

I. Executive Summary

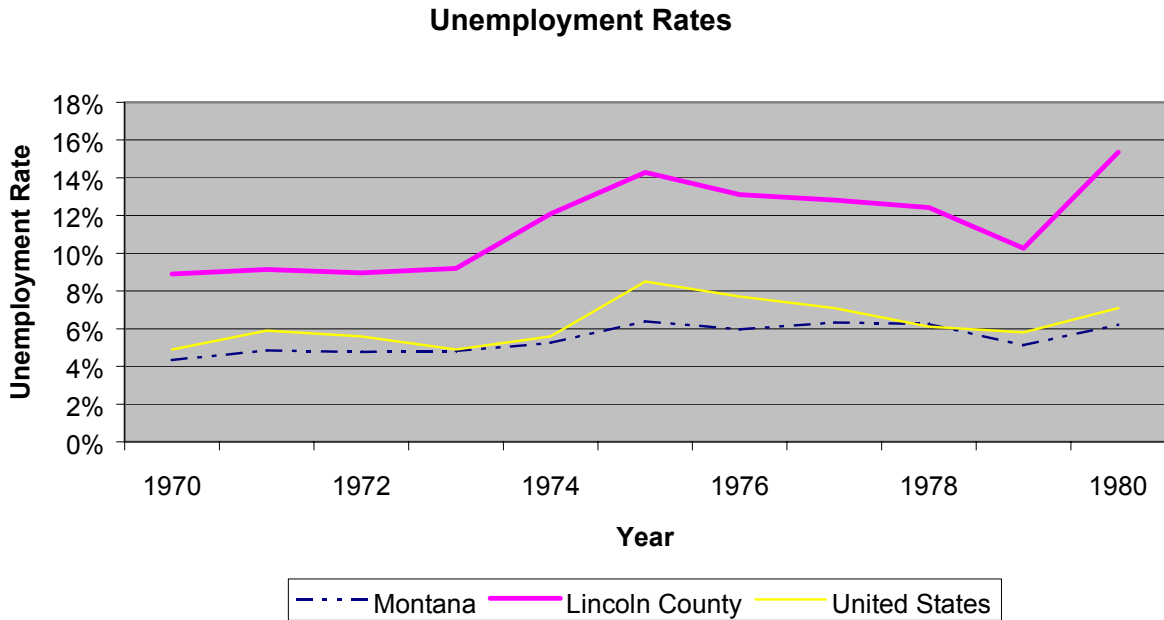
A small mining company whose stockholders include ASARCO, Inc. (American Smelting and Refining Company) plan to re-open the dormant Troy Mine and permit and open the proposed Rock Creek mine in northwestern Montana to produce silver and copper. Nearby, Noranda Minerals is attempting to permit a similar operation, the Montanore mine. This type of mining activity is not new to the region. ASARCO operated the Troy mine from 1981 to 1993, before shutting down due to declining mineral prices. This report examines many of the events surrounding the Troy mine—from before it was built in the late 1960s up until the present day.

It is not often that a rural community facing the large economic and social impacts posed by several mines has the opportunity to examine virtually the entire life-cycle of a similar mine in the same locality. Social scientists are not used to the luxury of having the real-life equivalent of a controlled experiment to estimate the impacts of proposed ventures on communities. But, Lincoln County, Montana can look to the historical record of the Troy mine, and use it as an invaluable tool in estimating the likely impacts of potentially having three very similar mines operating in or near their county.

The economy in Lincoln County, Montana during the late 1970s was not healthy. Personal income was low, unemployment rates were high, and the county lost population during the periodic recessions affecting it. Figure A shows the unemployment rate of Lincoln County compared with the United States and the State of Montana. County employment was dominated by resource extractive industries and government. As seen in Figure B, the county's economy was prominently represented by agriculture, forestry and fisheries, mining, and a manufacturing sector that was heavily dependent on logging. The aggregate 29 percent share claimed by these sectors probably understates the economic impact of the extractive industries in this region—especially logging. Taxable property values seen in the selected districts in Lincoln County were relatively stable throughout this pre-mine period. Federal government payments to Lincoln County from National Forest activities within the county had increased markedly in the mid-1970s—up to about the \$5 - \$7 million level annually in the latter part of the decade (1999 dollars).

