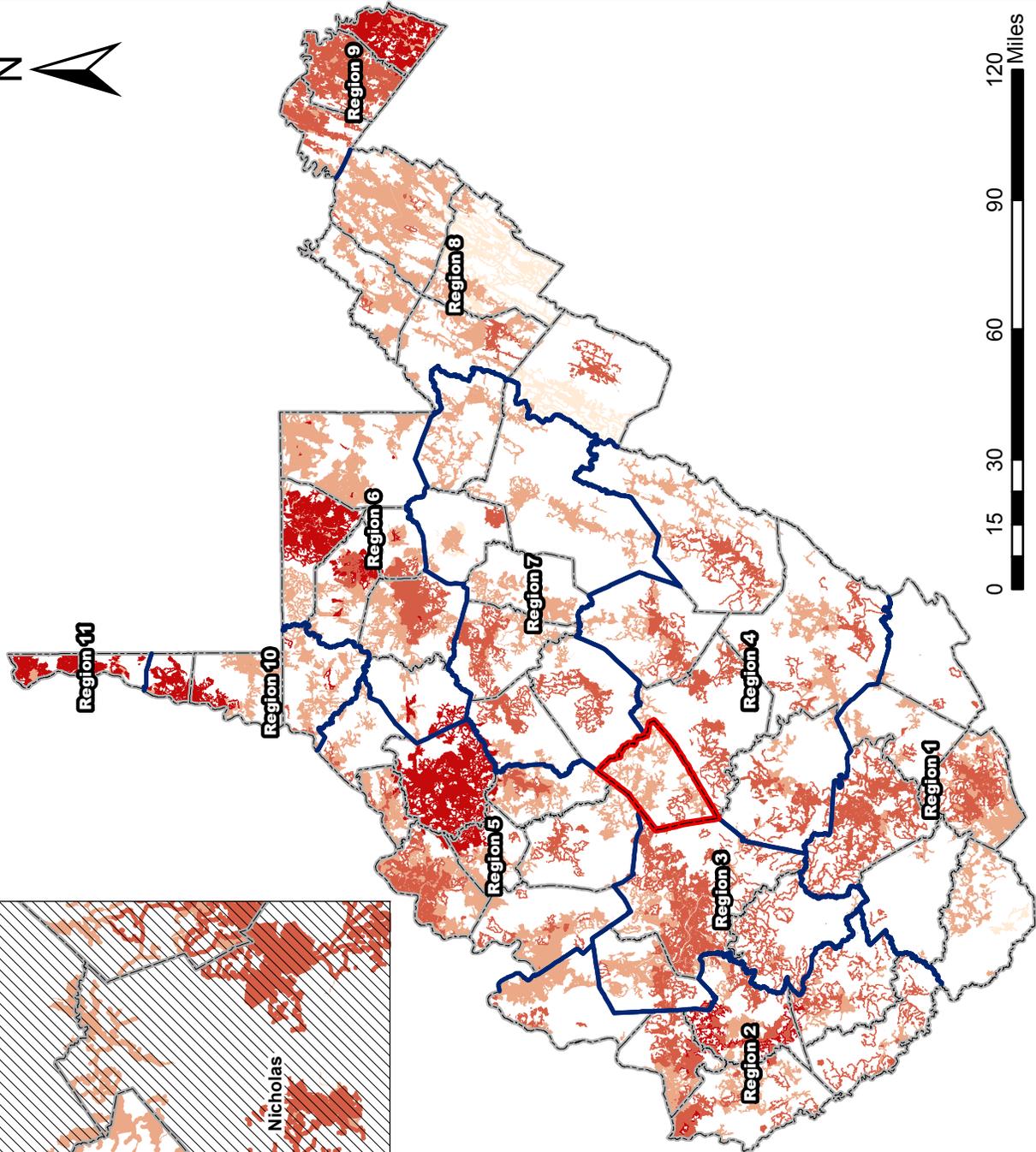
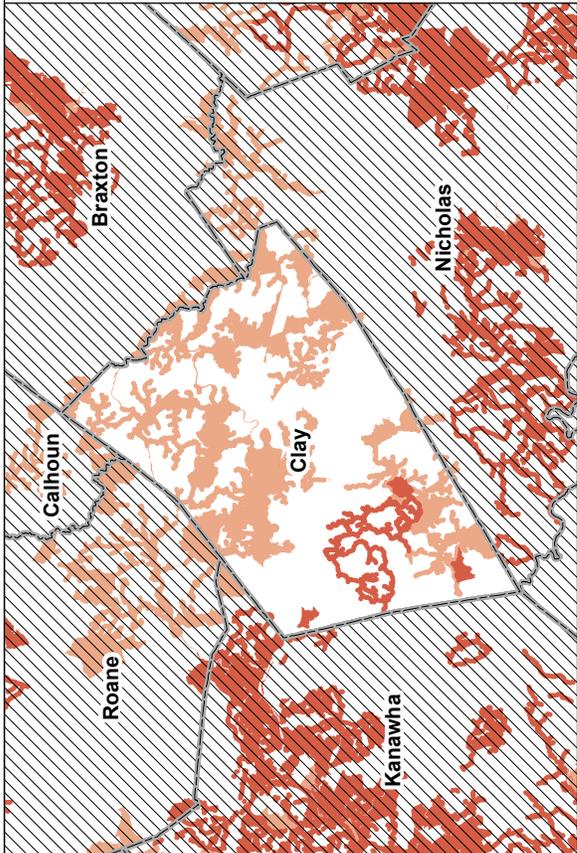
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www.rtiatati.org

Broadband - Internet MaxDown Speed Wireline

Clay County



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

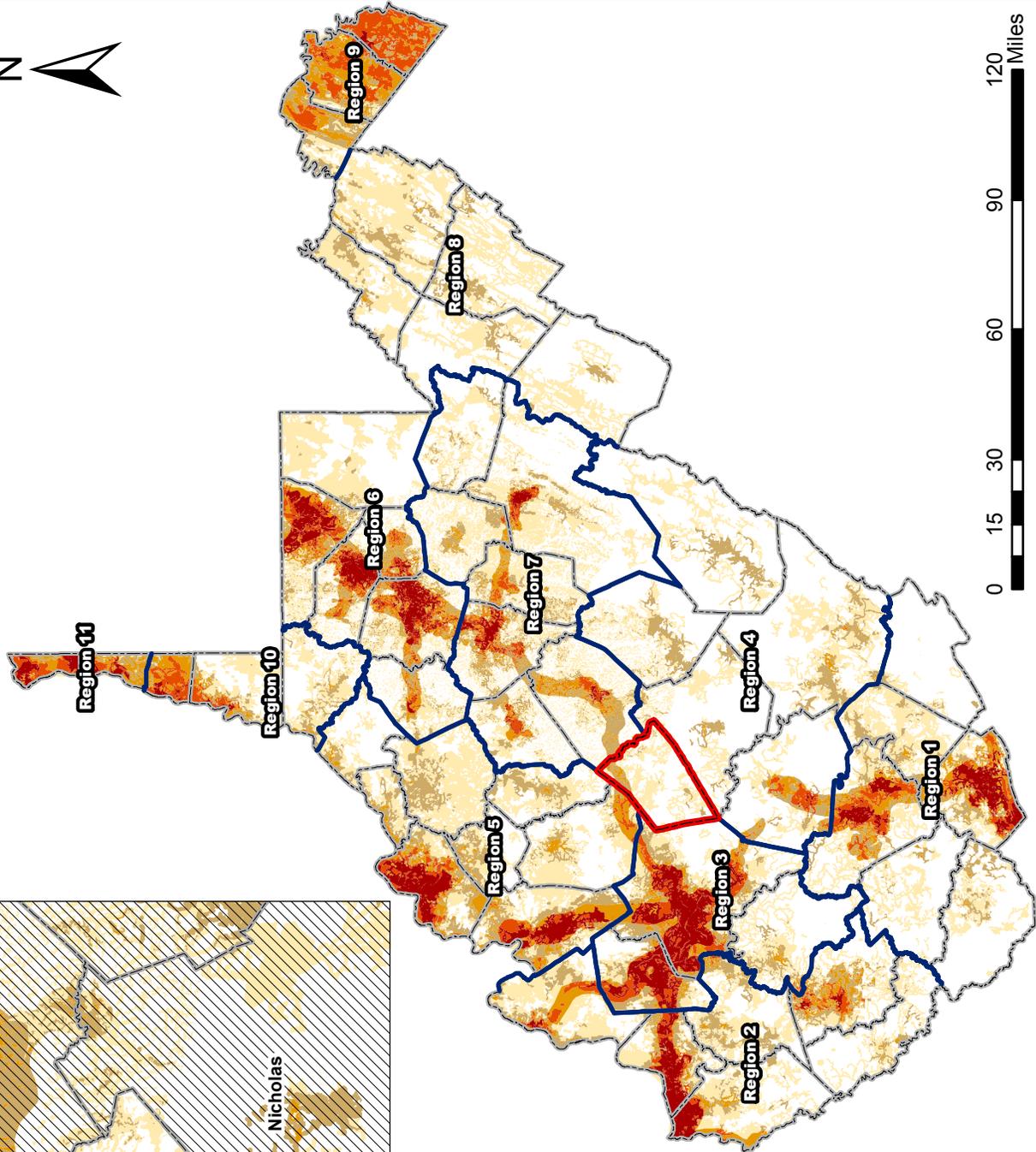
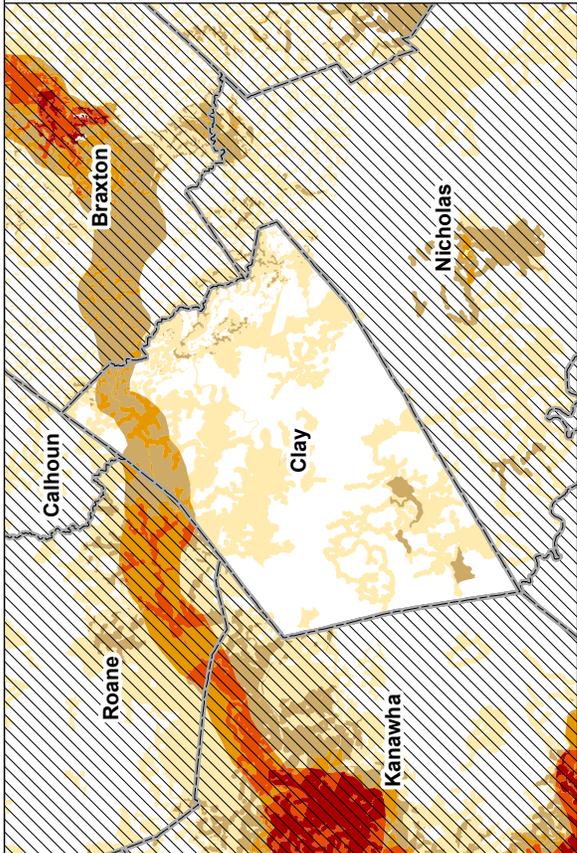
Source: West Virginia Broadband Mapping Program 2012

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Broadband - Internet Total Number of Providers

Clay County



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

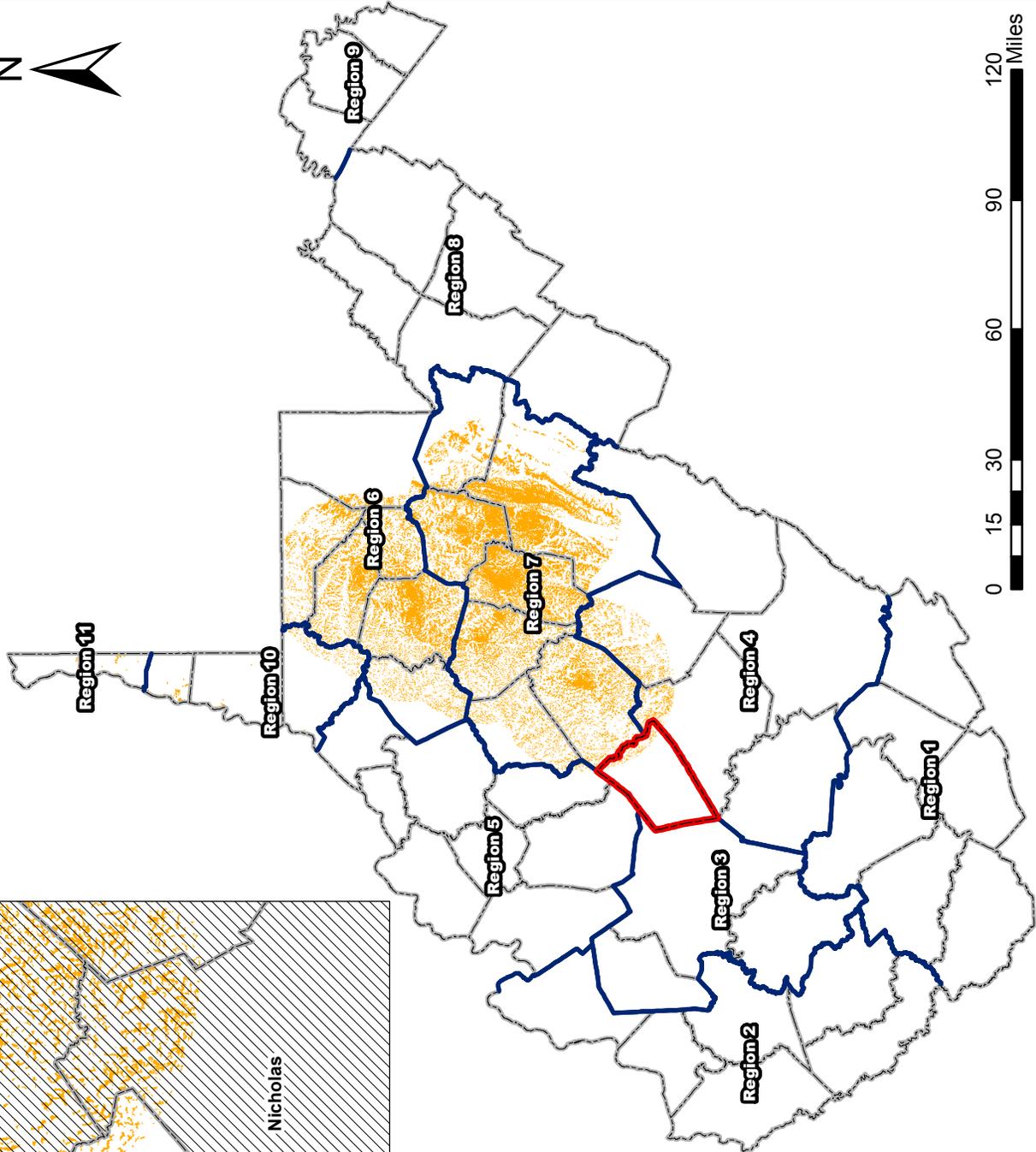
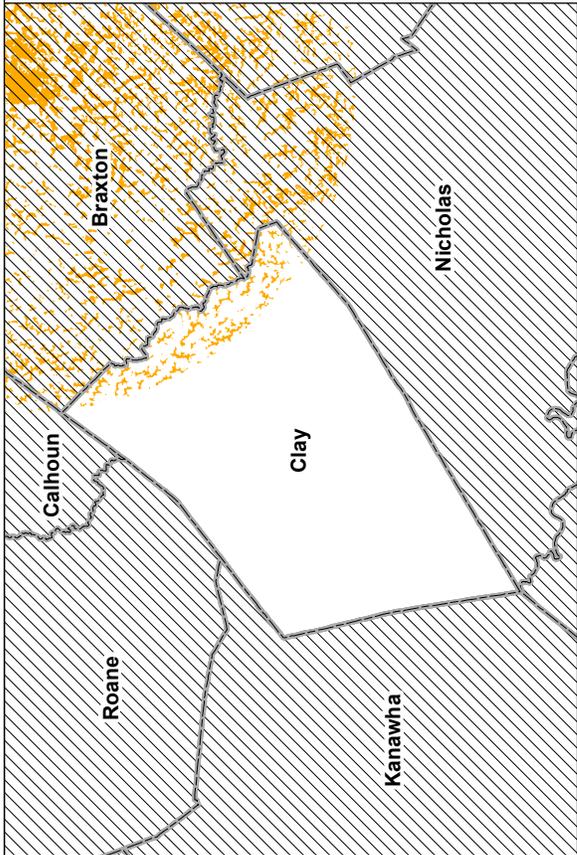
Source: West Virginia Broadband Mapping Program 2012

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Broadband - Internet Fixed Wireless Coverage

Clay County



- Planning Regions Line
- Fixed Wireless
- County Boundaries



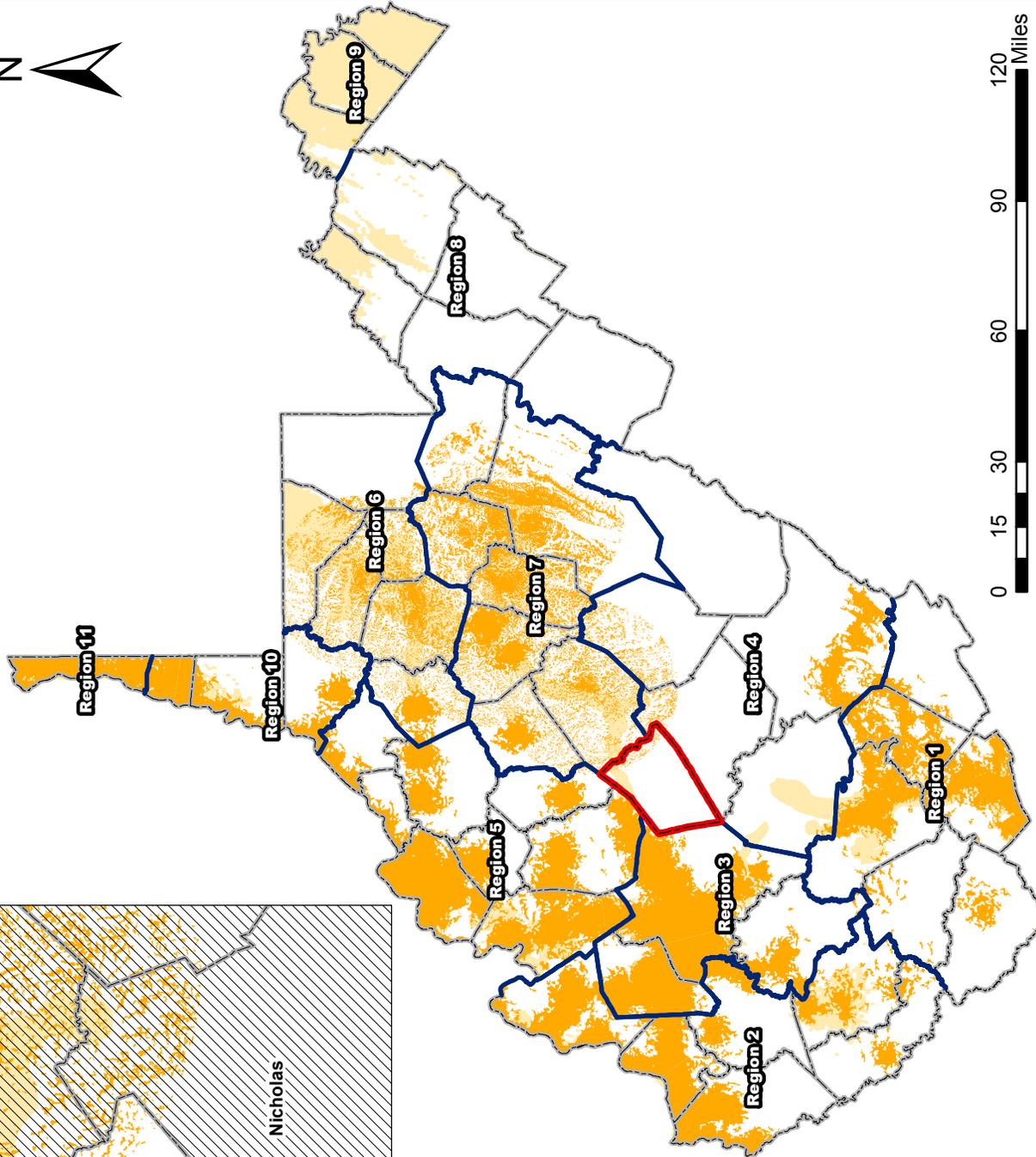
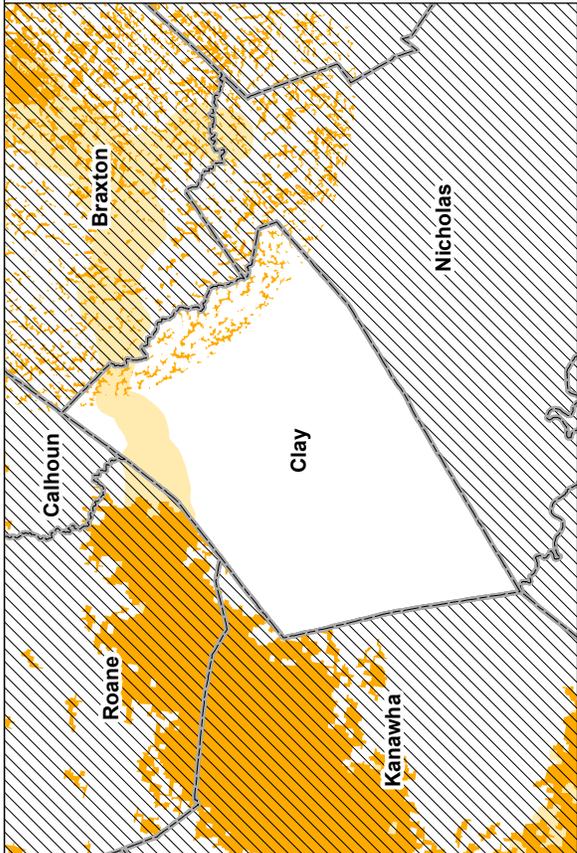
Source: West Virginia Broadband Mapping Program 2012

