

Volume 5--Chapter 16

LOCAL ECONOMIC ANALYSIS:
A CASE STUDY OF ELY, MINNESOTA

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Regional Copper-Nickel Study
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16.1 INTRODUCTION AND SUMMARY OF FINDINGS

The potential economic impacts of copper-nickel development are expected to occur at many different levels of influence. A mining corporation will operate in an international sphere of markets, prices and corporate finance, while it generates tax revenues to federal, state and local levels of government. At the regional level, the impact of an operation's employment, payroll and expenditures can be measured. But it is at the local level of influence that the results of development can have the most significant, and most severe, impacts on the existing population and their units of government. As demonstrated in Volume 5-Chapter 13, Local Government Fiscal Impacts, the fiscal impacts on local governments, when aggregated to a regional level, do not appear to be large or significant, but when the fiscal impacts are examined for individual communities, severe impacts can be seen if present methods of offsetting the costs of population increases are assumed. The same pattern is expected in terms of employment, payroll and changes in final demand. While changes in these economic indicators, when examined at the regional level, may not be significant, the impacts upon individual communities within the Study Area may be large in terms of their existing economy.

To assess the local economies of each community within the Study Area is beyond the scope of this report. The primary survey data requirements of such an undertaking would be prohibitively expensive. However, to show the economic forces which are present at the local level and to document the methodology used to study local economic impacts, a case study of Ely, Minnesota, is presented here. Ely was selected for the study for the reasons stated below.

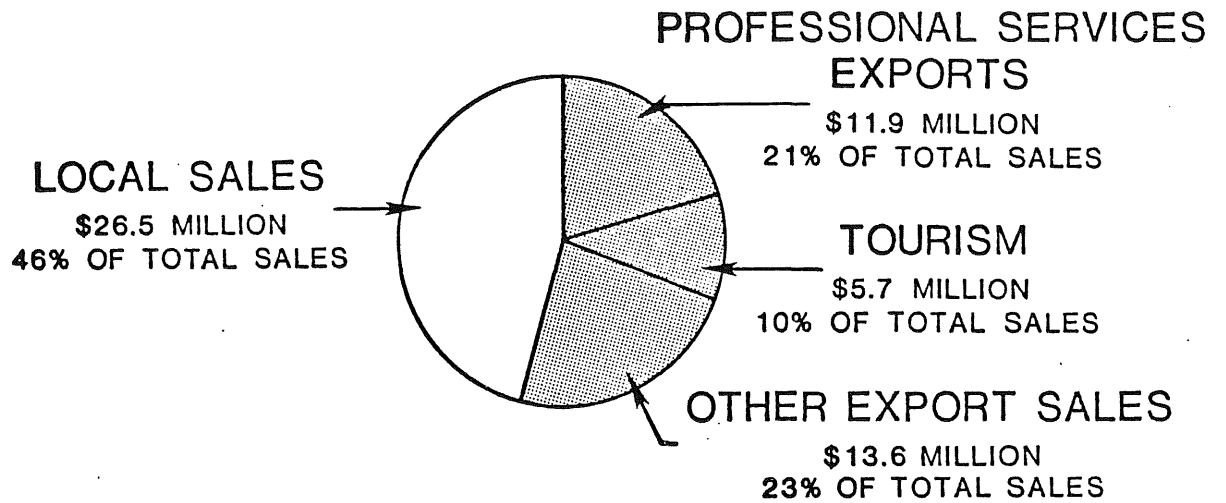
Ely is a community which stands apart from the rest of the Study Area. Separated from the Mesabi Iron Range and its taconite mining activity, Ely is to a large degree isolated from the remainder of the Study Area. In addition, the Ely economy is more diverse than that of the rest of the Study Area. While the other Study Area communities are dominated by activities of the nearby taconite firms, Ely's economy strikes a more-even balance among the resource economies of taconite, timber and tourism. The Ely area also represents a focus of the pro-versus anti-development (federal/state versus local government control) political forces within the state of Minnesota. The issues currently being debated with regard to the BWCA can be expected to carry over to the debate of copper-nickel development.

