An Evaluation of the Potential Socio-Economic Impacts of The Proposed Stibnite Mine on Valley County, Idaho

Prepared for

The Idaho Headwaters Economic Study Group

by

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Executive Summary

Section I. The Existing Valley County Economy

In the last half century Valley County has tripled in population while jobs have nearly quadrupled. The Valley County economy outperformed the national economy across a broad range of indicators of local economic vitality: population, employment, and real personal income. In the last ten years or so, the combination of natural growth and net in-migration added about 2,500 new residents in Valley County, but 87 percent of that growth was due to net in-migration, i.e., people "voting with their feet". Many of the people that moved into Valley County, brought with them a significant amount of "non-labor" income. In 2020 the non-labor sources of personal income in Valley County totaled $355 million. In comparison, the labor Earnings came to $261 million. That is, the non-labor personal income was 36 percent **larger** than the total labor earnings.

The historically important goods production in Valley County, timber and mining, have declined in the last several decades as a source of jobs. That is not a unique trend found only in Valley County. Rather, it is a state and national economic change. Jobs in goods production (Non-Services-Related), a category that includes timber and mining, were largely stagnant over the thirty-year period 1970 to 2000 relative to the growth in jobs in services sectors. During that 30-year period, jobs in Services Related industries rose steadily, almost quadrupling (3.9-fold) over that 30-year period.

Section II: Analyzing How the Proposed Mine's Work Force and Supplies Will be Obtained and the Reason This May Limit the Positive Impacts on the Local Economy

In this section we discuss the projected economic impacts associated with the Stibnite Gold Project (SGP). While Power Consulting was able to assess a variety of the local socio-economic impacts of SGP on Valley County, as presented in this study, we find it troubling that issues of HWY 55 transportation, spill risk, local wage scale problems, housing availability/affordability, and general infrastructure concerns were not adequately examined in either the Draft Environmental Impact Statement (DEIS) or the Supplemental DEIS (SDEIS). Public officials, elected leaders, and concerned citizens should not be making decisions about the future of their communities without a full comprehensive impact analysis having been carried out to inform their decisions. Specifically, we find that the DEIS and the SDEIS socioeconomic sections presented a 'benefits only' analysis. We will spend much of this section and parts of the following sections describing and quantifying that shortcoming.

Knowing where a proposed mine will get its operating supplies and its workers will help to determine what the economic impacts of the mine will be on the local area. If the mine is in a relatively remote setting, as is the case with the proposed Stibnite mine, then it is quite likely that the positive local economic impacts of the mine will be muted on the local area. The reason for this is that there are fewer economic links between the mine and the local towns that might otherwise supply the mine with the things that it needs to operate. Valley County may be the source of a lot of wealth being created, and the physical location of the mine, but it will not retain much of the wealth that is created. If we look at the Construction phase of the proposed mine, for example, more than 91 percent of the spending will occur outside of the local area. If we look a little deeper, into the total spending that the local area is modeled to receive, we see that only

8 percent of it will be in the local area. Of that 8 percent, 64 percent of that spending will be on direct wages for the people that are modeled to live in the local area. Furthermore, we suspect most of the workers will not live in the local area, therefore, this relatively small percentage will shrink to a few percent since those "local" workers will no longer live in the local area and will no longer spend their direct wages in the local area.

A complicating factor in all of this is that even if the local area was able to provide the workers for the mine, the 100 in-migrants that are projected to work at the mine will have a hard time finding housing. That is because Valley County does not have a lot of idle houses that are available to rent and or purchase. The Stibnite Supplemental DEIS specifically notes that the local rental market is becoming less affordable and the data that we have collected from the American Community Survey indicates that there are not enough vacant houses for sale for all the "local miners" to purchase one. What this adds up to is a housing market that is more expensive than the national average, more expensive than nearby Boise, and a market that will become increasingly less affordable for the locals if the mine is built and operates.

When we look at the potential fiscal impacts of the proposed mine on the local area, much of the same pattern holds. For the operations phase of the proposed mine, there will be $300,000 annually paid in property taxes[1] which will go to Valley County during the Operations phase, but all the other taxes are paid to state and federal governments. The $300,000 must then cover the cost increases that the mine puts on Valley County which include schools, roads, infrastructure, and emergency medical services. If we use the DEIS's methodology, then this increase in property taxes will not even cover the full costs of the miner's children attending school, while leaving no tax revenues for the other increases in demand for public services that the miners may put on Valley County.

With a well-paid, predominantly young, male workforce, with weeks at a time off, there are some social problems that can accompany this type of mining. Places like the Bakken in North Dakota and Montana and remote mining locations in Canada and Australia have been a natural research area to study the impact of this type of transient workforce. Since the miners will live at the mine site for two weeks while they work and then have two weeks off at a time, a separate culture will be created by the mine. Because of its structure, its pay, and the diverse cultures of its workforce, that separate mining culture may not fit well with the existing residents of the towns and cities that are closest to that mine.

Section III: Amenity Values and Community Perception

People have chosen to move to Valley County because of its natural beauty and the outdoor recreational opportunities that surround them. Additionally, people have been moving in at rates higher than the national, state, or rural county average, and they have brought "non-labor" income with them. In the economic literature these attractive local characteristics are called "amenities" and treated as economic values that improve the well-being of residents -just as the purchase of a home in an attractive neighborhood would. Recognition of the existence of these environmental values at certain locations also warns us that if we are not careful about how we manage special attractive natural landscapes, we may degrade significant existing amenities of considerable value, potentially creating a "dis-amenity" that leaves many people worse off.

[1] Stibnite Gold Project DEIS. Pages 4.21-26.

In one important sense, the proposed Stibnite Gold Project represents a gamble that puts at risk a known and existing outdoor economy that is supporting economic vitality in Valley County. What is being offered in its stead is a speculative but threatening multiple open pit mining venture that, if it is commercially successful, will bring only a relatively small and short run "bump" in additional economic activity in Valley County. When a mine or other types of industrial facilities are proposed near where people live, the people that live in the area, as well as the people that know about the new facility and the area, may change the way that they think about that area. That is, a "stigma", or negative perception, about an area caused by the negative characteristics associated with the industrial facility such as degraded air and water quality, noise, congestion, general run-down characteristics of the neighborhoods, falling property values, etc.

The stigma can be the result of many different local industrial degradations, but for the purpose of this report, we will consider spills from truck traffic delivering supplies to the mine and spills from Tailings Storage Facilities (TSF). There will be a dramatic increase in truck traffic as thousands of loads of materials are hauled from around the U.S. to the proposed mine site which will dramatically alter traffic patterns in the local area and all but assure that there will be spills. TSF are the permanent storage features at a mine that will hold back the toxic sediments that are left over from processing the ore to obtain the minerals. In the modern age of mining, and especially when dealing with open pit mines, there is an incredible volume of rock that is moved to recover a very small percentage of the mass moved as metal (in this case gold, antimony, and silver). The amount that is recovered, measured in grams per ton of rock moved, is between 1 and 2 in this case.[2] TSF design, in recent years, has not kept up with advances in mining technology and the statistics on failure show that the newer TSF are failing at a higher rate than the older ones.

The problem with having the proposed mine in Valley County is that so much of Valley County's economy is based on the high-quality natural landscapes that are in it and all around it. When we compare Valley County's economic vitality to that of the other Idaho non-metropolitan counties, we see that Valley County has significantly outperformed them. That is, people in Valley County received more income than their Idaho peers in other non-metropolitan counties. The average "bonus" to Valley County residents compared to the group of non-metropolitan counties was $7,400 a year per person in 2020 dollars. However, a Stibnite mine- related spill that casts a shadow of stigma over Valley County, could easily erase all potential benefits that the proposed mine could bring to Valley County during the mine operation phase. For example, a spill that caused a 2 percent decline in the Visitor-Recreation and Non-Labor Income in Valley County, could erase nearly all of the benefits of having 200 highly paid miners living in Valley County.

Section IV: Socio-Economic Volatility in Mining Communities

[2] Midas Gold. Midas Gold Completes Positive Feasibility Study for the Stibnite Gold Project, Idaho. 12.22.2022. https://midasgoldcorp.com/investors/news/2020/midas-gold-completes-positive-feasibility-study-for-the-stibnite-gold-project-idaho/

Metal mining is notoriously volatile, and gold is a charter member of the club of volatility. In fact, the price of gold has fluctuated by almost a factor of 10 in the last 50 plus years. However, regardless of gold price fluctuations, Valley County and the City of McCall will still have to make decisions about infrastructure. Things like schools, sewers, hospitals, roads, the size of the police and fire departments etc., will still require additional investments, because of the increased use by the miners.

We agree that the jobs that the miners will get will pay them well above average wages, but there will also be costs associated with having a mine in Valley County, and those costs have not been explored. Mines are generally located near small towns in rural portions of the U.S. that will have a harder time dealing with some of the negative impacts that come with the mine. As Perpetua has correctly shown, people who reside in Valley County *and* have mining jobs will have significantly higher than average pay when compared to other Valley County residents. That is known. What is unknown is what some of the costs associated with having the Stibnite mine in Valley County will be. The economic and social science literature tells us that there will be costs in the form of retarded economic growth, increased pressure on public services that Valley County provides, reduced educational attainment, and increased negative social interactions as a transient workforce tries to integrate into the local community. What this report also will show is that Valley County's economy is currently thriving and the reason that the economy is so robust, in large part, is because of the natural amenities that Valley County has. The possibility of short-term gain associated with the proposed mine should be carefully weighed against the potential for long term harm to an otherwise thriving economy

Table of Contents

Section I. The Existing Valley County Economy

1.1 The Relative Importance of Different Industries in the Valley County, Idaho, Economy: 2020 Jobs

Table 1 below, shows the distribution of the 7,100 jobs in Valley County as of 2020 among the various industries found in the Valley County economy.[3]

Although Valley County is a rural county in which 87 percent of the total land is forest land, less than one percent of the county's jobs, wage income, and economic output flow directly from the harvest and processing of the forest products from those forest lands. That is, only 36 jobs of the 7,122 total jobs in Valley County are in forest products.[4] Gold mining is now being widely discussed in Valley County because of Perpetua's proposal to re-start mining in the Stibnite Mining District, not because mining is a major sector of the *current* Valley County economy. Only about 100 of the 7,122 total jobs in Valley County in 2020 were in mining. See Figure 1 and the discussion below.

Other land-based economic activities in Valley County were also the sources of only a relatively small number of jobs in 2020, including farming, ranching, and fishing. The largest industries in Valley County in terms of the number of jobs reflect the relative importance of the visitor and the recreation economy. Consider, for instance, the 1,053 jobs associated with "Accommodation and food services" and the 1,439 jobs associated with Construction and Real Estate.

Table 1.

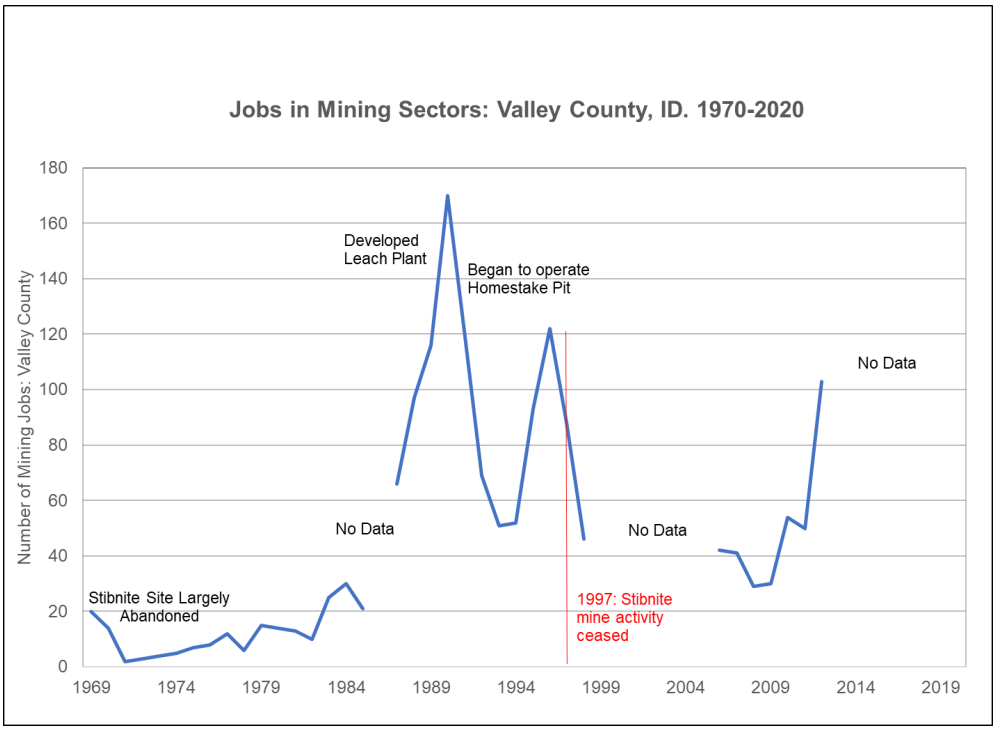
[3] The data in Table 1 comes from the U.S. Bureau of Economic Analysis (BEA). For the years 2001 to 2020, the BEA did not disclose the employment levels for some industries in Valley County in order to protect the privacy of the firms in some industrial classifications by avoiding the disclosure of economic information on *individual* firms. For the mining sectors, for instance, Valley County employment was not reported for half of the years. Headwaters Economics provides estimates of the missing data that were used in Table 1. This likely reduces the accuracy of the numbers reported in Table 1. However, replacing those estimated values with zeros would probably introduce a much larger error. The estimate of 2020 mining employment in Table 1 above is 103 mining jobs. That was the highest disclosed estimate BEA provided for the 2001-2020 period. It appears, however, that Valley County mining employment was declining from that peak year.

[4] Idaho's Forests and Forest Products Industry, University of Idaho, Policy Analysis Group, August 2019. Of course, the forested lands are a central part of the natural landscape that draws new residents and helps hold residents in Valley County. We will discuss the visitor, recreation, second home, and quality of life aspects of the local economy further below.

Number of Jobs by Place of Work Valley County, ID, Total Employment 2020	
Accommodation and food services	1,053
Government and government enterprises	1,017
Retail trade	889
Construction	766
Real estate	673
Health care and social assistance	543
Other services (except government)	353
Administrative and support and waste management	312
Professional, scientific, and technical services	272
Finance and insurance	209
Arts, entertainment, and recreation	186
Manufacturing	127
Educational services	110
Transportation & Wharehousintg	110
Mining, quarrying, and oil and gas extraction	103
Forestry and fishing	127
Farm employment	120
Wholesale trade	93
Information	46
Other	13
Total Employment: Valley County 2020	7,122

Source: U.S. BEA. CAEMP25N Total Full-Time and Part-Time Employment, by NAICS Industry. 2020

Figure 1.



Source: U.S. BEA, CAEMP 25N Total Full-Time and Part-Time Employment by NAICS Industry Economic Profile, Employment (number of jobs).: Valley, ID. 2020.

Figure 1 shows the U.S. BEA data for "mining" employment in Valley County for the 50-year period 1970-2020. Figure 1 is a bit of a mess and it is worth a little bit of time trying to understand why it is a mess and why the data does not synchronize with Table 1 above. To begin, there are several important points about the relative importance of "mining" in Valley County during that half century. As discussed above, some information on mining is withheld ("not disclosed") because it would reveal information on individual companies, violating privacy restrictions on federal data collection and publication. For this 50-year period, about 25 percent of estimated job data for the mining sector was undisclosed in the federal data. On Figure 1, "no data" marks the time periods for which we do not have mining employment data for Valley County. The employment directly associated with the Stibnite mining and processing operation was quite modest over the last half-century, peaking at 170 jobs in 1990 followed by a steep decline to about 50 jobs in 1993. For reference, in 2020 total employment in Valley County was about 7,100 jobs. During this 50 year period shown in figure 1, mining activity in Valley County was quite volatile, varying from almost 200 to near zero. As mining and mineral recovery technologies changed and global markets fluctuated between steep war-time demands and the disappearance of demand during periods of economic depression, the jobs associated with the Stibnite mineral belt came and went as the mines were periodically largely abandoned with crucial capital equipment not maintained or sold off.[5]

1.2 Trends in Indicators of Economic Vitality in Valley County

i. Population Trends in Valley County

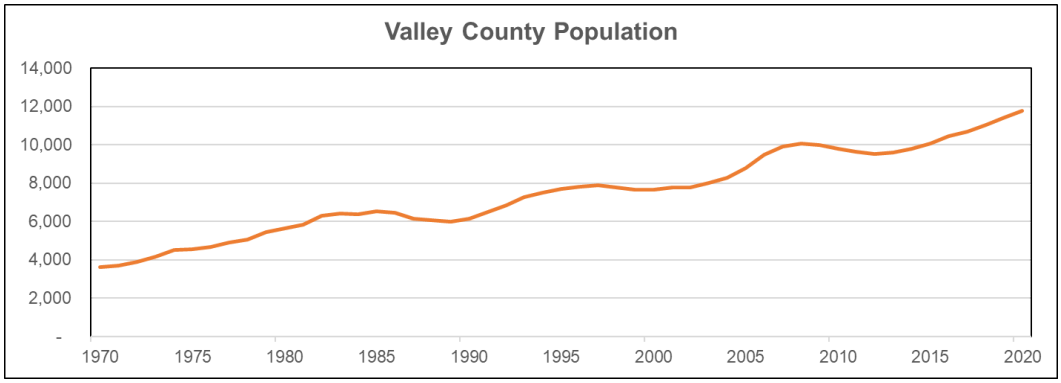
Population trends can be looked on as evidence that people "voting with their feet" are confirming that there are positive characteristics associated with a local area that allow it to attract and hold residents. A larger population could also increase the size of the market for goods and services, boosting the sales opportunities that local businesses face. The larger population could also increase the size and diversity of the labor force available to staff existing or new businesses. The demand for housing and new businesses could also increase the value of existing land and structures in the area.

Rising population can also be looked on as a threat to the quality of life in the community facing the increased population. Lager populations increase the demand for local government services such as schools, policing, fire, safety, and basic public infrastructure such as streets and sidewalks, etc. Higher property values tend to raise the local cost of living, burdening some residents while benefiting others. The character of the community that existed before the population increase took place could change, degrading the previous quality of life.

For better or worse, Valley County has experienced ongoing population growth over the last half-century or more. Between 1970 and 2021 the Valley County Population tripled. That represents a rate of growth of about 2 percent per year over that half century. As Figure 2 shows, there were fluctuations in population growth over that 50-year period as the national economy moved into recessions and then into recovery and back into periods of growth.

[5] Mitchell, V. History of the Stibnite Mining Area, Valley County, Idaho. Staff Report 00-3. Idaho Geological Survey, University of Idaho. April 2000
https://www.idahogeology.org/pub/Staff_Reports/2000/SR-00-3V1.pdf .

Figure 2.



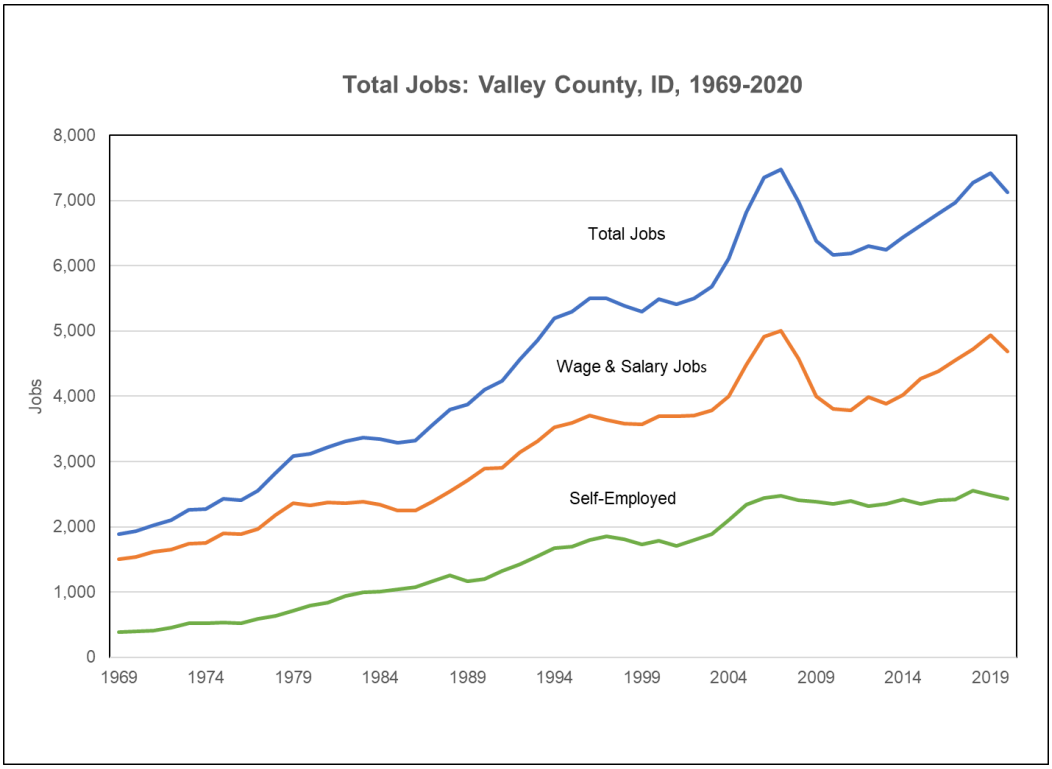
Source: U.S. BEA, Regional Economic Information System.

ii. Growth in Jobs in Valley County

Over the half-century between 1970 and 2020, total jobs in Valley County nearly quadrupled. As shown in Figure 3, below, the growth in jobs was not smooth. Slowdowns in the national economy periodically led to periods when employment declined. The most dramatic example of that was in 2007 when after a boom in job growth, the financial bubble broke, the nation descended into the “Great Recession” and one out of five jobs in Valley County, at least temporarily, disappeared. The booms and busts associated with that national economic cycle can be seen in the employment data shown in Figure 3 below.