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Broadband - Internet MaxDown Speed Wireless

Clay County



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



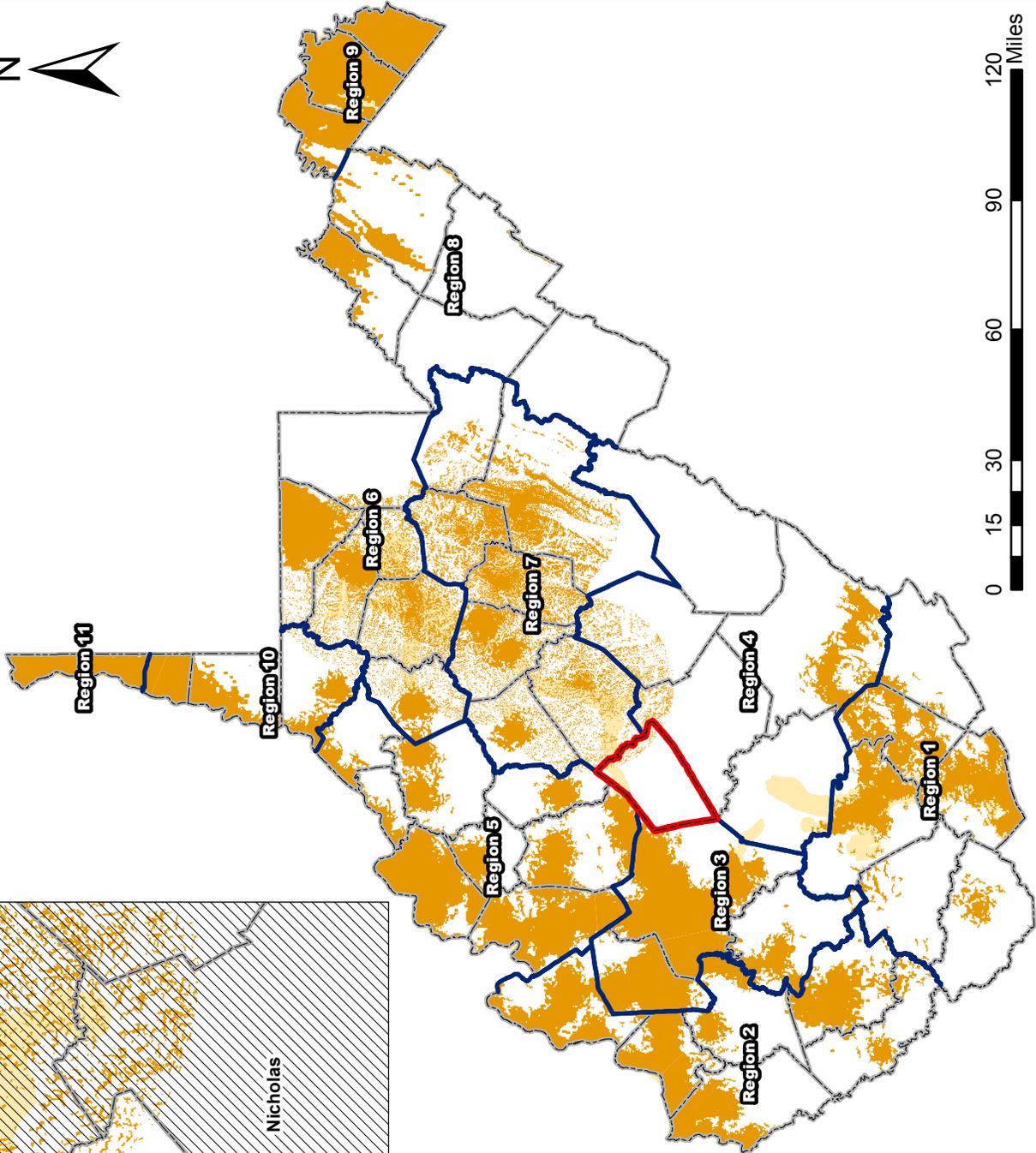
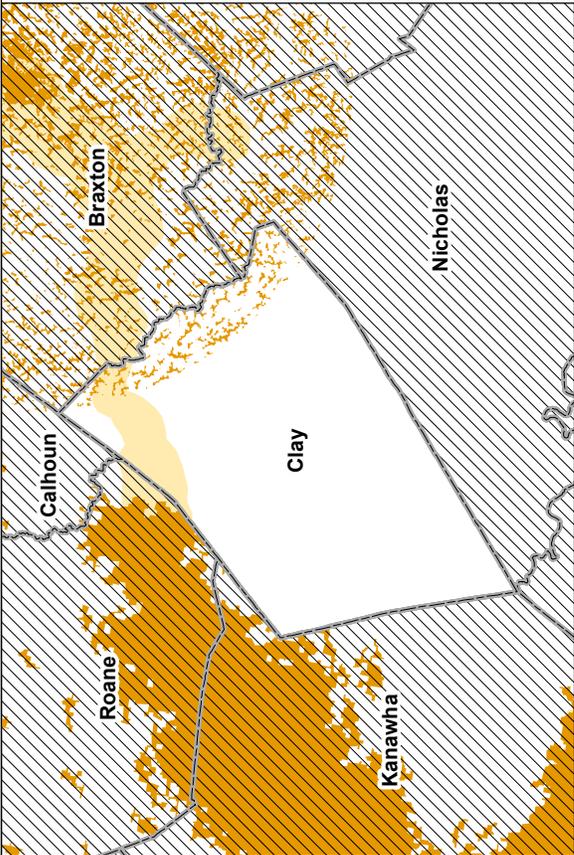
Source: West Virginia Broadband Mapping Program 2012

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Broadband - Internet MaxUp Speed Wireless

Clay County



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



Source: West Virginia Broadband Mapping Program 2012

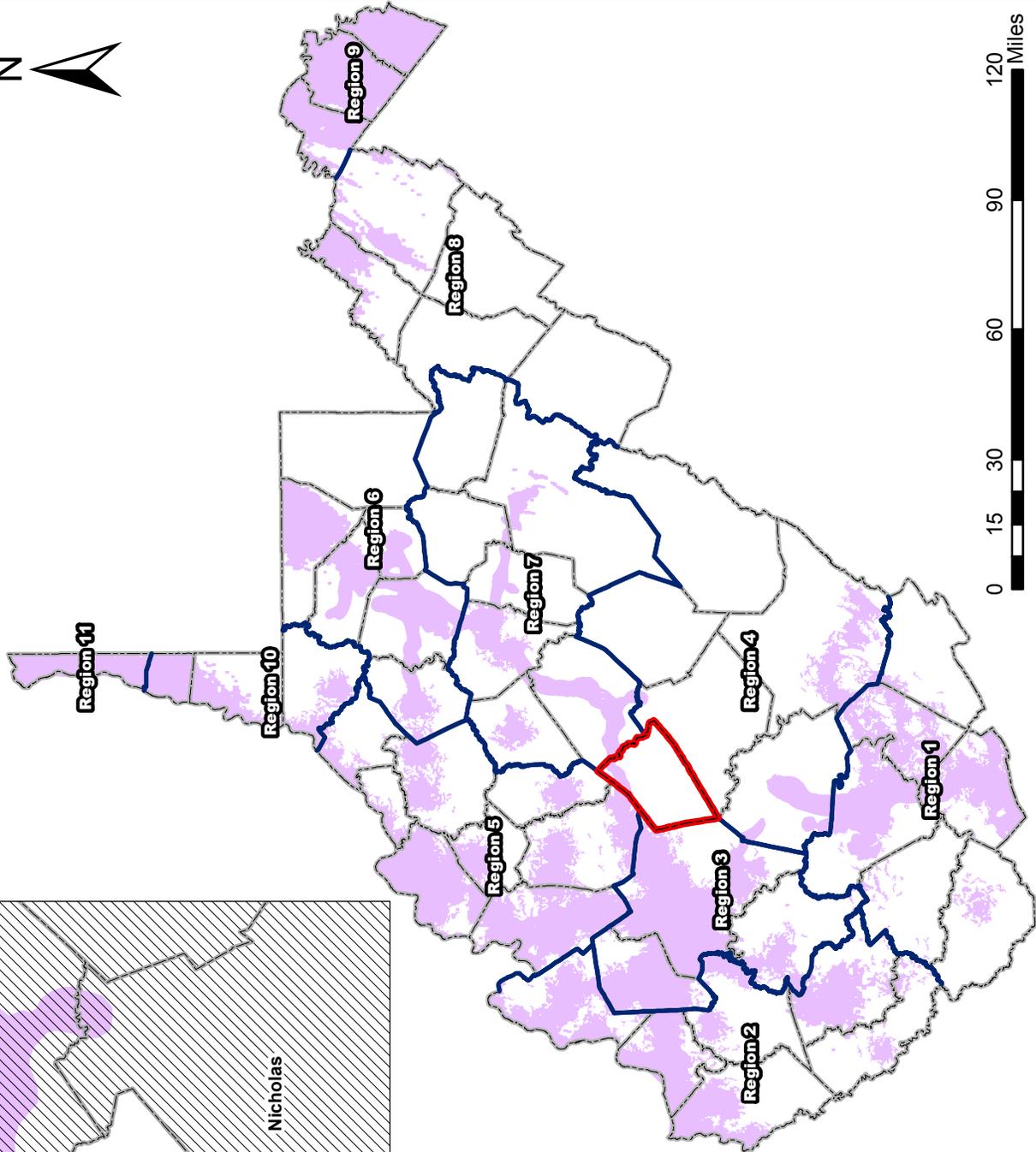
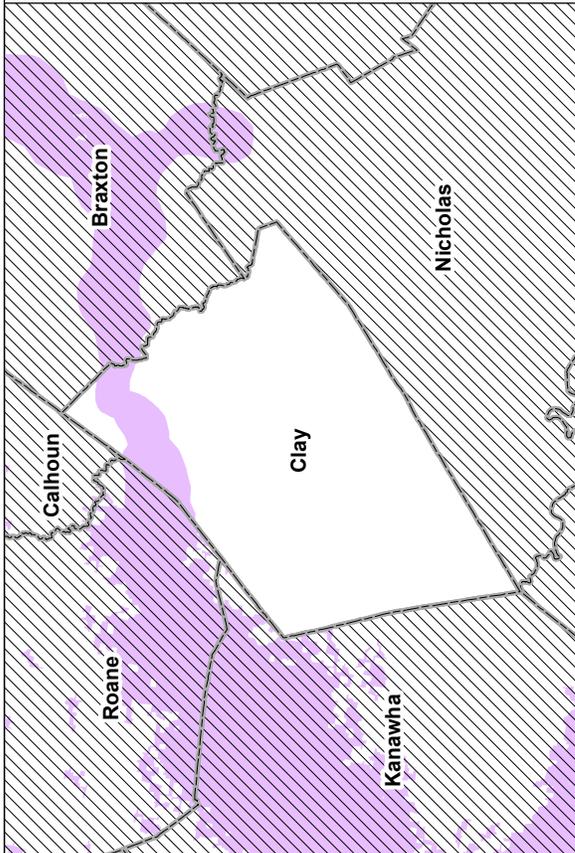
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Broadband - Internet Mobile Wireless Coverage

Clay County



- Planning Regions Line
- Mobile Wireless
- County Boundaries



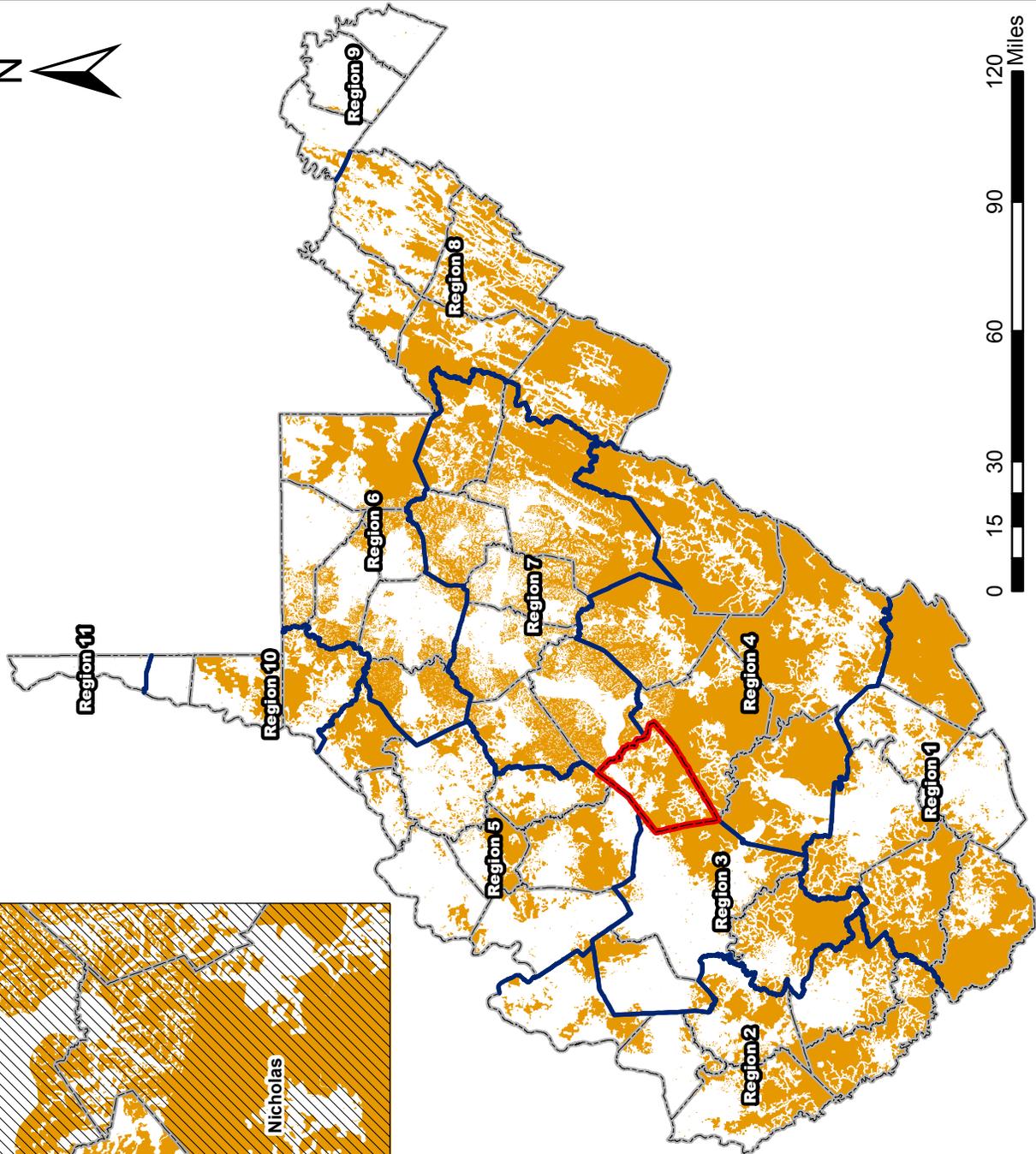
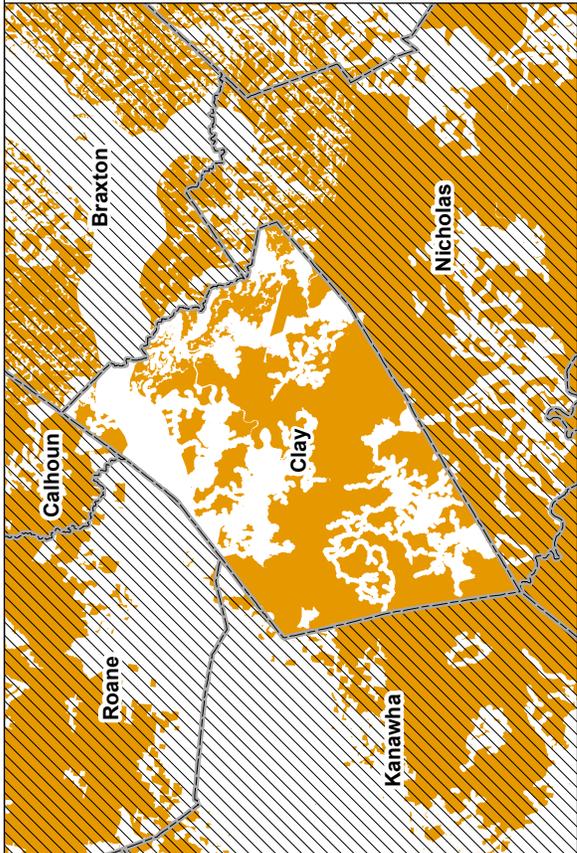
RTI
RAHALL APPALACHIAN
TRANSPORTATION INSTITUTE
www.rti.org

Source: West Virginia Broadband Mapping Program 2012

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Broadband - No Broadband Coverage

Clay County



-  Planning Regions Line
-  No Coverage Reported
-  County Boundaries

Source: West Virginia Broadband Mapping Program 2012

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Transportation

Highways

Clay County has a small part of Interstate 79 running through its most northern area. The County has no U.S. routes and 3 State routes: 4, 16, and 36 (Map 26).

Rail

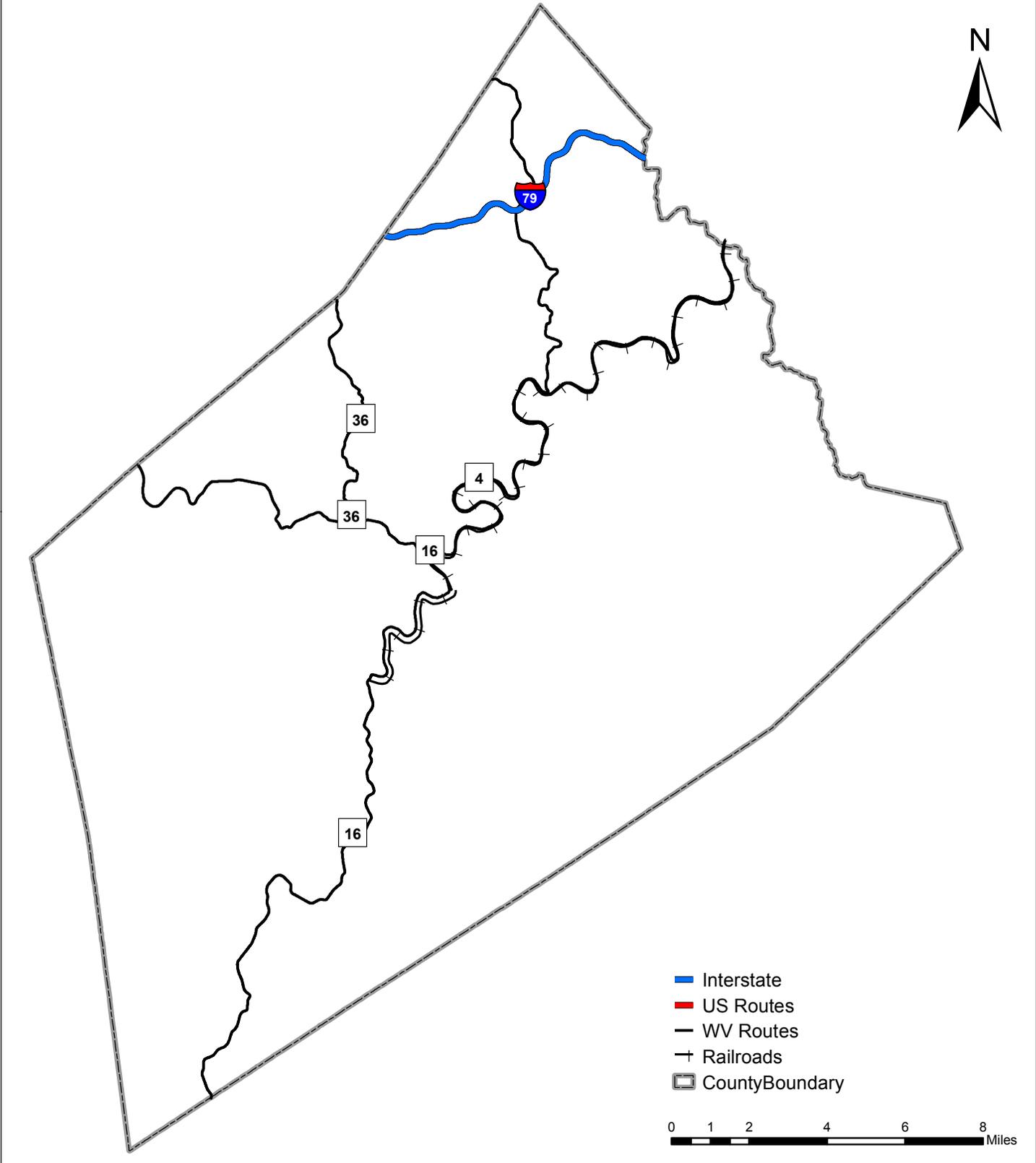
Clay County has several miles of rail track to maintain the extraction activities of the county.