Troy mine silver and copper production was predicted to last from 1981 through at least 1996. Estimates from the Troy mine Environmental Impact Statement (EIS) showed that the mine would produce total annual tax payments of about \$2.2 million (1977 dollars). About one-half of the annual \$2.2 million in taxes was projected for Lincoln County in property taxes. The EIS estimated that another \$200,000 annually would go to Lincoln County during mine production for the Gross Proceeds Tax. The state of Montana was expected to receive the remainder of the \$2.2 million for various other taxes. Much of the proceeds from one of the state-collected taxes—the Metalliferous Mines License Tax—was to be used in Lincoln County to help mitigate mine impacts. The EIS also projected that taxable values in the school district containing the mine would increase and possibly lead to a decrease in the tax rate in that area.

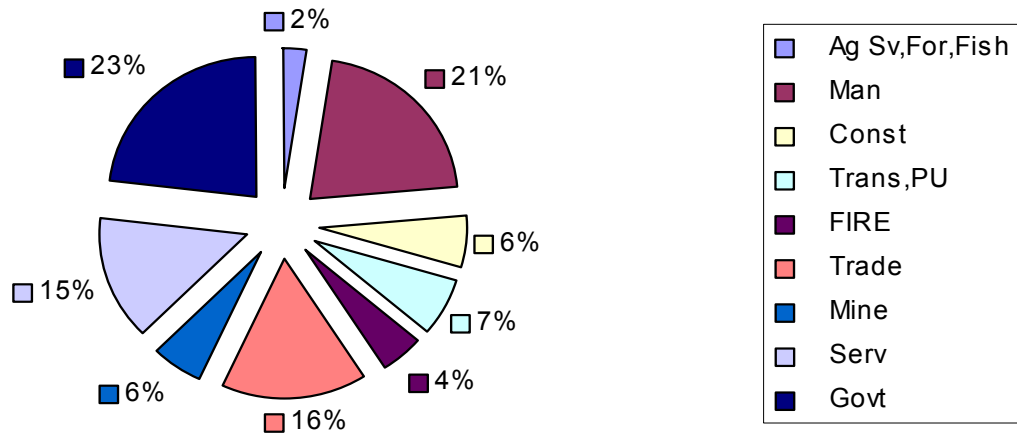
Figure A – U.S., Montana and Lincoln County Unemployment Rates, 1969-1980



Source: Montana Department of Labor, Office of Research and Analysis, Local Area Unemployment Statistics, U.S. Bureau of Labor Statistics, Office of Employment and Unemployment Statistics, 1999.