“Jobs” here does not refer only to wage and salary jobs where a worker is hired by a business. The self-employed are also included in the total of individuals “working” or “employed” or “holding a job.”

Figure 3.

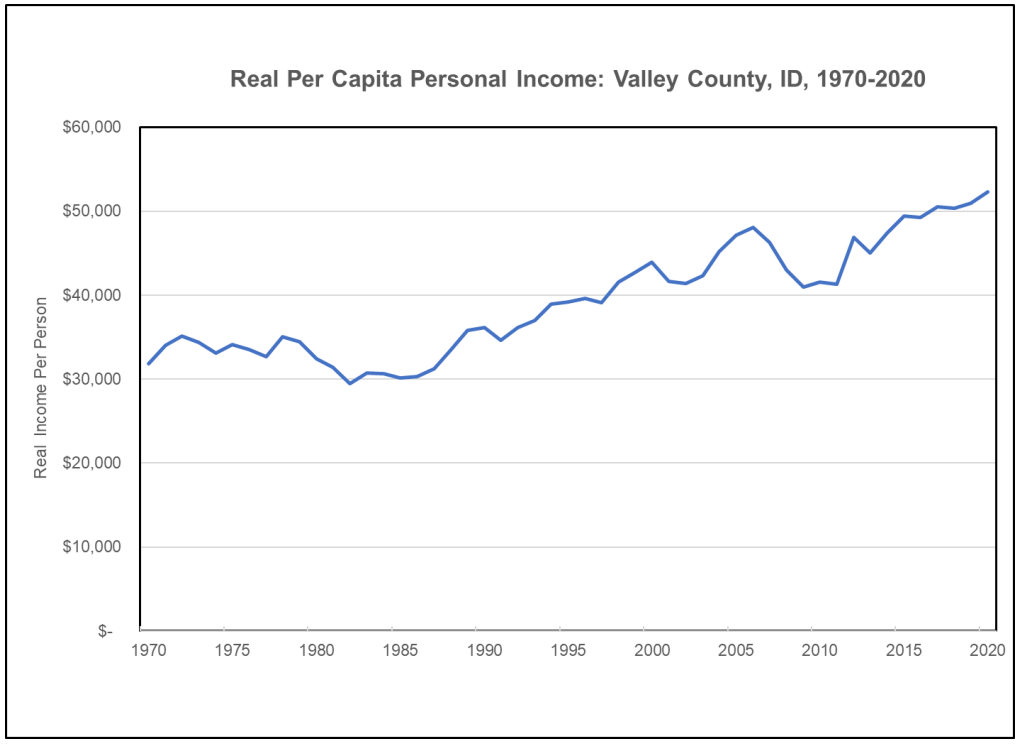


Source: U.S. BEA, CAINC4 Personal income and employment by major component, Valley County, ID.

iii. Ongoing Growth in Income Per Person

During this half-century-long view of the Valley County economy, average income per person rose significantly, from about $30,00 per person per year to about $50,000 in 2020, a 67 percent increase. This was after the impact of inflation had been removed. This was "real growth" in the purchasing power of residents' incomes. That was particularly true after the early 1980s when income per person increased by almost 80 percent. See Figure 4 below.

Figure 4.



Source: U.S. BEA, Regional Economic Information System. Converted to dollars of constant purchasing power using the Consumer Price Index.

iv. The Contribution of Forest Products and Mining to Valley County Economic Vitality

These positive economic trends in the growth of population, jobs, and real income per person over the past half-century in Valley County were not driven by the expansion in what often is asserted to be the county's historical economic base: metal mining and forest products. By 2001 those sectors of the Valley County economy provided less than a hundred jobs each, but then, during the economic fluctuations of 2001-2020, those two industries shrank to providing almost no direct jobs in Valley County and what extractive industry jobs there were, were volatile, varying in size significantly from year to year. See Figure 1 above for the metal mining industry and Figure 5 below for forest products.[6,7]

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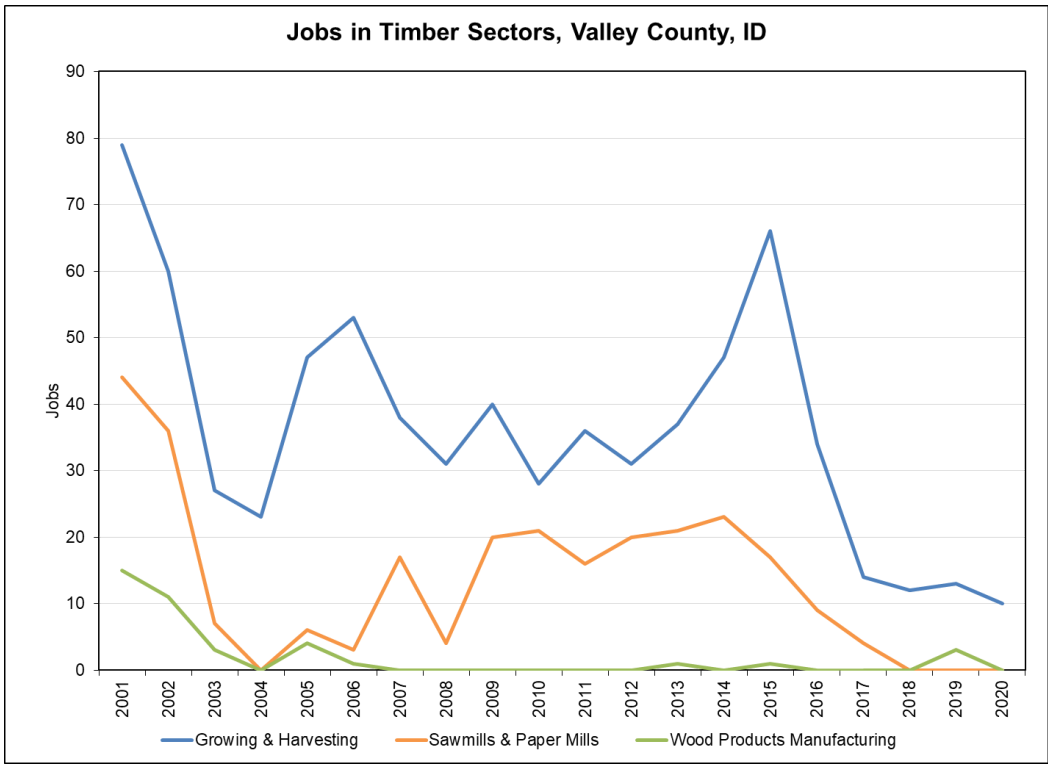
[6] Data on timber and mining sectors of the Valley County economy are somewhat limited because some of the information is suppressed to avoid reporting information on individual firms. In addition, some of the data series do not report on the number of self-employed workers. That tends to understate employment in those sectors. Finally, the data series begins in 2001 because the industry sector definitions were changed in the year 2000 from the previous Standard Industrial Classification to the North American Industrial Classification System. As a result, there is a discontinuity in the data between the economic data up to 2000 and the data reported for 2001 and later. We show only the data for 2001 and later.

[7] Headwaters Economics with financial support from the Bureau of Land Management, the U.S Forest Service, and other federal agencies has created and maintains a data base for each county in the United States that allows users of the system to create economic profiles of each county. See https://headwaterseconomics.org/eps.

Figure 5.



Source: Economic Profile System, Headwaters Consulting.

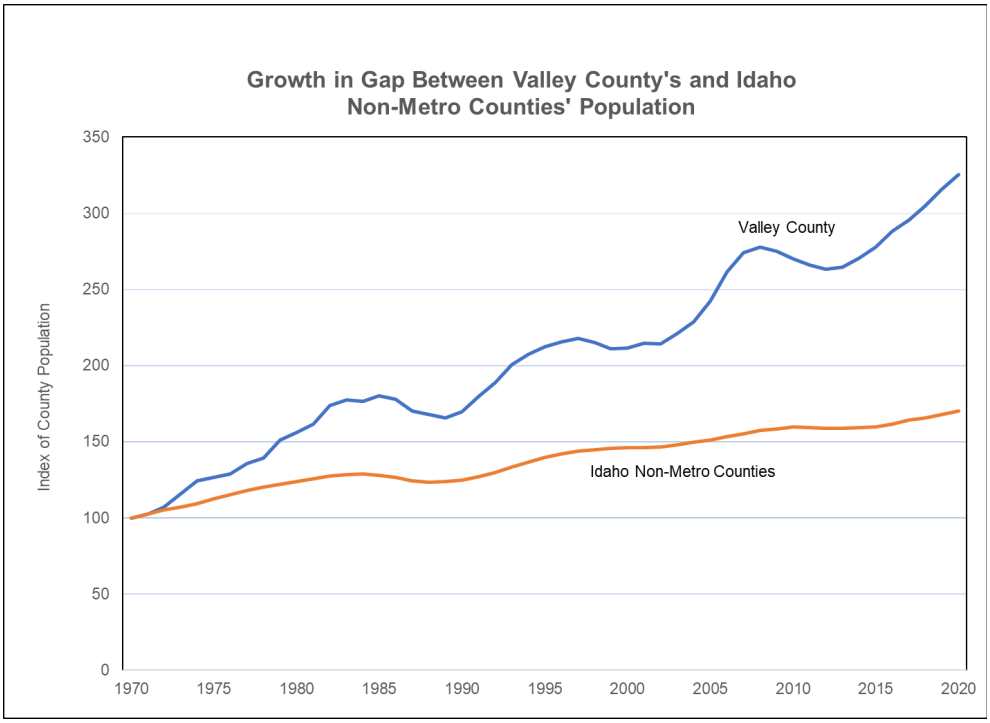
iv. Comparing the Valley County Economic Performance to Other Non-Metropolitan Idaho Counties, 1970-2020.[8]

The Valley County economy outperformed the other non-metropolitan Idaho counties as a group across a range of indicators of local economic vitality: growth in population, employment, and real average personal income per person. Figure 6 shows the high population growth rate in Valley County over the fifty-year period 1970 to 2020 compared to all of Idaho's non-metropolitan counties as a group. Because the population of all the non-metropolitan counties is much higher than just Valley County, we focus on the different growth rates expressing the changes in population as an index number that begins at 100 for both sets of counties. When that index value rises from 100 to 200, population has doubled, 100 to 300 indicates that Valley County population triples. etc. Clearly, Valley County was much more

[8] In evaluating the relative economic performance of Valley County, Idaho, we have chosen to use the economic performance of all of Idaho's other non-metropolitan Counties as a reference point. Large urban areas have socioeconomic characteristics that lead to quite different economies and societies. Given the relatively small population in Valley County, Idaho, (Just under 12,000 in 2020), it would be inappropriate to compare it to the largest urban areas of the state, e.g. the Boise or The Spokane-Coeur d'Alene Combined Statistical Areas.

successful during that half-century at attracting and holding residents than the whole group of other non-metropolitan counties in Idaho.

Figure 6.

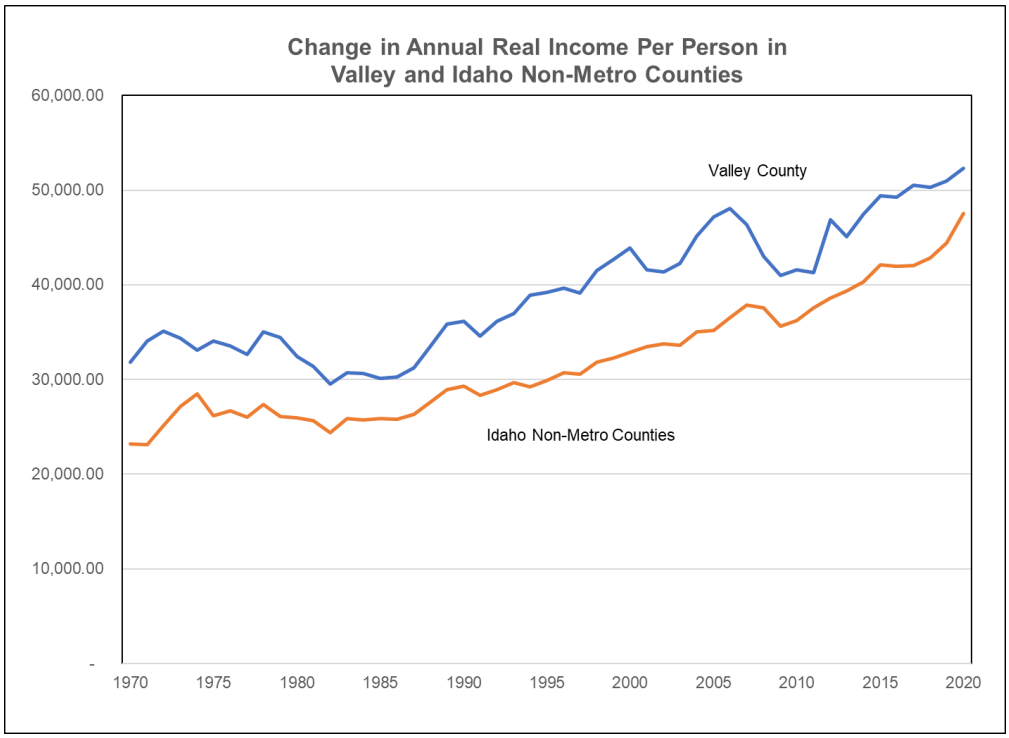


Source: U.S. BEA CAINC1, County and MSA personal income summary: personal income, population, per capita personal income.

One often used measure of overall local economic “prosperity” is average real income per person. That is calculated by summing up all of the income that flowed to individuals in the geographic area being studied and spreading all that income over the total population, i.e., dividing total personal income by the population. If we are interested in how this average income per person has changed over time, the impact of inflation should be removed by deflating the income data.

Figure 7 below compares how average income per person in Valley County to the whole group of Idaho non-metropolitan counties. Over the 50-year period we have been using, Valley County always had a higher average income per person. The distance between the two lines shows the size of the advantage Valley County had over the whole group of non-metro counties. That “bonus” average income that residents of Valley County receive varies significantly over time, from a high of $12,000 per person per year to a low of $4,000. The average “bonus” of the Valley average income per person compared to the non-metropolitan county level was $7,200 a year per person.

Figure 7.



Source: U.S. BEA, Regional Accounts, CAINC1 County and MSA personal income summary: personal income, population, per capita personal income. Adjusted for inflation using the Consumer Price Index.

1.3 The Sources of the Economic Vitality in Valley County: 2000-2020

i. Net In-Migration into "Attractive" Counties

As shown above, the population in Valley County has increased significantly over the last half-century (1969-2020), more than tripling, adding over 8,200 new residents. This was not due to a higher birth rate, i.e., births less deaths. If we look at the last decade, 2010-2020, the combination of natural growth and net in-migration added about 2,500 new residents in Valley County, but 87 percent of that growth was due to net in-migration, i.e., people "voting with their feet, those moving into Valley County minus those moving out, were boosting population in Valley County. This has significant economic implications because a growing part of personal income has become more "footloose," moving with individuals and households as they make residential location decisions.

ii. The Growing Importance of Income Not Tied to Current Work Activities

When discussing the local economy, as is demonstrated above, the tendency is to focus on jobs and the payroll that flows to workers in compensation for the work they do. That *labor income* is envisaged as circulating within the economy putting other people to work as workers spend their labor income to support their households. In doing so, they indirectly support other participants

in the local economy as those expenditures circulate from one economic factor to another within the local economy.

This economic model, of the circulation of money flowing through the local economy, correctly emphasizes the importance of the flows of income that coordinate and motivate a market economy. That focus, however, is almost exclusively on the circulation of *labor income,* which provides an incomplete view of the local economy. In the contemporary economy, people receive income from a much broader set of sources than wages, salaries, and the net income of the self-employed including:

- Investment income: returns on family assets: dividends, interest, and rent.
- A subset of the above: Retirement pension programs that provide a regular income not associated with current work efforts. Some of these are public programs (e.g. Social Security) while others are private pensions associated with past work activity.
- Government benefit programs that seek to protect access to basic necessities: medical care, food, housing, childcare, etc. Also, unemployment and disability compensation assist households during difficult times.
- Many of these are called “transfer payments” by economists because they are government economic benefits paid to individuals that are not paid in return for economic services rendered by those individuals.

There are two important aspects to these “non-labor” sources of income: First, in total, they are quite large and provide a substantial supplement to the payments households obtain from current work efforts. Second, these sources of income are often “foot loose” in the sense of moving from one location to another as the recipient moves geographically. The recipient does not have to reside in a particular local area (e.g. near a particular employer) to receive that income.

In 2020 the Non-Labor sources of personal income in Valley County totaled $355 million. In comparison, the Labor Earnings came to $261 million. That is, the Non-Labor personal income was 36 percent **larger** than the total Labor Earnings. Put another way, the Non-Labor Income made up 58 percent of the Total Personal Income received by residents of Valley County while Labor Income made up the other 42 percent.[9] See Figure 8 below.

Nation-wide Non-Labor Income has been growing more than twice as fast as labor income and is one-third or more of all personal income in nearly 90 percent of U.S. counties. With the Baby Boom generation reaching retirement age, it is likely Non-Labor Income will continue to be a growing source of personal income. As mentioned above, since the Non-Labor Income follows the recipient, areas that are attractive to retirees or others who have Non-Labor Income will benefit from these other important sources of Personal Income.[10]

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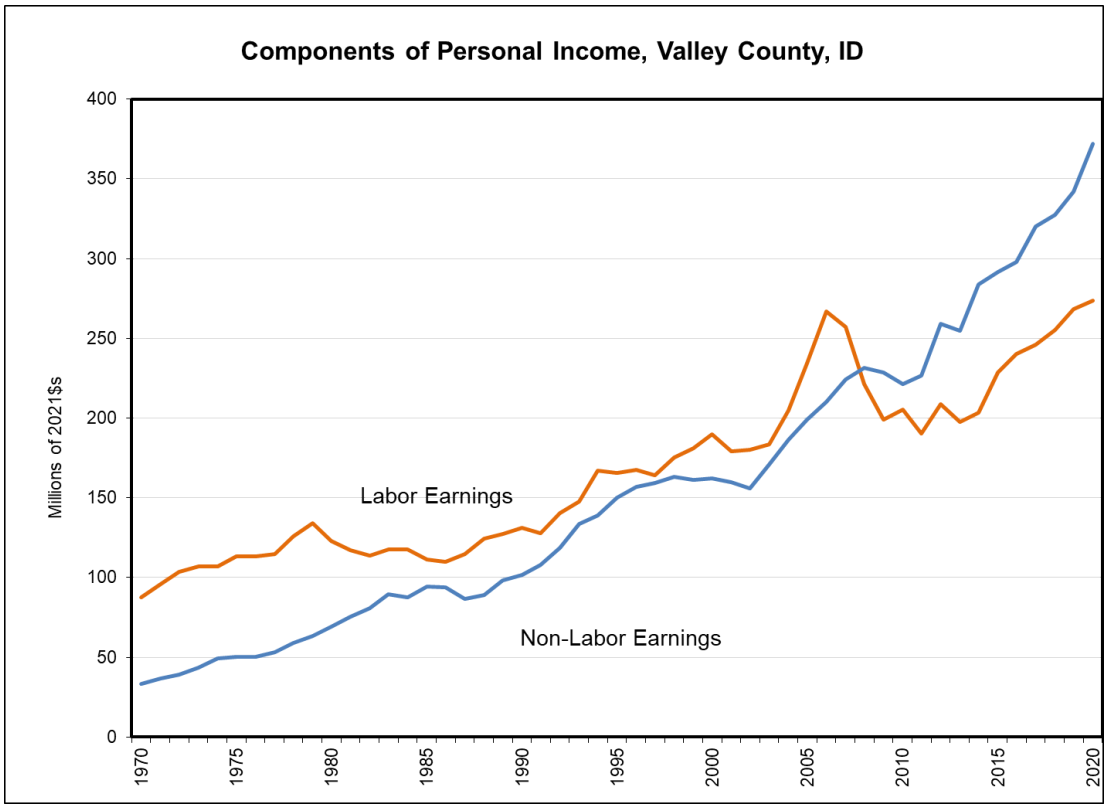
[9] Headwater Economics. Economic Profile System, Valley County, Socioeconomic Trends, Tab 2. 2022

[10] “Economy Surprisingly Dependent on Non-Labor Income”. 2017. Bozeman, MT: Headwaters Economics. https://headwaterseconomics.org/economic-development/trends-performance/economy-surprisingly-dependent-on-non-labor-income/.

Figure 8.



Source: U.S. BEA. Regional Economic Accounts, reported by Headwaters Economics' Economic Profile System, Socioeconomic Trends. 2021.

Note that in Figure 8 above, Valley County residents saw labor earnings increase relatively slowly between 1969 and 1999 and had more downturns than Non-Labor Income which had a more or less steady increase. Clearly, when thinking about income flowing into a local economy, the focus cannot be only on "payroll" or "wages and salary." Property Income as well as government support payments and pension programs provide a substantial non-wage supplement to labor income, boosting the flow of personal income to households.

iii. Economic Well-Being in "Recreation" Counties

Many rural counties have "economic bases" like Valley County's in the sense that visitor and recreation activities play a very important role in supporting the local economy. This has led to studies of the impact of such economic specialization in providing services to "visitors" and "second-home" owners on the local economic well-being of residents. Given that jobs in retail sales, food service, and accommodations are typically relatively lower paid, one might suspect that economic expansion that emphasized the proliferation of jobs in those sectors of the economy would not necessarily boost household or worker incomes.