Air

Clay County has no airport, but through the interstate is in close road-path proximity to Yeager Airport in Charleston.

Transportation

Clay County



Source: Interstate, US Routes, West Virginia Routes; West Virginia Department of Transportation 2012; Railroads; Rahall Transportation Institute 2012

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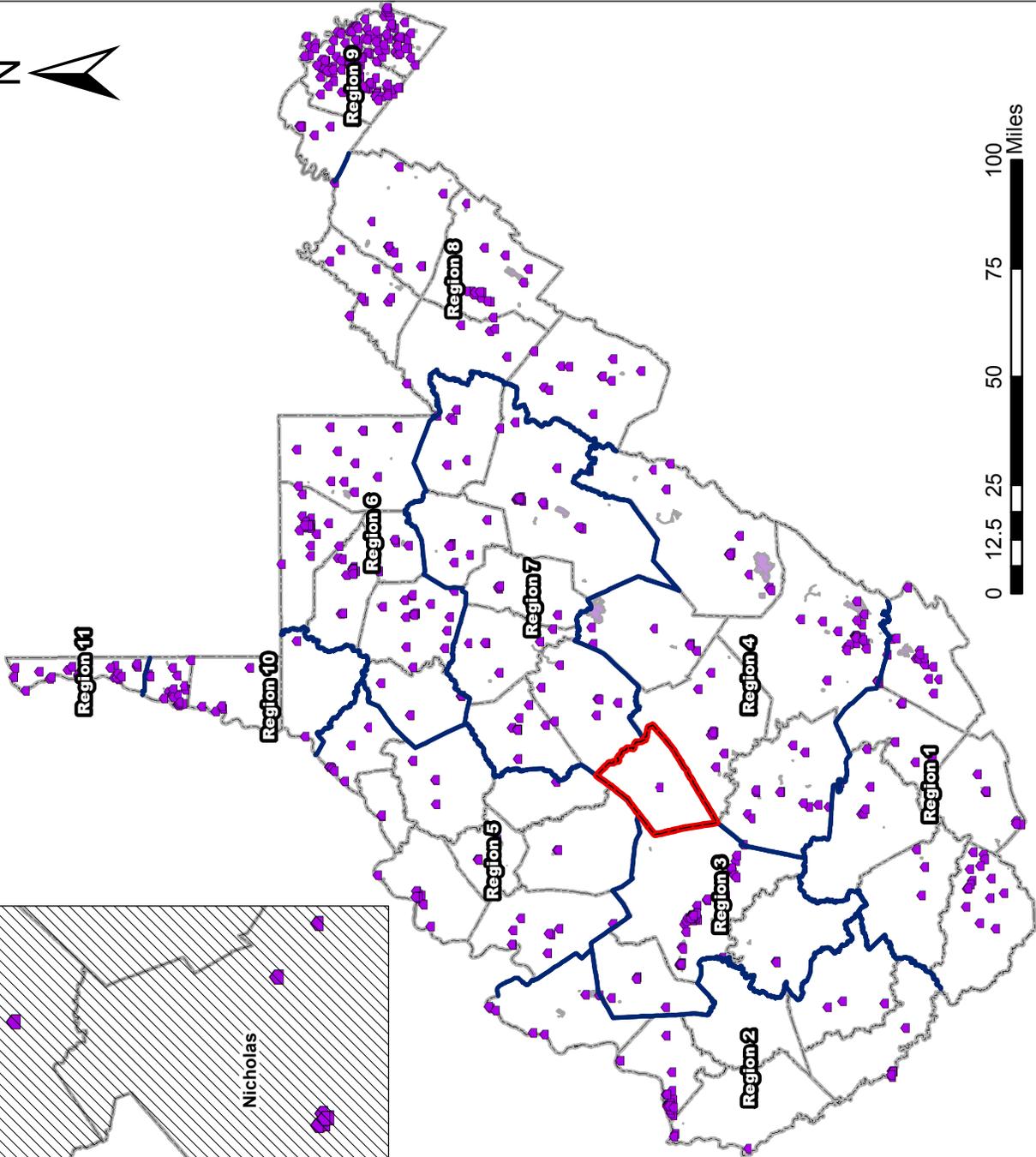
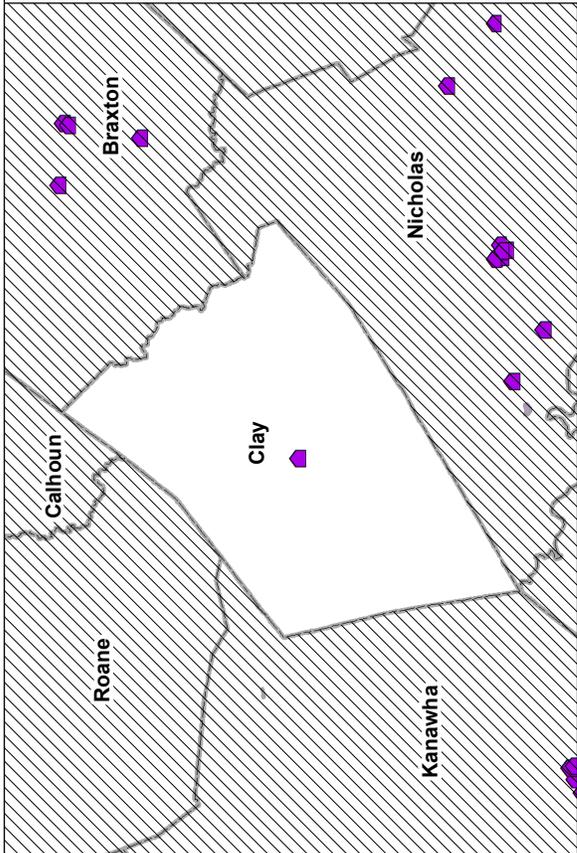


Historic Preservation

Historic preservation is essential in a state that is as steeped in early and coal mining history as West Virginia. Clay County has one listing in the National Register of Historic Places. This listing is the Old Clay County Courthouse in the city of Clay. It was built in the early 1900's and evokes the architecture of the time (Map 27). 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

Clay County



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



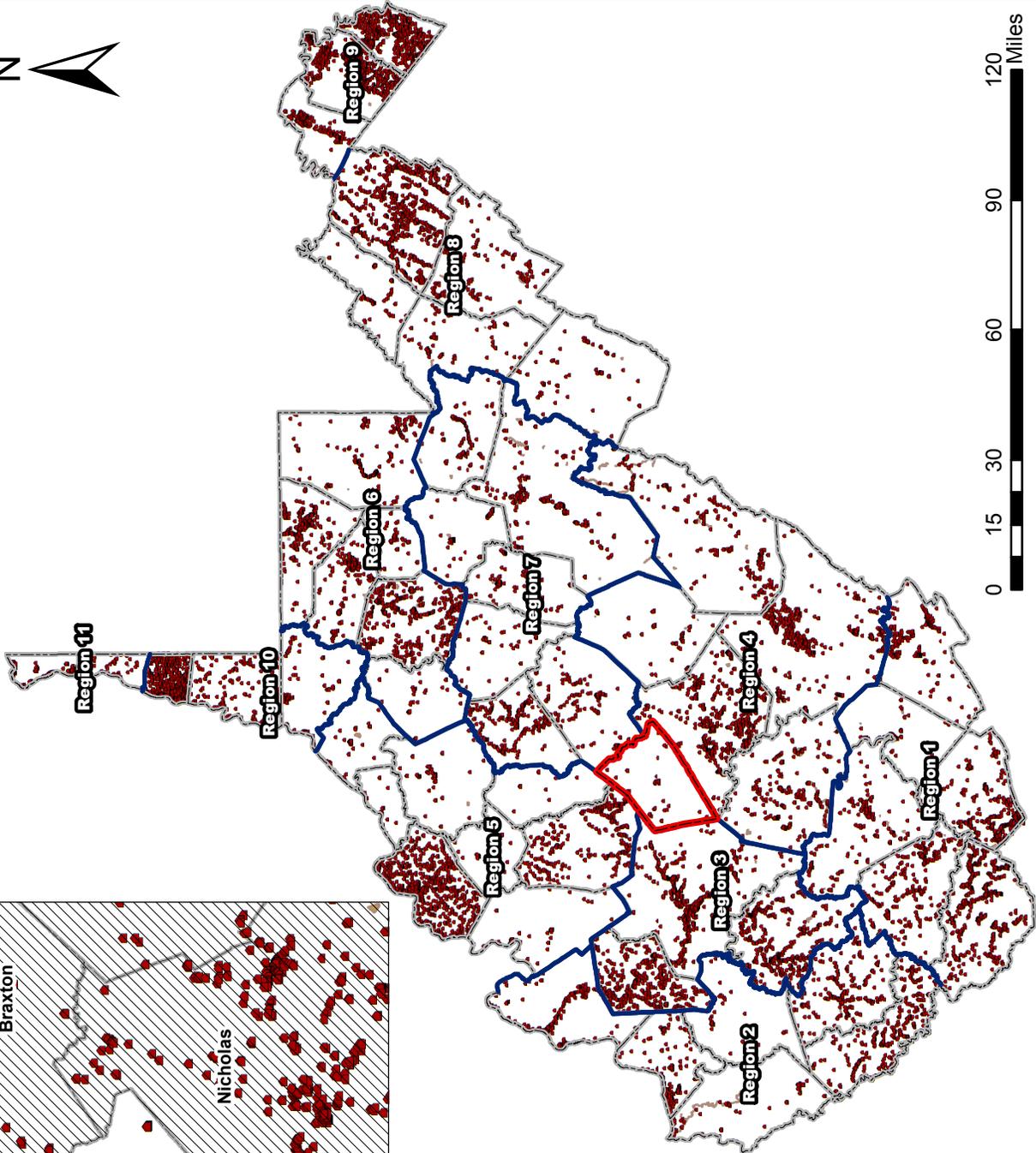
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Source: West Virginia State Historic Preservation Office 2012

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State Historic Architecture

Clay County



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

Source: West Virginia State Historic Preservation Office 2012

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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. Clay 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. Clay County has a major wetland line traversing the county (Map 29).

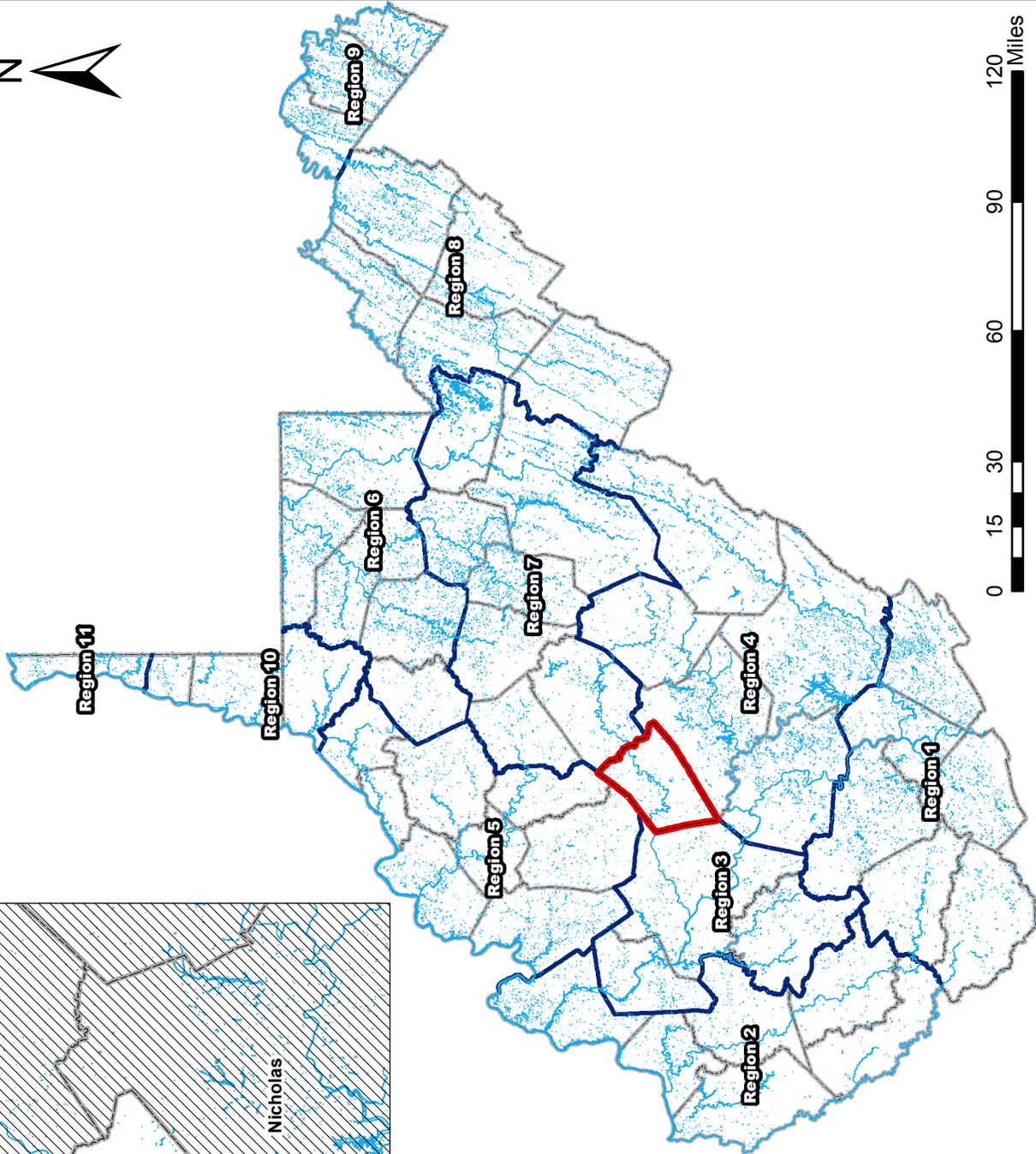
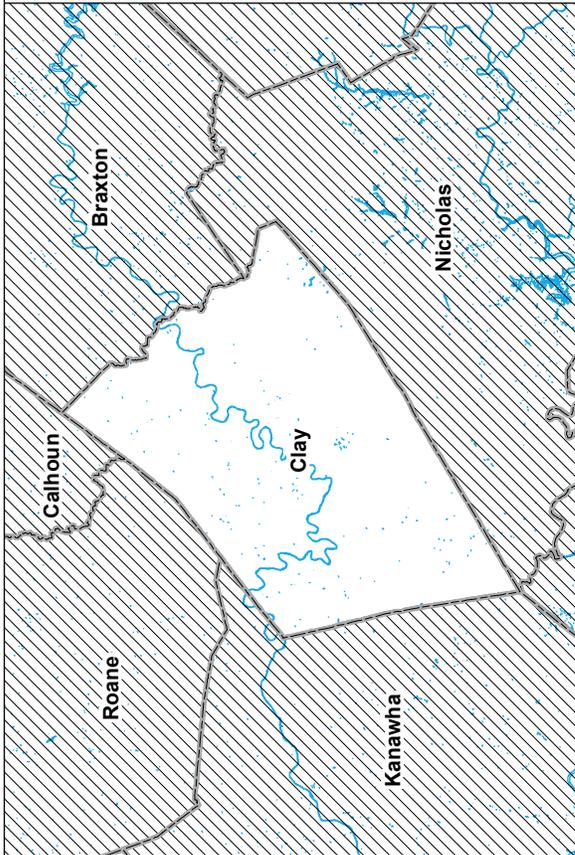
The State also possesses a respectable amount of park and forest land. Most of this land is located in the eastern portion of the State, the area that contains the main part of the Appalachian Mountain range. Clay contains no national or state parks but has several wildlife management areas (Map 30).

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; Clay 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

Clay County



-  Planning Regions Line
-  National Wetlands Inventory
-  County Boundaries



Source: United States Fish and Wildlife Service 1996

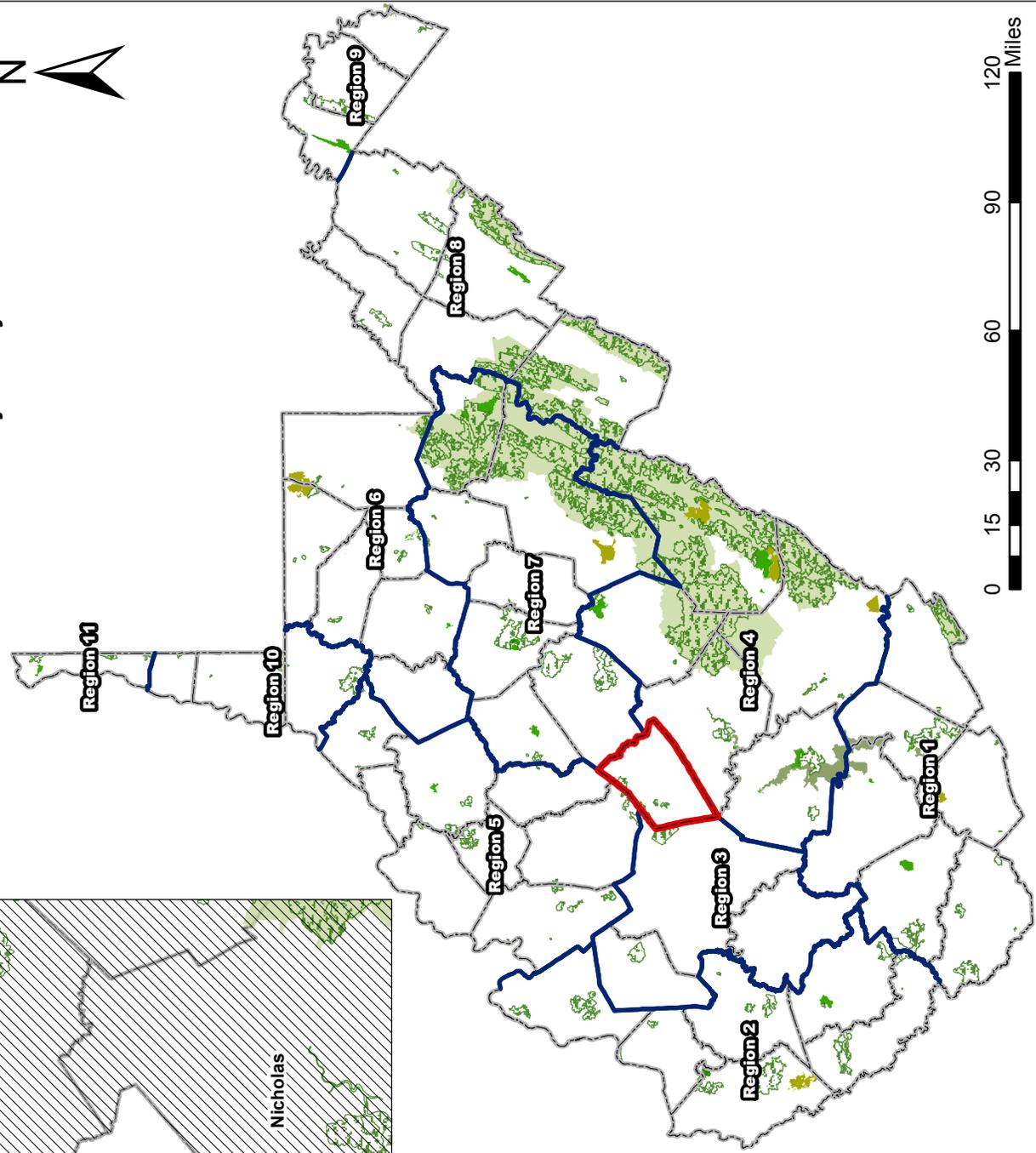
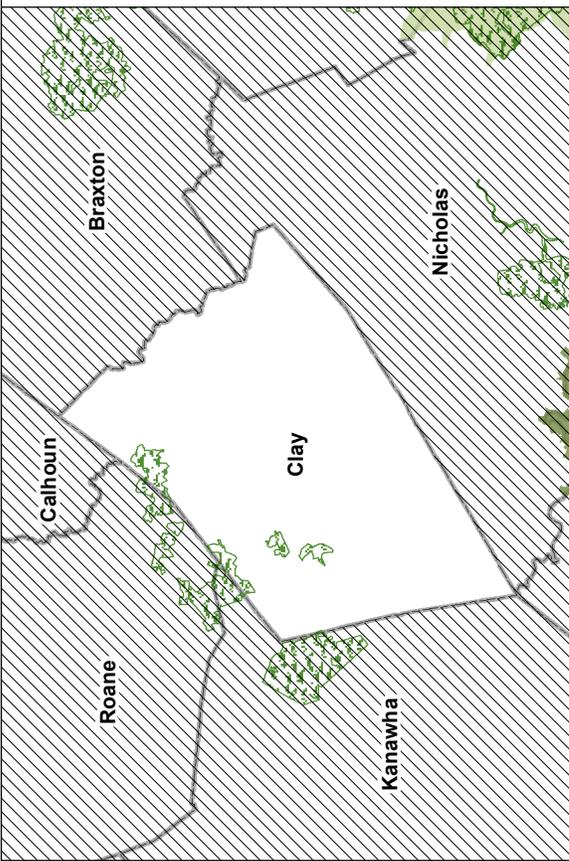
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www.rjrti.org

