

GREENBRIER COUNTY AND THE MOUNTAIN VALLEY PIPELINE



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Key-Log Economics

GREENBRIER'S ECONOMY: WHAT'S AT RISK

Greenbrier County has a robust and growing economy thanks in part to its clean, healthy environment and high quality of life. As a destination outdoor recreation area, residents depend on the pristine natural environment for a multitude of reasons. The Mountain Valley Pipeline, which would run 21.1 miles in Greenbrier, has triggered widespread concern over potential effects on the local community, land, water, and economy. This report describes the assets and trends that may be at risk if the Mountain Valley Pipeline were built and summarizes research on the potential economic impacts on land value, natural benefits, and key economic sectors in Greenbrier County.

At a Glance:

The Mountain Valley Pipeline in Greenbrier County

- ❖ Miles of pipeline: 21.1
- ❖ Acres in the construction corridor, permanent right-of-way (ROW), and surface infrastructure: 356, 127, and 10
- ❖ Most impacted land cover type (ROW only): forest (113 acres)
- ❖ Parcels touched by ROW: 90
- ❖ Parcels in the 1.4-mile-wide evacuation zone: 1,705
- ❖ Residents and housing units in the evacuation zone: 2,323 people and 232 homes (includes vacation homes whose owners would be counted in the county of their primary residence)
- ❖ Parcels from which the pipeline would be visible: 6,416, or 20% of all parcels in Greenbrier County
- ❖ Baseline property value at risk (and expected one-time cost due to the MVP):
 - In the ROW: \$4.5 million (\$187,000 to \$578,700)
 - In the evacuation zone: \$37.8 million (\$1.4 million)
 - In the viewshed: \$397.8 million (to avoid double counting with lost aesthetic value under ecosystem services, this effect is not separately estimated)
- ❖ Total property value lost (a one-time cost): \$1.6 to \$2.0 million
- ❖ Resulting loss in property tax revenue (annual): \$6,800 to \$8,500
- ❖ Ecosystem value of lost ecosystem services such as for water and air purification, recreational benefits, and others:
 - Over the two-year construction period (a one-time cost): \$3.9 to \$14.2 million
 - Recurring every year for the life of the MVP (annual): \$741,900 to \$2.7 million
- ❖ Lost economic development opportunities due to the erosion of Greenbrier County's comparative advantages as an attractive place to visit, reside, and do business. Under the scenarios described below, these could include:
 - Annual loss of recreation tourism expenditures of \$18.3 million supporting 201 jobs, \$8 million in payroll, and \$1.4 million in state and \$162,100 in local taxes
 - Annual loss of personal income of \$1.0 million due to slower growth in the number of retirees
 - An annual loss of \$609,100 of personal income due to slower growth in sole proprietorships
- ❖ Total estimated costs:
 - One-time costs (lost property value and lost ecosystem service value during construction) would total between \$5.5 and \$16.2 million
 - Annual costs (costs that occur year after year) would range from \$20.7 to \$22.7 million
 - Present discounted value of all future annual costs (discounted at 1.5%): \$1.4 to \$1.5 billion
 - One-time costs plus discounted value of all future annual costs: \$1.4 to \$1.5 billion

Note: For a number of reasons, these estimates are conservative and the actual economic cost of the MVP, if built, could be much higher. For details, please see the full report, "Economic Costs of the Mountain Valley Pipeline to Property Value, Ecosystem Services, and Economic Development in Virginia and West Virginia," available for download at keylogeconomics.com.

Greenbrier, West Virginia's second largest county, boasts history, unspoiled beauty, and charm. Nestled in the Allegheny Mountains, Greenbrier County is home to an abundance of areas for outdoor recreation including portions of the Monongahela and Jefferson National Forests, the trail head of the 78-mile Greenbrier River Trail, and the Greenbrier River (Greenbrier County Convention & Visitors Bureau, West Virginia 2016). Greenbrier is also home to Lewisburg, named the coolest small town by Budget Travel, The Greenbrier, a world class resort and hotel, family friendly events, and area farms and markets. All these features contribute to and benefit from the county's beautiful, clean environment. They are also an important part of Greenbrier's economic success, including faster population, employment, and income growth compared to the average for West Virginia's rural counties. Greenbrier exhibits what some researchers have termed "the rural growth trifecta"—a combination of outdoor amenities, creative workers, and entrepreneurship (McGranahan, Wojan, and Lambert 2010). Together, these factors attract people who create economic opportunity that fits with the landscape and culture of the area.