But this type of casual empiricism is too superficial. Residents of a local area who receive "property income," i.e. dividends, interest, and rent, or those "senior citizens" who retire with

pensions that they and their employers contributed to over decades of employment are not likely to be classified as “low income.” Similarly, residents whose medical costs are covered by Medicare or Medicaid will support local medical services providers, many of whom are not low-income either. Residents who build or purchase second homes in a “resort” community will help to support local people working in construction, real estate, finance, interior decorating, architecture, etc. Again, professions that are not necessarily low paid.

More careful economic analysis is required before sweeping generalizations about changes in local economic well-being can be made about communities that specialize in outdoor recreation or capitalize on local high quality natural landscapes and community quality of life. Economists have tried to identify local areas that have specialized in “recreation” by looking at the share of local jobs that go to eating and drinking places, accommodations, guided recreation, entertainment, and art. In addition, they have focused on the share of vacant housing units that are used seasonally to identify communities with a high percentage of second homes and rental units. These economic statistics are used to identify “recreation-dependent” county economies.

The analysis of economic characteristics and dynamics of these “recreation” counties show several important characteristics of recreation counties like Valley County.[11]

a. Recreation counties are more likely to attract in-migrants, especially in rural counties.
b. Migrants to recreation counties have higher incomes relative to in-migrants who move to non-recreation counties and relative to existing residents.
c. Recreational counties tend to provide longer-term support by recruiting new residents who may be business owners, entrepreneurs, or workers, supporting growth in earning per job across a community.
d. If the recreation county is a rural county, the in-migration will stimulate the local economy, offsetting the economic drawbacks rural counties otherwise have.
e. Average pay per job in rural recreation counties were lower but were increasing much faster than in non-recreation counties.
f. Recreation counties were much less likely to have out-migration exceed in-migration.

This tends to maintain or increase population in rural counties which often have had to cope with population declines. This study summed up its conclusions as follows: “Recreation, especially in non-metro places, draws new residents, higher incomes, and faster earnings growth than places without [high economic concentrations in] recreation.”[12]

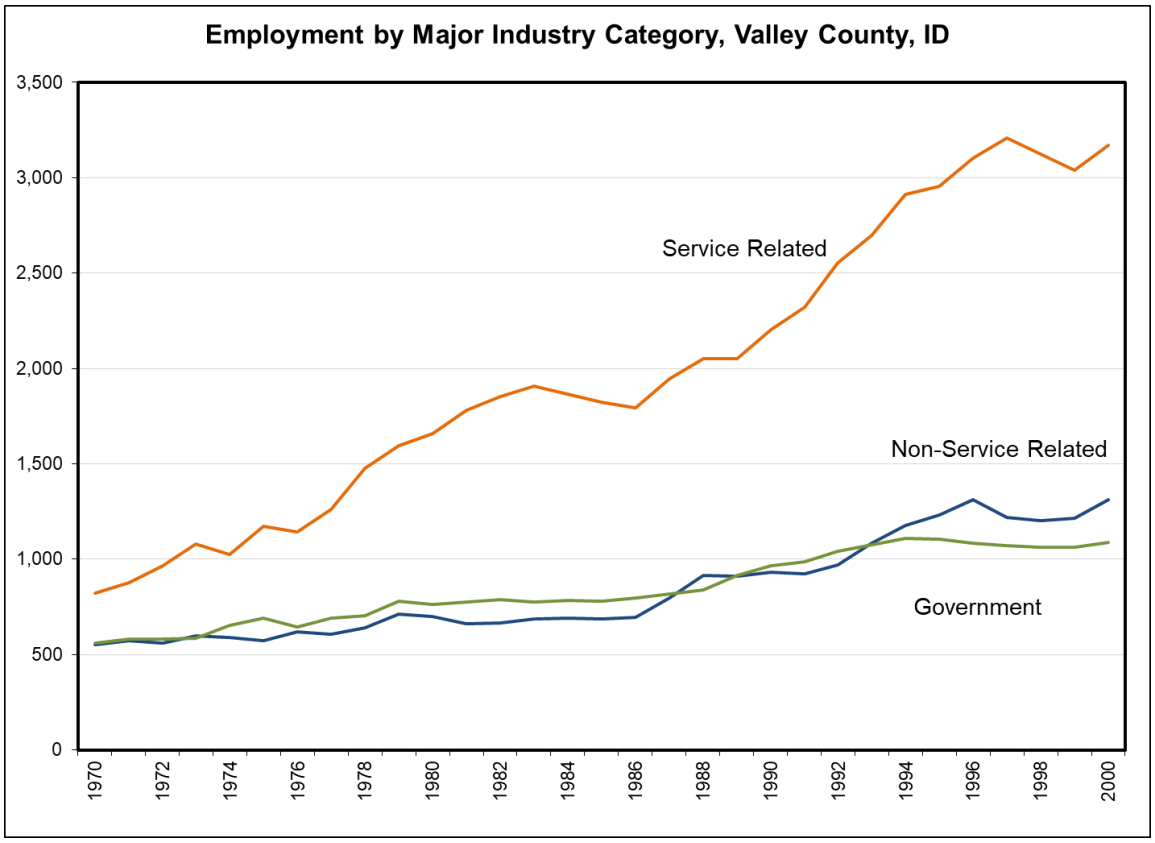
iv. The Shift of Economic Activity from Goods Production to Providing Services.

As indicated above, the historically important goods production in Valley County, forest products and metal mining, have declined in the last several decades as a source of jobs and income. That is not a unique trend found only in Valley County. Rather, it is a state and national economic change. As shown in the Figure 9, below, jobs in goods production (Non-Services-Related) were largely stagnant over the thirty-year period 1970 to 2000 relative to the growth in jobs in services sectors. During that 30-year period, jobs in Services-Related industries rose steadily, almost quadrupling (3.9-fold) over that 30-year period. Economic areas

[11] Headwater. Recreation Counties Attracting New Residents and Higher Income. Page 1. January 2019.
[12] Ibid.

that could meet those shifting demands of the market for services as opposed to goods, were more successful in serving those new markets and maintaining their economic vitality.

Figure 9.



Source: U.S. BEA. Regional Economic Accounts, reported by Headwaters Economics' Economic Profile System, Socioeconomic Trends. 2021.

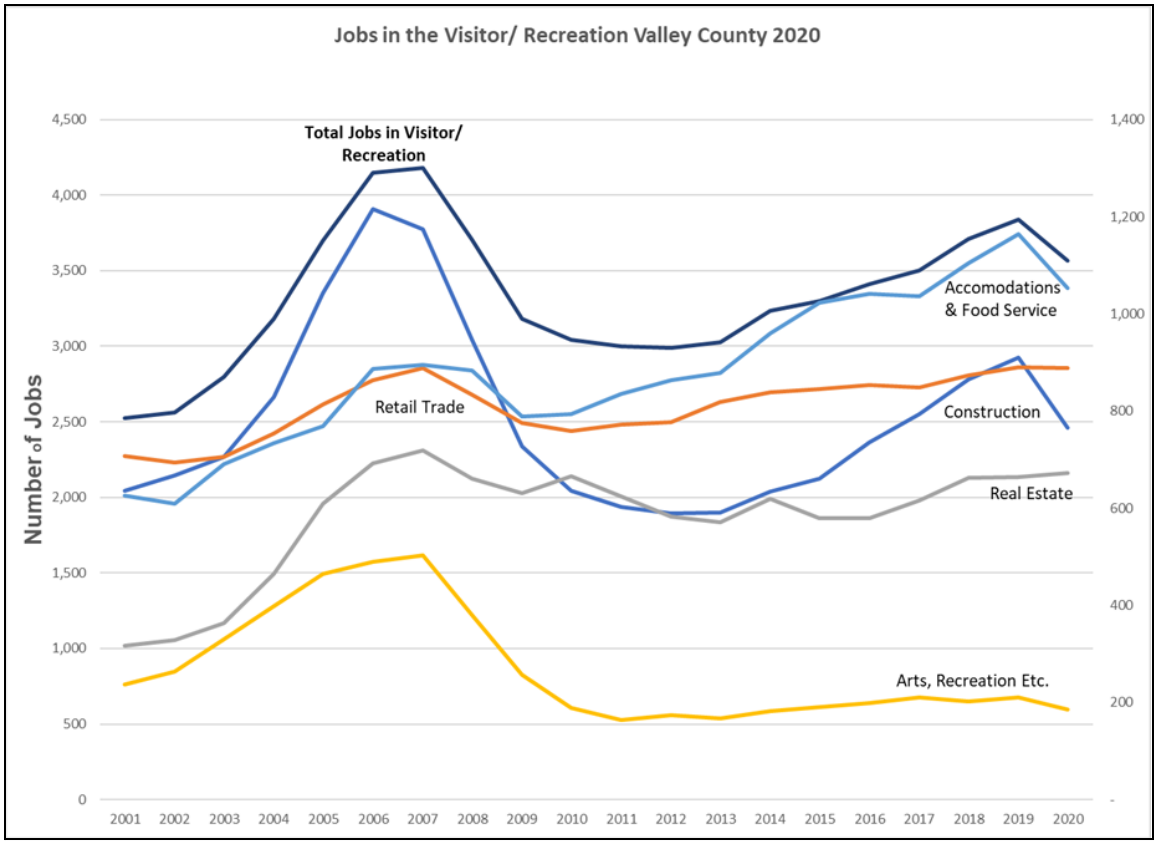
This shift from extracting "goods" from the landscape and processing them into products to be sold into national and international markets was dramatically visible in Valley County and the City of McCall. A "visitor" economy often somewhat mislabeled as "tourism," was being drawn to this relatively isolated location by the quality of the natural environment and the recreational activities that the natural landscape supported. Defining and measuring the "visitor" or "recreational" components of the economy is difficult because most of the economic activities that served residents also served visitors. The building of new and second homes, expansion of retail trade activities, the development of "food services" and the proliferation of guided recreation firms are some of the economic activities serving both residents and visitors. The growing visitor economy also strengthened and supported the long-run growth the Valley County economy as it ultimately attracted net in-migrants and the economy expanded and became more diverse.

Some of the new economic activity was clearly "visitor-related," e.g. lodging at hotels, resorts, etc. while "food services," for instance, served both residents and visitors. Home and business construction also served both seasonal visitors and new "permanent" residents. The same was

true of retail trade establishments. For these reasons, we have approximated the “visitor and recreation economy” by combining accommodations and food service, retail trade, construction, real estate, and art and recreation. These categories have been part of federal economic statistics for some time and collection of this “visitor” economy data has been given more emphasis by the federal “bean counters” in recent years.

Using these economic categories for the “visitor/recreation” economy, the total Valley County jobs in those categories peaked in 2007 at 4,200 jobs. This, not coincidentally, was the peak in the speculative boom that ultimately brought us the Great Recession when it collapsed in 2008. Recovery was slowed by Covid and is now threatened by economic uncertainty across the global economy. See figure 10 below.[13]

Figure 10.



Source: U.S. BEA. Regional Economic Accounts, reported by Headwaters Economics’ Economic Profile System, Socioeconomic Trends. 2021.

[13] The “Total Jobs in Visitor/ Second Home Economy” are shown on the left vertical axis. All of the sub-categories are shown on the right vertical axis.

II. Analyzing How the Proposed Mine's Work Force and Supplies Will be Obtained and the Reason This May Limit the Positive Impacts on the Local Economy

In this section we discuss the projected economic impacts associated with the Stibnite Gold Project (SGP). While Power Consulting was able to assess a variety of the local socio-economic impacts of SGP on Valley County, as presented in this study, we find it troubling that issues of HWY 55 transportation, spill risk, local wage scale problems, housing availability/affordability, and general infrastructure concerns were not adequately examined in either the Draft Environmental Impact Statement (DEIS) or the Supplemental DEIS (SDEIS). Public officials, elected leaders, and concerned citizens should not be making decisions about the future of their communities without a full comprehensive impact analysis having been carried out to inform their decisions. Specifically, the analysis that was done in the DEIS and SDEIS socioeconomic sections was largely a 'benefits only' analysis. In this section we will spend some time pointing out many of the different costs that were not quantified and showing why that is important.

Knowing *where* a proposed mine will get its operating supplies and its workers will help to determine what the economic impacts of the mine will be on the local area. If the mine is in a relatively remote setting, as is the case with the proposed Stibnite mine, then it is quite likely that the positive local economic impacts of the mine will be muted on the local area, which in this case is Valley County. The reason for this is that there are fewer economic links between the mine and the local towns that might otherwise supply the mine with the things that it needs to operate. The miners will work two-weeks-on and then two-weeks-off shifts and will live on site, at the mine during their "on" shifts. The mine will procure its supplies for itself and the miners ahead of time and will seek to lower their costs as much as they can. While there are small towns that are slightly closer to the proposed mine, larger cities like Boise are negligibly farther away, and will likely be the source of much of the mine's operating supplies that are purchased. This should not come as a shock to those that live in Valley County, since many of the residents of Valley County use Boise in precisely this same manner. Valley County is not a hub of industrial mining supply and has not been dependent on mining activity for some time. In fact, as we showed in the previous section, mining is not what drives the Valley County economy, and it is not what is driving the growth in Valley County. Valley County had a population of 11,085 in 2020 and 9,846 in 2010. This 12.6 percent increase, representing 1,239 people, is more than 10 times as many people as are projected to move to the local area by the DEIS for the operating phase of the proposed mine.[14] What we want to point out here is that many people are choosing to move to Valley County, and it is because of the current economy, the growth in the Valley County economy, and the natural bounty of the landscape, that they have decided to make that move.

As the previous section of this report documented, according to several economic metrics, Valley County has been doing well for itself in the recent past, and so it should look carefully at a proposed gold mine to make sure that the mine will be compatible with the sources of economic wellbeing that Valley County currently enjoys. In this section we will look at where the impacts of the proposed mine are likely to occur, where the miners and secondary workers for the mine are likely to come from and where they are likely to live, what the impact of the fiscal revenues

[14] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-21. August 2020.

generated by the mine are likely to be for the local area, and what the impact of having miners living in Valley County, but working such non-traditional shifts, will be.

2.1 Where Will the Impacts Be?

In the parlance of economics, 'multipliers' are often offered as an explanation of how any given project may benefit a community from a socioeconomic point of view. Multipliers, as the name suggests, describe the way that money created by a project circulates, or multiplies, in the local or regional economy. The more connected and complete the local economy, the more the local economy can capture and circulate the money created by a project. In this case, the project is the proposed Stibnite mine and the multipliers that have been discussed are associated with the mine workers spending their pay, or not, in the local area (Valley County) and the mine procuring the operating supplies that it needs, or not, from the local area. The higher the multipliers, the more the local area can support the mine by supplying the workers with the things that they need to live as they spend their pay, and the more the mine can procure its supplies from the local economy. The problem with this metric is that there are often very large multipliers for mines when the geography analyzed is very large, i.e. at a state or national level. But when we study impacts on smaller local areas, those multipliers may in fact be quite small. The reason that this is the case is that mines are often located in remote areas that are far from the supplies that a mine and or its miners need.

When economic impact modeling is done, as it was in this case, with a model named IMPLAN, the results are often quite surprising for people. When IMPLAN is used to model a local area, if there is a connection in the area, then IMPLAN will allow that connection to be made. If, for example, there is a gas station in Valley County that sells diesel fuel, then IMPLAN will assume that the mine can and will procure its diesel from that local supplier. The problem with this assumption is that the local supplier is likely incapable of supplying the volume of diesel that the mine will need, and the mine is unlikely to purchase it at a much higher price from the local supplier. The mine will instead attempt to minimize their costs and have the diesel fuel brought in from a regional or national supplier that can give them a much better price and more secure supply. If one is not very careful with the results of IMPLAN, specifically in a small, isolated economy, one can, mistakenly, allow connections that do not have an economic logic to them. We strongly believe that this is the case with the modeling done for the proposed mine. We will not turn this report into a referendum on the application and use of IMPLAN, but we do find it highly suspect that the mine will even procure a modest number of supplies from the very small towns found in the local area.

Valley County may be the site where a lot of wealth will be created, and the physical location of the mine, but it will not retain much of the wealth that is created. Section 4.21 of the DEIS describes the very large multipliers that will be created during the construction period, but it also shows that most of the positive impacts will occur outside of Valley County. For example, if we look at the total spending on the Construction Phase of the project, as shown in Table 2 below, we can see that the local area will be the source of a little less than 9 percent of the spending. The state of Idaho, which includes the local area, will be the source of 34 percent of the spending, and 66 percent of the spending will be from outside of Idaho. Put slightly differently, more than 91 percent of the spending on the Construction Phase will occur outside of the local area.

Table 2.

Total Spending For Construction Phase			
	Total Spending (Million)		% Of Total
Local	$	28.1	8.6%
State	$	110.9	34.0%
Nation	$	215.5	66.0%
Total	$	326.4	100.0%

Source: USDA Forest Service. Stibnite Gold Project. Page 4.21-8. August 2020.

The spending from the mine, on local supplies, is called "indirect" spending, and the combination of indirect and "induced" spending, where miners spend their direct pay, together represent the multiplier, or secondary impacts, that circulates money in the local area:

> "Construction activities are projected to support a total of $7.4 million indirect and $3.3 million per year (in 2017 dollars) in induced income within Valley and Adams counties' economies during the 3-year construction period."[15]

Based on the quote above, the $17.4 million in direct wages, created $10.7 million in indirect and induced income. This would then represent a multiplier of 0.615. In other words, for every dollar spent on direct wages, for the construction of the mine, 61.5 cents of "other" dollars are created. While the multiplier for the U.S. may be very high, perhaps as much as an order of magnitude higher or more, the fact is that the local area will receive only a very small fraction of the total spending during the Construction Phase. If we take this one step further and look at the assumed value of *all* of the minerals that are going to be recovered, which totals into the billions, and all of the local spending (direct, indirect, and induced)[16] on the three phases of the mine, then the local area stands to receive about 8 percent of the value of the minerals that are extracted from the mine.[17] Recall from Table 2 above, that this is quite close to the local spending percentages that are assumed in the DEIS. Put slightly differently, about 92 percent of the wealth that is created at the proposed mine will leave the local area.

In fact, 64 percent of the reported spending in the local area will be based on the direct pay of the miners who are purported to live in the local area.[18] In other words, the vast majority of the spending in the local area will be on the direct pay of the workers at the mine who are modeled to live in the local area. If, as we suspect, most of those workers will not live in the local area, then most of the local area's *direct* benefits will also leave. Since a large percentage of the multipliers for the local area are associated with the local workers spending their pay from the mine in the local area, this would then take a large percentage of the "secondary" pay out of the

[15] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-6 through 4.21-8. August 2020.
[16] Although we do not believe that Valley County will receive many of these benefits, we are using this as an example of the small percentage of benefits that will come back to the local area.
[17] This is a rather lengthy computation that uses the total spending in the local area from each phase of the Mine (pages 4.21-8,24, and 33), the length of time that each phase operates for, and the assumed volumes and value of the metals produced found on page 4.21-22 of the USDA Forest Service. Stibnite Gold Project DEIS. August 2020.
[18] If one adds all of the direct "local" pay from each of the three phases of the mine, then it represents 64 percent of the total local spending.

local area. The result is that we believe that assuming 8 percent of the value of the mine's production being spent in the local area is a very generous view of things. In our estimation, this value is likely to be only a couple of percent of the total value of the mine, at best.

While we believe that the local spending that is reported in the DEIS is likely too high, the exercise of calculating it is valuable to show that the local area will receive only a fraction of the wealth that is created. There will undoubtedly be many within Valley County who would be happy to have *any* amount of local employment and total spending. However, we feel that it is unlikely that Valley County will even see the meager impacts that are projected in the DEIS. The reason that we think this is that the locals themselves often shop in the greater Boise area. As the McCall 2018 Comprehensive Plan points out:

> "McCall gradually lost the traditional economic base (logging, milling, and crop-based agriculture) that drove local wealth in the 20th century. The region now imports most of its goods and services from the Boise metro area. It is paying for these imports with money brought in primarily by visitors, retirees, and the Forest Service."[19]

This makes economic sense. There is a large metro area (Boise) that is a little more than two hours away from McCall. While the residents of McCall likely do some of their shopping locally, for example when someone runs out of cream for their coffee, or eggs for breakfast, then the local store is the obvious choice. But given time to plan, many local people will plan to shop in Boise which has a more varied selection and cheaper prices. The same is true of the mine and the operating supplies that it will procure from the local area. It is certainly *possible* that the proposed mine may purchase some of its supplies in Valley County when they are in a bind, but generally they will plan to purchase them from a vendor that has cheaper supplies and a more varied selection. The other side of this basic argument is that Valley County does not have the ability to supply the proposed mine with many of its needs. Valley County, for example, does not produce mining equipment; nor is it a retail supplier of such equipment. Similarly, Valley County is not likely to be a competitive wholesale diesel supplier at the volumes that the mine will be purchasing. Remember that the ability to circulate money in the local economy is directly related to the local economy's ability to provide for the needs of the mine and/or mine workers. When those mine needs are very specialized, for example, mining supplies in rather large volumes such as explosives, various chemicals, mining, and chemical engineers, etc., it is easy to see why the multiplier impacts will be low.

This is the problem with relying on a model, like IMPLAN, which was used to model the impacts of the mine for the DEIS. The model assumes that because something *can* be purchased in the local area, that it will be. In practice, we find that it is unlikely that many of the supplies that are assumed to be purchased from the local area, namely Valley County, in the IMPLAN modeling, will be purchased there. Given the large volumes of supplies and the time to plan, the mine will choose to import supplies from the greater Boise metro area, or the U.S., or even the world. Remember that we are discussing the purchase of more than $260 million in materials, equipment, and services for the construction of the mine.