Figure B – Lincoln County, Montana Non-agricultural Employment Structure, 1980

Nonfarm Employment, Lincoln County, 1980

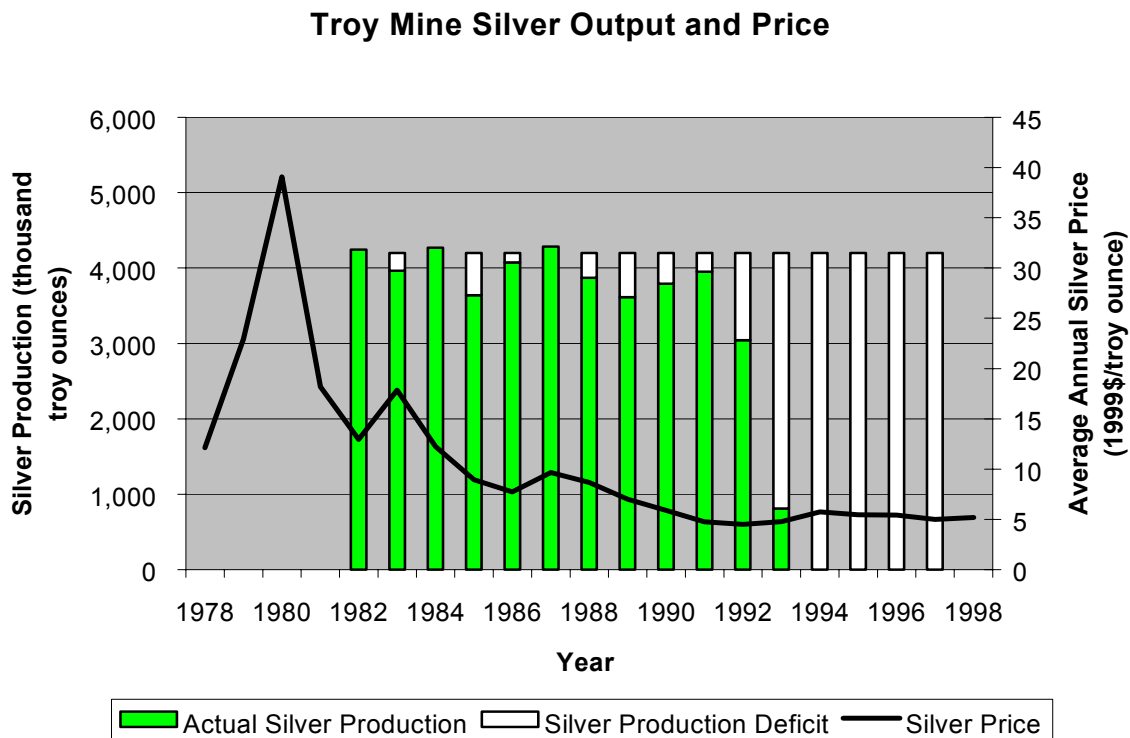


Source: U.S. Department of Commerce, Economics and Statistics Division, Bureau of Economic Analysis, 1999.

The Troy mine was not expected to significantly increase population in county. As a result, impacts on schools, housing, water, sewage, and other county services were not expected to trigger additional construction.

Silver and copper production at the Troy mine actually occurred from 1981 to 1993, three years short of predictions. Silver production during the mine life to date totaled about two-thirds of that projected in the EIS, as seen in Figure C. The solid line showing the declining silver price is a major reason for the premature shutdown. Copper production fared somewhat worse—totaling less than 60 percent of projections.

Figure C – Troy mine Silver Output, Production Goals, and Silver Price

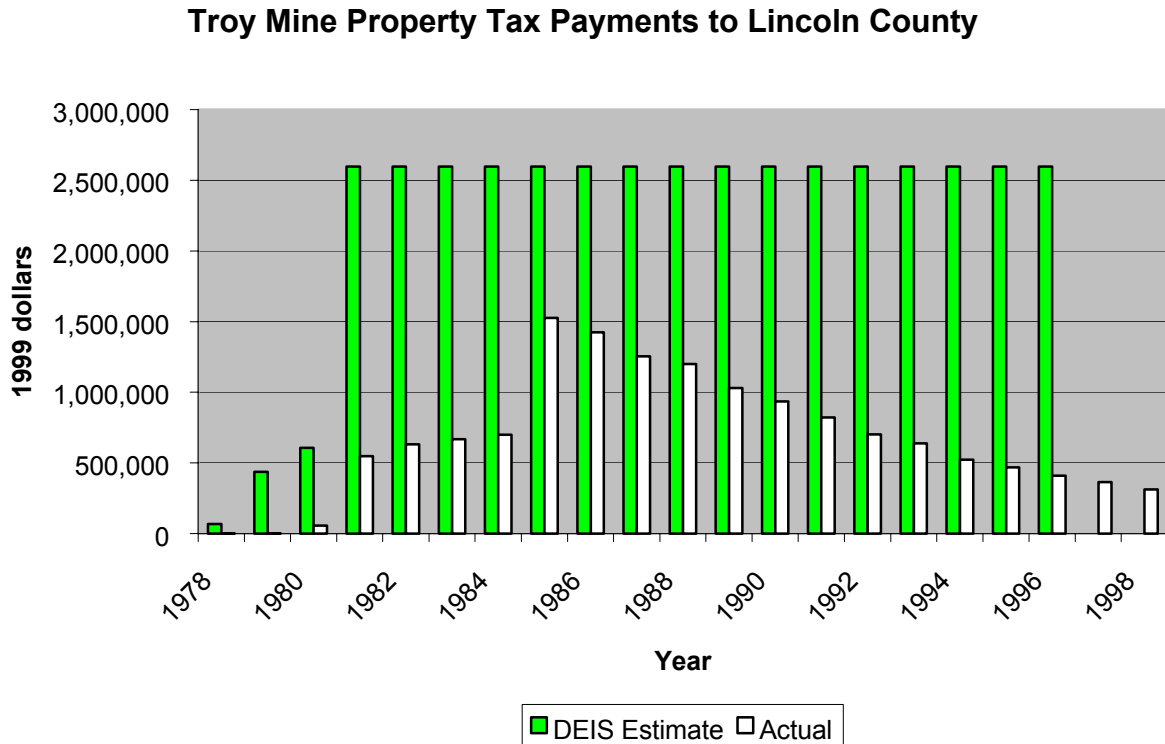


Source: EIS, 1978, and ASARCO, various years, annual reports.