One of the major issues in the debate over the BWCA was the role of tourism in the Ely area. While the role of tourism on the region's economy has been hotly debated over the recent past, little data has been presented in the arguments; primarily because tourism is a nebulous and difficult-to-quantify area of study. This report attempts to contribute to the understanding of the economics of tourism in Ely. For this and the factors mentioned in the previous paragraph, Ely is the subject of this case study of local economic analysis.

To study the economic forces at work in the Ely area, economic base theory is applied to an input-output transaction table to develop the multipliers used to show the direct and indirect impacts of interindustry trading, income and employment in Ely. To isolate the contribution of tourism to the Ely economy, final demand in tourism-related economic sectors is determined for residents and non-residents (tourists). This allows estimations of tourist sales in those sectors analyzed.

FIGURE 1

DISTRIBUTION OF ELY AREA ECONOMIC ACTIVITY, 1976



TOTAL SALES \$57.7 MILLION

LOCAL SALES \$26.5 MILLION 46%
EXPORT SALES \$31.2 MILLION 54%

SOURCE: 1977 SURVEY DATA, LICHTY & OTHERS, UMD

multipliers of 2.22 (inter-industry), 2.02 (employment), and 1.67 (income) are calculated. These multipliers, in each case, are at the approximate mid-range value among the 15 actual economic sectors in the Ely economy. Applying the inter-industry multiplier to the estimated \$6 million of tourist expenditures in Ely yields a total (direct plus indirect) impact of tourism in Ely of about \$13.3 million, supporting over 700 employees directly and indirectly.

The development of a single copper-nickel operation (fully integrated with mine, mill, smelter, and refinery) in the northern portion of the Duluth Contact (Resource Zones 1 and 2, nearest Ely) would result in employment at the operation-site of about 2,500 persons. Approximately 69 percent of the employees, or 1,725 persons, are expected to live within the Ely area and 1,100 new families, or about 3,300 additional population, are estimated to locate in the area. Of these, about 710 employees are expected to locate within the city of Ely, with the remainder in the surrounding area. An increase of 710 employees would be an increase of about 33 percent over 1970-1976 levels of the work force for the city of Ely.

The direct and indirect impact of the payroll expenditures of Ely area copper-nickel workers could reach \$38 million annually. This would represent a 66 percent increase in the volume of Ely area sales as estimated for 1976.

Housing construction, if it follows patterns established throughout the Study Area, for the new immigrant population could reach \$42 million in value. An additional \$24 million in indirect interindustry transactions could result from housing construction. The increase in valuation, if applied to 1976 area mill rates, would generate about \$2.1 million in city property tax revenue and \$2 million for the school district. As shown in Volume 5-Chapter 13 (Government

Fiscal Impacts), this would be insufficient to cover the anticipated operating and debt service costs of meeting new government service demands.

Ely may, because of its relative isolation, develop a number of businesses to offer goods and services to the new copper-nickel operations. At present there is a well developed taconite support infrastructure centered in Virginia and Hibbing along the Mesabi Iron Range. Support businesses developed in Ely could conceivably be off-shoots of the existing taconite-related industry as the equipment and supply requirements of the two mining operations are similar.