To a large degree, the same can be said about the potential for locals to work at the proposed mine. While some of the mine construction and operation jobs can be filled by locals that have

[19] McCall in Motion: 2018 McCall Area Comprehensive Plan. 2018. Page 74.

some construction experience, for example, Valley County is unlikely to have many unemployed mining engineers and hard rock geologists sitting around unemployed, waiting to find employment locally. For a host of reasons, including the very low unemployment rate in Valley County, the cost and availability of housing, the work schedule of the proposed mine, and the availability of workers in a County with relatively few residents, it is unlikely that many locals will be hired and unlikely that many of the proposed mine workers will relocate their residence to Valley County. Next, we will discuss why we believe that to be the case.

2.2 What is Local and Who is Likely to Live in the Local Area?

The boundaries of the physical area that is the economic impact study area is extremely important in determining the results of the study. The DEIS and the subsequent studies that it was based on are no different. If, for example Boise had been included in the "local" area for the DEIS, it would have dramatically skewed the results. The reason for this, as was discussed earlier, is that Boise can capture and circulate far more mine and worker spending than a small rural town in Valley County can. For *this* study, we have designated Valley County as the "local area". For the DEIS, it was Valley and Adams Counties[20] which is an acceptable alternative. Either of these *might* be appropriate, although we choose to focus on a narrower geographic area, and the county that would be the site of the mine. What is important is that the socioeconomics are described in a way that the people who will see the impact of the proposed mine, the locals, get a clear view of what may be in store for them. As we have already pointed out, the state of Idaho or the U.S. might well enjoy the benefits of the proposed mine, but they will not have to deal with the potential costs of the mine. Here we choose Valley County because it is where many of the projected impacts will take place. For example, it is the source of most of the DEIS's 100 local people projected to be hired for the mine work and the site of 100 others moving into the local area to work at the proposed mine.

> "Under the mid-value scenario, SGP [Stibnite Gold Project] operations would provide employment for 470 *Idaho* residents, of which 200 would live in *Valley County or Adams County*. As shown in the DEIS Table 4.21-3, it is expected that about 100 of these jobs could be filled by workers relocating to such a local two-county area."[21]

In this scenario there will be 100 local people working at the proposed mine and there will be 100 other mine workers that relocate to the local area. While this is possible, there are some compelling reasons to believe that neither of these scenarios will come to pass. First, when discussing the 100 locals that will work at the mine, which is slightly more plausible than some of the other reasons we will examine next, the unemployment rate is quite low in Valley County. The DEIS they assume that:

> "It is expected that most of the local construction workers would be adequately qualified and/or trainable for mine operations work and that many construction workers living locally or elsewhere within Idaho would likely accept mine operations jobs."[22]

[20] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-1. August 2020.
[21] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-21. August 2020.
[22] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-21. August 2020.

While this is a fine *idea*, the reality is that there are not enough "construction workers" in the local area to accomplish this. Looking at the 5-year American Community Survey (ACS) data from the Census for Valley County, there are 523 construction workers. It is possible that 100 of them will either quit and work at the mine or are already unemployed. However, that will only put upward pressure on the need for construction workers, and it is unlikely given the unemployment rate in Valley County. According to the St. Louis FED, the unemployment rate for Valley County was 3.1 percent in August of 2022.[23] Looking at the ACS data for Valley County there were 4,940 workers that worked between 1 and 52 weeks.[24] Combing the St. Louis FED and ACS data yields 153 available workers that are unemployed for the *whole* of Valley County. It is unlikely that *all* the unemployed people in Valley County are construction workers and is instead much more likely that somewhere around 16 of those 523 construction workers are unemployed, given the 3.1 percent unemployment rate. It seems unlikely to us that two-thirds of the unemployed people in Valley County will be qualified to work in the proposed mine. There is, of course, the possibility that the construction workers in Valley County will go to work for the mine in place of the jobs that they already have. If this happens then there will be a ripple effect through the construction industry as it will be harder to get people to do the construction jobs that they previously had been doing. All of us are now familiar with the different shortages of workers and supplies that is a result of the global Covid pandemic. This would only add to the current construction delays that are plaguing the U.S. and Valley County.

What is far more likely, is that the mine workers will simply come from outside of Valley County. The reason that we believe this, aside from the lack of available workers that we already discussed, is the work schedule of the mine. The mine will house people on site and will have them working two weeks on and then two weeks off. The mine will also be providing a shuttle service that runs from the Boise area which is a little more than a two-hour drive from McCall:

> "…non-local communities closer to Boise would offer greater housing options, amenities, and public services options within a relatively close travel distance (i.e., less than 2 hours) from the proposed employee bus/van pool pick-up locations in Cascade, McCall, and Donnelly (Highland Economics 2018)."[25]

Given that the mine workers will be commuting back from the mine every two weeks already, an extra two hours, or so, past the small-town pick-up locations does not seem like a terrible burden. It is, in fact, very likely that many of the mine workers will travel back to an airport like Boise and fly home to their residence somewhere other than Boise.

A complicating factor in all of this is that even if the local area was able to provide the workers for the mine, the 100 in-migrants that are projected to work at the mine will have a hard time finding housing. That is because Valley County does not have a lot of idle houses that are available to rent and or purchase. At first glance it may seem that this is not the case since the ACS data indicates that there are far more vacant houses than occupied houses in Valley County.[26] In fact, that data says that there are 8,621 vacant houses and only 3,920 occupied houses indicating that about 69 percent of all the housing in Valley County are vacant. However,

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[23] FRED. Unemployment Rate in Valley County, ID. Sep. 2022. https://fred.stlouisfed.org/series/IDVALL5URN
[24] Census. American Community Survey. 5 year estimates. Valley County.
[25] Stibnite Gold Project DEIS. Pages 4.21-9.
[26] U.S. Census. American Community Survey. 5 year estimates. Valley County.

if one travels to Valley County, you will notice that those vacant houses are second homes or vacation homes to which people from the surrounding area are very attached. That same ACS data shows that there were 91 houses for rent and 68 houses that were for sale. Again, it is possible that the 100 proposed in-migrants will purchase *all* 68 houses available and then rent 35 percent of the available houses, but this seems unlikely. Given that the median home value in Valley County in 2020, expressed in 2021 dollars, according to the ACS was more than $321,000,[27] which is about 34 percent more than the U.S. as a whole and about 14 percent more than Boise, it seems like a pricey option for potential miners to choose Valley County over Boise or the U.S. as a whole. In the DEIS, a rather fun idea is presented to get around the lack of available housing in Valley County. The idea is that it may be possible that the new in-migrant mine workers will be former residents of Valley County and that they will simply go back to living where they did in Valley County before! However, we find this suggestion speculative and unconvincing.

> "Some in-migrants may be former local residents who may reside with current residents when they return."[28]
>
> And…
>
> "Coupled with an increased prevalence of multi-generational households, a sizeable number of the in-migrating population may take up residence with friends or relatives that are existing residents and thereby have a lesser impact on local housing demand (Highland Economics 2018)."[29]

What we find convincing is that the people that work at the proposed mine will choose to live outside of Valley County. If they do choose to live in Valley County, then the residents of Valley County will see the available houses for sale go to near zero and the price of housing and rent increase. That has the potential to make Valley County an even less affordable place to live. Remember from Table 1 above that the number one industry in Valley County is "accommodations and Food Services." The problem with this is that this industry is also one of the lowest paid industries in Valley County. This necessarily means that increases in the price to rent or buy a home in Valley County will impact Valley County's largest group of workers the most.

Because there is a lack of available workers, because of the working shifts at the mine provide ample time off to travel back to wherever your home might be, and because there is not very much available housing and that housing that is available is expensive, it is unlikely that Valley County will be the residence of the mine workers. The Special Economic Report that was produced as part of the Supplemental DEIS process also points out that the house rental market in Valley County is becoming less affordable:

> "Conversely, median rental rates increased in Valley County by 4.5 percent ($727 in 2010 to $760 in 2018) … Between 2010 and 2018, the percentage of Valley County households paying more than 30 percent of their household income on rent grew from

[27] U.S. Census. American Community Survey. 5 year estimates. Valley County.
[28] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-12. August 2020.
[29] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-12 and 13. August 2020.

33.5 percent to 59.1 percent (Census 2010, 2018b). This increase indicates that the local rental market is becoming less affordable"[30]

2.3 Fiscal Revenues

Often, when a mine is sited in a rural area, the communities around the mine are encouraged by the mining company to think about all the desirable things that the local communities could do with the new tax revenue that would flow to local governments from the mines. The picture that is often painted is of local municipalities with coffers that suddenly overflow with tax revenue from the new mine. However, depending on the way that the taxes are structured, it may be very important to see how the taxes are allocated to other beneficiaries even if they are collected by the local governments. There are some taxes, for example, a general sales tax and its redistribution in Idaho, that is distributed to communities largely based on population.[31] This is important to understand because although there may be an increase in the collection of a sales tax, the distribution of that sales tax may not be representative of a change in the physical place where it is collected. Boise, for example, will see a far larger benefit from a mine buying supplies in Valley County, with respect to the sales tax, than those in Valley County. Valley County should also think about the potential increase in the demand for services that it might see directly or indirectly. While it can be very lucrative, for example, for a rural county to have a new metal mine, there may be a series of costs that come with the mine and its impacts. For example, what will be the impact on the roads, the schools, the EMS services, etc.? It would be important to be able to weigh the cost of the new mine in terms of the services local governments would have to provide to them. Directly or indirectly the mine would impose costs on the County, that the County would have to be able to pay for out of the new revenue that the County stands to gain from the mine. In this case, for Valley County, there appear to be no local fiscal benefits from the construction phase of the mine at all.[32] All of the projected taxes are state or federal. For the operations phase of the proposed mine there is $300,000 annually paid in property taxes[33] which will go to the local government, but all the other taxes are state and federal taxes. These cold facts are summed up in the DEIS:

> "As a result, Alternative 1 construction activities are expected to result in negligible tax revenue benefits for the local area's economy."[34]

With respect to the $300,000 in property tax that is paid annually by the proposed mine during the operations phase, we must remember that there is a cost that the mine is imposing on the local area. There is likely to be an increase in use of Emergency Medical Services (EMS), roads, schools, etc. The important question is then *if* the property taxes that are paid by the mine will offset the costs that the mine imposes on the local area. This point is made in the DEIS, but not explored.

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[30] USDA Forest Service. Stibnite Gold Project: Social and Economic Conditions Specialist Report. Page 19. August 2022.
[31] State of Idaho. Title 63: Revenue and Taxation, Chapter 36, Sales Tax. https://legislature.idaho.gov/statutesrules/idstat/title63/t63ch36/sect63-3638/
[32] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-17. August 2020.
[33] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-26. August 2020.
[34] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-18. August 2020.

> "The extent that the SGP- (Stibnite Gold Project)- related increase in local tax revenues would result in a net benefit to Valley County's public services would depend on the extent that they offset increases in costs to provide public services."[35]

Given that the Valley County budget for fiscal year 2021 is about $23.5 million,[36] this increase in property tax revenue would represent 1.3 percent of the County budget. If we look at total property taxes that were collected in Valley County in 2019, the most recent year available, then we see that a little more than $7.8 million was collected.[37] In this setting, the property taxes paid by the proposed mine would then represent a little less than a 4 percent increase. Neither of these metrics are negligible additions to the Valley County budget, but neither of them represents very large changes to the budget either. Without a careful accounting of how many people are likely to move into town and their impacts on the local systems, all that we can say with certainty is that the fiscal benefits are likely to be small, and the costs associated with the mine on Valley County are largely unknown.

To try and elucidate the uncertain net impacts of the proposed mine on the local government's fiscal balance we can look at some of the basic costs that a new resident might put on Valley County. The first cost that one might consider is that of schools. In Idaho, which spent the least amount on school per pupil, *in the country*, for fiscal year 2021, the state spent $8,376 per student.[38] The $300,000 per year in projected property taxes could then cover about 36 of the in-migrant miners' children attending school. The question is then, of the workers that will move into the local area, how many will have children of school age? The DEIS takes a guess, but does not then incorporate the cost of school into their analysis:

> "The public school system within the local area consists of several independent school districts located in McCall, Donnelly, Cascade, New Meadows, and Council. Under the mid-value worker residency scenario for Alternative 1, it is projected that up to 121 children may relocate to the local analysis area. In which case, the potential increase in school enrollment demand would be approximately 80 students (Census 2015; Highland Economics 2018). If these new students are evenly distributed across grades, then the average enrollment increase per grade would be approximately six additional students in each grade."[39]

If we believe that 80 students is the right number, then this will cost Valley County more than $670,000, which is significantly more than the increase in property taxes that the proposed mine

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[35] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-26. August 2020.
[36] Valley County. Proposed Valley County Fiscal Year 2021 Budget. August 2020. https://www.co.valley.id.us/media/Departments/Clerk/Budgets_Audits/Budget/FY2021/Publish-Revenue-Fiscal-Year-2021.pdf
[37] Valley County, Idaho. Report on Audited Basic Financial Statements and Supplemental Information. 2019. Page 7. https://www.co.valley.id.us/media/Departments/Clerk/Budgets_Audits/Audits/2019-Valley-County-Audit-1.pdf
[38] Thorington, J. Idaho again ranks last in education spending per student. Idaho Post Register. 5-11-2022. https://www.postregister.com/news/local/idaho-again-ranks-last-in-education-spending-per-student/article_4035d895-223a-58ba-8f36-796c3aa47d6e.html#:~:text=According%20to%20the%20report%2C%20Idaho,the%20national%20average%20of%20%2414%2C360.
[39] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-15. August 2020.

will pay.[40] Put another way, those 80 students would take up all the property tax money that is gained due to the presence of the mine in Valley County, and then some, and leave none for the other services which will have added costs because of the population increase. If those students, instead of being evenly distributed in each grade level, are more clustered in similar grade levels, then the County may have a harder time accommodating them.

> "Furthermore, if the in-migrating student population consists of more similarly aged children, then the increase for their corresponding grades would be higher and more likely to be difficult for the local school systems to accommodate. If this occurs, the adverse impact on the public school system could be very substantial if the current programs and facilities have insufficient capacity to absorb that additional student enrollment."[41]

One could try to make the argument that an individual's taxes cover the cost of children in school, but this is almost never the case. Our system is set up so that the whole of our society helps pay for the education of our children as a societal good. We wholeheartedly believe in this philosophy, but it does not discount the fact that if an additional 80 children are enrolled in Valley County schools, there will be an increased cost to Valley County residents. Funding of schools in Idaho is rather complex, but the largest portions of the state funds come from the property tax and sales tax[42] that are paid by residents of Idaho. In Valley County, which we already mentioned, the average home price is about $321,000 which equates to a property tax of around $1500 annually.[43] While digging into the sales tax part of this equation, since it largely runs through the state government and then is redistributed to the county and local governments, our point is the same. The individual taxes that are paid by the potential in-migrating miners will not cover the added cost to the schools. Finally, with respect to schools, which the last DEIS quote alludes to, there will likely not be enough room in the school systems for the additional 80 school children, which dramatically increases the potential costs. While we will not speculate on the cost of renovating or adding classrooms to the existing school systems

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[40] Although this is meant as an exercise to show that there are lots of undisclosed costs associated with the proposed mine, this is a rather tough task to complete with any fidelity. Although it is likely beyond the scope of this report, we have looked into this as deeply as we thought necessary. In a more nuanced look, it appears that McCall/Donnelly School district spends about $11,538 per student per year according to Idaho ED Trends. http://www.idahoedtrends.org/schools/173?question_id=2 If we then look at the average spending in Idaho per student, which is broken into State and Federal dollars, which are constant, and local dollars, which are not constant, we can see that McCall/Donnelly spends more than the average county, likely because of their slightly larger school mills according to Idaho ED Trends and "How Schools are Funded" from the Panhandle Alliance for Education. Following this thread, we can see that, if we accept McCall/Donnelly as a proxy, about $5,371 per student is paid by resident through property taxes. This would then assume that the $300,000 in increased property taxes would help to fund an additional 56 students and not, as we have stated above 36 students. However, aside from this being a rather circuitous route that is hard to follow, there are some assumptions that must be made to come to this calculation and in the end the numbers are relatively similar, so we will stick with the calculations in the main body of this report which are far easier to understand.

[41] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-16. August 2020.

[42] JA and Kathryn Albertsons Foundation. Five questions about education funding in Idaho. Page 22. https://dontfailidaho.org/pdf/JKAF_Rethink-Id-Ed-Funding.pdf and Panhandle Alliance for Education. How Idaho Schools are Funded. https://panhandlealliance.org/how-idaho-schools-are-funded/

[43] Idaho State Tax Commission. Estimated Property Tax. https://tax.idaho.gov/i-1072.cfm

to accommodate the children of the miners, it would be far more expensive than simply accommodating them in the existing school infrastructure if the capacity is available.

The reason that we looked a little deeper into the school issue as it relates to the additional cost of in-migrating miners, is to show how little of the costs have been quantified in the DEIS or by Perpetua Resources. We have already shown that the additional property taxes will not cover the cost of the additional students enrolled in school. This does not address all the other costs that Valley County will incur if hundreds of new miners move in. For example, it does not cover the cost of the damage that will be done to the roads in Valley County as all the heavy mining equipment and supplies for the mine pass through. The state of North Carolina looked at all the highway cost allocation studies that they could find and summarized them in their own cost allocation and revenue attribution study, and found that, in all of the State sponsored studies that they could find, heavy trucks, like the ones that will move equipment and supplied through Valley County, going to and from the potential mine, underpaid their incremental costs significantly.[44] The studies specifically noted that the heavier the vehicle, the more they underpaid. In Oregon, the underpayment was as much as 66.87 percent, in Nevada it was 73 percent, in Texas it was 35-49 percent, and in Idaho it was 27-33 percent. In every state study that was presented, the heavier the haul truck, the more they underpaid for the damage that they did to the roads. The corollary is obvious here, but we will lay it out to be crystal clear: The state of Idaho and Valley County will incur road damage from Stibnite bringing in the things that the mine needs to operate and the concentrate that the mine ships back out. The fees that the mine will pay will not cover the cost of those damages. This does not consider the potential for increased traffic accidents with large trucks, increased congestion in Valley County, or the nuisance of having thousands of large trucks constantly travelling through Valley County. It will also not cover the nuisance in the back country that is the attraction that the visitors and local recreationalists seek. These are some of the costs associated with the proposed mine that should have been discussed and quantified in the DEIS. There will undoubtedly be additional costs to the police, the fire department, the hospitals, the sewers, the roads, the telecommunications, etc.:

> “The population increase under Alternative 1 would likely result in limited effects to local police and fire protection services. Adams and Valley counties’ telecommunications and internet infrastructure operate at near capacity and, therefore, may have difficulty in maintaining service levels from increased service demand in some locations.
>
> Public service impacts under Alternative 1 would depend on both the location of any SGP-related population growth and the specific circumstances of the affected public services. It is possible that adverse public service impacts could occur to the local analysis area’s water and public school system, particularly if in-migrants are more highly concentrated in individual communities such as McCall (though this is hard to predict). In which case, there could be substantial adverse impacts to those public services.”[45]

[44] Hasn, M. at et al. North Carolina Highway Cost Allocation and Revenue Attribution Study. North Carolina Department of Transportation. NCDOT Project 2019-14. September 2021. Page 20, table 2.4
[45] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-16. August 2020.

In the above discussion of the potential impacts of the proposed mine we are not "talking out of both sides of our mouth." We would like to be very clear about this. Although we do not think that most of the miners will reside in Valley County, and, in fact, think that only a fraction of the hypothesized 200 miners will live in the local area, if they do find affordable homes there, they will bring a rather large cost to Valley County that is not offset by the small increase in Property Tax.

There are other potential costs associated with the siting of large industrial facilities in a "small town, rural area," other than the potential overuse of public and private infrastructure that then requires higher regular repair and maintenance costs and, possibly earlier replacement. Just as population growth could lead to the demand for housing to rise faster than housing supply, driving housing costs up, raising the local cost of living, something similar can happen when a large increase in the demand for workers is created by a large new industrial development.

The projected gross wage that Perpetua expects that it will be paying its Stibnite Mine work force will be about $91,000 per year.[46] This is far in excess of the prevailing wage in Valley County, even the prevailing wage for mining jobs in Valley County[47]. The SDEIS reports on the average wages by industry in Valley County using the Idaho Department of Labor data. The average wage across 12 different industries in Valley County was about $36,000 per employee. The average wage in Mining was about $80,000, over twice as much.[48]

Perpetua will be seeking its workforce for the proposed mine from local, as well as regional, and national, labor markets. This will, in effect, set up a competition for skilled workers within Valley County and the surrounding labor markets within commuting distance of the mine. Both government agencies and private businesses will find that some of their more capable employees will be attracted by the much higher wages that Perpetua will be offering potential employees. To retain their current work team, government agencies and private businesses will have to pay higher wages or accept less productive employees. This will increase the operating costs of organizations or reduce their productivity. For local government organizations that are already likely to be stressed by the increased usage of the infrastructure for which they are responsible, this will be a double cost burden.

Labor cost increases could adversely affect the capacity for public agencies that rely on lower paid, skilled workers for their operations (i.e., school bus drivers, garbage haulers, etc.) to continue providing their services. In addition to increasing their operating costs, in more serious cases, the labor shortages could result in business contractions and reduced public services if their work positions remain unstaffed. Contraction also could occur for private businesses relying on lower-wage or competing wage workers.

The DEIS and the socio-economic report that much of Section 4 of the DEIS is based on, clearly believe that the miners will move to the local area. What we are attempting to do here is to say

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[46] "Social and Economic Conditions Specialist Report," Supplemental Draft EIS, p. 38. "The "fully burdened compensation of all SGP employees (i.e. including management staff) is calculated to be $90,600 in 2017 dollars."

[47] The average mining wage for miners in Valley County was about $79,000 while Stibnite estimated its mining wages for its proposed operation would be about $91,000, about 15 percent higher. The Perpetua average included company management staff in addition to miners.