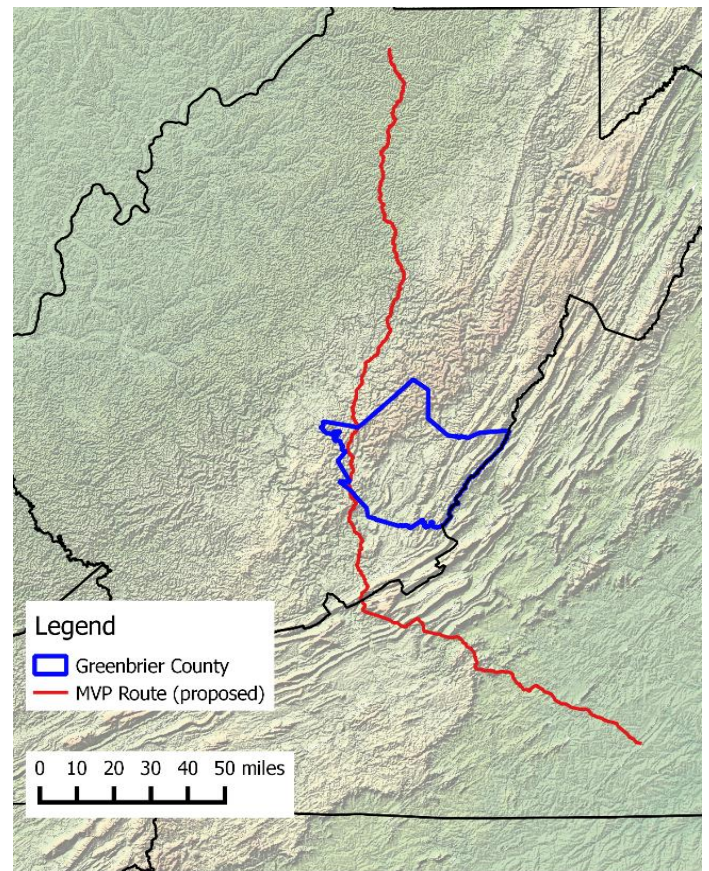


FIGURE 1 THE ROUTE OF THE PROPOSED MOUNTAIN VALLEY PIPELINE THROUGH GREENBRIER COUNTY

Recent Trends

Greenbrier County's population grew by 2.9% between 2000 and 2014 (Headwaters Economics 2015; US Census Bureau 2015).¹ The population increase is largely driven by in-migration, including people of retirement age. Between 2000 and 2014, Greenbrier experienced an average annual net in-migration of 99 people, the entirety of population growth. From 2000 to 2013, the population over the age of 65—often retirees who can choose where to live—grew from 17.7% to 19.8%.² Retirees bring their incomes, and when

¹ Unless otherwise noted, all employment, income, and population figures are from Headwaters Economics (2015), US Census Bureau (2015), and US Bureau of Economic Analysis (2015).

² Age distribution data is the most recent available from the US Census Bureau (2015).

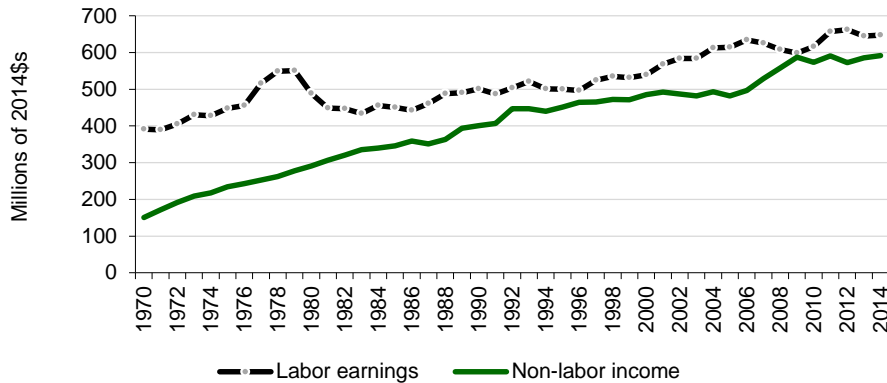


FIGURE 2: COMPONENTS OF PERSONAL INCOME, GREENBRIER COUNTY (SOURCE: HEADWATERS ECONOMICS 2015, US BUREAU OF ECONOMIC ANALYSIS 2015)