Property tax revenues never came close to reaching the impacts projected in the EIS, as portrayed by Figure D. Cumulatively, the Troy mine brought in less than 30 percent of the amount expected. The mine currently is in standby mode, but still paying property taxes.

Gross proceeds taxes, payable by the mine to the county, actually exceeded estimates in some years, but in aggregate amounted to about 60 percent of EIS estimates. The total amount of taxes paid to the state of Montana is not a matter of public record. However, one report about the Metalliferous Mines License Tax implies that, at most, 20 percent of the EIS-estimated amount was actually paid.

Figure D – Projected EIS and Actual Troy mine Property Tax Payments.

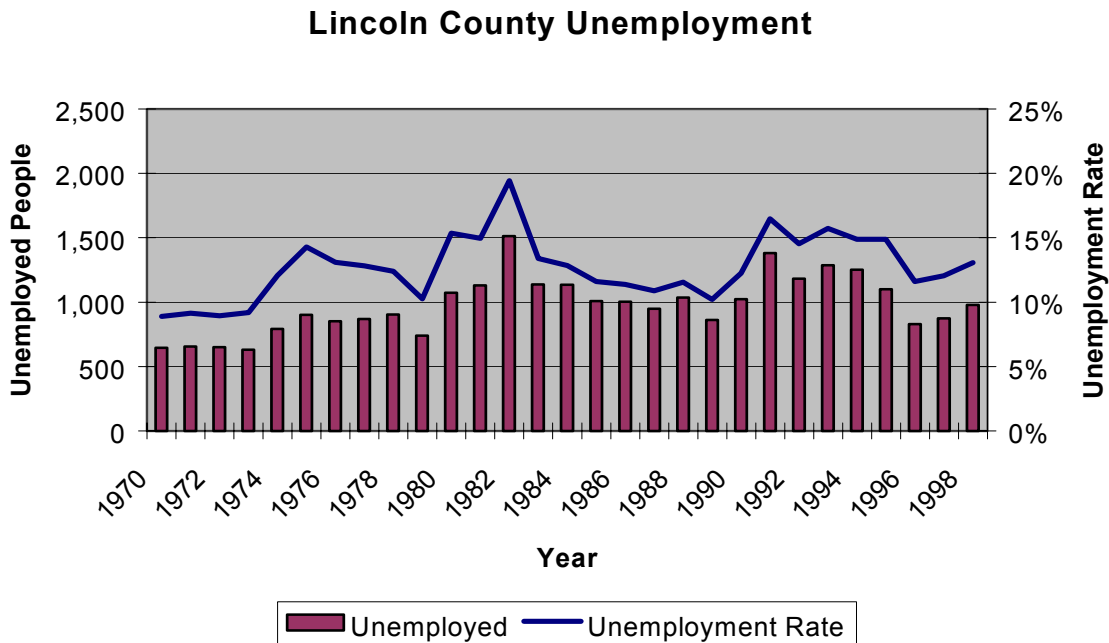


Source: Lincoln County Treasurer’s Office, 1999, personal communication.

Personal income in Lincoln County during Troy mine production did not improve relative to trends seen in the U.S. as a whole and Montana. In fact, Lincoln County personal income per capita plummeted during the study period and in 1997 was only 56 percent of the U.S. average, and 72 percent of the Montana average. Population changes during the mine life were actually less than estimated—probably largely due to a loss in population as a result of a severe recession in the timber industry.

While the mine did increase the employed labor force, unemployment and the number of unemployed people in the county leapt upwards during the Troy mine’s early years. Part of the reason for the jump in those two measures was the major recession in the logging industry. Some of the recently unemployed loggers were re-trained to work in the mine. Figure E depicts the employment and unemployment trends of Lincoln County during the study period. A likely significant factor in the jump in the unemployment rate to 19.4%, and in the number of unemployed from 1,100 to 1,500 in one year, was the number of unsuccessful job seekers that moved to Lincoln County in hopes of landing a Troy mine job. Nevertheless, unemployment rates in Lincoln County have always been well above analogous national and state rates, often more than twice the national and state figures, with and without the Troy mine.