[48] Ibid., p. 21, Table 6-8. All values in 2018 dollars.

that we do not find much evidence to support this, but if it happens, the costs, which are largely unreported, will be far larger than the benefits, which have been reported by Perpetua and the Stibnite DEIS. While we will not attempt to explicitly quantify the costs of having the miners move to Valley County, we will continue to lay out some of the social costs associated with having them in Valley County. We feel that this is important so that the local people of Valley County know exactly what is being proposed for their communities.

2.4 Social Issues

While some of the impacts of the potential miners living in the local area are possible to quantify, many are not. For example, if we knew how many of the miners were moving to the local area, and if we knew how many of them had kids of school age, then we could quantify the cost of having the additional children in the schools in Valley County. This potential cost to Valley County was noted, but not quantified in the DEIS. As quoted above:

> "Furthermore, if the in-migrating student population consists of more similarly aged children, then the increase for their corresponding grades would be higher and more likely to be difficult for the local school systems to accommodate. If this occurs, the adverse impact on the public school system could be very substantial if the current programs and facilities have insufficient capacity to absorb that additional student enrollment."[49]

What is more difficult to quantify is the impact that the mine may have on the social fabric of Valley County. The proposed mine represents something of an anomaly for the local area. The miners will be living at the mine site for 2 weeks at a time in what are often referred to as a "man camp". When the workers two weeks of work are up, they will be bussed back through the local area, and, if you accept the numbers in the DEIS, hundreds of them will live in the local area. While we believe that most of them will live either in the greater Boise area or elsewhere in the U.S., it is instructive to look at some of the social issues associated with miners living in local communities.[50]

With a well-paid, predominantly young, male workforce, with weeks at a time off work, there are some social problems that can be expected to accompany this type of industrial development. If we assume that two hundred mine workers take up residence in Valley County, they will be outsiders by virtue of their odd schedule, even before they may or may not engage in some of the other social maladies are considered in the text below. Working away from your community, and for some workers, their family, for two weeks, and then not working and living in the community for two weeks, is not a schedule that most people would want to keep. Adding in a higher-than-average pay, a predominately young male demographic, and a culture that is created in a remote camp for weeks at a time, necessarily separates the workers from the other people that call Valley County home. In fact, there are other places that have dealt with this for some time that we can look to and see how they fared with similar mining work, demographics of workers, and similar work schedules. Places like the Bakken in North Dakota and Montana and remote mining locations in Canada and Australia provide a "natural experiment" to study the

[49] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.21-16. August 2020.
[50] For a review of the socioeconomic studies of the impact of mining "man camps" on rural communities, see Kerry Carrington & Margaret Pereira, 2011 "Assessing the social impacts of the resources boom on rural communities," *Rural Society* 21.1.2.

impact of this type of transient workforce. There are many important social issues associated with mining in rural areas that have significant impacts on the well-being of residents and communities, and workers, e.g., increases in alcohol and drug consumption, increased pressure on local law enforcement, increased incidence of sexual and aggravated physical assaults, increased presence of convicted felons, etc. These impacts will not show up in the typical commercial statistics on jobs and income that are typically used to document the benefits of expanded mineral extraction, but these social changes can have substantial impacts on resident well-being. These impacts can be felt as workers move to the local area to work for the mine, but they can also be felt when the mine shuts down, as pointed out in the Social and Economic Conditions Specialist Report from the Forest Service that was part of the SDEIS.

> "However, as discussed above, in the absence of interim measures, there would be potential for substantial "bust" impacts following the cessation of the SGP's mining operations from the subsequent local job and income losses. If there are insufficient replacement job opportunities for the local residents no longer employed (directly or indirectly), then the local area economy would experience increased unemployment and reduced economic activity. Depending on the severity and duration of the economic dislocation and recovery, many of the local residents formerly employed (direct or indirectly) by the SGP's mining operations may choose to relocate out of the local area to find employment."[51]

An increased population requires the police and other social services providers to do more work. While this is likely happening already in Valley County, as the population has been expanding rapidly for at least the last 30 years, it is likely that a new population of miners in Valley County might put a larger strain on EMS than the in-migrants of the last 30 years. Archbold studied this in "Policing the Patch", where "the Patch" referred to the Bakken "oil patch" on the North Dakota-Montana border.[52] In that study Archbold reported that 80 percent of the police officers interviewed said the oil boom had affected their work. While the impacts were many and varied, the most basic impact was that the officers were called out for service significantly more than they had been before the oil boom in the Bakken. In fact, "…Four out of the eight police agencies included in this study have had triple the number of calls for service since 2008. One agency had double the number of calls for service…"[53] Police get called out on all sorts of service calls, but the basic fact that the Bakken area had 2-3 times the service calls to the police during the oil boom points to something in the community dramatically changing. Whatever changed, it was serious enough that residents asked the police for assistance much more often than they previously had. That there was an increase in violent crime in the Bakken mirrors directly the experience in the Marcellus Shale region of Pennsylvania which saw a 30 percent increase in violent crime as the unconventional gas boom developed there.[54] The same sort of story is told in Australia where mining towns in Queensland experienced rates of violence

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[51] USDA Forest Service. Stibnite Gold Project: Social and Economic Conditions Specialist Report. Page 41-42. August 2022.
[52] Archbold, C. Policing the Patch: And Examination of the Impact of the Oil Boom on Small Town Policing and Crime in Western North Dakota. *Police Quarterly*. 2014.
[53] Archbold, C. Policing the Patch: And Examination of the Impact of the Oil Boom on Small Town Policing and Crime in Western North Dakota. *Police Quarterly*. 2014.
[54] Komarek, T. Crime and natural resource booms: evidence from unconventional natural gas production. *Annals of Regional Science*. 2017.

to which police responded increased between 1.4 and 2.3 times the state average at the five different mining communities studied.[55] While no two communities are identical, the added presence of a significant number of new mine workers is likely to increase the service calls to the police and other public social services, and there will likely be a rise in the number of assault cases.

Much of the literature on mining camps and mining town maladies attempts to draw a correlation between community dependence on mining and alcohol and other drug use and abuse. In the Northwest Territories of Canada, which have seen a large increase in mining in the last decade, Gibson has quoted the Royal Canadian Mounted Police (the RCMP): "The RCMP estimates that 80% of crime is directly or indirectly related to alcohol or drug abuse."[56] In the United States, in fact, mining has had the top billing as the drunkest industry. According to Bush:

> "Workers in the mining (17.5 percent) and construction (16.5 percent) industries had the highest rates of past month heavy alcohol use."[57]

This was the second time in a row that mining had topped this list of industries by level of alcohol use. While we might be tempted to think that this was just a U.S. problem, studies focused on mining-impacted communities around the world show that heavy alcohol use is a common problem no matter where the mining town is located.

The influx of strangers into areas experiencing a mining boom may undermine existing community's social controls on resident behavior and create an environment attractive to those with a history of criminal behavior. One study of energy development in the Greater Yellowstone region found that the number of Registered Sex Offenders grew about 2-3 times faster in counties dependent on oil and gas extraction relative to those dependent on recreation or agriculture.[58]

One should not be shocked by these findings. A large group of relatively young, single, transient, males, generally unburdened by families, who work long and demanding hours out of sync with the local standard work week, who have a large amount of money to spend and long blocks of idle time, are not likely to make good neighbors without significant public planning and provision of support services. While the miners' barracks or man- camps may indeed be "dry" in the sense that alcohol is banned on mining company property and the mining company may have very stringent rules about what the miners can and cannot do when on company property, the same rules cannot, and likely should not, be applied to towns in the vicinity of the mine when the miners are on their own time pursuing their private interests. Many of the cultural dislocations that they acutely experience are felt throughout mining towns all around the world. Parkins recognized those experiences in his paper on social structure, fragmentation, and substance abuse in resource-based communities:

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[55] Carrington, K. The resource boom's underbelly: Criminological impacts of mining development. Australian and New Zealand Journal of Criminology. 2011.
[56] Gibson, G. Canada's Resilient North: The Impact of Mining on Aboriginal Communities. *Pimatisiwin: A Journal of Aboriginal and Indigenous Community Health* 3(1).
[57] Bush, M. Substance use and substance use disorder by Industry. The CBHSQ Report from the National Survey on Drug Use and Health. April 2015.
[58] Berger, J. Sexual Predators, Energy Development, and Conservation in Greater Yellowstone. *Conservation Biology* 24(3):891-896. 2010.

> "Specifically, the linkages between social structure, community fragmentation, and family dysfunction offer a way of understanding differential resistance and susceptibility to substance abuse. Five thematic areas were linked to susceptibility in this study: (1) an economy based on multiple divergent sectors, which gives rise to income disparity and social inequality; (2) a highly transient population, which results in social distancing and lack of social support; (3) shift work, which prevents opportunities for consistent and productive family and community relationships; (4) high incomes, which lead to material competition and financial stress; and (5) a culture of entitlement, which produces certain expectations and perceived privileges among some workers and their families."[59]

These "thematic" areas are exactly those that must be carefully considered when evaluating the social impacts of mining. It is the combination of these social impacts that leads a mining town, or a man camp, or the local area around a mine to become separated from the mine workers and leads to social dysfunction. A separate culture is created by the mine that, because of its structure, work scheduling, its pay, and the diverse cultures of its workforce, may not fit well with the existing residents of the towns and cities that are closest to the mine. The results are the specific social maladies discussed above. In this report we are not attempting to say that if the Stibnite mine is developed, then Valley County will be overrun by menacing mine workers. We are trying to point out that there will likely be an increased need for many of the services that Valley County provides. These services include emergency medical services, the police, and various social services that should all come together and plan to help mitigate some of the social maladies that are associated with mining which we discussed above. There will be increased time, money, and energy that needs to be spent in Valley County to accommodate the rather unique workforce that could be the Stibnite mine.

III. Amenity Values and Community Perception

3.1 Net-Migration, Amenities, and Local Economic Vitality

For several decades economists and economic development analysts have puzzled over the fact that among rural American counties, where slow economic growth and loss of population have usually been the rule, there have been a significant number of rural counties showing considerable local economic vitality in the form of population growth tied to net in-migration. Often that population gain has taken place despite the decline in the fortunes of the land-based economic activities that historically dominated the local rural economy: mining, agriculture, forest products, fishing, etc.[60] Clearly, people, voting with their feet, were indicating a more positive evaluation of the economic potential of some of these rural counties that were attracting in-migrants, often to some of the poorest areas of the nation.

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[59] Parkins, J. Linking social structure, fragmentation, and substance abuse in a resource-based community. *Community work and family*. 2011.

[60] For a review of the economic literature dealing with "The Economics of Amenities and Migration" see Garber-Yonts, Brian E. The Economics of Amenities and Migration in the Pacific Northwest: Review of Selected Literature with Implications for National Forest Management. 2004. United States Department of Agriculture, Forest Service, Pacific Northwest Research Station, General Technical Report, PNW-GTR-617, October 2004.

There was an obvious geographic pattern to some of this persistent local economic vitality. Much of it was associated with areas with more sunshine and warmer winter temperatures, hence the adoption of the “sun belt” label to identify those anomalous, more rapidly growing, rural areas. The general economic principle was that some locations had characteristics that made them attractive to potential inter-county migrants, such as a sunnier climate or a lower cost of living or a lower risk of being a victim of violent crime. Because the quality of local schools is also very important to many families, that too could serve as an “attractant” to particular areas. Local air and/or water pollution that may contain irritants or health hazards could also affect household location decisions.

Economists have labeled such site-specific positive characteristics of a particular location *amenities* and negative site-specific characteristics of a location, *dis-amenities.* But, if climatic characteristics could change migration patterns and the location of economic activity on a national scale, what other site-specific characteristics might support or undermine local economic vitality? Although cataloging such site-specific characteristics might seem like a hopelessly subjective undertaking, market economies for centuries have dealt with such subjective characteristics in every interaction of supply and demand as both consumers and producers evaluated in quantitative detail what the market opportunities were.

The location of economic activity involves both business firms and households evaluating the advantages of locating in one place as opposed to another. Both business firms and households will look at some of the same characteristics: What will pay levels be? What is the balance of labor supply and demand locally? What will the cost be of delivering different sets of goods and services to markets at different locations? Some of the local characteristics may be quite subjective: What is the quality of the schools and other basic urban infrastructure? How hostile or supportive is local government to the concerns of residents and businesses? Etc.

The economic importance of “climate” at certain times and places suggests that other *environmental* characteristics could be important to potential and actual residents: Levels of air and water pollution; crime levels, noise and congestion, urban density, the quality of public park systems and open space, diversity of cultural and commercial choice, the level of social and political conflict. Etc. This is certainly the case in Valley County, and their planning shows this.

The “comprehensive planning process” in Valley County, Idaho, and the City of McCall, Idaho, solicited input from over 3,000 residents and visitors to develop a set of values shared by both residents and visitors about what was attractive about Valley County. As the “2018 McCall Area Comprehensive Plan” has made explicit,[61] it is local environmental values that appear to be responsible for the net in-migration of new residents, the retention of visitors, and the accompanying vitality of the local economy. In the “Community Choices” survey that was part of the development of the Comprehensive Plan, “the number one value for residents and visitors [was] the mountain character and small town feel of McCall. That character was defined by the natural setting, open space, agricultural lands, good air and water quality.”

> “Access to nature-based amenities and an abundance of recreational opportunities were ranked second and third in the top reported values for the Valley County-City of McCall area. These features are part of what make McCall a thriving destination for

[61] P. 50

> visitors and place to live for residents…The community embraces environmental sustainability by managing its impact on the environment, including water and air quality, wildlife, soundscapes, the natural landscape, and trees."[62]

Open space and valued natural areas surround McCall. Public lands in the area are managed by state and federal agencies including the Bureau of Land Management (BLM) and United States Forest Service (USFS). The Payette and Boise National Forests surround McCall to the north and portions of them lie in both the area of impact and the study areas associated with the proposed Stibnite Gold Project.

These forests are composed of extremely diversified terrain including rugged mountains, high meadows, lakes, streams, and rivers. The USFS manages the Frank Church River of No Return Wilderness, a popular summer location with hiking and fishing opportunities, hot springs, historic homesteads, and Native American cultural resources.[63] That is just one of several federally protected wilderness areas and landscapes managed to support and protect a broad array of wildlife and the ecosystems on which that wildlife rely and, in turn, human visitors, also, highly value.

To some, this linking of natural landscape amenities along with enhanced human-crafted social, cultural, and urban physical amenities in Valley County, to local economic vitality may appear fanciful or just biased wishful thinking. As a practical matter, we are trying to understand why the economic vitality of Valley County continued and grew despite the near disappearance of much of the historical economy which had been the basis for the original development of those communities. The net in-migration that has boosted the region's population is real and hard to dispute. The high and rising property values are real as is the shift in ownership of residences from full-time residents to second-home or seasonal rental use. The ongoing increases in the share of total employment and payroll in accommodations, eating and drinking establishments, and recreation services tell a very compelling story that confirms residents' and employees' descriptions of their experiences living and working in Valley County.

There appears to be a consensus that Valley County is one of the many "mountain towns" in rural areas of the U.S. that have attracted in-migrants that stimulate population and economic growth. Scenic beauty, recreation features of the natural landscape, relatively low population density, wildlife habitat, clean air and water, etc. This economic transformation of "mountain towns" does not eliminate all economic problems or make it easy to develop a consensus about the objectives of public policy and the appropriate public policy tools to use to obtain those objectives. But a clear understanding as to what the economic forces are that are driving the dramatic changes in Valley County are necessary before rational public policies to protect and enhance the local economic vitality and quality of life there can be successfully implemented.

3.2 The Real Estate Agent's Mantra: "Location, location, location"

The underlying economic logic behind the reality of "amenity-driven" or "amenity supported" local economic vitality may look more familiar if we briefly talk about residential real estate markets. Some aspects of the value of residential property can be easily quantified: the square feet of floor area, the size of the lot, the age of the home, the number of bathrooms and

[62] Ibid. p. 50.
[63] Ibid. p. 88.

bedrooms. It is not that these quantitative measures can be combined to determine exactly what purchasers would be willing to pay for the residence or what sellers would accept as a reasonable price, but this information *is* somewhat correlated with the likely market price of a residential property.

However, all those quantitative measures have little to do with "location, location, location."[64] Most of us are able to identify "high rent neighborhoods" in the general region in which we live. We know what suburbs that have invested heavily over time in their schools. We know where the run-down public schools are. We hope we know what neighborhoods are relatively safe from crime. We know which neighborhoods have relatively uncongested and quiet traffic. In large urban areas, the level of air pollution may be much higher in some neighborhoods than in others because of air movements and temperature gradients. We probably know what neighborhoods are in transition from upper middle class to lower middle class or are moving in the opposite direction: gentrifying old, poor, neighborhoods.

Note that the evaluation of all these characteristics involves subjective judgements that involve placing a dollar value, at least implicitly, on very "subjective" characteristics. These are relative values in the sense that the evaluator would have to consider how important each of these characteristics was compared to the others: What would we be willing to sacrifice in travel distance, time, frustration, and accident risk, for example to gain access to higher quality of schools to which our children would have access.

It should be noted that real estate researchers and economists use the same statistical tools to determine what quantitative judgements in dollar terms buyers and sellers of residential properties make. That is, the variation in sales price of residential properties across large and diverse real estate markets will reveal the relative prices that buyers and sellers are implicitly placing on different qualitative characteristics of residential properties, including those associated with different location characteristics. Juggling all those different characteristics of alternative residential properties that we are considering may be difficult but participants in residential property markets regularly and successfully decide what price they are willing to pay for a residence or require before they will sell a residence. Residents and potential in-migrants to Valley County are regularly making similar judgements about moving-in or moving-out or staying put.

Residents and potential residents will have to balance all the different economic aspects of inhabiting a particular area to find the local mix of benefits and costs that best suits their preferences. Business firms will also have to adjust to the changing labor costs as well as the rest of the local cost of doing business. Business owners and managers have preferences for where they live too!

The U.S. Forest Service, not surprisingly, given the millions of acres of public lands it manages, has done some of the leading economic research evaluating the environmental services and

[64]Large, "park-like," lots are almost certainly likely to be associated with "high rent" neighborhoods. The same might be said about very large homes: "McMansions". Part of the point of the large lots and residences is to separate the very rich from other citizens. The well to do may also lobby for zoning restriction that pursue the same goal of providing the well-to-do with a culturally more homogeneous neighborhood.

values associated with forest lands.[65] The titles of some of that work indicate some of the findings, “Intra-Regional Amenities, Wages, and Home Prices: The Role of Forests in the Southwest.” “Forest Amenities and Location Choice in the Southwest.” In fact, the Forest Service, in its Social and Economic Conditions Specialist Report, filed as part of the SDEIS, points out how attractive Valley County is and how that attractiveness has enticed new residents.

> “Both Valley and Adams counties include large areas of federally administered lands. These federally managed lands, as well as the private lands surrounding them, are prized for their remoteness and natural beauty. In recent years, both counties have attracted new residents including recreationists and retirees looking for small towns, natural beauty, and wide-open areas and landscapes.”[66]

3.3 Creating Dis-amenities by Degrading Amenities

Most of the discussion above has focused on the environmental or recreational values associated with locations in and around Valley County and how recognizing those amenities helps us explain some land use patterns and outcomes. Recognition of the existence of these environmental values also warns us that if we are not careful about how we manage special landscapes, we may degrade significant existing amenities of considerable value, i.e we can degrade an amenity, potentially leaving a dis-amenity behind that leaves many people worse off. We can burden ourselves and others with losses, leaving them worse off because they have lost something of value to them and/or have had to take costly steps to shield themselves from that loss.

Of course, the same economic tools that can be used to estimate the value of the amenities at a particular location can be used to measure the cost of a dis-amenity created by degrading existing environmental qualities. In fact, those economic tools often have been used to calculate the damage done by the creation of noxious sites at particular locations, e.g. the locating of polluting activities such as coal-fired electric generators, the building of radioactive waste processing facilities, the locating of large regional waste disposal facilities. The noise associated with many contemporary economic activities: The hum associated with operating large numbers of electronic servers; the noise associated with regional airports and congested trucking routes; noxious odors associated with the ponds of animal waste created at “factory farming” sites or urban sewage treatment and disposal facilities. Etc.

Metal mining has the potential to convert what are now amenities, namely world class natural landscapes of mountains, forests, streams and rivers, and the wildlife that inhabits them, into dis-amenities. Existing valuable benefits may be converted into their opposites: waste lands that may deteriorate indefinitely into the future.

The Executive Summary for the USFS initial Stibnite Gold Project Draft Environmental Impact Statement provided the following description of the Stibnite Gold Project:

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[65] Ibid.

[66] USDA Forest Service. Stibnite Gold Project: Social and Economic Conditions Specialist Report. Page 22. August 2022.

> "The Stibnite Gold Project proposed for the mountains above the Valley-McCall area would be a large and complex industrial operation. That Project consists of a mine site and processing facilities, associated access roads, and off-site facilities located in Valley County in central Idaho. The mine site is in the East Fork South Fork Salmon River (EFSFSR) drainage basin.
>
> The Stibnite Gold Project site area is a complex blend of both remote wilderness lands with high recreational values and potential wilderness characteristics, and areas impacted by historical gold, silver, antimony, and tungsten mining, processing, and resulting legacy contamination. The potentially affected area encompasses approximately 3,500 acres.
>
> [The Stibnite Project] plan of operations would conduct mining operations that produce gold and silver doré, and antimony metal concentrates using three open pit mines, transportation equipment, ore processing facilities, development rock storage facilities, a tailing storage facility, a water treatment facility, road construction, electrical transmission lines, and various other facilities needed to support mining activities.
>
> The Project would require upgrades and new construction to electric infrastructure outside of the mine site and subject to different approvals. The plan of operations incorporates closure and reclamation activities, and mitigation that may avoid, minimize, or compensate for adverse environmental effects caused by the Project and also incorporates actions that mitigate legacy contamination at locations within the mine site. Under the Project plan the construction, operations, closure, and reclamation phases of the Project would take place over a period of approximately 20 years, not including the period of time required for long-term monitoring and maintenance. Environmental monitoring and maintenance would continue for as long as needed to demonstrate that the site has been fully reclaimed. "[67]

The "processing" of the ore to produce gold and silver doré as well as antimony ore concentrates will involve many different industrial chemical and physical processes at the mine site in the mountains of Valley County, including:[68]

- The crushing and grinding of the currently mined ore as well as reclaimed historical tailings.
- The use of flotation technology to concentrate the antimony and gold/silver ores.
- The leaching of the gold and silver from the concentrates using sodium cyanide.
- The gold-cyanide complex would be treated with activated carbon and the carbon with the gold-cyanide complex would be washed with an acid solution and then a hot alkaline solution.
- The resulting gold-bearing solution would then be transferred to the electrowinning refinery.
- The molten material from the induction furnace, principally gold and silver, would be poured into doré bars that would be shipped offsite for further processing and refining.