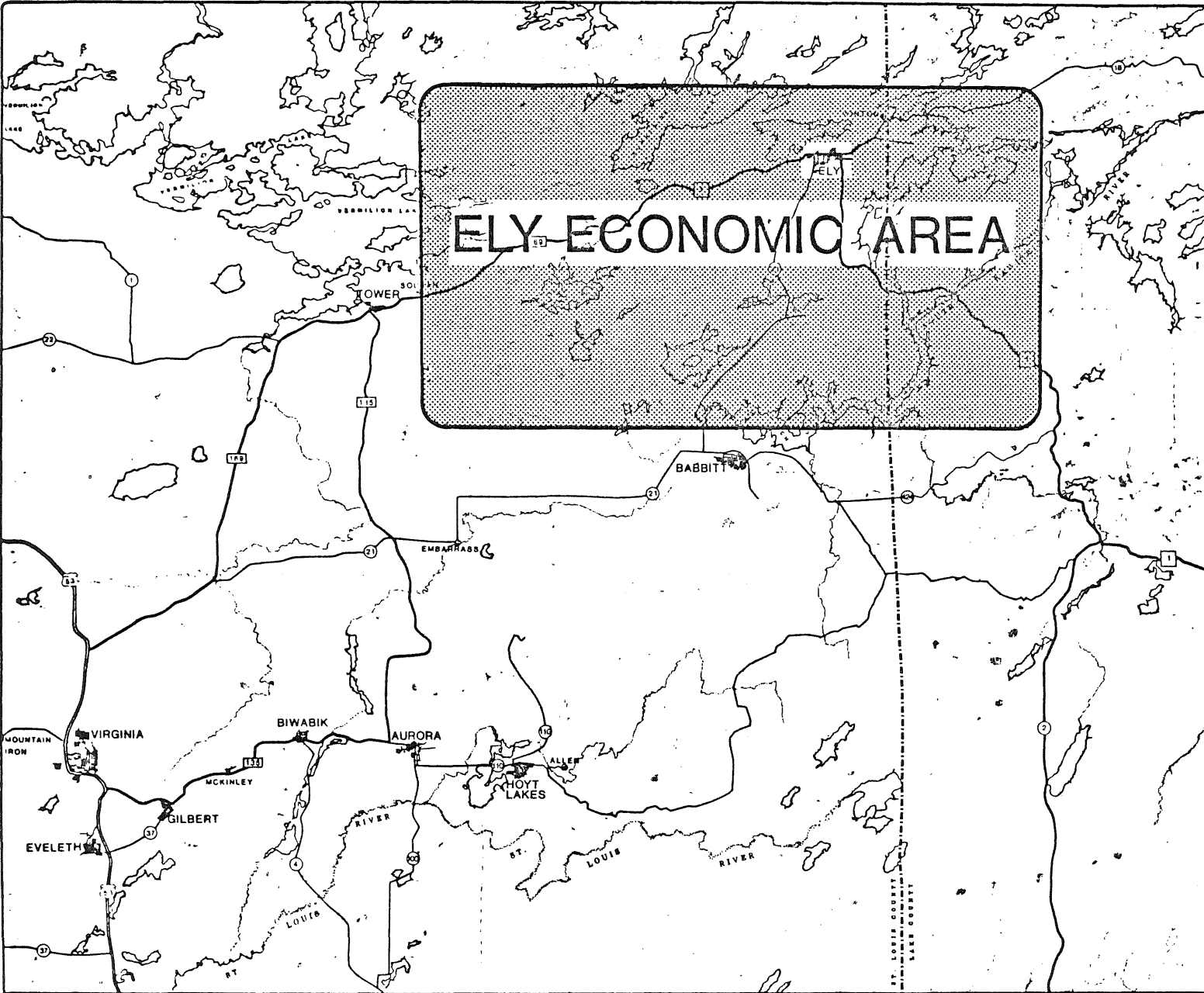
Ely, then, can be expected to feel a significant economic impact in the event of nearby copper-nickel development. Because of its isolation, the concentration of impacts may be greatest for Ely and the northern-most resource zones.

Similar development elsewhere in the Study Area would generate identical economic stimuli, but the impacts resulting from development may be less concentrated than is the case in Ely due to the residential settlement patterns (as discussed in Volume 5-Chapter 7) effective over the remainder of the Study Area. In other areas, the existing taconite support industry could more effectively handle the demands of copper-nickel development without additional expansion.