they spend it they create opportunities for economic development, including in higher-end services such as healthcare and financial services. The increase in immigration is one reason for the 3.8% increase in employment in the real estate and rental and leasing industries since 2001. More new residents means more

real-estate transactions and more opportunities (jobs) for Realtors, rental agents, and support services.

Besides labor income, earnings from a wage-and-salary job and/or self-employment, Greenbrier residents also receive “non-labor income” in the form of earnings on investments (dividends, interest, and rent) and transfer payments, such as Social Security and Medicare. As a share of the total, non-labor income now accounts for 48 out of every 100 dollars earned or received by Greenbrier residents, almost double the rate in 1970. Since 2000, non-labor income has grown by 21.9%. This does not mean labor earnings are unimportant. Wages, salaries, benefits, and self-employment income still make up 52.2% of personal income in the county, increasing by 20.1% since 2000.

Like retirees, entrepreneurs and small business owners in a variety of industries choose where they locate, basing their decisions on amenities and quality of life, rather than on access to input or output markets or other traditional business concerns (Rasker and Glick 1994). One indicator of this phenomenon in Greenbrier is the growth in the number of sole proprietorships. By 2014, the county’s 4,181 sole proprietors accounted for about 22.2% of jobs, growing by 5.3% since 2000. The growth in sole proprietors illustrates the extent to which the creative activity of Greenbrier’s new and long-time residents drives economic development.

Travel and tourism are also an important and growing part of Greenbrier’s economy. The industry—composed of passenger transportation, arts, entertainment, recreation services, accommodation, food services, and portions of the retail sector—represents 29% of total private employment in the county. Between 2010 and 2014, Greenbrier saw a \$22.8 million increase in traveler expenditures,³ a 13.9% increase in travel generated

³ Purchases by travelers during their trip, including hotel/motel occupancy taxes and other applicable local and state taxes, paid by the traveler at the point of sale (Dean Runyan Associates 2015).

employment, and a \$11.1 million increase in travel related payroll (Dean Runyan Associates 2015).⁴

A relatively low unemployment rate, rapid personal income growth, and a high per-capita personal income (PCPI) further indicate the county's overall economic health. The unemployment rate was 6.8% in 2014 compared to 7.4% for all of non-metro West Virginia. Personal income increased by 21% between 2000 and 2014, higher compared to 19.6% for all of non-metro West Virginia. Greenbrier's PCPI stood at \$34,966 in 2014 compared to \$33,164 for non-metro West Virginia.

In the context of the proposed Mountain Valley Pipeline, it is worth emphasizing Greenbrier's population and economic growth has occurred without energy infrastructure of the MVP's type or scale. While some claim that the pipeline will bring some benefits (Ditzel, Fisher, and Chakrabarti 2015), and Governor Tomblin has said such infrastructure would "create promising opportunities for future generations,"⁵ public officials must consider how the MVP would change Greenbrier's current conditions and whether such change would really be for the better. Our research, summarized in this report, shows some of the ways in which the MVP could make things worse.

Impacts of the MVP

Property Values

The MVP would affect property values in three ways: from loss of use and enjoyment of the property, from safety risks, and from diminished aesthetic quality of views. With some overlap, these effects would be most prominent in three zones: in the right-of-way (ROW), in the evacuation zone (including a narrower "high consequence area"), and within sight, or in the viewshed, of the pipeline.