[67] Page ES-2.
[68] Chapter 2 of the original USDA Forest Service. Stibnite Gold Project DEIS. August 2020.

- Stibnite expects to store the liquified waste (tailings) from all of these processes in a pond behind a 460-foot-high dam that it will construct on federal National Forest lands. The pond will ultimately occupy approximately 423 acres.[69]
- In the processing of the various streams of metal ore, caustic alkaline and acidic washes are used to increase the concentration of the metals being sought. Those liquids have to be neutralized before being disposed of.
- The metal ore concentrates and gold and silver doré must be shipped from potentially isolated rural mine and ore processing sites to national or international markets where they can be further processed to convert them into manufactured products. This can lead to congestion and pollution in the mountains, valleys, and rural areas through which the metals and metal ore concentrates must be moved.

Mining, mineral processing, and transportation of potential noxious or toxic material can degrade environmental quality from the mine to the concentrators to the huge waste tailings storage facilities that often permanently damage ground water and present the risk of catastrophic failure of the dams holding back huge amounts of toxic liquified waste to the local population. It is important to keep in mind that the proposed Stibnite Gold Project would site a large industrial chemical project in the head waters of one of the most important recreational rivers in the Inland West, namely, the Salmon River. The Stibnite Mine is located on the East Fork of the South Fork of the Salmon River. The Salmon River would become the mine's waste disposal facility. In one important sense, the proposed Stibnite Project represents a gamble that puts at risk a known and existing recreational economy that is supporting economic vitality in Valley County. What is being offered in its stead is a speculative but threatening open pit mining venture that, if it is commercially successful, will bring only a relatively small and short-run "bump" in additional economic activity in Valley County.

3.4 Stigma

When a mine or other types of industrial facilities are proposed near where people live, the people that live in the area, as well as the people that know about the new facility and the area, whether they live there or simply travel there, may change the way that they think about that area. To help understand how this might play out, we present two scenarios to help illuminate how people might think differently about an area after an industrial facility or mine is sited nearby. In one scenario, there is a mine that is sited right on the boundary of a National Park, directly adjacent to a river that flows into the park. In the second scenario, there is an industrial facility that is sited right next to multiple other industrial facilities in a manufacturing hub in the upper mid-west of the U.S. In the first scenario, it is likely that there would be some sort of public outcry. This would likely happen because if the mine is permitted and begins operating, people's view of the National Park and the nearby towns might change to some degree. It is likely that people would not see the National Park, the river that flows into it, and the nearby towns as environmentally pristine as they did before. In the second scenario, there might not be much of a mindset shift because the area in which the industrial facility was sited already had been thought of as polluted and dirty. However, in both scenarios the facilities would be thought of as having a "stigma" attached to them associated with the environmental degradation assumed to be associated with a particular industry located there.

[69] Ibid. p. 2-33.

The phenomenon of *stigma* is something that economists have been studying for some time. In fact, there is a relevant economic literature dealing with how the stigma associated with a place might affect economic decisions. The stigma that this literature analyzes was created by concerns about an environmental pollutant or a source that taints people's perception of the attractiveness of an area. This could be a landfill, a coal mine, a metal mine, an industrial facility, a polluted river, etc. For example, a place that would otherwise be considered desirable to live in, to move to, to vacation or recreate at, has a stigma associated with the environmental degradation from an industrial facility nearby that discourages people from going there. This literature has paid special attention to what is called the "new West" as much of the western U.S. has transitioned from resource-based economies to service-based economies. With that transition, many former mining towns, like Park City, UT. for example, have been able to erase and/or mitigate their stigma to become high-amenity destinations. Colocousis succinctly described stigma in this way:

> "However, scholars have more recently documented the relationship between negative external perceptions of poor communities and their inability to attract new investment, a dynamic in which community stigma functions as a sort of ''Achilles heel'' in attempts at redevelopment (e.g., Erickson et al., 2008; Sampson and Raudenbush, 2005)…The processes through which certain places become stigmatized on the basis of perceived environmental risks and are therefore viewed as undesirable have also become a focus of study in recent years."[70]

What Colocousis found was that even in high amenity areas, areas that were situated near intact forests, mountains, or near rivers that people would otherwise want to visit or live near, in-migration, tourism, and redevelopment were not evenly distributed. Skouloudis links a "place-identity" to local areas that can be impacted by high-risk industrial facilities. This is an argument that almost everyone will readily recognize. When we think of the areas that we would like to visit, or have visited, that are high-amenity locations, we attach a place-identity to them when we think of them as in the National Park example above. McCall, ID., for example, is another location that is associated with pristine high-mountain lakes that are surrounded by mountains and forests. The identity to McCall is inseparable from that of a high-quality mountainous lake environment. This desirable mountainous area is presumably the reason that, as we pointed out earlier in this report, almost 70 percent of the homes in Valley County are second homes of people who spend their free time in the area. This attachment of place and identity is why, when an industrial facility is sited in one of these high-amenity areas, the potential for a negative impact on that area could be considered.

> "Wester-Herber's review paper (2004) points out the need to include local attachment to a specific geographical place in the debate on industrial risks and delineates how aspects of place-identity can be negatively affected when changes are made to a landscape by the introduction of high-risk industrial ventures."[71]

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[70] Colocousis, C. ''It Was Tourism Repellent, That's What We Were Spraying'': Natural Amenities, Environmental Stigma, and Redevelopment in a Postindustrial Mill Town. Sociological Forum. 2012.
[71] Skouloudis, A. et al. Industrial pollution, spatial stigma and economic decline: the case of the Aspos river basin through the lens of local small business owners. Environmental Planning & Management. 2016.

In the most recent Supplemental Draft Environmental Impact Statement that was released in October of 2022, there was a Social and Economic Conditions Specialist Report[72] that pointed out the same attachment that is described in the economic literature. Instead of a "place identity" that we just described, they call it a "sense of place."

> "The central Idaho region provides residents and visitors a natural and rural setting with a remote character, outdoor recreation opportunities, natural beauty, and scenic quality of public lands. Many area residents value these characteristics. The "sense of place" experienced and valued by central Idaho communities is based on the region's remote and rural setting, natural and undeveloped landscape, along with topography and vegetation, and the presence of cultural and traditional uses (e.g., open rangelands). "Sense of place," can be described as an unquantifiable value that attracts people to specific locations, generates a community identity, and ultimately contributes to the overall quality of life for residents (Williams 2014)."[73]

The quote above is exactly in keeping with our analysis. It is a connection with the land that the local people feel. They are drawn to the area because the lands are "prized for their remoteness and natural beauty. In recent years, both counties have attracted new residents including recreationists and retirees looking for small towns, natural beauty, and wide-open areas and landscapes."[74] Again, this is exactly what our report is attempting to point out. The extra step that we are taking now, that is not taken in the Special Report nor in the DEIS/SDEIS, is that there is a very real potential that the proposed mine will impact the character of Valley County and make it a less attractive place to live.

What this stigma literature makes clear is that even if we are focused on a high-quality amenity area like Valley County, it *can* be negatively impacted by the possibility of a new high-risk industrial source, like the proposed Stibnite mine. Even though a particular town might be in a high-amenity area, if it had a source of known industrial pollution nearby, or the potential for a new source of industrial pollution, its growth might not be the same as the county or regional growth. For example, in rural Coos County, NH., and the City of Berlin, NH. that were studied by Colocousis, the "tourism sector is the second largest in the state and account for a fifth of Coos County's economy, but only 4% of the city's."[75] In other words, in the County that was known for tourism (Coos), that was specifically related to high amenity outdoor experiences, the town that had these same amenities but had been stigmatized by their past industrial pollution, there was a drop of 16 percent between the tourism that the County received (20 percent of their total economy) and the 4 percent that the stigmatized City received. Or put another way, tourism represented 5 times as large a place in the County's economy as it did in the City's. In fact, this City has taken to encouraging motorized recreation, which is more resource intensive and has a much larger impact on the local land, as opposed to Coos County, which has in general adopted lower-impact recreational activities like mountain biking, hiking, and less resource-intensive

[72] USDA Forest Service. Stibnite Gold Project: Social and Economic Conditions Specialist Report. August 2022.
[73] USDA Forest Service. Stibnite Gold Project: Social and Economic Conditions Specialist Report. Section 6.4 Page 22. August 2022.
[74] USDA Forest Service. Stibnite Gold Project: Social and Economic Conditions Specialist Report. Section 6.4 Page 22. August 2022.
[75] Colocousis, C. ''It Was Tourism Repellent, That's What We Were Spraying'': Natural Amenities, Environmental Stigma, and Redevelopment in a Post-industrial Mill Town. Sociological Forum. 2012.

activities. In this case, the stigma associated with the industrial pollution has dramatically altered a small town's ability to capture tourism dollars and has forced them to embrace a much more resource-intensive section of the tourism economy that is not faring as well. The city, and the surrounding area, are perceived as being polluted and so it has, as a strategy to deal with its stigma, catered to a type of outdoor recreation that perpetuates that perception with real negative economic consequences.

3.5 The Possibility of a Spill from a Traffic Accident

The proposed Stibnite mine is in a remote location in Valley County. Regardless of which one of the different alternatives is being considered, the supplies that the mine needs to operate will have to be sourced from far away. A few of the supplies will come from Valley County, but the vast majority, as we have carefully laid out in the preceding sections, will come from outside of Valley County, and many from outside of Idaho. Because the Stibnite DEIS was so vague about the potential for a spill while transporting supplies to the proposed mine, the Idaho Conservation League and Advocates for the West hired Susan Lubetkin to review the Stibnite DEIS in 2020.[76] The result of that review is a rather sobering take on the potential for a spill along the transportation corridor to the mine.

> "More than 30 different hazardous materials will be brought to and from the mine site if the SGP is approved. Those hazardous materials include fuels, explosives, acids, and toxic materials, but the dangers posed by the reagents are not discussed. Under Alternatives 1, 3, and 4, more than 7.7 million gallons of bulk liquid hazardous materials in at least 1,100 truckloads, as well as more than 143,000 tons of bulk solid hazardous materials in at least 5,300 truckloads, will be transported along the roadways every year. Under Alternative 2, more than 9.2 million gallons of bulk liquid hazardous materials in at least 1,300 truckloads and more than 95,000 tons of bulk solid hazardous materials in at least 3,300 truckloads will be moved along the transportation corridor annually. Although the SGP DEIS promises that there will be a pilot vehicle to accompany bulk liquid transport, only 522 pilot cars per year are shown in traffic impact studies. Spills from SPCC facilities may be twice as likely as spills from vehicles, but the SGP DEIS did not discuss the possibility of spills from storage facilities."[77]

While we will get into the possibility, that is mentioned at the end of the quote above, of a spill from a Tailings Storage Facility, here we are focused on the transportation of materials. As the quote above alludes to, and we have spent some time discussing, most of the material for the mine will be sourced outside of Valley County. The result is that the mine materials, many of them hazardous, will have to come from far away and be brought through Valley County to the proposed mine site.

> "I was able to find potential distributor locations nearest to Cascade, Idaho for 21 supplies that would be used at SGP. Only five supplies (propane, gasoline, nitric

[76] Lubetkin, S. Review of the Transportation Corridor Risks of Hazardous Material Spills in the Proposed Stibnite Gold Project Draft Environmental Impact Statement. 10.27.2020.
[77] Lubetkin, S. Review of the Transportation Corridor Risks of Hazardous Material Spills in the Proposed Stibnite Gold Project Draft Environmental Impact Statement. 10.27.2020. Page ii.

acid, sulfuric acid, and hydrogen peroxide) were available within 100 miles of Cascade, Idaho. Diesel fuel was available inside a 250-mile radius. The remaining reagents I was able to find distributors for were only available from cities that were up 500 or 1,000 miles away."[78]

The problem with sourcing the mining supplies from far away is, of course, that they need to travel a much longer distance before they reach the mine. The way that the potential for a spill is calculated is based on the mileage that the material will have to travel as well as the type of road and the conditions of the road that the truck that is hauling the supplies must travel on. The farther away, or the rougher the road, the more potential there is for a spill. Since many of the supplies must travel a great distance and there is a lot of dirt road that needs to be traveled to get the supplies to the proposed mine, this increases the chance that there will be a spill. Because there are often rivers and bodies of water in this portion of Idaho, there is also an increased potential that if there is a spill, it will impact a body of water. After considering more appropriate and recognized spill rates, considering the condition of the roads, and considering more than just the SH-55 to mine portion of the haul routes, Lubetkin found that:

"**Overall, spills and crashes involving heavy vehicles are near certain to occur for all Alternatives**. The calculations shown here serve as an example of the general process for estimating spill and crash numbers and likely underestimate the risks. Still, these numbers indicate that the impacts that spills and accidents may have on the environment and human safety along the transportation corridor should be seriously and thoroughly considered.

The SGP DEIS's rudimentary attempt at quantitatively estimating the risk of hazardous materials spills was constrained to a limited analysis area and a single source (trucks) of potential spills. This narrow consideration of the possible impacts of the transportation corridor and hazardous materials misses other effects. Transportation impacts extend beyond the risk of spills. Mine-related spills of hazardous materials can come from many processes besides transportation. The conclusions in the DEIS that spills along the roadway will have limited if any impacts on fish and the aquatic environment are not justified. Neither are conclusions that spills from chemical storage will be rare or small."[79]

We will now turn to the possibility of a spill from the proposed Tailing Storage Facility.

3.6 The Possibility of a Tailings Storage Facility Failure

Tailing Storage Facilities (TSF) are the permanent storage features at a mine that will hold back the toxic sediments that are left over from processing the ore to obtain the metals. In the modern age of mining, and especially when dealing with open pit mines, there is an incredible volume of rock that is moved to recover a very small amount of metal (in this case gold, antimony, and silver). The metal that is recovered, measured in single grams per ton of rock

[78] Lubetkin, S. Review of the Transportation Corridor Risks of Hazardous Material Spills in the Proposed Stibnite Gold Project Draft Environmental Impact Statement. 10.27.2020. Page iii.
[79] Emphasis added. Lubetkin, S. Review of the Transportation Corridor Risks of Hazardous Material Spills in the Proposed Stibnite Gold Project Draft Environmental Impact Statement. 10.27.2020. Page iv.

moved, is between 1 and 2 in this case.[80] In other words, the percentage of gold in the rock ore being mined is thousandth of one percent. Aside from this being an amazing example of the value of gold, we bring this up also to point out that 99.999 percent of the rock that is mined and processed will have to be carefully stored in or as part of the TSF. The overburden, and any other rock that is either below the threshold that makes sense for them to process and or does not react poorly with the air or with water, can be used to help buttress the "downstream" TSF. This specific TSF design (downstream) is among the soundest TSF designs that are currently being used. The waste rock from the processing, as well as waste rock that cannot be in contact with the air and or with meteoric water (rain), will have to be stored in the TSF. The TSF will then be entrusted with keeping those toxic sediments out of the Salmon River until *the end of time.* This is one of the most serious problems with metal mining in the world. Although the design of the TSF for the proposed Stibnite Mine appears to be a good one, it will eventually suffer the same fate of all TSF, it will fail. No one knows when the Stibnite TSF will fail, and it has been designed so that it can, for example, stand up to a once in 475-year seismic event.[81] But the fact is that it will eventually fail. While one might think that this seismic event is a very high standard to require a TSF to meet, what it means is that in any given 50-year period, there is a 10 percent chance that there will be an earthquake that exceeds this standard.[82] While this might seem like a low probability event, the potential damage that comes with it is extreme. These low probability, high impact events need to be taken very seriously and approached with extreme caution. We are not exaggerating the risks associated with the possibility of the TSF failing. In recent research, and research that we report on here, the rate of TSF failure is increasing and not decreasing as one would expect with technological advances, and or time.[83]

In January of 2017, the Center for Science in Public Participation released an updated list of worldwide TSF failures.[84] This list includes data on 291 TSF failures including the location and year of the failure; for 42 of the locations the list also includes the date that the associated mine or processing facility became active. We used this list and added the active starting date for 56 additional facilities with failures that occurred since 2000 to determine the maximum age of storage facilities that failed.[85] Out of the 59 TSF failures that occurred since 2000, we could determine the active starting date for 46 facilities. The average age of TSF that between 2007 and 2016 failed is 43.4 years with a maximum TSF age of 134 years and a minimum TSF age of 1 year. This average age of TSF failures is slightly less, but not significantly different from the

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[80] Midas Gold. Midas Gold Completes Positive Feasibility Study for the Stibnite Gold Project, Idaho. 12.22.2022. https://midasgoldcorp.com/investors/news/2020/midas-gold-completes-positive-feasibility-study-for-the-stibnite-gold-project-idaho/

[81] USDA Forest Service. Stibnite Gold Project DEIS. Pages 4.2-8. 2020.

[82] Gould, N. Understanding the Language of Seismic Risk Analysis. Expert Commentary from IRMI. 2003. https://www.irmi.com/articles/expert-commentary/understanding-the-language-of-seismic-risk-analysis

[83] See citations and research below.

[84] Center for Science in Public Participation. Tailings Dam Failures 1915-2016. http://www.csp2.org/files/Tailings%20Dam%20Failures%201915-2016-4%20.xlsx

[85] The maximum age of the failed TSF are calculated by the year of the failure minus the year that the facility became active.

average age of 45.2 years for the TSF failures between 1940 and 1999.[86] Although the data is sparse, they indicate that the average age of facilities at which TSF failures occur has not greatly improved with advances in tailings dam construction. This is not surprising considering that most tailings dam failures occur at active dams (see table 3 below).[87] In other words, the technology clearly has not been improving with the mining methods because TSFs are failing before the mining is over. The TSF, in years old, is not even zero years since it has not begun its "long watch" which begins when the mine is officially closed.

Table 3.

Recreated from Table 9-1. Number and cause of tailings dam failtes at active and inactive tailings dams.			
Failure	Number of Tailings Dam Failures*		
Failure Causes	Active Dams	Inactive Dams	Total
Overtopping	20	8	28
Slope Instability	30	1	31
Earthquake	18	0	18
Foundation	11	1	12
Seepage	10	0	10
Structural	12	0	12
Erosion	3	0	3
Mine Subsidence	3	0	3
Unknown	15	3	18
TOTALS	122	13	135
*Data are presented for 135 tailings dam failures for which causes were reported, from 1917 to 2000			
Source:ICOLD 2001.			

Further, a 2015 study of TSF failures shows that the occurrence of “Serious” or “Very Serious” TSF failures has increased decade-by-decade since 1940.[88] This study also shows a negative correlation between increased number of serious or very serious TSF failures and copper ore grade, copper production cost, and copper price (See the table 4 below). In other words, as either the price of copper, the production cost of copper, or the grade of copper ore decrease, the number of serious or very serious failures increases. While we do not want to speculate on the mechanisms that cause the failure, the correlation would suggest that when there is less money coming into the mine, the failure rate increases. As we have shown, as mines go after lower and lower grades of ore, the size of the TSF must increase at an exponential rate. For example, an ore that has 1 percent gold has 99 percent waste rock that must be stored somewhere. A mine that has .1 percent gold, or 10 percent of the initial value has ten times as much waste rock as our initial condition, or 99.9 percent waste rock.

Table 4.

[86] Between 1940 and 1999 there were 225 TSF failures, 52 of which we have active starting dates for. A decade-by-decade breakdown of the average age of TSF failures from 1947-2016 ranges from 19.5 years (1947-1956) to 61.9 years (1957-1966).

[87] U.S. EPA. An Assessment of Potential Mining Impacts on Salmon Ecosystems of Bristol Bay, Alaska (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA 910-R-14-001A-C, ES, 2014. CHAPTER 9. TAILINGS DAM FAILURE

[88] Bowker, L., and Chambers, D., 2015. The risk, public liability, & economics of tailings storage facility failures. http://www.csp2.org/files/reports/Bowker%20%26%20Chambers%20-%20Risk-Public%20Liability-Economics%20of%20Tailings%20Storage%20Facility%20Failures%20%E2%80%93%2023Jul15.pdf

Table 3.1 Correlation Between Failure Severity and Mining Metric Indicators

	Cu Ore Production	Cu Metal Production	Cu Grade	Cu Prod Cost	Cu Price
Very Serious Failures	0.860	0.881	-0.794	-0.788	-0.427
Serious Failures	0.720	0.826	-0.884	-0.682	-0.126
Other Failures	-0.265	-0.099	0.298	0.300	0.489
Other Accidents	-0.216	-0.050	-0.312	0.281	0.485

Abbreviations:
Cu Prod Cost = Cost to produce copper concentrate from copper ore, including waste disposal
Cu Grade = grade of copper in the ore
Cu Prod = copper ore production
Other Failures = tailings dam failures and incidents other than Serious or Very Serious Failures
Serious Failures = Serious tailings dam failures
Very Serious Failures = Very Serious tailings dam failures

Sources: USGS Metal Statistics (2014a), Schodde (2010), ICOLD (2001), WISE (2015) & additional

The authors further conclude that, with respect to TSF design, the ability to recover smaller percentages of valuable minerals has not been accompanied by better TSF:[89]

> "The advances in mining technology over the past 100 years which have made it economically feasible to mine lower grades of ore against a century of declining prices have not been counterbalanced with advances in economically efficient means of managing the exponentially expanding volume of associated environmental liabilities in waste rock, tailings and waste waters."