Public Land - Parks and Forests

Clay County



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



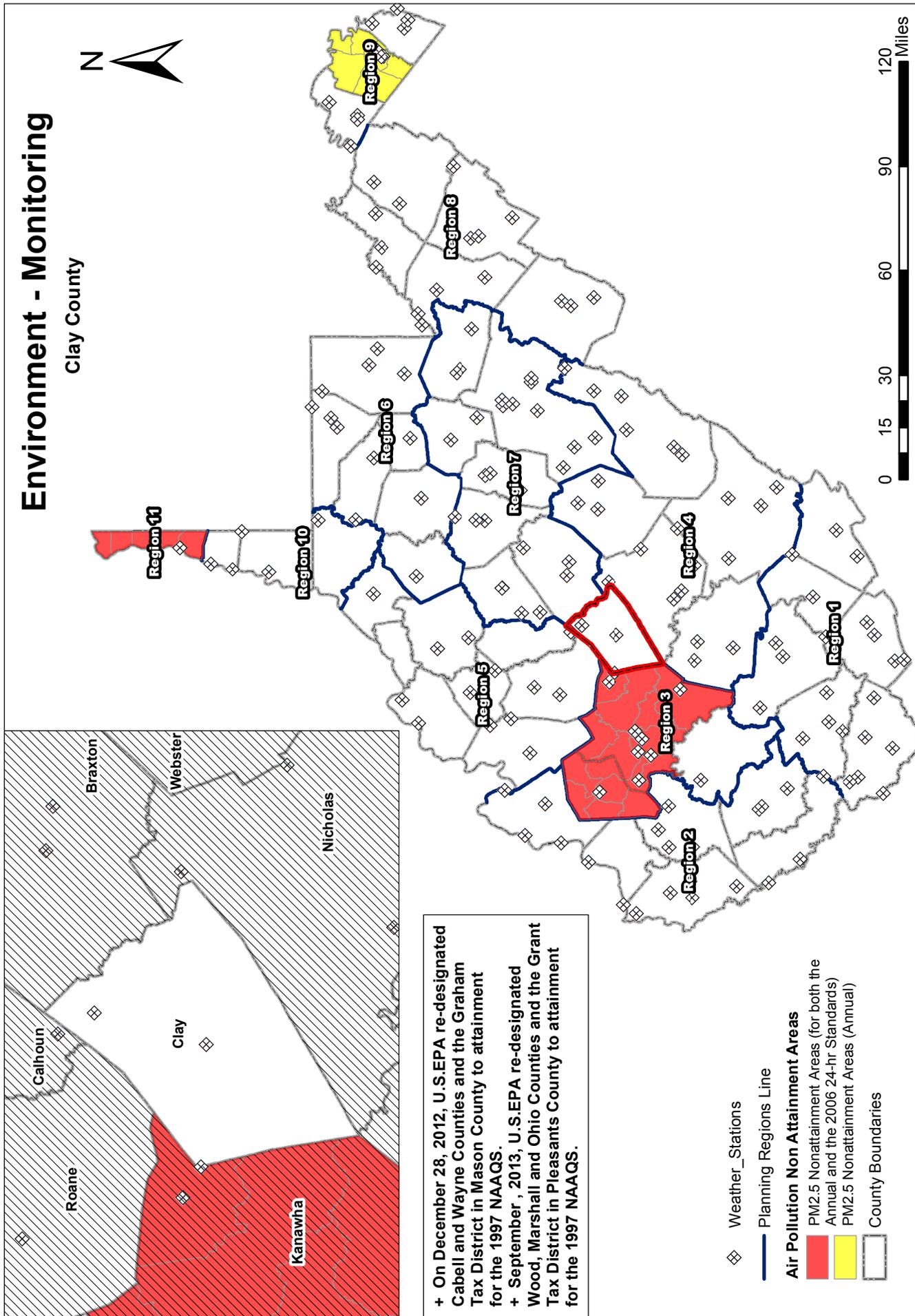
Source: Wildlife Management Areas; West Virginia Division of Natural Resources 2002; State Forest; West Virginia Division of Forestry 2004; State Park; West Virginia Division of Natural Resources; National Resource Analysis Center 2000; National Forest; United States Forest Service 2003; National Park;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

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Environment - Monitoring

Clay 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

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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. Clay County has several oil fields and is a highway for gas pipes (Map 32). Clay County does not have extensive play in the Marcellus Shale, though activity in surrounding counties indicate that it probably could (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. Clay County has developed its current system to take advantage of the surrounding natural resources and to market these activities.

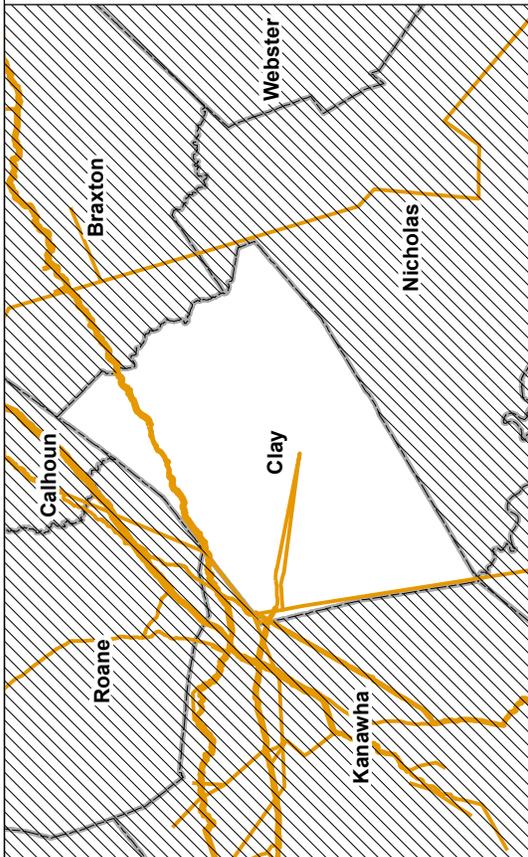
Potential renewable energy sources were also examined. Wood byproducts are a potential energy source classified as biomass energy. Naturally it is most useful in areas with a great deal of wood products. West Virginia is one of the most forested States in the country. Clay County appears to be one of the most forested counties in West Virginia (Map 34). Clay County has taken some advantage of this forestry, with the availability and production of wood byproducts being larger than in many other counties (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, but Clay appears to be one of the counties least favorable for development. Clay County does not appear to be a favorable location for solar development or wind development. 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).

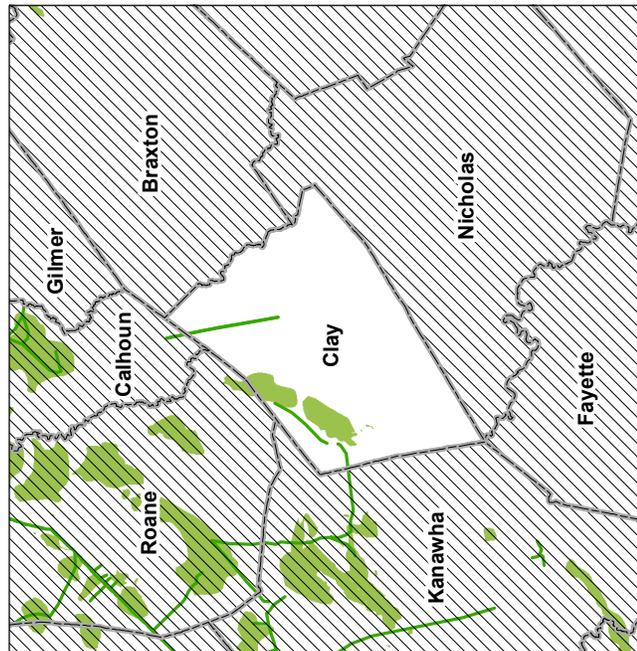
⁹ Ibid.

Energy - Gas and Oil

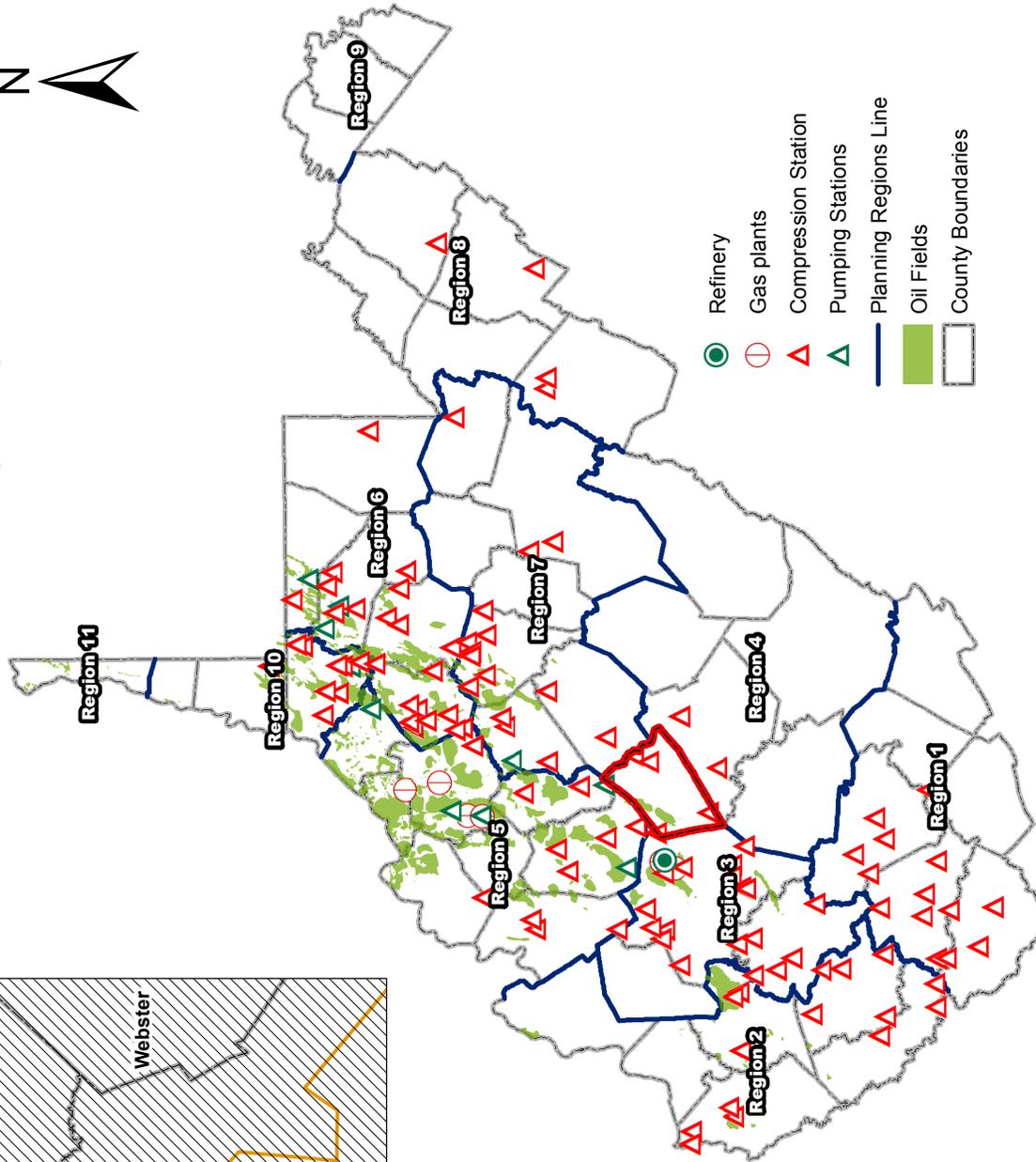
Clay County



Gas Pipe



Oil Pipelines
Oil Fields



- Refinery
- Gas plants
- Compression Station
- Pumping Stations
- Planning Regions Line
- Oil Fields
- County Boundaries



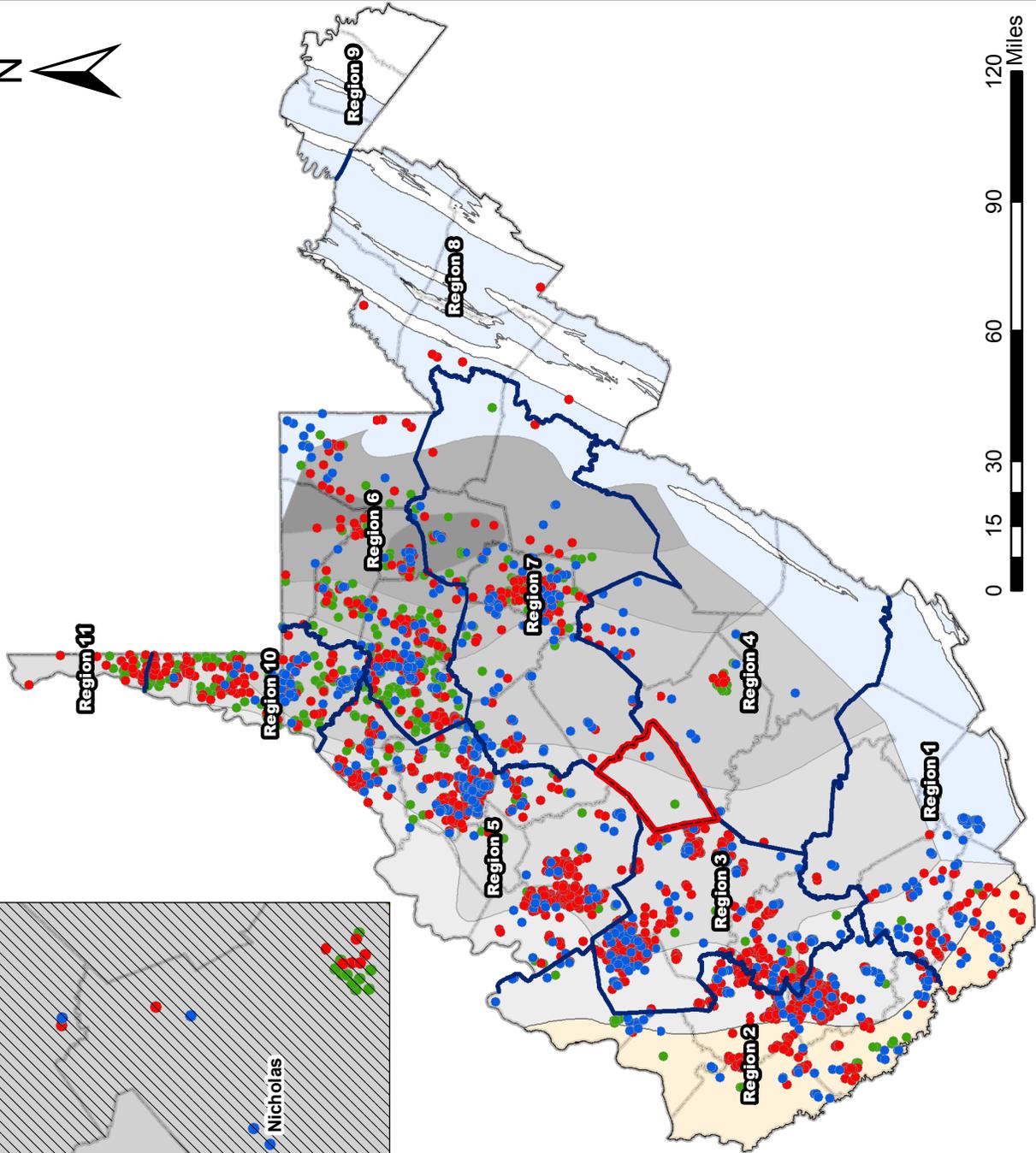
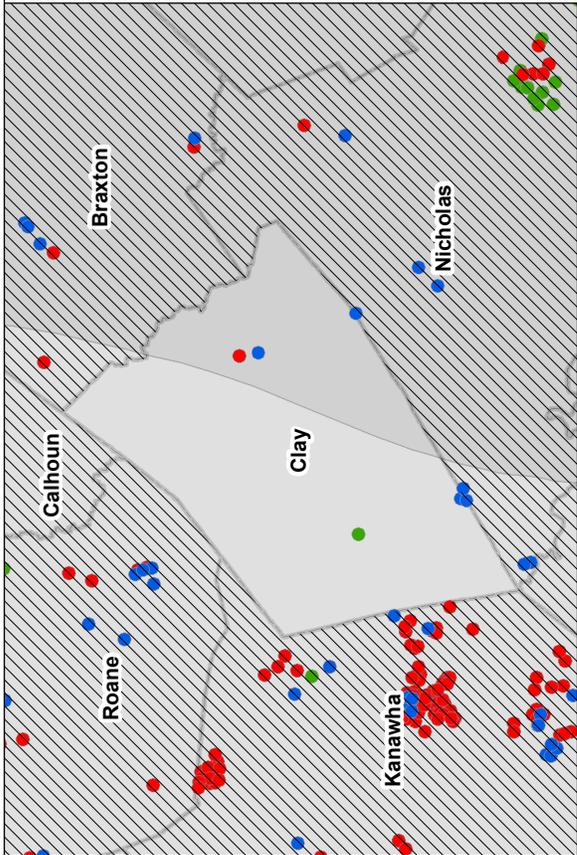
Source: West Virginia Geological and Economic Survey 2007