Figure E – Lincoln County Unemployment Data



Source: Montana Department of Labor, Office of Research and Analysis, Local Area Unemployment Statistics, U.S. Bureau of Labor Statistics, Office of Employment and Unemployment Statistics, 1999.

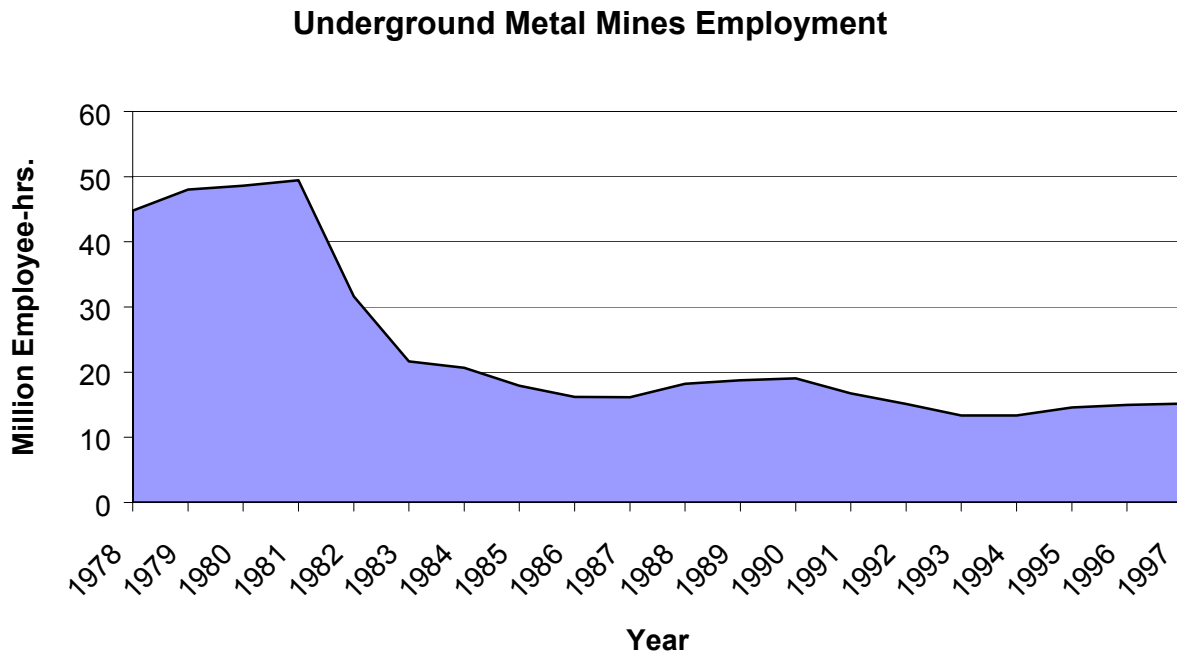
According to ASARCO, total aggregate hourly employee turnover during the period 1979 to 1992 was 310 percent (not including the terminal layoffs that started in 1992). This figure is difficult to put into either a regional context (what was the turnover elsewhere in Lincoln County), or an industry context (what were turnover rates for hourly employees elsewhere in the mining industry).

Examination of the released/hired ratio for hourly employees shows that, during the early years where the mine was hiring its initial labor force, a low employee release/hire ratio was seen. However, after the mine was established, and even during peak production, release/hire ratios began to grow. With one exception, more employees were released than hired every year from 1985 until shutdown. In latter years of mine output the released/hired ratio ranged up to more than 400 percent. From 1993 until the present, numbers are not available from ASARCO, but obviously with shutdown occurring in 1993, the ratio of released to hired workers must have been much higher.

Underground metal mining activity in this country has declined dramatically during the last generation. Figure F depicts hourly employment at underground metal mining sites. The number of hours worked by underground metal-mining workers peaked at just below 50 million hours in

1981. By 1994 the hours worked by these wage-earners had dropped to about 13.4 million hours—a decrease of 73 percent. Even though material moved at underground metal mines picked up in the mid-to-late 1990s, metal mining employment only recovered to about 15.2 million hours in 1997, a level that is almost 70 percent below the peak year of 1981.