16.2 CHARACTERISTICS OF ELY

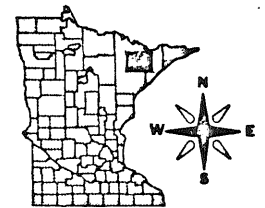
Ely is the northernmost community in the Study Area and is the terminus of the major north-south highway leading to it, U.S. 169 (Figure 2). The city is situated on a major east-west state highway, MN 1. It is also the terminus of a branch of the Duluth Mesabi and Iron Range rail line. Because of its relative isolation and its location adjacent to the Boundary Waters Canoe Area, Ely has developed a sizable reputation as a wilderness recreation center.

Figure 2



ELY ECONOMIC AREA

LEGEND



KEY MAP

1:422,400



MEQB REGIONAL COPPER-NICKEL STUDY

Ely has been described by Professor Uel Blank as "... the major focal point (in St. Louis, Lake, and Cook counties) for the lake-resort area along the western part of the BWCA". Professor Blank's research found that tourists identified Ely with fishing and wilderness activities; that recreation service users tend to be less mobile with respect to length of stay in the Ely region than was true for some of the other identified focal areas; that tourists visiting the Ely focal area tended to have incomes in excess of \$15,000 (1972 data), which was higher than the average for the other identified focal areas; and that a significant number of the users come from the states of Minnesota, Indiana and Illinois. In short, it was found that the Ely area did have a unique pattern of recreational use and user characteristics.

The history of mining in Ely is long. The city was founded shortly after the opening of the Pioneer Mine in 1886. In 1967, the Pioneer Mine, which was the first mine opened, was the last mine to close. During the 81 years of its existence, the Pioneer and other mines dominated the economy of Ely, at times accounting for up to one-half the employment in the city. Since the closing of the last natural iron ore mine in Ely, the lost mining employment in the city has been partially made up by employment with the taconite operations located along the Mesabi range to the south of Ely. A 1976 survey of taconite operations indicates that 694 persons employed in the taconite industry had an Ely mailing address. The workers represent about 30 percent of the Ely area work force (the sum of Ely area taconite workers and Ely area employment). Assuming a 1976 average salary of \$19,580, the total payroll of Ely taconite employees represented nearly \$13.6 million, of which about \$6.7 million could have been expected to have been spent in the Ely community. Using the multiplier described below, the indirect effect of taconite employee expenditures in 1976 was about \$7.4 million of additional economic activity in Ely.

The taconite employees' expenditures in Ely, using an average of one Ely employee per \$35,500 in sales, indirectly accounted for about 190 jobs in the Ely economy.

Mining and recreation are both industries which are based on the distinctive combination of natural resources of the Ely area. Yet another resource based economy is influential in the Ely area; the timber industry has a long history of economic activity in the area. Current estimates of the timber industry indicate that there are five small firms engaged in the harvesting, milling, and wholesale of lumber and wood products in the Ely area. In 1976, these firms employed about 100 persons and had a total output of about \$3.5 million. Since 1976, however, there have been drastic reductions in timber harvesting activity in the Ely area. The ban on BWCA timber removal imposed in 1973 forced the Ely operators to shift to areas of harvest outside the BWCA. Since 1976, several Ely timber firms have closed down or reduced operations.

Ely steadily lost population from 1950 (5,474) to 1970 (4,904) and leveled off at 4,961 in 1976 based on U.S. Bureau of Census estimates. Simultaneously, the age of the population increased from 8 percent of the population over 65 in 1950 to 15 percent over 65 in 1970. The education level increased from an average of 9.6 school years completed in 1950 to 12.1 school years completed in 1970. The overall size of the labor force declined 20 percent from 2,135 in 1950 to 1,698 in 1970, according to census data. As estimated by the Department of Economic Security and taconite company data, employment in Ely was about 2,300 (including about 700 taconite industry employees) in 1976. Important in the composition of the work force was the increase in female participation by 40 percent from 381 in 1950 to 535 in 1970, while the number of females actually employed increased 30 percent from 368 in 1950 to 479 in 1970. Total unemployment increased from

4.3 percent in 1950 to 9.7 percent in 1970. While this information indicates that both the population and the economy of Ely were on a decline from 1950 to 1970, other figures show a more positive trend in the 1970s.