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Energy - Marcellus Wells

Clay 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

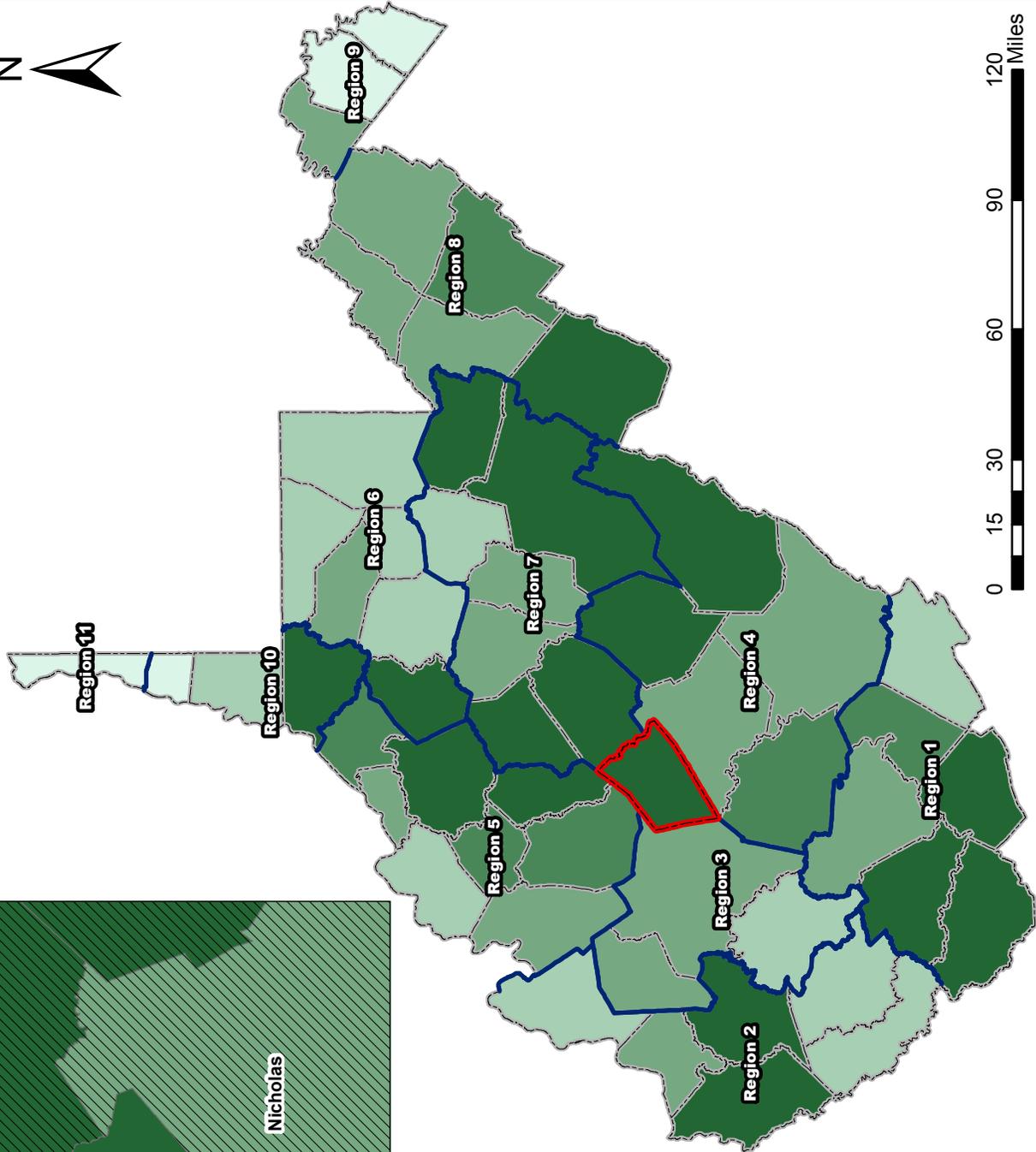
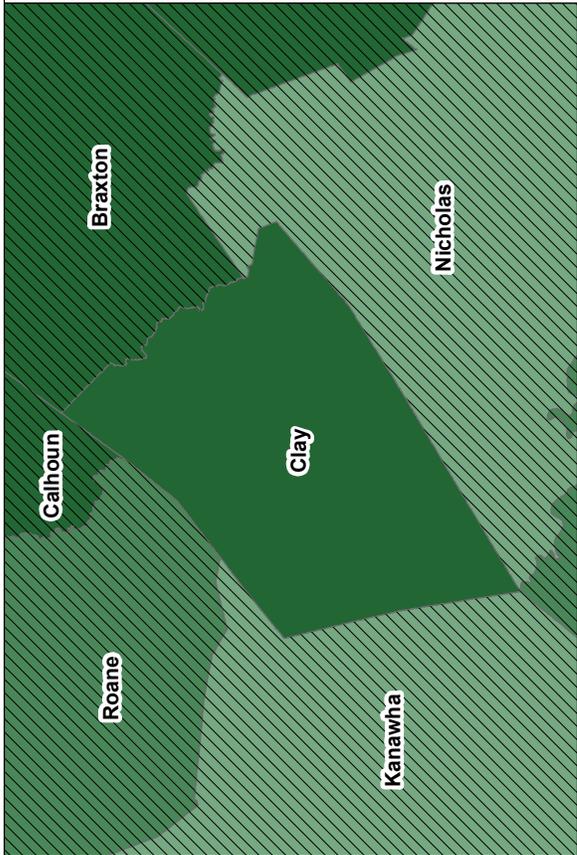
Source: West Virginia Geological and Economic Survey 2013

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Energy - Percent Forest Coverage

Clay County



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

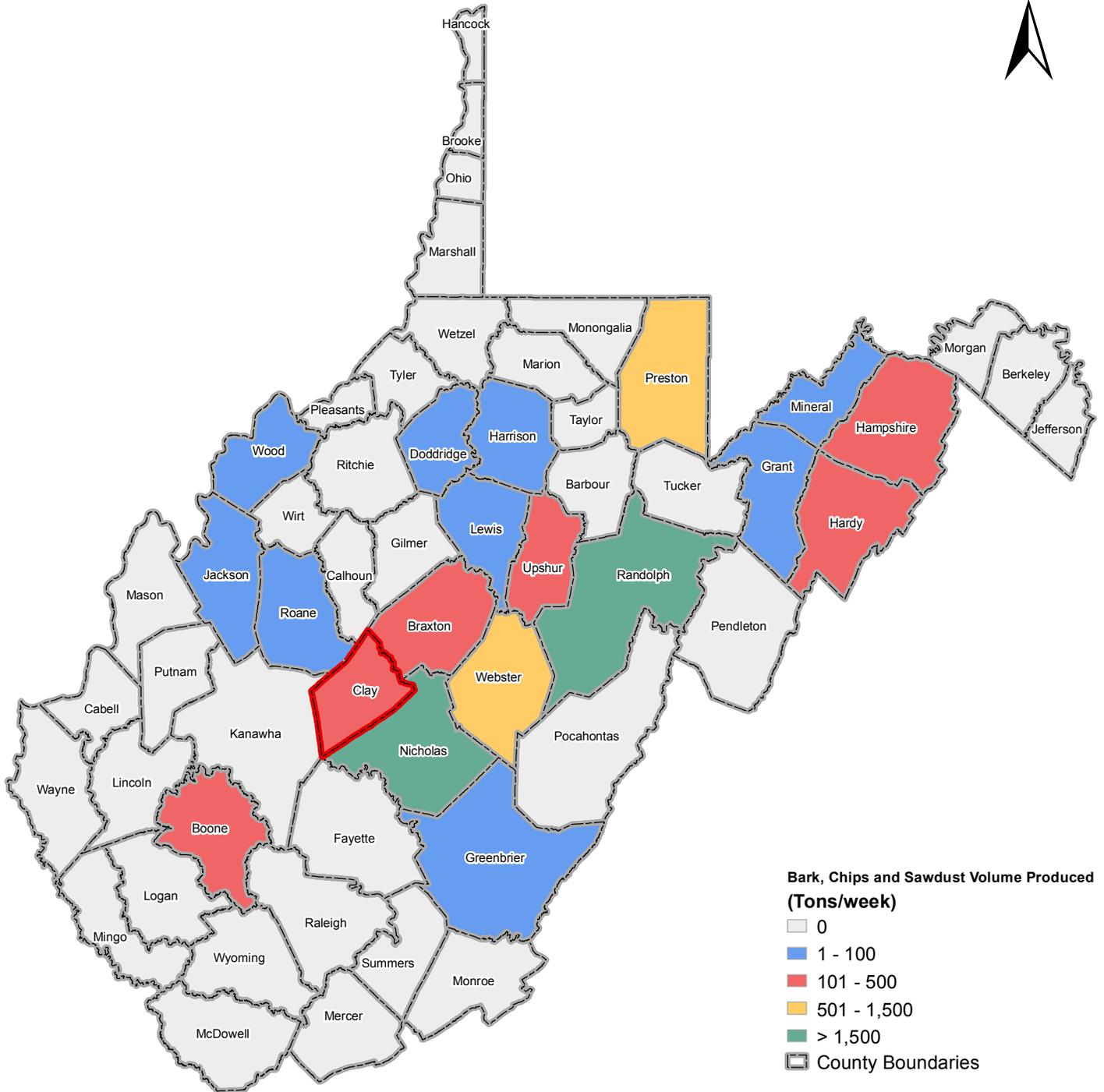
Source: Raahall Transportation Institute 2013

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Renewable Energy - Wood By Products

Bark, Chip and Sawdust Volume Produced - Clay County



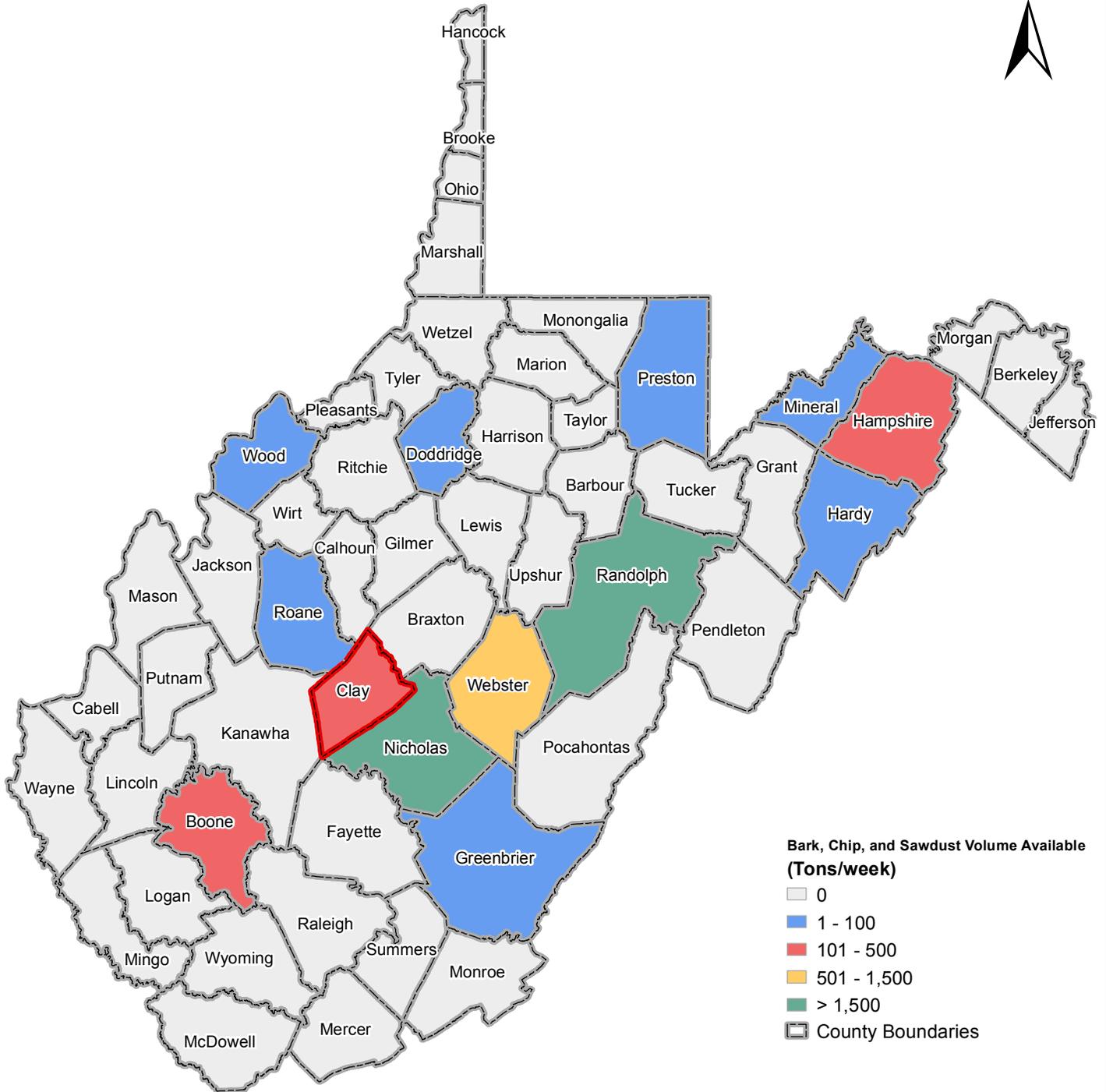
Source: Appalachian Hardwood Center 2011

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Renewable Energy - Wood By Products

Bark, Chip, and Sawdust Volume Available - Clay County



Bark, Chip, and Sawdust Volume Available (Tons/week)

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



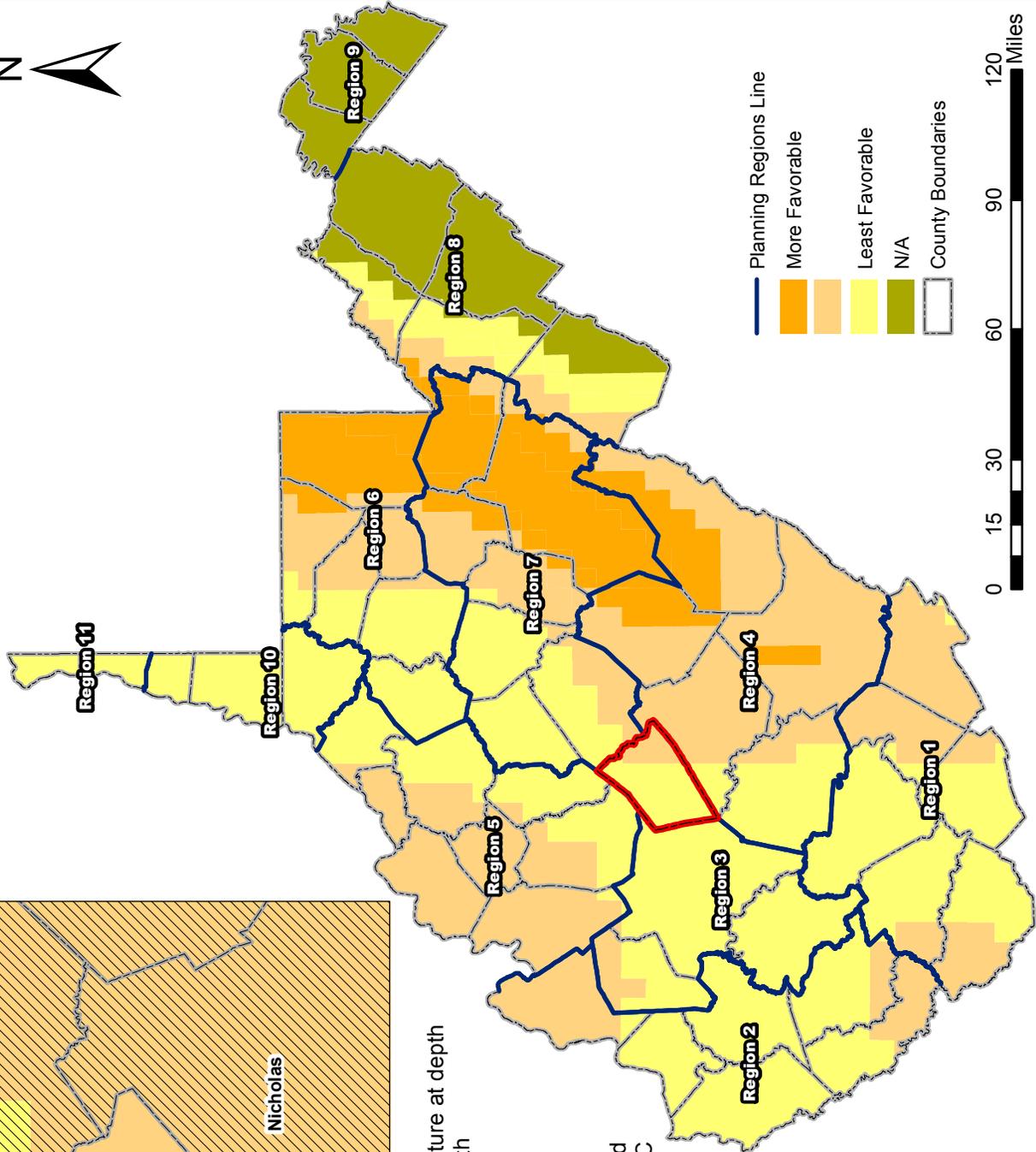
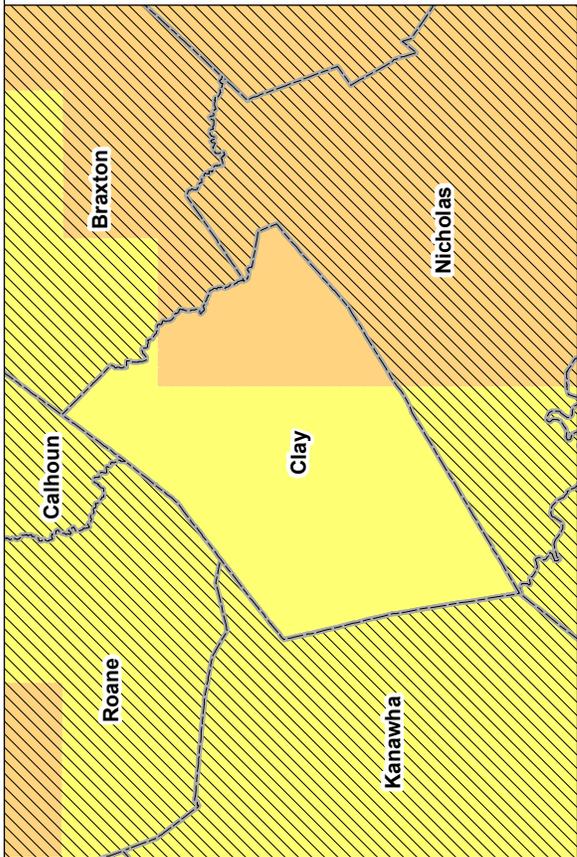
Source: Appalachian Hardwood Center 2011

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Energy - Geothermal Resource of Clay 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 \geq 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.