Figure F – Hourly Employment at Underground Metal Mines in the United States



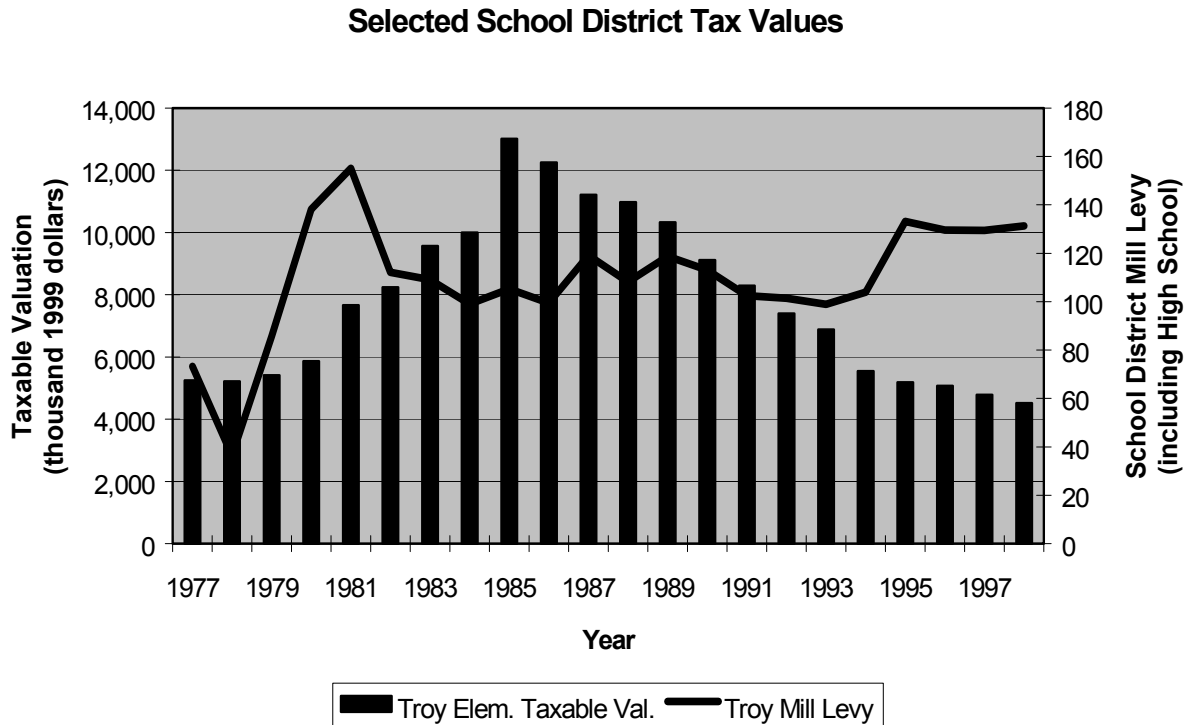
Source: MSHA, various years, Historical Data 1978 - 1997, Metallic Mineral Mining Operations.

Material handled and output has not declined nearly as much as employment because domestic metal-mining companies have been successfully implementing labor-saving technologies and actions. While earth-moving activity at domestic underground metal mines has decreased by about 40 percent, hourly employment has dropped by almost 70 percent. Given labor-savings trends exhibited by underground metal mines during the last generation, and the significant decrease in the number of these mines, it is clear that domestic mining companies have dedicated themselves to continually decreasing hourly employment in this sector.

Figure G shows the pattern of mill rate levies and taxable valuation for the Troy School Districts. The taxable value of the Troy School District did increase markedly during the early tenure of the mine, but dropped back down starting in 1985. By the mid-1990s, taxable value of the Troy School District was below late-1970s levels and dropping further. Two building levies were reportedly added to the tax rate in the district during Troy mine operations. Overall, mill levies for the District increased at the start of mine operations and fluctuated in 100-120 range, before increasing again to about 130 mills in 1995. There is no clear evidence of a long-term decrease in

the mill rate due to mine-related activities. Countywide, taxable valuation did decrease after mine closure, but patterns seem to indicate that forest products dominate the county valuation, not minerals.