Loss of use and enjoyment of properties would be felt most acutely by owners of parcels the proposed 50-foot-wide ROW crosses or touches. Forestland in the ROW will be stripped and converted to shrub or grassland, eliminating the prospect of future timber income (Williams 2015). Cropland in the ROW cannot be managed in the same way due to restrictions on the landowner's ability to cross the pipeline with heavier farm equipment (Monroe and Monroe 2015; Leech 2015). This means farm and forestland adjacent to the ROW would become less valuable if it becomes more expensive to reach woodlots or fields on the far side of the ROW.

Current and future residential housing is another productive use of land potentially suffering an economic loss from the MVP. People now living on parcels in the ROW will feel less safe, may be at risk of losing wells and

⁴ All dollar values have been adjusted for inflation.

⁵ Quoted in Mountain Valley Pipeline (2016).



"[Our] property was planned as a luxury home and horse property. We have invested well over \$500,000 in a log home and barn. I doubt anyone wants to live here with a noisy compressor station just a third of a mile up the road. What's more, we were told that we have about \$50,000 worth of standing timber... we will lose that value and the value of future harvest because the timber equipment can't cross the pipeline"

-Liz Tobey, Dawson, WV

springs during or after construction, and will be deprived of the peace, quiet, and scenic views paid for when properties were initially purchased. There would also be a loss for potential subdivision and development depending on how and where the pipeline crosses unimproved properties.

These economic losses translate into financial losses when current owners attempt to sell their properties and find buyers are far less interested in them. Patricia Laurrell from Blacksburg, Virginia, a real estate appraiser with over 25 years of experience, found that properties near pipeline installation areas result in decreased property values due to visual contamination (Laurrell 2015). Alinda Perrine, a real estate agent from Lewisburg, WV, found that the possibility of a pipeline "is a major issue, one about which you must inform your clients" (Perrine 2015). In nearby Montgomery County, VA, Christian Reidys, a professor at Virginia Tech, recently purchased 5.2 acres with a vision of building a home. However, a month after the purchase, he learned that the MVP route would cross through his property. The home building project was

canceled, and Reidys and his Realtor, Jim Sarver, agreed they were ethically bound to disclose the potential pipeline crossing to potential buyers of the property. Sarver stated he does not "see how anyone could buy the property with that [the pipeline's] uncertainty," and Reidys has one contract on the property contingent on the parcel not including a natural gas easement (Adams 2016).

Based on the current value of Greenbrier properties, as well as surveys of buyers, realtors, and appraisers (Kielisch 2015),⁶ the total loss of property value for the parcels touched by the proposed pipeline ROW in Greenbrier ranges from \$187,000 to \$578,700.

⁶ Some of our estimates based on the survey of prospective home buyers reported in Kielisch (2015) are conservative. Some 62.2% of the survey respondents said they would not purchase a property with a pipeline (smaller than the MVP would be) at any price. The remaining survey respondents were split between those who would offer 21% less and those who would offer the same amount. In our estimates we use the average price reduction for just those buyers who stay in the market – that is, an average reduction in offer price of 10.5%. If one considers that 62% of buyers are effectively reducing their offer prices by 100%, the average reduction in offer price would be 66.2%.

Properties outside the ROW, but still near the pipeline, would also suffer a loss in value. First there is a “high consequence area,” within which one’s survival of an explosion would be unlikely. The high consequence area would be 0.4 miles wide (1,092 feet on either side) for a pipeline of this size. There is also a 1.4-mile-wide evacuation zone (3,583 feet on either side), defined as the area an unprotected human would need to move beyond in order to avoid burn injury in the event of an explosion or a fire following a leak. Living with the 24/7/365 possibility of having to evacuate one’s home or business at a moment’s notice, if notice is even possible, diminishes the value of the property to its owner.

As with the effects within the ROW, the loss of value to owners within the high consequence area and the larger evacuation zone translates into lower prices if and when current owners choose to sell. At least one ROW landowner has been told by two insurance agencies that rates would likely increase for properties like hers if, indeed, coverage remains available at all (Roston 2015). The effect in the high consequence area, arguably, would be greater than in the evacuation zone. However, due to a lack of studies estimating such a difference, we are conservatively assuming that the effects within the entire evacuation zone, including within the high consequence area, are the same.