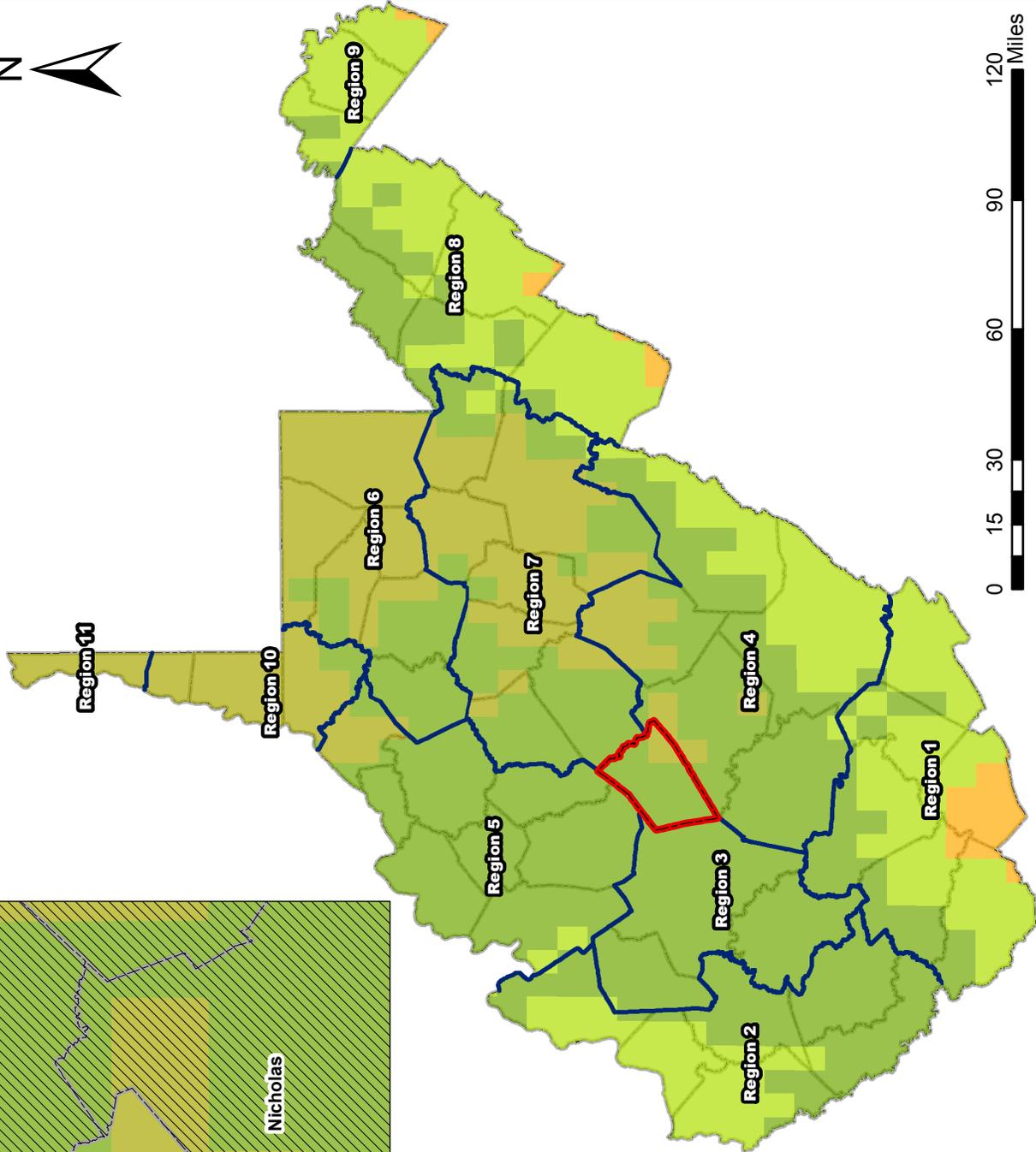
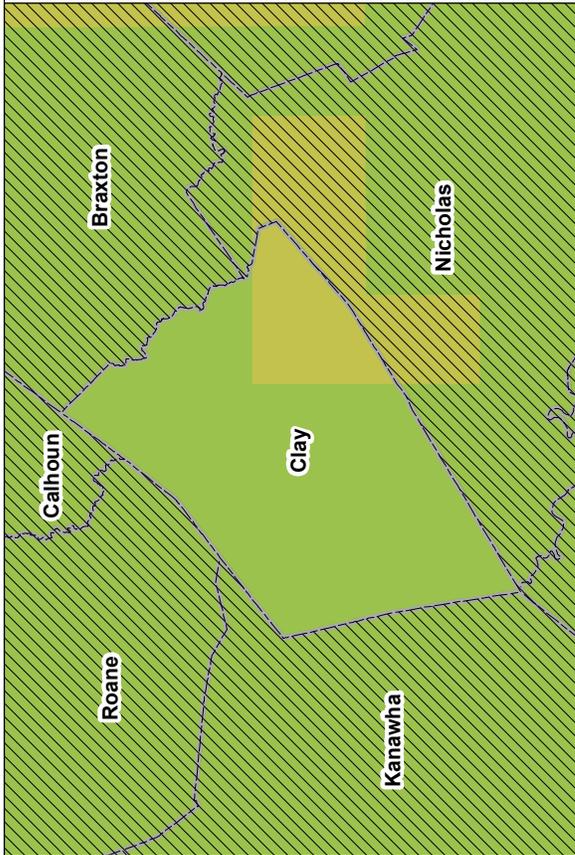
Source: National Renewable Energy Laboratory 2009

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Solar - Renewable Energy

Clay 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

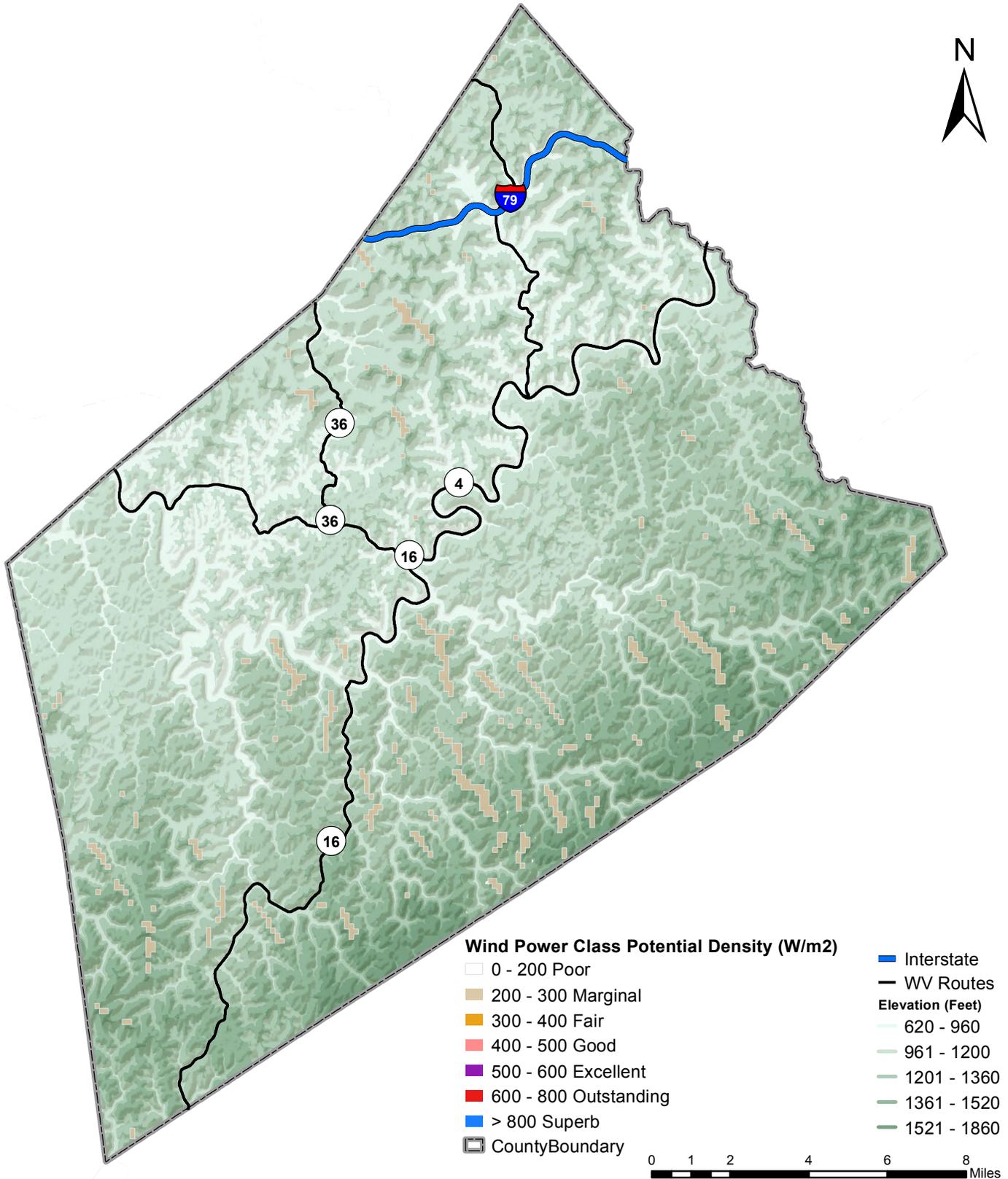
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Renewable Energy-Wind

Clay County



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

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IV. Land Use Smart Planning

The research team constructed a smart planning criterion that would apply to each mine site in Clay. 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.

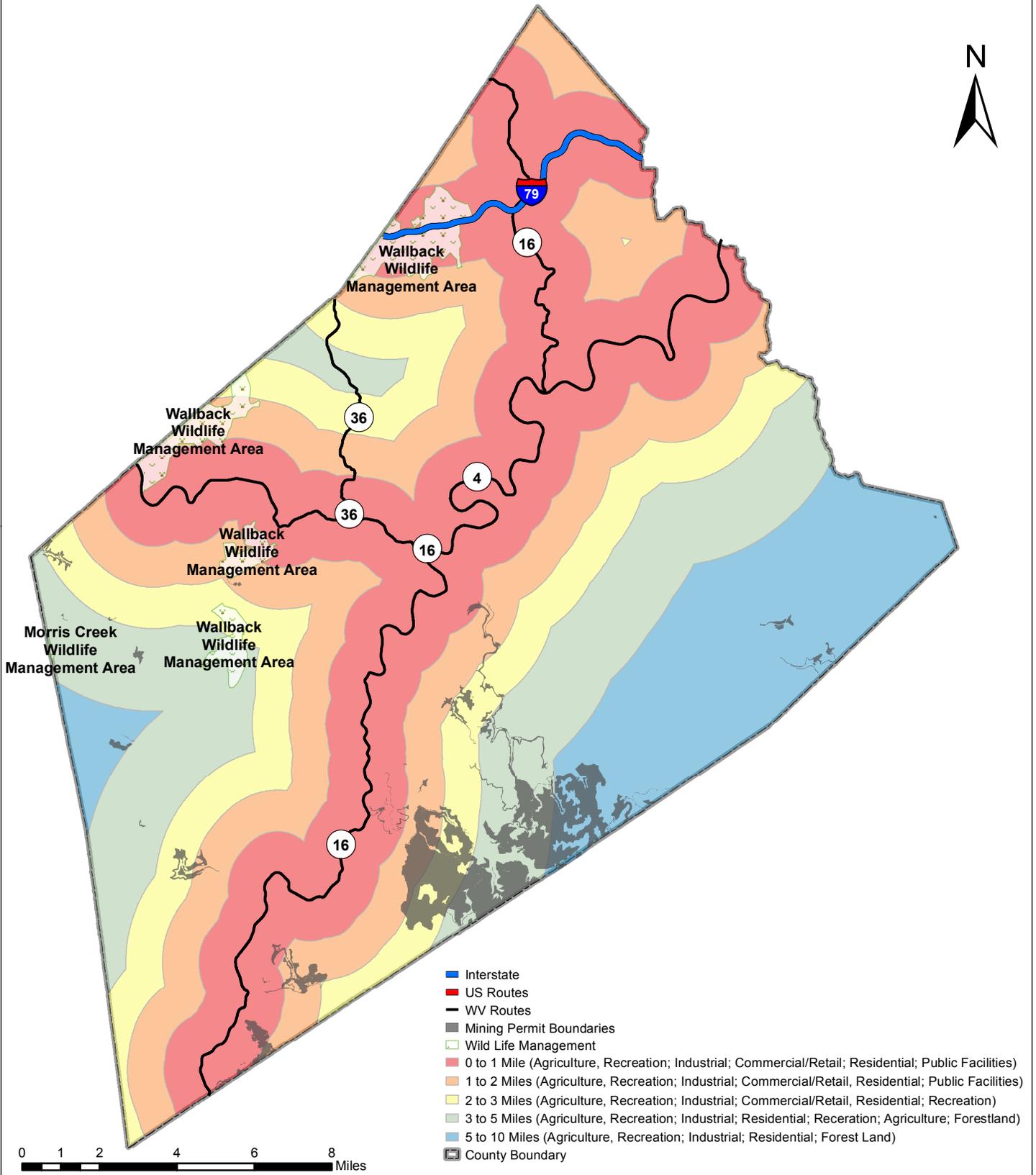
Table 2: Smart Planning Utilizations

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, Recreational
Utilization Area 2-3 miles	Industrial, Commercial/Retail, Residential, Recreational
Utilization Area 3-5 miles	Industrial, Residential, Recreational, Agriculture, Forestland
Utilization Area 5-10 miles	Industrial, Residential, Agriculture, Forest Land, Recreational
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

Clay County



Source: Rahall Transportation Institute 2014

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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 Clay 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: Clay County Potential Surface Mine Sites for Development

Site_No	Permit_ID	Permittee	Facility Name	Issue Date	Expiration Date	Acres
1	S200605	FOLA COAL COMPANY LLC	Cannel Coal Point Removal	11/3/2006	11/3/2016	88.12
2	S009879	LAND USE CORPORATION	NA	8/17/1979	1/26/1993	35
3	S006379	HICA CORPORATION	NA	5/8/1979	2/7/1998	103
4	S004084	PISGAH RIDGE COAL CORP	NA	7/13/1984	9/13/1989	8.26
5	S008180	S & K CORP	NA	8/11/1980	8/11/1985	70
6	S200494	FOLA COAL COMPANY LLC	WINOC NO. 1 SURFACE MINE	2/14/1995	2/14/2005	605.35

Site No	Permit ID	Permittee	Facility Name	Issue Date	Expiration Date	Acres
7	S009179	ZY COAL CO, INC	NA	7/6/1979	7/6/1992	64
8	S601188	CRAVAT COAL CO	NA	8/29/1989	8/29/1994	68.3
9	S600188	PROSPERITY ENERGY, INC	NA	4/12/1988	4/12/1993	27
10	S201496	FOLA COAL COMPANY LLC	SURFACE MINE NO. 2A	4/23/1997	4/23/2012	192.18
11	S200307	FOLA COAL COMPANY LLC	Cannel Coal Surface Mine	5/14/2009	5/14/2014	286.9
12	S200697	FOLA COAL COMPANY LLC	WINOC NO. 2 SURFACE MINE	8/20/1997	8/20/2017	808
13	S022874	BADGER DISTRIBUTING INC	NA	11/20/1974	11/20/1989	25
14	S200798	FOLA COAL COMPANY LLC	BULLPEN FORK SURFACE MINE	2/16/1999	2/16/2019	336.1
15	S003080	ZY COAL CO, INC	NA	2/15/1980	2/15/1992	62
16	S600587	AMERICAN MINERALS CORP	NA	10/21/1987	10/21/1992	113
17	S601989	FOLA COAL COMPANY LLC	MONOC #2 SURFACE MINE	12/11/1989	12/11/2004	596
18	S201298	FOLA COAL COMPANY LLC	IKE FORK NO. 1 SURFACE MINE	7/30/2001	7/30/2016	385.7
19	S201293	FOLA COAL COMPANY LLC	SURFACE MINE NO. 2	7/20/1994	7/20/2014	1230.84
20	S602888	ZY COAL CO, INC	NA	4/28/1989	4/28/1994	190.39
21	S009884	LAND USE CORPORATION	NA	12/11/1984	12/11/1989	70
22	S201012	FOLA COAL COMPANY LLC	Webb Branch Surface Mine	3/11/2014	3/11/2019	207

Site No	Permit ID	Permittee	Facility Name	Issue Date	Expiration Date	Acres
23	S007583	GREENDALE COALS INC	NA	9/15/1983	8/24/1992	224
24	S012075	DAVID HEETER DOZER CO.	NA	5/22/1975	5/22/1980	55
25	S603286	ALPHAINE CORP	NA	10/9/1986	10/9/1991	30
26	S601387	X.W. CORP	NA	5/22/1987	5/22/1992	25
27	S304188	APPALACHIAN FUELS, LLC.	DINGESS-RUM NO. 5	4/10/1989	4/10/1999	390
28	S301393	FOLA COAL COMPANY LLC	SURFACE MINE # 1	11/17/1993	11/17/2003	206.6
29	S020377	S & K CORP	NA	12/2/1977	12/2/1982	19
30	S009385	GREENDALE COALS INC	NA	9/18/1985	9/18/1990	198.38
31	S016177	LAND USE CORPORATION	NA	9/30/1977	1/26/1992	59
32	S001982	S & K CORP	NA	2/11/1982	2/11/1987	50
33	S200396	FOLA COAL COMPANY LLC	MONOC 4 SURFACE MINE	10/11/1996	10/11/2016	695
34	S007385	CHICOPEE COAL COMPANY INC	BARBARA LYNN SURFACE MINE NO.	8/5/1985	8/5/2000	219
35	S601489	FOLA COAL COMPANY LLC	MONOC #3 SURFACE MINE	9/11/1989	9/11/2004	166.34
36	S004381	PISGAH RIDGE COAL CORP	NA	7/11/1983	7/11/1988	64
37	S007079	ZY COAL CO, INC	NA	7/6/1979	7/6/1992	51
38	S602588	VANDALIA RESOURCES INC	NA	3/16/1989	3/16/1999	73
39	S602188	VANDALIA RESOURCES INC	NA	10/12/1989	10/12/1999	181.14
40	S200995	FOLA COAL COMPANY LLC	SURFACE MINE NO. 3	5/13/1996	5/13/2016	1749.52
41	S200502	FOLA COAL COMPANY LLC	Surface Mine No. 4A	6/3/2003	6/3/2018	1743.08

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, Existing Highway, and Proposed Highway)
 - Distance to major airports (Tri-State, Yeager)
 - Distance to Intermodal Terminal Facility and Huntington Port
 - 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, National Waterway Network

The following tables illustrate the results of road-path and Euclidean distance assessments for all of the identified sites. Proposed Highways were not analyzed for Clay County as they were not within the scope of the County. 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	S200605	15.96	I79	1.87	S16	0.24	Old Dleta 81, Leatherwood Road
2	S009879	14.19	I79	4.17	S16	0.60	Pisgah Ridge Road
3	S006379	13.37	I79	8.20	U19	0.38	Taylor Fork Road
4	S004084	14.29	I79	4.26	S16	0.12	Pisgah Ridge Road
5	S008180	15.02	I79	0.93	S16	0.03	Leatherwood Road
6	S200494	17.75	I79	8.50	S16	1.16	Lilly Fork
7	S009179	11.90	I79	2.65	S16	0.01	Lilly Fork
8	S601188	3.61	I79	2.72	S16	0.35	Road Fork
9	S600188	12.10	I79	6.72	S4	0.06	Lizemore Road
10	S201496	19.13	I79	6.08	S16	0.41	Left Hand Fork

Site No.	Permit ID	Interstate (IS)	Sign - IS	Existing Highway (EH)	Sign - EH	Paved Road	Paved Road Name
11	S200307	16.08	I79	1.99	S16	0.18	Leatherwood Road
12	S200697	17.67	I79	8.42	S16	0.55	Lilly Fork
13	S022874	15.44	I79	1.35	S16	0.26	Leatherwood Road
14	S200798	17.50	I79	4.46	S16	0.51	Leatherwood Road
15	S003080	11.48	I79	2.24	S16	0.44	Lilly Fork
16	S600587	6.48	I79	1.10	S4	0.39	River Haven Road
17	S601989	19.20	I79	6.16	S16	0.36	Left Hand Fork
18	S201298	22.01	I79	8.97	S16	1.66	Leatherwood
19	S201293	19.24	I79	6.20	S16	0.73	Leatherwood Road
20	S602888	12.70	I79	3.45	S16	0.01	Lilly Fork
21	S009884	14.68	I79	4.65	S16	0.12	Pisgah Ridge Road
22	S201012	17.24	I79	8.00	S16	0.63	Lilly Fork
23	S007583	22.30	I79	2.24	S16	0.13	Pack Fork Road
24	S012075	17.72	I79	2.53	S16	0.28	Adonijah Fork Road
25	S603286	16.41	I79	2.32	S16	0.28	Leatherwood Road
26	S601387	14.51	I79	0.42	S16	0.31	Leatherwood Road
27	S304188	21.77	I64	1.16	S16	0.64	Sangamore Road Fork
28	S301393	19.52	I79	6.48	S16	1.06	Leatherwood Road
29	S020377	16.02	I79	1.92	S16	0.32	Leatherwood Road
30	S009385	22.18	I64	1.57	S16	0.52	Sangamore Road Fork
31	S016177	15.83	I79	4.79	S16	0.38	Pisgah Ridge Road
32	S001982	16.31	I79	2.22	S16	0.64	Leatherwood Road
33	S200396	21.92	I79	8.88	S16	0.40	Leatherwood
34	S007385	19.46	I79	2.09	S16	0.51	Truman Hollow Rd (Delta 91)
35	S601489	18.22	I79	5.17	S16	0.17	Leatherwood Road
36	S004381	14.29	I79	4.26	S16	0.12	Pisgah Ridge Road
37	S007079	10.52	I79	1.27	S16	0.09	Dundon
38	S602588	17.94	I79	3.85	S16	0.41	Leatherwood
39	S602188	17.13	I79	2.77	S16	0.00	Branch Lick
40	S200995	20.51	I79	7.46	S16	1.15	Left Hand Fork
41	S200502	18.48	I79	4.22	S16	0.99	Sycamore, Old Delta 76

