

## WHAT DOES THE RESEARCH SUGGEST?

When trying to better understand the potential impact of a proposed frac sand mine may have on the local community, it is helpful to examine the works of others who have studied the issue. Somewhat surprisingly, there has been a notable decline in the number of studies examining U.S. mining. Most recent studies focus on large scale international operations which provide very little comparative insights for the smaller frac sand mining operations in Wisconsin. Most studies that can contribute to our understanding of the effects of mining on income, job migration, transportation, and land ownership are largely qualitative with the exception of the effects of mining on property values. In other words, other than a small handful of studies looking at the impact of mines on property values, most studies are detailed case-studies of individual mining communities. What follows is a summation of general findings pervasive in the mining literature that pertain to the effects of mining on four key local elements: housing prices, transportation, income, and job migration.



Recent literature suggests that mining seems to have a negative effect on the value of property within a close proximity to the mine. The farther the property is from the mine, the less likely local mining activities would be detrimental to housing prices. While this conclusion seems less than surprising, the researchers advise caution in broadly applying these conclusions: unique community characteristics is important in discerning accurate predictions.

Although frac sand mining in Wisconsin is a relatively new phenomenon there are two particular studies that are helpful as we try to understand the potential effects of mining on Wisconsin communities. In a statistical analysis of the impact of surface coal mining on housing values Williams (2011) found that the greater prevalence of mines contributed to significant decreases in county property values. Williams estimated that each additional surface mine decreases housing values in the county by between .34% and 1.7%. While lacking exact figures, this study also finds a clear negative relationship between the proximity of homes to a mine and their associated values. Similar findings are proposed in another study concerning a gravel mine operation in Richland Township, Michigan. Erickcek (2006) purports that a proposed gravel mine will reduce property values by \$31.5 million in aggregate. This estimate encompasses over 1,400 homes, making up 60% of total residential properties.

Transportation of materials is a very influential factor when attempting to discern the effects of mining on local communities. In Erickcek's (2006) study of gravel mine operations in Michigan, Erickcel notes that there are many associated activities aside from the hiring of hauling drivers. A study that focuses on the effects of a proposed haul route to a quarry on nearby residences concludes that property owners are willing to pay more to be farther from the route. Specifically, property owners' willingness to pay to be farther from the route increases at 4.94% per kilometer or roughly 7.92% per mile. In essence people are less willing to live near either the mine itself or haul routes and this is reflected in lower property values in close proximity to either.

Mining wages typically are high relative to other sectors in the local economy. The general consensus in the available research literature is that mining leads to an increased level of average income. A number



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of studies find that smaller amounts of jobs are being created by new mining operations due to the increasingly mechanistic nature of the industry. Recent mining endeavors are associated with capital intensive activity, thus, creating relatively higher wages for fewer workers. Also, due to the volatility of the mining industry and its intrinsic association with commodity prices, one tends to find a lower concentration of other activities in mining dependent counties. A specialized rural economy in mining, therefore, tends to be more unstable relative to an economy with diversified economic activities.

Numerous studies, such as the work by Freidenburg and Wilson (2002), indicate that mining activity is quite volatile and heavily correlated with the boom-bust cycle of commodity prices. Labor migration is associated with this volatile cycle inherent to mining activity; high rates of population increases mirror the increased demand for energy and minerals. In a study done analyzing the migration patterns of rural Appalachia, a region noted for its coal industry, Cushing (1999) finds that in times of increased demand for coal the in-migrants to the region are not conducive for future economic growth. The majority of these in-migrants could be characterized as older and/or less educated individuals. Thus, when mining operations slow or close these workers are less competitive for other employment opportunities and can become a hindrance to future economic growth.

The available research on U.S. mining impacts on local communities points to three general conclusions:

- ◆ Land prices tend to be depressed close to the mines and haul routes.
- ◆ Jobs tend to be fewer but higher paying and the low skill jobs tend to be taken by low skilled less educated in-migrants.
- ◆ Mining dependent local economies tend to be more unstable and as such less likely to experience spin-off development.

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When considering the development of a sand mine there are several issues that the community should consider. These range from the potential economic benefits associated with employment opportunities to the compatibility of open pit mines with tourism and environmental concerns. When considering these issues it is important that local elected decision-makers and concerned citizens have access to the best information available. This series of factsheets is aimed at providing some insights into a range of issues surrounding the development of frac sand mines.