The evacuation zone through Greenbrier would touch 1,705 parcels, not counting those already affected by the ROW. Based on the current value of these properties and research on the decrease in property value due to a risk of evacuation (Boxall, Chan, and McMillan 2005), the MVP would induce an additional loss of \$1.4 million in property value.

Depending on topography, the pipeline will also be visible for many miles in all directions. In Greenbrier, 6,416 parcels will have their views affected by the pipeline. Homebuyers, realtors, and commercial property owners know the importance of the proverbial “million-dollar view.” While the pipeline might not erase quite that much value from a given property, it is likely a property with a view that suddenly includes a pipeline right-of-way where there was once an unbroken view of woodlands or farm fields will experience a real loss in value. David Hurt, Franklin County, Virginia’s former County Supervisor and a real estate agent specializing in rural land, found “that mountain views are a major selling point. With the proposed route...being visible for miles around, it will make many properties within view of the mountain less desirable with diminished market value” (Hurt 2015, 201). This lost value would be reflected in the loss of aesthetic value included with other effects on ecosystem services described in the next section.

Leaving aside the value lost in the viewshed and counting only the impacts in the right-of-way and the evacuation zone, the MVP could cause between \$1.6 and \$2.0 million in lost property value in Greenbrier

County. Applying the median property tax rate for the county, this one-time loss in property value translates into an annual loss of property tax revenue between \$6,800 and \$8,500.

These estimates of lost property value and tax revenue are conservative for five reasons. First, and as explained in footnote six,⁶ estimated impacts on sale prices for properties in the ROW do not take into account the fact that more than three out of five prospective buyers would not buy such properties at any price. Second, our estimates treat properties in the (higher risk) high consequence areas as if they are affected only to the same degree that properties in the evacuation zone would be affected. Third, they do not take into account the disproportionate effect the MVP would have on the assessed value of developable, but currently unimproved, parcels for which the MVP could impede subdivision. Depending on where and how the ROW crosses these properties, it is likely that some will lose their potential for future development and the assessed value and associated property tax revenue will fall. Fourth, we have not quantified the effect of additional surface infrastructure, such as access roads, that would take up land outside the right-of-way. Fifth and finally, the estimated impacts on tax revenue do not reflect lost value for properties with pipeline-damaged views. If the MVP is permitted, a property-by-property reappraisal of all parcels affected in any of these ways and in all areas—along the ROW, in the evacuation zone, and throughout the viewshed—should be undertaken to determine the full impact on landowners and local tax revenues.

Ecosystem Services

The construction and presence of the MVP will alter the flow of natural benefits people receive from well-functioning, healthy ecosystems. Known as “ecosystem services” and defined as the benefits people obtain from ecosystems, these natural benefits include services such as clean water for drinking and for industrial processes, food grown on cropland, raw materials, and the aesthetic value of beautiful views from residential and commercial properties as well as from areas used for recreation.

Ecosystems also protect people and property from extreme events like floods and wildfire, regulate local and global climate, clean the air, support food production through natural pest control and pollination, provide wildlife to hunt, fish to catch, and spaces for other forms of recreation.

Because these ecosystem benefits are benefits to people, they convey economic value. To the extent the MVP would reduce the flow of these benefits, the reduction must be counted among the MVP’s economic costs. Beyond this economic rationale, there is a growing legal and regulatory imperative to consider ecosystem services effects, particularly where federal land, such as the Jefferson National Forest, and federal actions are involved (USDA Forest Service 2012; Donovan, Goldfuss, and Holdren 2015).

To estimate these costs, we use the well-established “benefit transfer method” in which different land uses are associated with different rates of delivery of various ecosystem services. For example, each acre of forest produces a certain number of dollars’ worth of aesthetic value, recreational opportunity, water, and water flow regulation, among others each year. Similarly, cropland produces food and other natural benefits at its particular rate. Urban open space makes its own contribution to aesthetics and other values. These rates of delivery are transferred to the study region from previous research on areas that are reasonably similar to the study region.