Table 5: Shortest Distances from Sites to Airports

Site No.	Permit ID	Tri-State Airport	Yeager Airport
1	S200605	84.19	34.96
2	S009879	88.59	39.69
3	S006379	98.44	49.52
4	S004084	88.16	38.92
5	S008180	83.25	34.02
6	S200494	92.14	43.22
7	S009179	86.29	37.38
8	S601188	86.98	38.56
9	S600188	74.14	24.90
10	S201496	88.41	39.18
11	S200307	84.31	35.08
12	S200697	92.06	43.15
13	S022874	83.67	34.44
14	S200798	86.79	37.55
15	S003080	85.88	36.96
16	S600587	69.65	20.73
17	S601989	88.48	39.25
18	S201298	91.29	42.06
19	S201293	88.52	39.28
20	S602888	87.09	38.18
21	S009884	87.76	38.52
22	S201012	91.63	42.72
23	S007583	81.83	32.60
24	S012075	78.20	28.96
25	S603286	84.64	35.40
26	S601387	82.83	33.59
27	S304188	81.52	33.63
28	S301393	88.81	39.57
29	S020377	84.25	35.01
30	S009385	81.93	33.01
31	S016177	87.11	37.87
32	S001982	84.54	35.30
33	S200396	91.20	41.97
34	S007385	81.34	32.10
35	S601489	87.50	38.26
36	S004381	88.16	38.92
37	S007079	84.92	36.00
38	S602588	86.17	36.93
39	S602188	77.61	28.37
40	S200995	89.79	40.55
41	S200502	84.91	35.67

Table 6: Shortest Distances from Sites to Other Transportation Methods

Site No.	Permit_ID	Railroad (RR)	Owner (RR)	Intermodal Terminal Facility	Intermodal Terminal Facility Name	Kanawha River Network	Huntington Port
1	S200605	4.11	ELKR	23.93	Cyprus Kanawha Corp Eagle Dock	18.05	76.31
2	S009879	1.84	ELKR	28.83	Cyprus Kanawha Corp Eagle Dock	21.21	80.71
3	S006379	0.37	XXXX	44.01	Cyprus Kanawha Corp Eagle Dock	29.82	90.55
4	S004084	2.27	XXXX	27.91	Cyprus Kanawha Corp Eagle Dock	21.57	80.28
5	S008180	3.73	ELKR	23.00	Cyprus Kanawha Corp Eagle Dock	17.84	75.37
6	S200494	4.95	XXXX	37.69	Cyprus Kanawha Corp Eagle Dock	21.11	84.26
7	S009179	0.63	XXXX	31.84	Cyprus Kanawha Corp Eagle Dock	23.13	78.40

Site No.	Permit_ID	Railroad (RR)	Owner (RR)	Intermodal Terminal Facility	Intermodal Terminal Facility Name	Kanawha River Network	Huntington Port
8	S601188	2.37	ELKR	38.79	Martin Marietta Aggts: Charleston	32.57	79.09
9	S600188	2.68	XXXX	25.95	Martin Marietta Aggts: Charleston	15.40	66.26
10	S201496	5.20	NS	28.16	Cyprus Kanawha Corp Eagle Dock	19.39	80.53
11	S200307	3.55	ELKR	24.05	Cyprus Kanawha Corp Eagle Dock	18.52	76.43
12	S200697	4.21	XXXX	37.62	Cyprus Kanawha Corp Eagle Dock	22.27	84.18
13	S022874	3.41	ELKR	23.41	Cyprus Kanawha Corp Eagle Dock	18.14	75.78
14	S200798	3.97	ELKR	26.53	Cyprus Kanawha Corp Eagle Dock	18.99	78.90

Site No.	Permit_ID	Railroad (RR)	Owner (RR)	Intermodal Terminal Facility	Intermodal Terminal Facility Name	Kanawha River Network	Huntington Port
15	S003080	0.09	XXXX	31.43	Cyprus Kanawha Corp Eagle Dock	23.72	77.99
16	S600587	0.38	XXXX	21.45	Martin Marietta Aggts: Charleston	18.88	61.76
17	S601989	5.40	XXXX	28.23	Cyprus Kanawha Corp Eagle Dock	20.08	80.60
18	S201298	4.99	NS	31.04	Cyprus Kanawha Corp Eagle Dock	21.98	83.41
19	S201293	4.89	NS	28.27	Cyprus Kanawha Corp Eagle Dock	18.84	80.64
20	S602888	1.27	XXXX	32.64	Cyprus Kanawha Corp Eagle Dock	22.50	79.22
21	S009884	2.51	ELKR	27.52	Cyprus Kanawha Corp Eagle Dock	21.14	79.88

Site No.	Permit_ID	Railroad (RR)	Owner (RR)	Intermodal Terminal Facility	Intermodal Terminal Facility Name	Kanawha River Network	Huntington Port
22	S201012	4.37	XXXX	37.19	Cyprus Kanawha Corp Eagle Dock	21.34	83.75
23	S007583	0.54	XXXX	16.13	Cyprus Kanawha Corp Eagle Dock	11.72	73.95
24	S012075	4.54	XXXX	18.69	Cyprus Kanawha Corp Eagle Dock	13.39	70.32
25	S603286	3.13	ELKR	24.38	Cyprus Kanawha Corp Eagle Dock	18.51	76.76
26	S601387	3.16	ELKR	22.58	Cyprus Kanawha Corp Eagle Dock	18.00	74.95
27	S304188	1.24	XXXX	14.17	Cyprus Kanawha Corp Eagle Dock	10.15	73.65
28	S301393	5.62	ELKR	28.55	Cyprus Kanawha Corp Eagle Dock	18.03	80.93

Site No.	Permit_ID	Railroad (RR)	Owner (RR)	Intermodal Terminal Facility	Intermodal Terminal Facility Name	Kanawha River Network	Huntington Port
29	S020377	4.04	ELKR	23.99	Cyprus Kanawha Corp Eagle Dock	18.31	76.36
30	S009385	0.90	XXXX	14.57	Cyprus Kanawha Corp Eagle Dock	10.68	74.06
31	S016177	3.47	ELKR	26.85	Cyprus Kanawha Corp Eagle Dock	20.78	79.23
32	S001982	4.22	ELKR	24.29	Cyprus Kanawha Corp Eagle Dock	18.48	76.66
33	S200396	3.99	NS	30.95	Cyprus Kanawha Corp Eagle Dock	20.75	83.32
34	S007385	2.36	XXXX	17.20	Cyprus Kanawha Corp Eagle Dock	13.47	73.46
35	S601489	5.16	ELKR	27.24	Cyprus Kanawha Corp Eagle Dock	19.63	79.61

Site No.	Permit_ID	Railroad (RR)	Owner (RR)	Intermodal Terminal Facility	Intermodal Terminal Facility Name	Kanawha River Network	Huntington Port
36	S004381	2.27	XXXX	27.91	Cyprus Kanawha Corp Eagle Dock	21.57	80.28
37	S007079	0.04	XXXX	30.46	Cyprus Kanawha Corp Eagle Dock	23.28	77.03
38	S602588	2.23	ELKR	25.91	Cyprus Kanawha Corp Eagle Dock	19.51	78.29
39	S602188	4.61	XXXX	20.06	Cyprus Kanawha Corp Eagle Dock	13.79	69.73
40	S200995	4.26	NS	29.53	Cyprus Kanawha Corp Eagle Dock	18.59	81.91
41	S200502	5.48	ELKR	24.65	Cyprus Kanawha Corp Eagle Dock	17.43	77.02

Table 7: Shortest Distances from Sites to Sewer Lines (SL) and Water Lines (WL)

Site No.	Permit ID	SL	Public Utility - SL	WL	Public Utility - WL
1	S200605	5.23	Town of Clay	0.87	Clay County Public Service District
2	S009879	2.02	Town of Clay	1.87	Clay Municipal Waterworks
3	S006379	9.26	City of Summersville	0.63	Birch River Public Service District
4	S004084	2.40	Town of Clay	2.01	Clay Municipal Waterworks
5	S008180	4.98	Town of Clay	0.31	Clay County Public Service District
6	S200494	5.95	Town of Clay	4.62	Clay County Public Service District
7	S009179	1.64	Town of Clay	1.11	Clay Municipal Waterworks
8	S601188	7.69	Town of Clay	0.81	Clay County Public Service District
9	S600188	8.50	Town of Clay	0.08	Queen Shoals Public Service District
10	S201496	6.55	Town of Clay	3.51	Clay County Public Service District
11	S200307	4.64	Town of Clay	1.04	Clay County Public Service District
12	S200697	5.79	Town of Clay	5.33	Clay Municipal Waterworks
13	S022874	4.65	Town of Clay	0.57	Clay County Public Service District
14	S200798	4.85	Town of Clay	1.78	Clay County Public Service District
15	S003080	1.75	Town of Clay	1.20	Clay Municipal Waterworks
16	S600587	9.92	Town of Clay	0.47	Queen Shoals Public Service District
17	S601989	5.93	Town of Clay	3.65	Clay County Public Service District
18	S201298	7.34	Town of Clay	6.49	Clay County Public Service District
19	S201293	6.94	Town of Clay	3.23	Clay County Public Service District
20	S602888	1.77	Town of Clay	1.31	Clay Municipal Waterworks

Site No.	Permit ID	SL	Public Utility - SL	WL	Public Utility - WL
21	S009884	2.70	Town of Clay	2.43	Clay Municipal Waterworks
22	S201012	5.34	Town of Clay	4.47	Clay County Public Service District
23	S007583	6.24	Kanawha Falls Public Service District	1.21	Gauley River Public Service District
24	S012075	8.31	Kanawha Falls Public Service District	1.39	Clay County Public Service District
25	S603286	4.31	Town of Clay	0.91	Clay County Public Service District
26	S601387	4.51	Town of Clay	0.30	Clay County Public Service District
27	S304188	4.67	Kanawha Falls Public Service District	0.72	Gauley River Public Service District
28	S301393	6.56	Town of Clay	2.05	Clay County Public Service District
29	S020377	5.10	Town of Clay	1.12	Clay County Public Service District
30	S009385	5.20	Kanawha Falls Public Service District	0.75	Gauley River Public Service District
31	S016177	3.80	Town of Clay	3.23	Clay County Public Service District
32	S001982	5.21	Town of Clay	1.43	Clay County Public Service District
33	S200396	7.91	Town of Clay	5.64	Gauley River Public Service District
34	S007385	8.02	Kanawha Falls Public Service District	0.96	Clay County Public Service District
35	S601489	5.76	Town of Clay	3.12	Clay County Public Service District
36	S004381	2.40	Town of Clay	2.01	Clay Municipal Waterworks
37	S007079	0.65	Town of Clay	0.09	Clay Municipal Waterworks
38	S602588	3.26	Town of Clay	1.32	Clay County Public Service District
39	S602188	8.53	Town of Clay	1.93	Clay County Public Service District
40	S200995	7.55	Town of Clay	3.45	Clay County Public Service District
41	S200502	6.55	Town of Clay	1.34	Clay County Public Service District

Table 8: Shortest Distances from Sites to Broadband and Power Lines

Site No.	Permit_ID	Broadband	Provider	Power Lines	Type	Size_kV
1	S200605	0.24	Citizens Telecommunications Company of West Virginia	1.60	Transmission	115-138
2	S009879	1.53	Citizens Telecommunications Company of West Virginia	1.57	Sub-Transmission	Unknown
3	S006379	0.71	Citizens Telecommunications Company of West Virginia	0.18	Transmission	115-138
4	S004084	1.35	Citizens Telecommunications Company of West Virginia	1.71	Sub-Transmission	Unknown
5	S008180	0.03	Citizens Telecommunications Company of West Virginia	0.93	Transmission	115-138
6	S200494	1.31	Citizens Telecommunications Company of West Virginia	0.61	Sub-Transmission	Unknown
7	S009179	1.63	Citizens Telecommunications Company of West Virginia	3.37	Sub-Transmission	Unknown
8	S601188	0.40	Citizens Telecommunications Company of West Virginia	0.81	Transmission	115-138
9	S600188	0.06	Cebridge Acquisition LLC	3.01	Sub-Transmission	Unknown

Site No.	Permit_ID	Broadband	Provider	Power Lines	Type	Size_kV
10	S201496	1.17	Citizens Telecommunications Company of West Virginia	1.19	Sub-Transmission	Unknown
11	S200307	0.25	Citizens Telecommunications Company of West Virginia	1.38	Sub-Transmission	Unknown
12	S200697	2.29	Citizens Telecommunications Company of West Virginia	1.45	Sub-Transmission	Unknown
13	S022874	0.06	Citizens Telecommunications Company of West Virginia	0.93	Transmission	115-138
14	S200798	0.57	Citizens Telecommunications Company of West Virginia	1.23	Sub-Transmission	Unknown
15	S003080	1.26	Citizens Telecommunications Company of West Virginia	3.94	Sub-Transmission	Unknown
16	S600587	0.52	Cebridge Acquisition LLC	0.72	Transmission	115-138
17	S601989	1.25	Citizens Telecommunications Company of West Virginia	0.42	Sub-Transmission	Unknown
18	S201298	2.11	Citizens Telecommunications Company of West Virginia	2.51	Sub-Transmission	Unknown
19	S201293	1.40	Citizens Telecommunications Company of West Virginia	1.75	Sub-Transmission	Unknown

Site No.	Permit_ID	Broadband	Provider	Power Lines	Type	Size_kV
20	S602888	1.72	Citizens Telecommunications Company of West Virginia	2.72	Sub-Transmission	Unknown
21	S009884	0.90	Citizens Telecommunications Company of West Virginia	1.24	Sub-Transmission	Unknown
22	S201012	1.90	Citizens Telecommunications Company of West Virginia	0.36	Sub-Transmission	Unknown
23	S007583	1.02	Citizens Telecommunications Company of West Virginia	1.09	Transmission	115-138
24	S012075	0.28	Citizens Telecommunications Company of West Virginia	3.16	Sub-Transmission	Unknown
25	S603286	0.34	Citizens Telecommunications Company of West Virginia	1.05	Sub-Transmission	Unknown
26	S601387	0.13	Citizens Telecommunications Company of West Virginia	0.47	Transmission	115-138
27	S304188	0.11	Cebridge Acquisition LLC	1.58	Transmission	115-138
28	S301393	1.24	Citizens Telecommunications Company of West Virginia	2.42	Sub-Transmission	Unknown
29	S020377	0.12	Citizens Telecommunications Company of West Virginia	1.77	Sub-Transmission	Unknown

Site No.	Permit_ID	Broadband	Provider	Power Lines	Type	Size_kV
30	S009385	0.23	Cebridge Acquisition LLC	1.38	Transmission	115-138
31	S016177	0.42	Citizens Telecommunications Company of West Virginia	0.56	Sub-Transmission	Unknown
32	S001982	0.30	Citizens Telecommunications Company of West Virginia	1.74	Sub-Transmission	Unknown
33	S200396	1.32	Citizens Telecommunications Company of West Virginia	2.34	Sub-Transmission	Unknown
34	S007385	0.18	Citizens Telecommunications Company of West Virginia	0.29	Sub-Transmission	Unknown
35	S601489	1.67	Citizens Telecommunications Company of West Virginia	0.82	Sub-Transmission	Unknown
36	S004381	1.35	Citizens Telecommunications Company of West Virginia	1.71	Sub-Transmission	Unknown
37	S007079	0.70	Citizens Telecommunications Company of West Virginia	3.23	Transmission	115-138
38	S602588	0.86	Citizens Telecommunications Company of West Virginia	0.07	Sub-Transmission	Unknown
39	S602188	0.41	Cebridge Acquisition LLC	3.87	Sub-Transmission	Unknown

Site No.	Permit_ID	Broadband	Provider	Power Lines	Type	Size_kV
40	S200995	1.29	Citizens Telecommunications Company of West Virginia	2.16	Sub-Transmission	Unknown
41	S200502	0.85	Citizens Telecommunications Company of West Virginia	2.49	Transmission	115-138

Table 9: Shortest Distances from Sites to Sewer and Solid Waste Treatment Facilities

Site No.	Permit_ID	Sewer Treatment (ST)	Facility Name (ST)	Solid Waste Treatment (SWT)	Facility Name (SWT)
1	S200605	9.01	Town of Clay Water Treatment Plant	25.26	Montgomery, City of
2	S009879	5.05	Town of Clay Water Treatment Plant	27.92	Central WV Refuse
3	S006379	8.87	Childrens Emergency Shelter - Nicholas County	17.45	Central WV Refuse
4	S004084	5.14	Town of Clay Water Treatment Plant	28.01	Central WV Refuse
5	S008180	8.07	Town of Clay Water Treatment Plant	24.33	Montgomery, City of
6	S200494	8.54	Town of Clay Water Treatment Plant	31.01	Central WV Refuse
7	S009179	2.69	Town of Clay Water Treatment Plant	25.15	Central WV Refuse
8	S601188	2.71	Big Otter Food Mart	17.50	Central WV Refuse
9	S600188	7.92	COBB RENTAL SUBDIVISION	25.63	Montgomery, City of
10	S201496	9.99	Town of Clay Water Treatment Plant	29.48	Montgomery, City of
11	S200307	9.11	Town of Clay Water Treatment Plant	25.38	Montgomery, City of
12	S200697	8.46	Town of Clay Water Treatment Plant	30.93	Central WV Refuse

Site No.	Permit_ID	Sewer Treatment (ST)	Facility Name (ST)	Solid Waste Treatment (SWT)	Facility Name (SWT)
13	S022874	8.49	Town of Clay Water Treatment Plant	24.74	Montgomery, City of
14	S200798	8.36	Town of Clay Water Treatment Plant	27.86	Montgomery, City of
15	S003080	2.27	Town of Clay Water Treatment Plant	24.74	Central WV Refuse
16	S600587	8.42	SANDY BRAE GOLF COURSE	22.16	C.A.M.C. (Incinerator)
17	S601989	10.08	Town of Clay Water Treatment Plant	29.56	Montgomery, City of
18	S201298	12.87	Town of Clay Water Treatment Plant	32.36	Montgomery, City of
19	S201293	10.09	Town of Clay Water Treatment Plant	29.60	Montgomery, City of
20	S602888	3.49	Town of Clay Water Treatment Plant	25.95	Central WV Refuse
21	S009884	5.54	Town of Clay Water Treatment Plant	28.40	Central WV Refuse
22	S201012	8.04	Town of Clay Water Treatment Plant	30.50	Central WV Refuse
23	S007583	14.48	SMITHERS CITY OF	17.44	Montgomery, City of
24	S012075	12.28	COBB RENTAL SUBDIVISION	20.02	Montgomery, City of
25	S603286	8.95	Town of Clay Water Treatment Plant	25.71	Montgomery, City of
26	S601387	7.56	Town of Clay Water Treatment Plant	23.91	Montgomery, City of
27	S304188	12.53	SMITHERS CITY OF	15.48	Montgomery, City of
28	S301393	10.39	Town of Clay Water Treatment Plant	29.88	Montgomery, City of
29	S020377	9.07	Town of Clay Water Treatment Plant	25.32	Montgomery, City of
30	S009385	12.93	SMITHERS CITY OF	15.89	Montgomery, City of
31	S016177	6.68	Town of Clay Water Treatment Plant	28.18	Montgomery, City of
32	S001982	9.36	Town of Clay Water Treatment Plant	25.61	Montgomery, City of

Site No.	Permit_ID	Sewer Treatment (ST)	Facility Name (ST)	Solid Waste Treatment (SWT)	Facility Name (SWT)
33	S200396	12.78	Town of Clay Water Treatment Plant	32.28	Montgomery, City of
34	S007385	12.51	Town of Clay Water Treatment Plant	18.52	Montgomery, City of
35	S601489	9.08	Town of Clay Water Treatment Plant	28.57	Montgomery, City of
36	S004381	5.14	Town of Clay Water Treatment Plant	28.01	Central WV Refuse
37	S007079	1.31	Town of Clay Water Treatment Plant	23.77	Central WV Refuse
38	S602588	9.56	Town of Clay Water Treatment Plant	27.24	Montgomery, City of
39	S602188	11.69	COBB RENTAL SUBDIVISION	21.39	Montgomery, City of
40	S200995	11.37	Town of Clay Water Treatment Plant	30.86	Montgomery, City of
41	S200502	11.53	Town of Clay Water Treatment Plant	25.98	Montgomery, City of

Table 10: Shortest Distances from Sites to Gas Pipe and Oil Pipe

Site No.	Permit_ID	Gas Pipe (GP)	Company Name (GP)	Oil Pipe (OP)	Company Name (OP)
1	S200605	4.40	Tennessee Gas Pipeline Co.	2.72	CS
2	S009879	0.94	Tennessee Gas Pipeline Co.	1.32	CL
3	S006379	3.62	Hope Gas, Inc.	1.39	E
4	S004084	1.27	Tennessee Gas Pipeline Co.	1.90	CL
5	S008180	4.22	Tennessee Gas Pipeline Co.	2.04	CS
6	S200494	4.87	Tennessee Gas Pipeline Co.	1.99	E
7	S009179	1.52	Tennessee Gas Pipeline Co.	2.45	CL
8	S601188	0.90	Columbia Gas Transmission Corp.	0.97	CL

Site No.	Permit_ID	Gas Pipe (GP)	Company Name (GP)	Oil Pipe (OP)	Company Name (OP)
9	S600188	1.09	Dominion Transmission Inc.	1.31	CN
10	S201496	5.47	Tennessee Gas Pipeline Co.	2.79	Unknown
11	S200307	3.81	Tennessee Gas Pipeline Co.	2.53	CS
12	S200697	4.87	Tennessee Gas Pipeline Co.	0.87	E
13	S022874	3.89	Tennessee Gas Pipeline Co.	1.99	CS
14	S200798	3.89	Tennessee Gas Pipeline Co.	3.33	CS
15	S003080	2.03	Tennessee Gas Pipeline Co.	2.93	CL
16	S600587	0.04	Dominion Transmission Inc.	0.11	CN
17	S601989	4.82	Tennessee Gas Pipeline Co.	2.99	E
18	S201298	6.41	Tennessee Gas Pipeline Co.	1.04	E
19	S201293	5.88	Tennessee Gas Pipeline Co.	2.31	Unknown
20	S602888	1.13	Tennessee Gas Pipeline Co.	2.06	CL
21	S009884	1.59	Tennessee Gas Pipeline Co.	2.02	CL
22	S201012	4.27	Tennessee Gas Pipeline Co.	1.71	E
23	S007583	4.12	Dominion Transmission Inc.	0.72	C
24	S012075	2.83	Dominion Transmission Inc.	1.45	CS
25	S603286	3.53	Tennessee Gas Pipeline Co.	2.05	CS
26	S601387	3.73	Tennessee Gas Pipeline Co.	1.48	CS
27	S304188	2.97	Dominion Transmission Inc.	1.35	C
28	S301393	5.60	Tennessee Gas Pipeline Co.	2.61	Unknown
29	S020377	4.24	Tennessee Gas Pipeline Co.	2.89	CS

Site No.	Permit_ID	Gas Pipe (GP)	Company Name (GP)	Oil Pipe (OP)	Company Name (OP)
30	S009385	3.34	Dominion Transmission Inc.	1.20	C
31	S016177	2.69	Tennessee Gas Pipeline Co.	2.89	E
32	S001982	4.30	Tennessee Gas Pipeline Co.	3.21	CS
33	S200396	6.85	Tennessee Gas Pipeline Co.	1.36	E
34	S007385	4.94	Dominion Transmission Inc.	0.98	C
35	S601489	4.68	Tennessee Gas Pipeline Co.	3.42	E
36	S004381	1.27	Tennessee Gas Pipeline Co.	1.90	CL
37	S007079	1.51	Tennessee Gas Pipeline Co.	2.21	CL
38	S602588	2.45	Tennessee Gas Pipeline Co.	2.02	CS
39	S602188	2.56	Dominion Transmission Inc.	1.97	CS
40	S200995	6.48	Tennessee Gas Pipeline Co.	1.77	Unknown
41	S200502	5.67	Tennessee Gas Pipeline Co.	2.82	Unknown

Suitability Model

The suitability model for Clay 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 Clay 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 three 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 5 to 10 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.