Figure G – Taxable Valuations and Mill Levies of Troy School Districts



Source: Lincoln County Treasurer’s Office, personal communication, 1999.

Silver has a number of industrial, investment, jewelry, and consumer applications. While many mines produce silver as the principal product at the mine, there are more mines that produce silver as a byproduct. Byproduct output of silver is difficult to predict because changes in the silver price do not necessarily impact byproduct silver production. Secondary sources of silver, stockpiles, and central-bank holdings constitute an important supply of the metal, in addition to mine production.

After decontrol of the silver price in the U.S. during 1967, the most prominent silver price occurrence was the jump to near \$40 per ounce in 1980 (1999 dollars). Since that time the silver price has generally declined to a level near \$5 per ounce (1999 dollars), where it is today. The demand for silver is projected to grow faster than additional silver supplies. As a result, future silver prices are projected to rise.

Copper is a very important metal to industrialized societies. Its foremost use is for electrical applications. However, copper use for non-electrical purposes is very widespread in developed countries. Three major types of mines produce copper worldwide. South America, especially Chile, the southwestern U.S., and parts of central Africa are the most significant mined sources of copper. Copper mines are among the largest mines in the world. And, these mines are also the primary source of many byproduct minerals—ranging from silver, lead, and zinc, to selenium, palladium, and tellurium. Because of these important byproducts, changes in the copper price can have a large influence on the supply of other minerals. Copper price has been subject to cycles during the study period. Currently, the real copper price is near a twenty-year low. Because of the current plethora of copper mine capacity, and the expectation of more in the near future, copper prices are not expected to recover significantly anytime soon.

ASARCO net earnings showed a very strong relationship with copper prices during the study period. The highest earnings for the company occurred in 1979 when the average copper price was almost \$2 per pound (1999 dollars). The mid-1980s were not kind to ASARCO, the company experienced losses in three consecutive years that coincided with copper prices near \$1 per pound. Current copper prices near \$0.70 or below per pound mean that the company will likely continue to lose money.

Examination of the last generation of ASARCO annual reports shows that the company embarked on a major change in their strategic outlook during the mid-1980s period of losses. ASARCO changed from a company that made most of its money smelting and refining metals for other mining firms, to a vertically integrated base metal company. This change meant that the company acquired major copper and lead mines, and divested many other operations. The resulting company is one that primarily mines copper and lead, smelts and refines the ore, and then sells the finished product.

ASARCO has been legally involved with a host of Superfund sites, many perhaps as a result of the more than 100 years that the firm has been in the mining industry. The company has been very outspoken in its criticism of Superfund legislation. One other result of the company's conversion to a vertically integrated base metal company is the de-emphasis of silver and precious metal operations such as the Troy mine. Nevertheless, ASARCO states in several recent annual reports that the company plans to restart Troy mine operations while it develops the nearby Rock Creek deposit. Remaining Troy mine reserves are expected to provide three additional years of mining activities. As this paper is being published, ASARCO is in active talks with different merger partners.

In summary, the Troy mine clearly brought some benefits to Lincoln County during its abbreviated tenure. Some high-paying jobs were created and some mine-related taxes were paid to the community and the state as a result of silver and copper extraction at the mine. However, before the Troy mine operated, Lincoln County, Montana was a county with very high unemployment with their economy dominated by the ups-and-downs of a timber-dependent

economy. The Troy mine changed none of these characteristics, and indeed may have exacerbated the high unemployment rate by drawing numerous unsuccessful job seekers to the region. To the extent that these unsuccessful job seekers remained in the area, they became an added draw on the community's scarce resources.

A generation of labor-saving efforts at underground metal mines, combined with a significant decrease in the number of these mines, implies that future prospects for underground metal miners in this country are not bright. In fact, examination of economic performance in the last generation shows that northwestern Montana's continued reliance on extractive industries has resulted in the region falling further and further behind the rest of the state and the nation. While most of Montana and the U.S. were de-emphasizing logging, mining, and other extractive industries in favor of service-related activities, virtually every economic measure shows that Lincoln County has not shared in the prosperity seen elsewhere.

**An Analysis of the Impacts of the Troy Mine,
ASARCO, Inc.,
Lincoln County, Montana
And
An Examination of ASARCO Corporate Performance
1974 to Present**

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