Finally, with respect to studies on TSF dam failures, the most recent data, from 2022, comes to the same conclusions:

> "…since 1915, a total of 257 failures have been recorded with circa 2,650 fatalities and 250 million m^3 of contaminated residues released to the environment. Almost 50% (115 million m^3) of the released volumes have been recorded after 2000, with circa 640 fatalities. These data highlight that the challenge of safely storing mine waste is growing in scale and complexity"[90]

In other words, advances in TSF design and safety have not kept up with advances in mining, resulting in greater environmental risk associated with TSF from more recent construction. It is our understanding that this, in large part, has to do with the massive volumes of waste rock that are created at these open pit mines coupled with the increased incidence of heavy rainfall events.[91] The proposed Stibnite mine is no different. A recent study by Piciullo et al. sums things up quite neatly:

> "Tailings dams are commonly built incrementally to increase the storage capacity of the Tailings Storage Facility (TSF), usually without interrupting the mining activities. Dam management practices, lack of knowledge on tailings behavior and the poor

[89] Bowker, L., and Chambers, D., 2015. The risk, public liability, & economics of tailings storage facility failures. http://www.csp2.org/files/reports/Bowker%20%26%20Chambers%20-%20Risk-Public%20Liability-Economics%20of%20Tailings%20Storage%20Facility%20Failures%20%E2%80%93%2023Jul15.pdf
[90] Piciullo, L. et al. A new look at the statistics of tailings dam failures. Engineering Geology. 2022.
[91] Piciullo, L. et al. A new look at the statistics of tailings dam failures. Engineering Geology. 2022.

> performance of monitoring and management processes have resulted in disastrous tailings dam failures with human and economic losses, as well as huge environmental consequences to ecosystems and local communities."[92]

We bring up these failures with TSF to highlight that there is a very real chance that the TSF will fail while Valley County is still a populated human settlement. If that failure happens and the Salmon River is polluted by the waste rock and cyanide that is used to process the gold, then there will be a massive environmental cleanup that has to take place. That cleanup will have some stigma attached to it and it will, as we have described above, negatively impact Valley County. In fact, there does not have to be a spill from the proposed Stibnite mine for the stigma to impact Valley County. Just the presence of a gold mine with the potential to create a massive environmental disaster in Valley County is enough to have some stigma attached to Valley County. While we are not using this example as a direct corollary or forecast a massive TSF breach that poisons the Salmon River, or that there will be a 16 percent drop in tourism associated with the proposed mine as described earlier in this section, Valley County should certainly think long and hard about the potential for the proposed mine to impact their economy.

3.7 The Economic Value of High Quality Natural and Social Environments

As discussed *above*, residents of and visitors to Valley County recognize the important *economic* values associated with the natural and social setting of McCall and Valley County. The 2018 McCall Area Comprehensive Plan, developed under the guidance of the Valley County Commissioners and McCall City Council, reported on a survey of 3,000 residents and visitors it carried out as to what the values were that made Valley County an attractive place to live, work, and do business.

> "[T]*he number one value* for residents and visitors [was] the mountain character and small town feel of McCall. That character was defined by the natural setting, open space, agricultural lands, good air and water quality." "Access to nature-based amenities and an abundance of recreational opportunities were ranked second and third in the top reported values of survey participants for the Valley County-City of McCall area. These features are part of what make McCall a thriving destination for visitors and place to live for residents…"[93]

Our discussion also documented the high level of economic vitality that Valley County has been able to attain and maintain over the last half-century. Compared to all of Idaho's other non-metropolitan counties as a group, Valley County has significantly outperformed these other non-metropolitan counties. One often-used measure of overall economic "prosperity" in a particular area is *average real income per person*. That is calculated by summing up all of the annual income that flowed to individuals in the geographic area being studied and spreading all of that income over the total population, i.e. dividing total personal income by the population. If we are interested in how this average income per person has changed over time, the impact of inflation should be removed by deflating the income data to the current value of the dollar.

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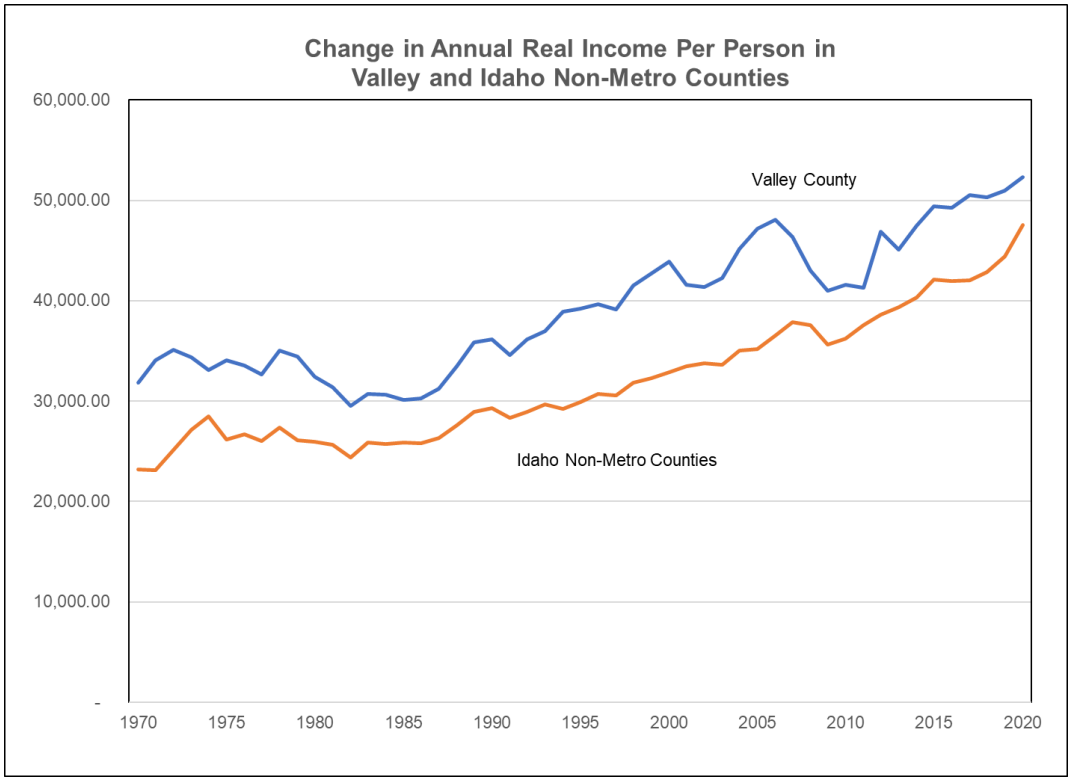
[92] Piciullo, L. et al. A new look at the statistics of tailings dam failures. Engineering Geology. 2022.
[93] Op. Cit. "Comprehensive Plan," p. 50.

Figure 11, below, shows this inflation adjusted average annual income per person in Valley County over the last half-century. As can be seen, over the 50-year period we have been using, Valley County always had a higher average income per person than the group of all Idaho non-metropolitan counties. The distance between the two lines in the chart shows the size of the advantage Valley County had over the whole group of non-metropolitan counties. That "bonus" average income that residents of Valley County received varied significantly over time, from a high of $12,000 per person per year to a low of $4,000. The average "bonus" to Valley County residents compared to the group of non-metropolitan counties was $7,400 a year per person in 2020 dollars. The sum of those benefits across all Valley County residents in 2020 was $87.3 million per year.

Of course, to the extent that the productivity of the local economy can be maintained, this "bonus" income will be a recurring annual benefit to the residents of Valley County. A stream of income over time, of course, is worth more than just one of those payments.

Figure 11.



Source: U.S. BEA, Regional Accounts, CAINC1 County and MSA personal income summary: personal income, population, per capita personal income. Adjusted for inflation using the Consumer Price Index.

The hypothesis offered to explain the relatively high measures of local economic vitality in the City of McCall and Valley County "Comprehensive Plan" was that the landscapes in and surrounding Valley County were largely managed for conservation purposes by Federal Agencies. These lands provided a wealth of recreational opportunities to residents and visitors. In addition, the City of McCall had managed to protect its small-town community "feel" despite the relatively fast growth and transformation of the city into a recreation destination. This

attracted visitors some of whom became residents and helped the city to hold on to its residents, supporting modest ongoing growth.

This hypothesis, that protected natural landscapes would stimulate local economic vitality was analyzed in a 2013 study, appropriately titled "The Effect of Protected Federal Lands on Economic Prosperity in the Non-metropolitan West."[94] "Protected" lands were public lands managed by government agencies for conservation purposes rather than commercial extractive activities. National Parks, National Wilderness Areas, wildlife refuges, and Wild and Scenic Rivers etc. are examples of such "protected lands". Valley County was one of the western non-metropolitan counties that was included in the study. The study calculated the part of the average income per person in each county that was due to the amount of protected federal lands in that county.

There were 284 non-metro counties in the west, containing 46.2 million acres of protected public lands. Sixty-one non-metro western counties contained no protected public lands. Only nine non-metro western counties contained more than one million acres of protected public lands. Valley County was one of those: Valley County had the third highest number of protected public acres in the west.

The study's conclusion about the impact of this high level of protected federal lands on average income per person in Valley County was that in 2010 dollars, average income per person in Valley County was $11,626 higher than it otherwise would have been. That added about one-third to what the average income per person in Valley County would have been without any protected public lands.[95]

As the study summarized its results:

> "These estimates represent the average effects of protected public lands after accounting for the presence of other public lands, the presence of other natural amenities, the degree of access to markets, the growth or decline in commodity sectors, and the presence of protected public lands in neighboring counties."[96]

If we adjust this impact on income per person in Valley County for inflation between 2010 and 2020 and use the population of Valley County in 2020, the implied total additional income due to the protected federal lands in Valley County was $163.1 million per year.

Figure 11, above, provides a less sophisticated measure of the advantage residents of Valley County have over the group of all non-metropolitan counties in Idaho as measured by real income per person. The average difference between real income per person in Valley County and the same income measure for the group of all Idaho non-metropolitan counties was $7,400 per person. The sum of these annual bonuses in income per person across all residents of Valley County would be $87.3 million per year.

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[94] Rasker, Ray et. al. 2013 The Journal of Regional Analysis & Policy, 43(2):110-122, MCRSA.
[95] "Per Capita Income Explained by Protected Federal Lands in the Non-Metro West." http://headwaterseconomics.org/land/protected-public-lands-increase-per-capita-income/
[96] Ibid. p. 118.

3.8 The potential impact of a spill on the Salmon River from the proposed Stibnite mine

We have spent some time and care in describing the link between the Valley County economy and the natural environment in which it is immersed. That economy is very sensitive to the potential for environmental degradation at the proposed mine. We will not go into details about what a potential spill might look like or how it might happen. We have already laid out the literature that describes how often a TSF releases toxic material in one form or another, and we have already discussed the stigma that comes with a mine and or a spill from a mine. What we seek to do here is to present a scenario where there is some sort of toxic release, or a series of releases, from the proposed mine and the South Fork of the Salmon River is impacted. Again, we will not talk about a specific event, but we will assume here that there is a need to mitigate the damage done to the river system and that it will take time to evaluate the damage and design and carry out remediation measures. For this exercise, we will assume that there is a series of spills over the life of the mine and that it takes an additional ten years to complete the cleanup once the mine has finished operations. We are not suggesting that the spill will be so massive that it takes ten years to clean it up. We are suggesting that remediation takes some time to be planned, carried out, and monitored. The extent of the pollution must be quantified, a plan to clean up the mine site and the downstream affected environment must be thought through, and then the cleanup process must be completed. Once the cleanup has been completed, it will take some time for the natural environment to recover, and it will also take some time for the stigma associated with the mine and the environmental degradation to abate.

In our scenario this process is assumed to take 25 total years. This is the 15 years that the mine is planning to operate as well as the time that it will take to close the mine, plus an additional ten years to clean up, allow the environment to recover, and the stigma associated with the mine and the spill to wear off. This is a time frame that is consistent with recent monitoring work on mine abatement work in the U.S. that showed that:

> "A new study based on long-term monitoring data from four sites in the western United States shows that cleanup efforts can allow affected streams to recover to near natural conditions within 10 to 15 years after the start of abatement work."[97]

In this scenario, the visitor and recreation sectors of the Valley County economy as well as the Non-Labor Income sector of the economy are assumed to take a relatively small hit. Those sectors of the Valley County economy, which we have already shown are directly related to the natural amenities of Valley County, will decline by 2 percent during this period. Again, we are not assuming that these sectors of the economy *will* decline by 2 percent if the mine is allowed to begin operations. It is quite possible that the impact could be far larger. What we seek to do here is to show that even if there is a relatively small decline in these sectors of the economy, it will have an impact that rivals the potential benefits that the mine could provide to Valley County. Recall from our earlier discussions that the Visitor and Recreation sectors of the Valley County Economy are about one-third of the total in terms of employment in 2020,[98] and that the

[97] Stephens, T. Long-term monitoring shows successful restoration of mining-polluted streams. UC Santa Cruz News Center. 5.4.2021. https://news.ucsc.edu/2021/05/mine-remediation.html
[98] Headwaters Consulting. Economic Profile System. Valley County Travel and Tourism. 2022.

Non-Labor Income represents about 58 percent of total personal income.[99] We are also not assuming that these sectors of the economy would be growing steadily as they have in the past, with a few exceptions associated with the Great Recession and the Covid Pandemic. We are taking a static view of the year 2020 and looking at the potential impact on the existing economy in Valley County if it did not change for the next 25 years. While this is an unlikely scenario, we are not attempting to accurately project what the Valley County economy will look like in 25 years. We are simply trying to show that a small slowdown in these important sectors can have an outsized impact on the overall county economy. Since both the Visitor and Recreation sectors and the Non-Labor Income in Valley County are likely to continue to grow, while we know that the proposed mine's resident workforce will not, we are confident that this exercise will produce a conservative result.

Remember that the proposed Stibnite mine is projected to directly employ 200 "local" people and that their total pay is projected to be $18.7 million annually.[100] When we look at the combination of the Visitor-Recreation sectors and the Non-Labor Income, it totals $447 million annually. If we assume that the proposed mine will run for the longer of the time periods given (15 years), then it will produce a total of $280.5 million dollars in direct pay to the 200 local workers. The total of the Visitor-Recreation sectors and the Non-Labor Income, over the 25 years that the stigma is associated with the mine, is $11.2 billion. In this scenario, the impact of the mine workers' direct pay is 2.5 percent of the total of the Visitor-Recreation sectors plus the Non-Labor Income. In other words, the benefit of having 200 highly paid miners in Valley County for 15 years could be almost completely wiped out by a 2 percent decline in the Visitor-Recreation sectors plus the Non-Labor Income.

This small modeling exercise should not come as a surprise. Above we discussed economic analysis by Rasker that showed that more than one -third of Valley County income per person was directly tied to the natural amenities in the form of public land, in and around Valley County. In the preceding sections we investigated the large amount of Non-Labor income and how people effectively "vote with their feet" by moving to areas with high quality natural amenities. Remember also that the Non-Labor Income represents a larger portion of the economy than labor income does in Valley County. Finally, it is important to remember the dramatic differences in response by local economies to environmental impacts that we presented in the stigma section of this report. Areas that become stigmatized because of industrial pollution of one kind or another can have vastly different impacts on Visitor and Recreation sectors of their economy, even when the two economies are geographically very close. While it is very likely that the Valley County Visitor and Recreation sectors and the Non-Labor Income sector of the economy are likely to continue to grow and will continue to represent a larger portion of the Valley County economy, there is no growth projected for the SGP work force. The mine plan seeks to remove all the economically feasible minerals found there.

All this evidence points to a basic modeling exercise that is likely to be a conservative estimate of the potential impacts of the proposed mine having some type of spill or toxic release that impacts the Salmon River. What this shows us is that even a very small impact to the Valley County economy, because of the proposed mine polluting the Salmon River, will very likely wipe

[99] Headwaters Consulting. Economic Profile System. Non-Labor Income. 2022.
[100] USDA Forest Service. Stibnite Gold Project DEIS. Page 4.21-22. August 2020.

out all of the benefits that Valley County has been told it would enjoy from the Stibnite mine being developed.

Section IV: Socio-Economic Volatility in Mining Communities

4.1 A Critical Review of the Perpetual Narrative That the Stibnite Mine Will be Good for the Environment and Supportive of a New Sustainable, Low Carbon, Green Economy

There has been a lot of coverage of the new "green economy" in the news recently and the supply chain shortages that have plagued the U.S. and the world since the beginning of the pandemic. To address some of these issues, and because the U.S. must procure many different things, including metals and metal ore concentrates, from countries with whom we are not on very good terms, the U.S. federal government has deemed certain minerals "critical" to our national security.[101] Antimony, a metal that is on that critical list for the Inflation Reduction Act, is one of the metals that could be mined at the proposed Stibnite mine and its production could allow Perpetua Resources a small tax cut, from the Federal Government for their production of antimony. How that plays into the new green economy will be something that we will explore a little later in this part of our report. Also in the Inflation Reduction Act are tax credits that will be given to Americans who purchase electric vehicles that are assembled in the U.S.[102] As many news stories have pointed out recently, the demand for electric vehicles, and the potential tax cut for Americans, far outweighs the current production of those vehicles which makes it "difficult or impossible to take advantage of the tax credits in the short term while manufacturers adjust."[103] As battery technology rapidly evolves and we are all forced to learn a little more about what makes up these new "green" technologies, minerals that formerly merely occupied a part of the periodic table, to which most of us never really paid much attention, are now ever present in the news. For example, lithium is hard to find in the U.S., although there are now many different mines that are vying for permits to mine lithium in the U.S. to help satisfy the demand for it. While there may be a long line of different mining companies trying to begin mining for lithium, the process is long and cumbersome, thanks in part to antiquated mining laws like the 1872 Mining Law that still governs federal mining claims. As states and local municipalities scramble to keep up with the proposed mines and understand where they might fit into the new green economy, the Federal Government is trying to sort out the complicated system that tries to both encourage mining on federal lands as well as make sure that it does not permanently degrade those same lands. In this part of the report, we will attempt to sort out where the U.S. is attempting to go to meet the demands of the new green economy and where the proposed Stibnite mine may fit in.

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[101] Congress. H.R. 5376- Inflation Reduction Act of 2022. 2022. https://www.congress.gov/bill/117th-congress/house-bill/5376/text?q=%7B%22search%22%3A%5B%22inflation+reduction+act%22%2C%22inflation%22%2C%22reduction%22%2C%22act%22%5D%7D&r=1&s=1

[102] Electrification Coalition. Inflation Reduction Act Impact on Electric Vehicles. https://www.electrificationcoalition.org/work/federal-ev-policy/inflation-reduction-act/

[103] Jones Day. The Inflation Reduction Act: Impact on Electric Vehicles and Transportation Industries. August 2022.https://www.jdsupra.com/legalnews/inflation-reduction-act-impact-on-1691338/

4.2 What is Perpetua Proposing to Mine?

While the Perpetua website advertises a variety of claimed benefits that the proposed Stibnite mine will provide to the U.S. and our transition to a green economy,[104] the fact is that the Stibnite mine *is* a gold mine and *not* an antimony mine. This is not meant to be a criticism; it is a simple statement of fact. Many, if not most, mines have other valuable trace metals or secondary objectives that can add real value in making the mine more profitable, and that is certainly the case with the proposed Stibnite mine. We mention this because, if you look at the Perpetua website, you might not know that the proposed Stibnite mine is a gold mine first and foremost. The name, Stibnite *Gold* Project should remind us as to what Perpetua is pursuing. However, much of what Perpetua is talking about is the antimony that they will potentially produce, or the cleanup of environmental damages from past mining, but that is not what the mine is being developed for. If we look at the mine in terms of the value of the resources that Perpetua plans to produce, which we feel is the most sobering assessment possible, then we can see that most of the value of the proposed Stibnite mine is in its potential for gold.[105]

About 11 percent of the total projected value of the mine is antimony, with about 1 percent being silver, and about 89 percent being gold. A different valuation process, carried out by the previous owner, Midas Gold, for its Feasibility Study, placed the value at 94 percent for gold, ¾ of a percent for silver, and about 5.5 percent for antimony.[106] Whatever the percentages are, the point is that this is a gold mine and not an antimony mine. This is important because this is not an antimony mine that is being developed to ease the pressure of the U.S. reliance on other countries for critical metals. This is a gold mine that will produce some antimony. That the U.S. happens to designate antimony, one of fifty critical metals to get the designation, is a coincidence that Perpetua is now trying to take advantage of by highlighting what would otherwise be a small component of its proposed mining operation. We are not denigrating the 'critical' designation that antimony has been given, we are simply pointing out that Perpetua is here for the gold and happy to talk about the antimony.

While it is true that Perpetua would like to produce antimony, it is unclear where the antimony will go once it is concentrated. When the DEIS was written the antimony's destination was not specified.

> "The antimony concentrate would be transported from the mine site for off-site smelting and refining. It is unknown at this time where or how the concentrate from the mine would be processed, and depending on the buyer, it could be processed by any number of companies, in any number of states or foreign countries."[107]

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[104] Perpetua Resources. Antimony is Critical. February 2022. https://perpetuaresources.com/wp-content/uploads/February-2022-Antimony-Its-Critical.pdf and Perpetua Resources. Antimony. April 2021. https://perpetuaresources.com/wp-content/uploads/Antimony-White-Paper.pdf

[105] USDA Forest Service. Stibnite Gold Project DEIS. August 2020. Pages 4.21-21. 2021.