Acreage converted from a more productive to a less productive land use results in lower ecosystem service values. During construction, the MVP would convert all acreage in the 125-foot-wide construction zone to barren land, which has no ecosystem service value. After construction, we assume acreage in the construction zone but outside the 50-foot-wide ROW would return to its previous land use/land cover. Additional land would be converted to barren or urban land (both of which have relatively low ecosystem service productivity) for use as permanent access roads and other pipeline-related infrastructure. Within the ROW, we assume previous forestland would return to shrub/scrub and that cropland would return as pasture/forage.⁷ All other acreage, including those beginning as shrub/scrub or pasture/forage is assumed to return to its pre-pipeline use or cover type.

The other driver of change in ecosystem service value is the difference in per-acre productivity for land that returns to its previous use after construction. For example, post-construction differences in soil structure, compaction, and other factors may render pasture/forage less valuable for food production, for water purification, and for producing other benefits once a pipeline runs through it. Similarly, urban open space might become less suitable as a place for children to play or people to relax once it becomes open space occupied by a high-pressure gas transmission line. While we are aware of one proposed study focused on agricultural productivity,⁸ there are not yet data indicating how severe the changes would be. Our estimates assume, therefore, that acreage in the ROW is as productive after construction as any other acreage in the same land use/land cover.

⁷ We recognize that some land in the ROW could technically be used for crop production again after construction. However, restrictions on the weight of machinery that can cross the pipeline itself may make such production uneconomic. Moreover, the presence of the pipeline and restrictions on activities that can occur within the ROW can have spillover effects on the crop fields through which the ROW passes. In the similar context of the Atlantic Coast Pipeline, Augusta County farmer Harry Crosby has testified, the ROW would take an entire field of 30-40 acres out of crop production (Crosby 2015a; Crosby 2015b). Our assumption that ONLY the acreage in the ROW itself would be lost to crop production is therefore a conservative one.

⁸ Once funded, this Ohio State study would use field-level data to examine the anecdotal evidence gathered over the course of decades that fields with pipelines have lower crop and forage yields than those without (Culman 2015).

In Greenbrier, ecosystem service value lost in the temporary conversion from forest, cropland, urban open space, and other areas to a 125-foot-wide construction zone ranges from \$2.0 to \$7.1 million in each of the two years of construction.⁹ Ecosystem service value lost in the ROW each and every year thereafter is estimated to be between \$689,500 and \$2.5 million. Access roads and other new surface infrastructure, which would take up a total of 10.2 acres in Greenbrier, would result in an additional annual loss of \$185,000. Diminished aesthetic value represents the largest share of these losses. Disruptions to water supplies and loss of protection from extreme events make up much of the remainder.

These estimates are conservative for several reasons. First, the ROW could serve as a pathway for invasive species or wildfire to penetrate areas of interior forest habitat more quickly, thereby reducing the natural productivity of an even larger area. During construction, the construction corridor itself could be a source of air and water pollution that may over-burden the ability of surrounding areas to absorb sediment, particulates, and other pollutants. If that is the case, the ecosystem service value of the construction corridor during construction would not be zero, it would be negative.

Finally, these estimates reflect only changes in natural benefits that occur due to changes on the surface of the land. Particularly because the proposed pipeline would traverse areas of karst topography, there is concern subsurface hydrology could be affected during construction and throughout the lifetime of the pipeline (Pyles 2015). Blasting and other activities during construction could alter existing underground waterways and disrupt water supply. There is also a risk that sediment and other contaminants could reach groundwater supplies if sinkholes form near the pipeline during construction or afterwards. These scenarios would entail further loss of ecosystem service value and, for the homeowners or municipalities affected, major expenditures. For example, officials in Augusta County, Virginia, a county on the proposed Atlantic Coast Pipeline's route, estimate it would cost at least \$2.1 million to establish a new municipal well (Hoover 2015, 201).