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

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:

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

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

1. Weighting

Table 11 prioritizes post-mining land-use criteria for surface coal mining site selection in Clay 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 11: Weighting Sites Selection Criteria

No	Criteria	Weight
1	Interstate	8
2	Existing Highway	8
3	Yeager Airport	3
4	Tri-state Airport	3
5	National Waterway Network Ports	5
6	Sewer Treatment Facilities	7
7	Solid Waste Treatment Facilities	8
8	National Waterway Network	4
9	Intermodal Terminal Facilities	6
10	Sewer Lines	8
11	Railroads	5
12	Water Lines	10
13	Power Lines	10
14	Gas Pipes	6
15	Pipe Lines	6
16	Broadband	9

2. Scoring

2.1 Absolute Scores:

The shorter the distance to a feature from a site, the higher absolute score the site receives. Table 12 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 above, 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 “Solid Waste Treatment Facilities” are much smaller than ones for “Intermodal Terminal Facilities”. This is because treatment facilities are much denser than intermodal terminal facilities. In addition, solid waste treatment facilities are considered more important in site selection (weight: 8 vs. 6).

Table 12: Absolute Scoring System

Absolute Score		10	7	5	3	1
Criteria (Distances in miles)	Existing Highway	0 - 5	5 - 10	10 - 15	15 - 20	> 20
	Intermodal Terminal Facilities	0 - 10	10 - 20	20 - 30	30 - 40	> 40
	Interstate	0 - 5	5 - 14	14 - 22	22 - 30	> 30
	National Waterway Network Ports	0 - 30	30 - 50	50 - 70	70 - 90	> 90
	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
	Tri-State Airport	0 - 30	30 - 50	50 - 70	70 - 90	> 90
	Yeager Airport	0 - 30	30 - 50	50 - 70	01 - 90	> 90
	Broadband	0 - 0.5	0.5 - 2	2 - 3	3 - 4	> 4
	Gas Pipe (Natural Gas)	0 - 0.5	0.5 - 1.5	1.5 - 2	2 - 2.5	> 2.5
	National Network Waterway	0 - 2.5	2.5 - 5	5 - 7.5	7.5 - 10	> 10
	Power Lines	0 - 0.5	0.5 - 1.5	1.5 - 2	2 - 2.5	> 2.5
	Pipe Lines (Oil)	0 - 0.25	0.25 - 0.5	0.5 - 0.75	0.75 - 1	> 1
	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	

2.2 Relative Scores:

Table 13 shows four statistical groups and their relative scores in the Clay 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 13: Relative Scoring System

		Threshold (Distances in miles)				
		Min - Q1	Q1 - Q2	Q2 - Q3	Q3 – Max	
		10	7.5	5	2.5	
Relative Score						
No.	Criteria	Min	Q1	Q2	Q3	Max
1	Interstate	3.61	14.29	16.41	19.13	22.30
2	Existing Highway	0.42	2.09	3.85	6.16	8.97
3	Yeager Airport	20.73	34.44	37.38	39.25	49.52
4	Tri-state Airport	69.65	83.67	86.29	88.48	98.44
5	National Waterway Network Ports	61.76	75.78	78.40	80.60	90.55
6	Sewer Treatment Facilities	1.31	7.56	8.95	10.39	14.48
7	Solid Waste Treatment Facilities	15.48	23.91	25.71	28.57	32.36
8	National Waterway Network	10.15	18.03	18.99	21.34	32.57
9	Intermodal Terminal Facilities	14.17	23.93	27.24	30.46	44.01
10	Sewer Lines	0.65	4.31	5.23	6.94	9.92
11	Railroads	0.04	2.23	3.47	4.37	5.62
12	Water Lines	0.08	0.87	1.34	3.12	6.49
13	Power Lines	0.07	0.82	1.45	2.34	3.94
14	Gas Pipes	0.04	2.03	3.81	4.82	6.85
15	Oil Pipes	0.11	1.36	1.99	2.61	3.42
16	Broadband	0.03	0.28	0.85	1.32	2.29

3. Clay County’s Suitability Model:

Table 14 shows the total scores of all studied sites in Clay County. Site No-16 (Permit ID = S600587) has the highest score of 638. The sites with higher total scores suggest better opportunities for development. Results in Table 14 are also plotted in the bar chart (Figure 15) for better visualization. Among 27 analyzed potential development sites of Clay County, it is easy to notice the top 5 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.

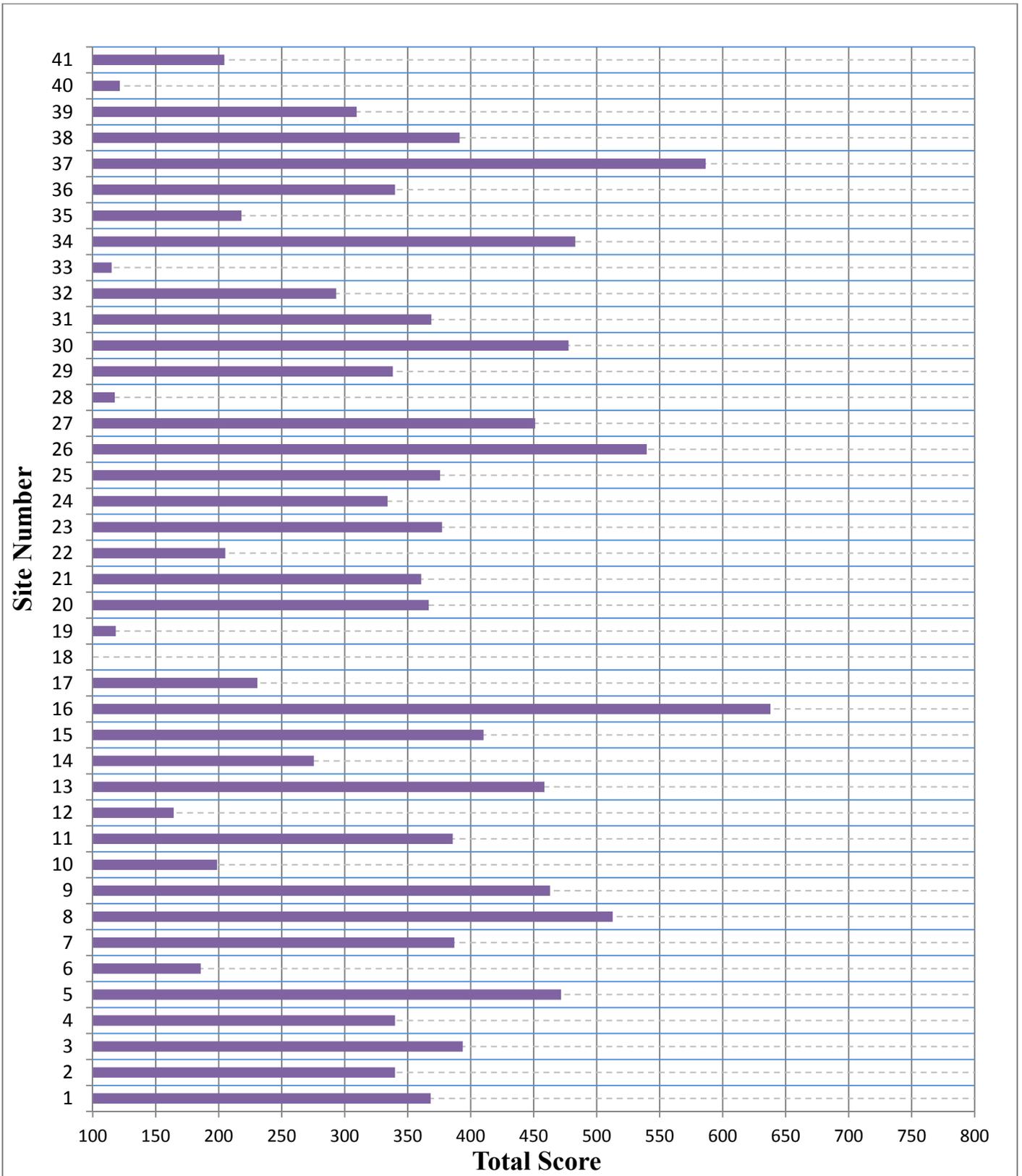
Besides a distance analysis, a suitability model for Clay is supported by demographic data as well as two additional analyses, which are workforce analysis and retail location density (shown on Table 15 and Map 41). The best decision will be made with careful consideration of the suitability analysis as well as the demographic and economic information.

Table 14: Total Score of Mine Sites in Clay County

Site No.	Permittee	PermitID	Score
1	FOLA COAL COMPANY LLC	S200605	368.25
2	LAND USE CORPORATION	S009879	340
3	HICA CORPORATION	S006379	393.75
4	PISGAH RIDGE COAL CORP	S004084	340
5	S & K CORP	S008180	471.75
6	FOLA COAL COMPANY LLC	S200494	185.75
7	ZY COAL CO, INC	S009179	387
8	CRAVAT COAL CO	S601188	512.75
9	PROSPERITY ENERGY, INC	S600188	463
10	FOLA COAL COMPANY LLC	S201496	198.75
11	FOLA COAL COMPANY LLC	S200307	385.75
12	FOLA COAL COMPANY LLC	S200697	164.25
13	BADGER DISTRIBUTING INC	S022874	458.5
14	FOLA COAL COMPANY LLC	S200798	275.5
15	ZY COAL CO, INC	S003080	410.25
16	AMERICAN MINERALS CORP	S600587	638
17	FOLA COAL COMPANY LLC	S601989	230.75

Site No.	Permittee	PermitID	Score
18	FOLA COAL COMPANY LLC	S201298	68.5
19	FOLA COAL COMPANY LLC	S201293	118.25
20	ZY COAL CO, INC	S602888	366.75
21	LAND USE CORPORATION	S009884	360.75
22	FOLA COAL COMPANY LLC	S201012	205.25
23	GREENDALE COALS INC	S007583	377.25
24	DAVID HEETER DOZER CO.	S012075	334
25	ALPHAINE CORP	S603286	375.75
26	X.W. CORP	S601387	539.75
27	APPALACHIAN FUELS, LLC.	S304188	451.25
28	FOLA COAL COMPANY LLC	S301393	117.5
29	S & K CORP	S020377	338.25
30	GREENDALE COALS INC	S009385	477.75
31	LAND USE CORPORATION	S016177	368.75
32	S & K CORP	S001982	293.25
33	FOLA COAL COMPANY LLC	S200396	115
34	CHICOPEE COAL COMPANY INC	S007385	483
35	FOLA COAL COMPANY LLC	S601489	218
36	PISGAH RIDGE COAL CORP	S004381	340
37	ZY COAL CO, INC	S007079	586.5
38	VANDALIA RESOURCES INC	S602588	391.25
39	VANDALIA RESOURCES INC	S602188	309.5
40	FOLA COAL COMPANY LLC	S200995	121.5
41	FOLA COAL COMPANY LLC	S200502	204.5

Figure 15: Clay 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 15: Employment and unemployment within radius of 5, 10 and 15 miles from the site

Rank	Permit_ID	Emp_05	Unemp_05	Emp_10	Unemp_10	Emp_15	Unemp_15
1	S200605	1044	111	2870	361	3877	661
2	S009879	1008	133	3178	516	4151	759
3	S006379	347	81	1024	254	2282	514
4	S004084	953	131	3064	506	4153	760
5	S008180	1151	120	2923	371	3867	658
6	S200494	594	83	2301	327	4006	708
7	S009179	827	136	3044	572	4175	771
8	S601188	565	201	1393	427	2540	614
9	S600188	911	96	2475	303	3253	479
10	S201496	619	75	2343	297	3884	662
11	S200307	1077	118	2958	384	3946	686
12	S200697	563	87	2245	354	4041	723
13	S022874	1158	123	2973	386	3910	674
14	S200798	957	109	2876	374	3969	693
15	S003080	783	138	3001	587	4156	770
16	S600587	317	54	1537	228	3174	478
17	S601989	668	85	2420	321	3965	691
18	S201298	394	62	1853	286	3834	666
19	S201293	599	71	2309	282	3824	639
20	S602888	880	134	3068	549	4179	770
21	S009884	974	129	3048	484	4134	753
22	S201012	666	93	2430	359	4051	723
23	S007583	780	70	2010	195	2910	368
24	S012075	1334	120	2416	265	3197	451

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

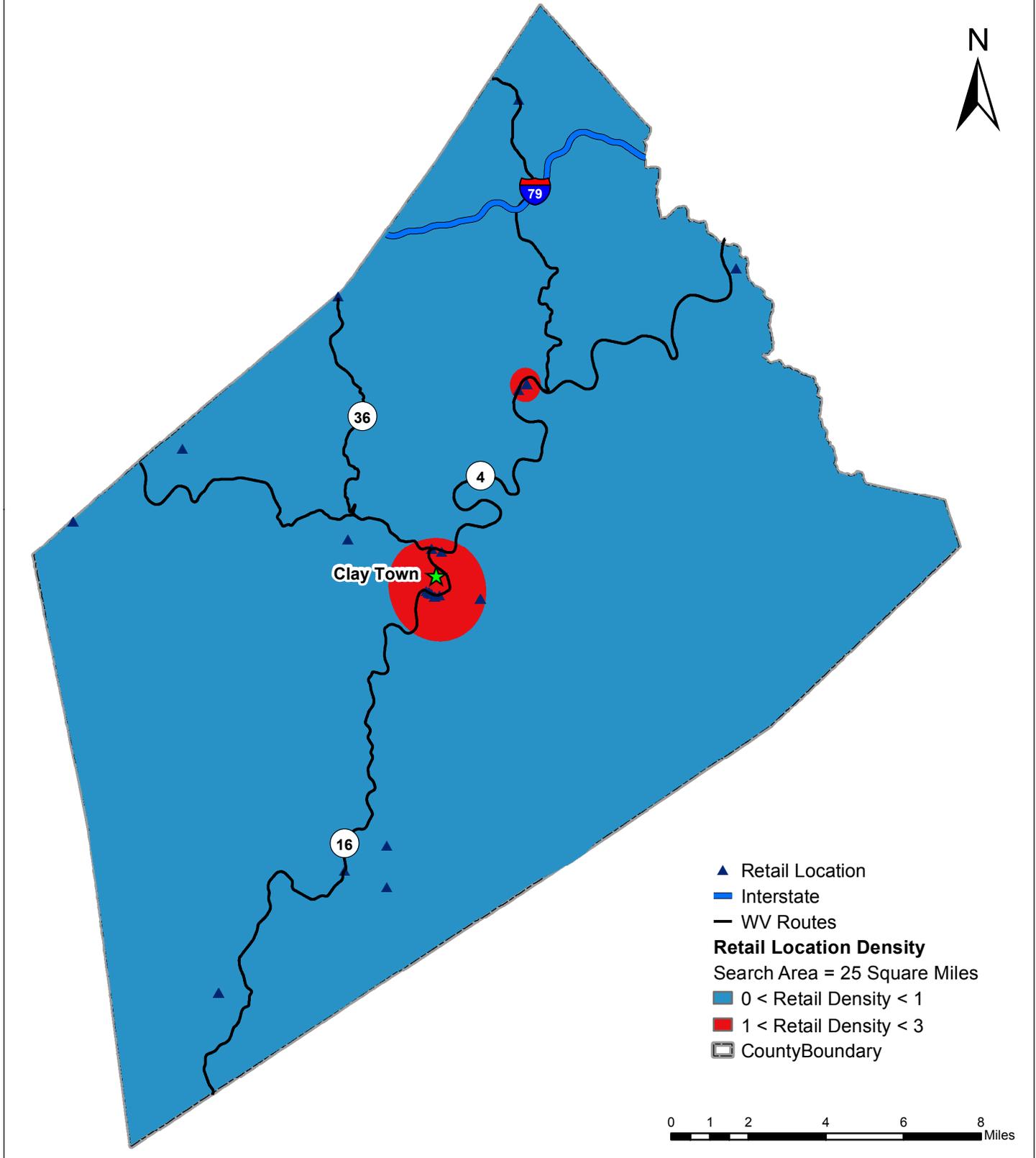
Rank	Permit_ID	Emp_05	Unemp_05	Emp_10	Unemp_10	Emp_15	Unemp_15
25	S603286	1147	125	3019	401	3958	691
26	S601387	1233	129	3007	395	3900	671
27	S304188	563	51	1739	160	2657	309
28	S301393	766	84	2578	306	3790	628
29	S020377	1020	111	2881	366	3907	672
30	S009385	639	58	1842	172	2746	329
31	S016177	899	117	2847	424	4094	738
32	S001982	969	107	2849	361	3915	674
33	S200396	349	50	1780	249	3719	620
34	S007385	1110	100	2305	244	3218	448
35	S601489	731	89	2519	329	3953	686
36	S004381	953	131	3064	506	4153	760
37	S007079	826	140	3129	591	4173	772
38	S602588	1135	131	3148	450	4066	729
39	S602188	1352	123	2464	278	3226	460
40	S200995	509	60	2147	260	3735	610
41	S200502	858	90	2635	308	3736	611

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

Clay County



Source: ESRI 2011

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VI. Conclusion

Clay County has endured several adverse shocks over the decades. Due to government services and the sustainment mining support jobs, wages have been growing in the county, but unsteadily and recently very erratically. Also, these two sectors may not continue to be stable (as indicated by the fall in employment in Natural Resources and Mining), aging and educational issues persist, and post-mine land use has not been active. This plan could be useful in advancing Clay County's development goals utilizing its 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 Clay County to thrive.

Through a site distance analysis and complete demographic calculation, this plan provides the most comprehensive understanding of the economic state of Clay 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.