[106] Midas Gold. Midas Gold Completes Positive Feasibility Study for the Stibnite Gold Project, Idaho. 12.22.2022. https://midasgoldcorp.com/investors/news/2020/midas-gold-completes-positive-feasibility-study-for-the-stibnite-gold-project-idaho/

[107] USDA Forest Service. Stibnite Gold Project DEIS. August 2020. Pages 4.4-9. 2021.

It would seem then that this source of antimony will not necessarily secure America's green energy future after all since its destination is unknown. Or at least it was unknown when the DEIS was published. Since that time, "Perpetua Resources entered into a partnership to supply a portion of our antimony production to support the commercialization of Ambri's liquid metal battery for large-scale storage of clean energy."[108] Here again, we are left wondering what "a portion of our antimony" really means and how much of the critical metal will stay within the U.S. We are not the only people that are questioning this claim about the antimony that Perpetua wants to produce. In an opinion piece in the Idaho Statesman in September of 2022, Will Tiedemann[109] asks many of the same questions that we do, taking it one step further stating:

> "First, Perpetua has not yet secured a domestic refinery to process the SGP antimony ore into a finished product of usable grade for battery applications. To our knowledge, no domestic refinery currently has the capability or capacity to do so. Instead, international refineries, likely in either Mexico or Oman, will have to be contracted to process SGP's antimony ore. By utilizing international refineries, it remains unknown whether Perpetua will retain ownership of their processed antinomy ore and to whom it ultimately will be sold."[110]

The only antimony processing facility in the U.S., is in Montana and that facility is "in a sold-out condition"[111] meaning that they cannot process any of Stibnite's antimony. Even if Ambri could process the antimony in the U.S., they do not, as of yet, have a commercial scale battery that is available for commercial use.[112] What the antimony from Stibnite will *not do* is go into the electric vehicles that we have heard so much about recently and will not be associated with the tax cuts that citizens can get from purchasing an electric vehicle or the battery related production location specifications of the Inflation Reduction Act. What has been laid out in the DEIS and by Perpetua, is that a small component of the total value of the proposed mine (11 percent) will be antimony. Of that small component, an unknown amount will go to a U.S. based battery manufacturer to produce "low-cost, large-scale batteries",[113] that have no current commercially available products, and the destination of the rest of the antimony is unknown and could go to "any number of states or foreign countries."[114] Again, the point that we are trying to raise here, is that Perpetua wants to run a gold mine but is happy to talk about the very small volume of antimony that *might be available* to support American efforts to reduce carbon emissions.

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[108] Perpetua Resources. Antimony: Powering our Clean Energy Future. https://perpetuaresources.com/antimony/

[109] A Conservation Associate of the Idaho Conservation League.

[110] Tiedemann, W. A mine to provide a rare mineral for batteries? Or for gold to make the rich richer.. Idaho Statesman. 9.12.2022. https://www.idahostatesman.com/opinion/readers-opinion/article265465541.html

[111] USAC. Home. 2022. https://www.usantimony.com/#:~:text=*Our%20antimony%20smelter%20and%20precious,where%20the%20plant%20is%20located.

[112] Ambri. Ambri Announces Its Innovation Hub - Expanding Manufacturing Capacity with New Facility in Massachusetts, a Major Milestone in Its Commercialization. 6.2.2022. https://www.prnewswire.com/news-releases/ambri-announces-its-innovation-hub--expanding-manufacturing-capacity-with-new-facility-in-massachusetts-a-major-milestone-in-its-commercialization-301560038.html

[113] Perpetua Resources. Antimony: Powering our Clean Energy Future. https://perpetuaresources.com/antimony/

[114] USDA Forest Service. Stibnite Gold Project DEIS. August 2020. Pages 4.4-9. 2021.

4.3 Antiquated mining laws

As the country attempts to wean itself from the critical metals that we procure from rather dubious sources, there has been a rather strong pull to look at the permitting process for mines in the U.S. On the 150th anniversary of the most notorious of U.S. mining laws, the General Mining Law of 1872,[115] the Biden administration convened an interagency working group (IWG) to review the antiquated law.

> "This meeting was the first external engagement of the Department of Interior-led Interagency Working Group on Mining Regulations, Laws, and Permitting, which is charged with providing recommendations to Congress on how to reform the mining law to ensure new production meets strong environmental standards throughout the lifecycle of the project, ensure meaningful community consultation and consultation with Tribal nations, and reduce the time, cost, and risk of mine permitting. "[116]

Anyone that has been involved in the mine permitting process can see the immediate need for this type of reform. Likely anyone that takes the time to critically read this report will be able to agree with this sentiment also. This is reform that was asked for by the Government Accountability Office in 1989.[117] An example of part of the 1872 law that needs reform, is the money, or lack thereof, that is paid to the Federal Government for a mining claim. Currently, somewhere between $2.50 and $5 per acre is paid for mining claims on federal land depending on whether it is a "lode or placer claim."[118] The IWG is made up of experts from all different fields and has a list of objectives too long to quote in this report. What is clear from their goals is that they want to make sure that the U.S. gets a fair return for allowing mining to take place on its land, that the natural environment will be looked out for during the construction, operation, and closure of mines, that the land be restored, the environmental problems mitigated, and that the currently convoluted process of mine permitting be sped up. We bring this up here because all of this is needed, in this specific mine, although it is unlikely to help in this case. Any objective viewer can see that the U.S. needs to be able to source some of its critical minerals from the U.S., but we need to be able to do so in a fair and environmentally responsible way. That is the rub in the argument for the proposed Stibnite mine. If they were going after critical minerals that would help the U.S. effort to transition to a greener economy, and if the mine were permitted in a way that could ensure that the water, land, and environment would be looked after during the entire mining process and once the mine is gone, as the revision of the antiquated 1872 Mining Law promises, then perhaps this mine would be worth pursuing. That question, however, is not one that we have been asked to answer. What we are trying to point out is that the Federal Government is trying to reform the mining laws so that these questions are not so hard to

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[115] BLM. About mining and minerals. https://www.blm.gov/programs/energy-and-minerals/mining-and-minerals/about

[116] The Biden Administration. Readout of the White House's First Stakeholder Convening on Mining Reform. 5.11.2022. https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/11/readout-of-the-white-houses-first-stakeholder-convening-on-mining-reform/#:~:text=The%20General%20Mining%20Law%20of,it%20to%20promote%20westward%20expansion.

[117] GAO. Federal Land Management: The Mining Law of 1872 Needs Revision**. 3-10-1989.** https://www.gao.gov/products/rced-89-72

[118]Penn State College of Earth and Mineral Sciences. Lesson 2.3: The General Mining Law of 1872 (as amended). https://www.e-education.psu.edu/geog000/node/8

answer, and if the answer is that the mine should be permitted, then it is done in a much safer and more expedient fashion.

In conclusion, we find that the proposed Stibnite mine is a gold mine with the value of the gold representing at least eight times that of antimony. The antimony, although designated a critical metal by the Biden administration, will largely go to an unknown refinery, likely outside of the U.S. The antimony that stays within the U.S., which is an unspecified fraction, will be sold to a company that wants to produce industrial scale batteries and not, as many will assume, batteries for the electric cars. The mining laws within the U.S. are antiquated and complicated and put far too large of a burden on local areas that will host the mines. Because of this, the Federal Government is in the process of overhauling the 1872 Mining Law. It is the hope of the Biden administration that when that law is revised, it will allow local communities, like Valley County, to make sure that the mines are responsibly developed to ensure that the U.S. can source the critical metals that it needs while also ensuring that the local environment is protected, and the mining companies fairly compensate U.S. citizens for the leasing of public land and removal of valuable minerals. While it is likely that the mining laws will not be reformed in time for the decisions that need to be made with respect to the proposed Stibnite mine, it helps to highlight the complicated nature of deciding to open a metal mine and what the impacts, short and long term, will be on local communities.

4.4 Volatility in the Metal Mining Market

Metal mining is notoriously volatile, and gold is a charter member of the club of volatility. In the last 50 years or so, the price of gold has fluctuated from a high, in real 2022 dollars, of a little more than $2,500 per ounce in January of 1980, to a low of $264 per ounce in August of 1970. Put another way, the price of gold has fluctuated by almost an order of magnitude in the last 50 plus years. Lest one think that we are cherry picking the data, and it is only low at the beginning of the last fifty years which was shortly after the United States gave up on the Gold Standard, in April of 2001, gold fell to $430 per ounce. For a more complete view of things, see figure 12 below.

Figure 12.

Source: CPI is From the Federal Reserve Economic Data (FRED) and is based on CPI for all urban consumers: all items. The gold price is from LBMA Precious Metal Prices. https://www.lbma.org.uk/prices-and-data/precious-metal-prices#/

Keeping the figure above in mind, even if we only look at the volatility of the last 5 years, we can see that there was a high of $2208 per ounce in August of 2020 and a low of $1382 per ounce in September of 2018. The difference between the two, separated by less than two years, is $826, which is 60 percent of the lower, September 2018 value. Anyone with a basic understanding of business would be able to tell you that if your business loses 83 percent of its value over a two-year period, as was the case between 2000 and 2018, that the business is going to have trouble surviving. Of course, the reciprocal can happen also. Perhaps you would rather focus on the fact that the same hypothetical business increased its value by more than a factor of 5 over a ten-year period, between April 2001 and September 2011? For the point that we are making, both are a symptom of the same issue, and that is the volatility of international metal markets. In this case it is the international gold market, but the same can be said about most of the metal markets. Metal markets are notoriously volatile.

In this case, when we are talking about the potential to have the Stibnite mine located in Valley County, we are then talking about the mine's ability to continuously operate in the face of the roiling seas of the international metal market. If we look back to Figure 12 again, we can see that the horizontal portion of each of the gridded boxes in the background of the figure can be representative of the 5 years. Since the mine plans to operate for 12- 15 years, the lifetime of the mine can then be thought of as three grid squares.[119]There are a couple of periods where one might be able to argue that there was continuous growth in the gold market, but for most 15-year periods, there is rather serious volatility. In the face of such volatility, there are only a couple of things that can be done. If the price of the gold is increasing, then you might well

119

attempt to increase your output. If the price is decreasing, then you will likely reduce your output or idle your mine. Now, clearly this will not happen if the price of gold changes by some very small amount, as it does daily. However, if, over a 3-year period, the value of the gold that you produced dropped by 63 percent, as it did between 1980 and 1982, then you would be very likely to idle your operation in hopes of a speedy market recovery.

The reason that this is important to consider, is that metal mines that are idled do not pay the people that work in the mines. If those people recently moved to your local community, as the DEIS and Perpetua assume, then your community will have a lot of newly unemployed people in it. While we have shown that the fiscal contributions to the local tax base are relatively small, totaling $300,000 per year while the mine is operating, if Valley County comes to depend on this revenue, then a closed mine would be an added cost that the County would have to shoulder. If we assume that the multipliers are correct, as discussed in section 2 of this report, then there will be six tenths of a job created for every direct job at the mine. If Perpetua will hire 200 people to work in their mine, this would then be 120 local people who would be indirectly working for the mine in the local area. If the mine were to idle, for example because the price of gold drops dramatically, then the local area would have 320 workers that are now unemployed. As we have pointed out repeatedly, we believe that most of the workers will be living in the greater Boise area or the U.S. in general, but if you believe Perpetua, then many of these people will live in Valley County. It is worth at least considering the idea that hundreds of people would be laid off as the mine is idled due to low commodity prices.

However, perhaps the larger issue, and one that incorporates the ups and downs of the international metal market, is the economic wellbeing of mining dependent communities in the U.S. over a longer period.

4.5 Taking a Larger View of Things: Mining Dependence and Economic Well Being

Mining has long been described as having a boom followed by a bust. The figure on gold prices above clearly shows at least 3 large boom bust periods and a host of smaller perturbations in the price over the last 50 years. When we think of the impact of those commodity prices on a mine, those booms and busts are generally, but not always, directly related to production. The mine produces as much as possible when the price is high and slows down production as much as possible when the price is low. With some mines, for example, the production of natural gas in the unconventional wells across the U.S. in the last 20 years, this has sometimes meant producing at a loss. In those cases, it may be quite hard to idle a well once it is tapped and there may be a shortened timeline associated with the wells as they are interconnected with other wells. In those cases, the extraction companies may be forced to produce at a loss to recover as much of their costs as they can. However, gold mines generally do not operate in this fashion. In some cases, it is that the resource in question has played out, but often it is because the value of the commodity drops or rises significantly. Often, mines can come back online when the commodity prices rebound, but there may be a cost associated with this price volatility to those communities that have mines in them.

While mining dependent communities, when they are mining, often have higher than average wages and salaries associated with that mining, they also live in fear of the next drop in commodity prices. One could imagine being a County Commissioner and being reticent to

invest in schools for the children of miners that may not be around in the next five to ten years. The same can be said about most shared public infrastructure. Things like sewers, hospitals, roads, the size of the police and fire departments etc. All those public services are paid for through taxes that are largely collected by local governments, and they are directly proportional to the number of taxpayers that they are collecting from. They are sized and staffed based on the expected load or population that will be using them. While there might be an immediate need to expand some of those services while a mine is in operation, and there are miners to help shoulder the additional burden that they put on a municipality, when those miners go, the local governments may be stuck paying for those upgrades or increases in services that they no longer have the same demand for. There is also the very real possibility that when the mine leaves, the community and the natural environment are in worse shape than before they came, and there is a real and sustained negative impact on the local community indefinitely. This is exactly what has happened to many different mining communities and whole mining regions across the U.S. The other option that a local municipality has, is to not pay for the upgrades or increases and deal with an increased demand for the same local service, while the mine is operating. Local communities must decide if there is enough time to pay for the investment that is necessary to accommodate for the increased use of the community infrastructure. This can be the tradeoff or quandary associated with the mining industry in a small community. There is a real possibility to have local people receive higher than average pay, but that pay will be dependent on international metal markets and the resources that are available locally to be mined.

There are clear examples of historic mining districts that have not fared very well, even though they created immense wealth in the time that they operated, and all we need to do is look at other mining dependent areas in the United States for examples of what has happened in the past. Before we present a few of the larger studies that have looked at these topics, if you have traveled to some of the classic examples of mining dependence in the U.S. cities like Butte, MT., then you will understand what the outcome looks like. Butte was once described as the “Richest Hill on Earth” and is now a struggling hard scrabble town that has, as its chief point of reference, the monstrous Berkeley Pit which is the remains of an open pit copper mine that dominates historic Butte. There is the Copper Triangle in Arizona, the Appalachian Coal fields of the east coast of the U.S., the Bakken oil shale boom of North Dakota and Montana, and on and on. In fact, there are whole states that have had their economic hopes pinned on resource extraction and have recently felt the pinch of that dependence. The state of Alaska, long famous for giving every resident a “dividend” from the production of oil on the North Slope of Alaska, now finds itself in a financial crisis. Alaska, now infamous for its dependence on different commodities, has chased furs, gold, military infrastructure from World War II, and now oil to pay little to no property or income taxes. Recently however, Alaska, in the face of flagging oil production and a drop in the price of oil, has found itself nearly bankrupt having pinned almost its entire fiscal health on the taxes associated with the production of oil.

> “The national economic expansion from 2009 to 2020 was the longest recorded in the history of the United States. The unemployment rate fell dramatically, and real gross domestic product (GDP) steadily increased. However, many petroleum-producing states experienced local recessions during this period because of declining oil prices. One of these states was Alaska, which was in a recession from March 2015 to April

> 2018…. Falling oil prices also hurt the state government, which relied on petroleum (oil and gas) for 92 percent of its total revenue in 2011."[120]

Clearly Valley County has not pinned 92 percent of the total revenue that it collects on the proposed Stibnite mine, but the comparison is instructive. Depending on a commodity, whose value is linked to the international commodity market, is necessarily betting that the market will remain strong over the time that the governments or communities are most dependent on it. In the case of Alaska, this worked well when Alaska was producing large volumes of oil and the price of oil was relatively strong. Recently, it has not worked well for them, as their oil fields have been depleted, their production went down dramatically, and the price of oil began to fluctuate more widely. There is a large and growing body of literature that looks at the impact of mining on the socioeconomics of different communities. Freudenburg, in 2003, did a meta-analysis of all the available literature related to mining and local economic well-being: "In this article, we assemble literally all of the relevant quantitative findings on mining that we have been able to identify in published and/or technical literature from the United States."

> "…in the case of poverty or unemployment rates—as well as for the overall body of findings—the results are consistently and significantly negative, whether the neutral/indeterminate findings are combined with negative ones or omitted from the equations altogether. Until or unless future studies produce dramatically different findings, there appears to be no scientific basis for accepting the widespread, "obvious" assumption that mining will lead to economic improvement."[121]

Although 2003 was now almost two decades ago, the results certainly still appear to hold true. Given the evidence from Freudenburg, it would appear prudent to have as diversified an economy as possible, and not look to mining for the "obvious" assumption that mining will lead to economic improvement, since their analysis showed quite the opposite. In the context of the Valley County economy, which is relatively diversified and is no longer dependent on the extractive industries, it would be wise to make sure that Valley County stays diversified. In the context of the necessary upgrades that may be necessary to accommodate for the increased presence of miners associated with the proposed mine, it would be prudent to think long and hard about what investments will be made to accommodate the demands to extend government services for them, since there is no obvious economic improvement that will come with the mine, at least empirically. When looking at a very large geographic area, that of Appalachia, that has been dominated by the coal industry for much of the last 100 years, it appears that mining dependent counties show slowed economic growth and less educational attainment.

> "…the coal industry provides incentives for less educational attainment, and that lower educational attainment levels in coal-producing counties explain part of their lower growth rates."
>
> And

[120] U.S. Bureau of Labor Statistics. Oil, budgets, migration, and retirees: Alaska's 2015-18 recession. https://www.bls.gov/opub/mlr/2022/article/oil-budgets-migration-and-retirees-alaskas-2015-18-recession.htm

[121] Freudenburg, W. et al. Mining the Data: Analyzing the Economic Implications of Mining for Nonmetropolitan Regions. Sociological Inquiry. 2003.

> "No doubt, coal mining provides opportunities for relatively high-wage employment in the region, but its effect on prosperity appears to be negative in the longer run. Our results suggest that a significant portion of that negative effect may be attributed to coal-industry disincentives to the accumulation and regional retention of human capital."[122]

According to the quote above, from Douglas et al., coal mining is associated with lower educational attainment for the people of Appalachia as well as a slowed growth rate. The "natural bounty" of the earth cannot be assumed to be a gift that all communities should receive with open arms. One could argue that gold mining in Valley County, ID. is a far cry from Appalachia, however the fact remains that communities that are faced with a decision on whether to allow mining on their local lands would do well to collect as much evidence as they can of the experiences of others. The potential benefits are well known, and Perpetua will tell you exactly what they are. All one need do is look at their website or look at the socioeconomic section of the DEIS, which was based on work that Midas Gold and Perpetua paid to have done. Here we will not seek to affirm or deny the validity of that work. What we are seeking to do is to say that we agree that the jobs that the miners will get will pay them well above average wages, but there will also be *costs* associated with having the mine in Valley County, and those costs have not been explored. Here we are attempting to present some of the economic evidence of the impact of mining on the communities that live with those mines. We have already gone over some of the potential "maladies" that mining related communities can face. In that literature, much of the impact of a mine on a local community is described through the lens of the miners that move into the local area. Those miners are predominantly male, young, well paid, don't necessarily have ties to the local community or family with them, and work odd hours, for example two weeks on and two weeks off. All these things may contribute to them not fitting in with a local community as well as more traditional in-migrants might. Social scientists have looked at things like drug related mortality rates across all the U.S. to try and figure out what factors may play important roles in those deaths. A recent study tried to control for all the possible different factors that could contribute to drug related death in the U.S. and found that the single largest contributing factor was whether the community was dependent on mining.

> "The average county-level age-adjusted drug-related mortality rate was 16.6 deaths per 100,000 population (2006–2015), but there were substantial geographic disparities in rates. Controlling for county demographic characteristics, average mortality rates were significantly higher in counties with greater economic and family distress and in counties economically dependent on mining."[123]

This rather remarkable finding, found that mining was associated with a greater than 13 percent increase in "age adjusted mortality rate." This was by far the largest increase of the labor markets that were analyzed and was about a half a percentage point behind the largest age adjusted mortality rate increase which was associated with "family distress." We are not social workers or sociologists who are trying to tell you that if the proposed Stibnite mine goes in there will then be massive increases in drug overdoses. What we are trying to point out is that there is

[122] Douglas, S. and Walker, A. Coal Mining and the Resource Curse in the Eastern United States. Journal of Regional Science. 2016.
[123] Monnat, S. Factors Associated with County-Level Differences in U.S. Drug-Related Mortality Rates. American Journal of Preventive Medicine. 2018.

a very clear link between mining and the communities associated with the mines. Mines are generally in smaller towns in rural portions of the U.S. and those places may have a harder time dealing with some of the negative impacts that come with the mine. As Perpetua has correctly shown, those people who reside in Valley County *and* have mining jobs will have significantly higher than average pay when compared to other Valley County residents. This is known. What is unknown, and what we are trying to lay out, is what some of the costs associated with having the Stibnite mine in Valley County will be. From the economic and social science literature, there will be costs in the form of retarded economic growth, increased pressure on services that Valley County provides, reduced educational attainment, and increased negative social interactions as a transient workforce tries to integrate into the local community. What we have also shown is that Valley County's economy is currently thriving and the reason that the economy is so robust, in large part, is because of the natural amenities that Valley County has. The possibility of short-term gain associated with the proposed mine should be weighed against the potential for long term harm to an otherwise thriving economy.

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