Economic Development Opportunity

Adopted in 2014, the Greenbrier County Comprehensive Plan recognizes “that a healthy environment is central to citizens' health, welfare, and quality of life, Greenbrier County strongly supports the wise stewardship of our natural environment, including air and water resources, agricultural and forestal resources, and geologic resources, with special emphasis on the protection of environmentally sensitive areas and features (springs, sinkholes, caves, other karst features, floodplains, and wetlands) which contribute to overall environmental health and citizens' quality of life” (Greenbrier County Planning Commission 2014). The MVP would undermine progress

⁹ While construction at any given point along the pipeline would not take two years, we assume that it would be two years before the construction zone is fully revegetated and functioning as the land use or ecosystem type in which it will stay during operation of the pipeline.

toward this goal if the loss of scenic and recreational amenities, the perception and the reality of physical danger, and environmental and property damage were to discourage people from visiting, relocating to, or staying in Greenbrier. Workers, businesses, and retirees who might otherwise choose to locate along the MVP's proposed route will instead pick locations retaining their rural character, productive and healthy landscapes, and the promise for a higher quality of life. Research regarding the Atlantic Coast Pipeline (ACP), a similar 42-inch interstate natural gas pipeline being proposed to cross West Virginia and Virginia along a more northerly route, validates this concern (Phillips, Bottorff, and Wang 2016). With the possibility of the MVP looming, business plans in the region have stalled and the real estate market has slowed (Smith 2015a; Smith 2015b; Adler 2015).

Greenbrier County residents are also concerned the MVP could have broad, negative impacts on the economy. More specifically, residents from counties the MVP would cross that have submitted comments to FERC are concerned about the potential environmental impacts, public safety, property values, and historical and cultural resources (Pipeline Information Network 2015).

The fears associated with the economic impacts are consistent with research results from this region and around the country demonstrating that quality of life is often of primary importance when people choose places to visit, live, or do business. As Niemi and Whitelaw (1999, 54) state, "as in the rest of the Nation, natural-resource amenities exert an influence on the location, structure, and rate of economic growth in the southern Appalachians. This influence occurs through the so-called people-first-then-jobs mechanism, in which households move to (or stay in) an area because they want to live there, thereby triggering the development of businesses seeking to take advantage of the households' labor supply and consumptive demand." They note that decisions affecting the supply of amenities "have ripple effects throughout local and regional economies."

Along similar lines, Johnson and Rasker (1995) found that quality of life is important to business owners deciding where to locate a new facility or enterprise and whether to stay in a location already chosen. This is not surprising. Business owners value safety, scenery, recreational opportunities, and quality of life factors as much as residents, vacationers, and retirees.

Although it is difficult to predict exactly how large an effect the MVP would have on decisions about visiting, locating to, or staying in Greenbrier, based on information provided by business owners to FERC and as part of this research, we can consider reasonable scenarios for how the MVP might affect key portions of the county's overall economy.

Greenbrier residents and residents from all over the region affected by the MVP believe the pipeline will harm the travel and tourism industry. In Monroe County, the MVP's proposed route is grinding Birdsong Farm, an

organic apiary's, plans to expand and create a U-pick strawberry farm to a halt (Chlepas and Chlepas 2015). The owners of the apiary canceled their high tunnel grant and estimate a long-term loss in revenue to the county of as high as half a million dollars. Orus Ashby Berkley, a Summers County businessman, predicts the pipeline will "completely destroy the use, purpose, business operation, well, commercial septic system, two rental houses, and public campground" on his property, located on a highly valuable strip of land valued in excess of \$250,000 (Berkley 2015).

While more systematic research could provide refined estimates on the impact of natural gas transmission pipelines on recreation and tourism spending, one plausible scenario is that the impact is at least as high as the minimum of business owners' reported expectations. For example, if the MVP were to cause a 10% drop in recreation and tourism spending from the 2014 baseline, the MVP could mean \$18.3 million less in travel expenditures each year in Greenbrier. Those missing revenues would otherwise support roughly \$8 million in payroll, \$1.8 million in local tax revenue, \$162,100 in state tax revenue, and 201 jobs in the county's recreation and tourism industry each year.¹⁰ In the short run, these changes multiply through the broader economy as recreation and tourism businesses buy less from local suppliers and fewer employees spend their paychecks in the local economy.

Along similar lines, another important economic engine affected by the MVP is retirement income. In county-level statistics from the US Department of Commerce, retirement income shows up in investment income and as age-related transfer payments, including Social Security and Medicare payments. In Greenbrier, investment income decreased by 0.8% per year from 2000 through 2014, and age-related transfer payments grew by 3.9% per year. During roughly the same time period (through 2013), the number of residents age 65 and older grew by 15.4% (1.2% per year), and this age cohort now represents 19.8% of the total population.²

Although it is difficult to precisely quantify the effect of the MVP on retirement income, given the strong expression of concern from residents about changes in quality of life, safety, and other factors influencing retirees' location decisions, it is important to consider that some change is likely. Here, we consider what just a 10% slowing of the rate of increase might entail. For Greenbrier, this scenario entails an annual decrease in investment and age-related transfer payments of approximately \$1.0 million. That loss would ripple through the economy as the missing income is not spent on groceries, health care, and other services, such as restaurant meals, etc.

¹⁰ Raw data on travel expenditures is from Dean Runyan Associates (2015). This reduction in economic activity would be in addition to the lost recreation benefits (the value to the visitors themselves over and above their expenditures on recreational activity) that are included with ecosystem service costs.

The same phenomenon also applies to people starting new businesses or moving existing businesses to Greenbrier. This may be particularly true for sole proprietorships and other small businesses who are most able to choose where to locate. As noted, sole proprietors account for a large and growing share of jobs. If proprietors' enthusiasm for starting businesses in Greenbrier were dampened to the same degree as retirees' enthusiasm for moving there, the effect would be, based on average proprietor's income in recent years, about \$609,000 less in added labor earnings each year.

For "bottom line" reasons (e.g., cost of insurance) or due to the owners' own personal concerns, other businesses besides sole proprietorships might choose locations where the pipeline is not an issue. If so, further opportunities for local job and income growth are missed.

These are simple scenarios and the actual magnitude of the impacts will not be known unless the pipeline is built. Even so, because the pipeline is promoted by supporters as an economic stimulant, bringing jobs and other benefits to the region, it is important to consider the potential for loss.

Conclusion

The full costs of the proposed Mountain Valley Pipeline in Greenbrier County are wide-ranging. They include one-time costs like reductions in property value and lost ecosystem services during pipeline construction, which we estimate to be between \$5.5 and \$16.2 million. Also, there are ongoing costs like lost property tax revenue, diminished ecosystem service value, and dampened economic growth that recur year after year for the life of the pipeline. These annual costs would range from \$20.7 to \$22.7 million per year. Most of these costs would be borne by Greenbrier County residents, businesses, and institutions. By contrast, the MVP's one local benefit is an estimated average tax payment of \$1.73 million per year during construction and operation (Ditzel, Fisher, and Chakrabarti 2015). Other MVP-promoted benefits, such as jobs from the MVP's construction and operation and those stemming from lower energy costs, would accrue primarily in other places (Ditzel, Fisher, and Chakrabarti 2015).¹¹

The decision to approve or to not approve the MVP does not hinge on a simple comparison of estimated benefits and estimated costs. The scope and magnitude of the costs outlined here, however, reflect and are an important component of the full environmental effects that must be considered in making that decision. Impacts on human well-being, including those that can be expressed in a monetary value must be taken into account by the Federal Energy Regulatory Commission and others weighing the societal value of the Mountain Valley Pipeline.

¹¹ For a number of reasons the MVP-sponsored studies present benefit estimates that may be inflated. See Phillips (2015) for a review of those studies' methods, assumptions, and conclusions.

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Author's Note

For a full explanation of the concepts, methods, data, and assumptions behind the estimates in this summary, as well as estimates for the eight-county region comprising Greenbrier, Summers, and Monroe County in West Virginia, and Giles, Craig, Montgomery, Roanoke, and Franklin Counties in Virginia, please see the full technical report, "Economic Costs of the Mountain Valley Pipeline to Property Value, Ecosystem Services, and Economic Development in Virginia and West Virginia," available at both websites listed below. We are grateful for the assistance of POWHR coalition members and others in identifying local information sources and reviewing a draft of the report. Key-Log Economics however, remains solely responsible for the content of this report, the underlying research methods, and the conclusions drawn. We have used the best available data and employed appropriate and feasible estimation methods but nevertheless make no claim regarding the extent to which the magnitude of these ex ante estimates will match actual economic effects if and when the MVP is built.

POWHR

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