The median family income in Ely increased 78 percent from 1950 to 1970 (taking into account inflationary trends). Based on Minnesota Department of Revenue information on gross sales by Ely businesses and sales per filer of sales tax information, the Ely economy shows a marked increase for the 1969 to 1975 period. Gross sales increased 82 percent and sales per filer increased 38 percent after adjustment for inflationary trends. Bank debits (an indicator of economic activity) in Ely increased 24 percent in real terms from 1970 to 1976.

It appears that if there was a decline in the economy of Ely from 1950 to 1970 (a trend somewhat countermanded by median family income increases), then the period of 1970 to 1976 shows an increase in economic activity by most indicators and a leveling off of population decline. Thus, the economy of Ely seems relatively stable through 1976.

The survey conducted to gather data for the construction of the input-output model of the Ely economy provides a picture of the current (1976) status of the area. Total sales of \$57.7 million are estimated for 1976 with employment (not including taconite employees) in Ely of 1,624. Table 1 shows a breakdown by sector of sales and employment for 1976.

Table 1

16.3 ECONOMIC ANALYSIS METHODOLOGY

In order to adequately describe the detailed characteristics of the Ely economy and provide the analytical framework to assess the impacts of potential copper-

Table 1. Number of firms, estimated employment, and estimated total sales for Ely economic sectors, 1976.

INDUSTRIAL CATEGORY	NUMBER OF FIRMS	ESTIMATED EMPLOYMENT	ESTIMATED TOTAL SALES (\$10 ³)
1. Construction	18	56	1,746
2. Lumber and Wood Products	5	107	3,491
3. Communications, Transportation, Utilities	19	31	2,398
4. Wholesale Trade	4	26	1,278
5. Durable Retail	22	80	4,605
6. Non-Durable Retail	21	145	1,725
7. Grocery	4	55	4,788
8. Cafes and Taverns	13	257	1,296
9. Automotive, Service Stations	16	72	6,048
10. Finance and Insurance	15	31	7,778
11. Lodging	55	89	1,554
12. Personal and Recreational Services	32	109	1,254
13. Professional Services	20	236	16,023
14. Other Services	<u>20</u>	<u>330</u>	<u>3,689</u>
15. Households			
TOTAL	264	1,624	57,673

DEMAND SECTORS (sectors which purchase goods and services in their final form)

- 15. Local Households
- 16. Government
- 17. Exports

SOURCE: 1977 survey data.

nickel or other resource oriented development on a local economy, a variety of analytical methods were considered. It was decided that a modified input-output economic base methodology would best serve the dual purposes of characterization and impact assessment. An input-output orientation provides the framework to describe the interindustry transaction and final demand relationships which occur within the economic system, whereas an economic base frame of reference views the economy in terms of exports and imports. Together, these two analytical tools provide the means to assess the direct and indirect development-related impact of changes in the economy.

Two fundamental concepts of this methodology merit amplification. The isolation of that portion of an economy's final demand which is exported is fundamental to economic base theory. Also, the concept of economic multipliers is of vital importance in assessing the total impact resulting from any particular change or impulse to an area's economy.

Economic base theory is built upon the concept that it is the portion of an area's economic activity which is exported that truly drives the economy. All other activity, then, is cast as support to export, or basic, activity. Then, any change which results in an increase in export activity will carry with it a change in the support activity of an area. An economic base multiplier can be derived which reflects the relationship between the export (basic) and support (non-basic) segments of the economy.

The concept of the multiplier is especially important in utilizing the input-output method of analysis. Three different types of multipliers are considered below: an interindustry transactions multiplier, an income multiplier, and an employment multiplier. Though different in application and use, each is basi-

cally similar in concept. The multiplier is derived from the input-output framework of interindustry transactions and is used to estimate the total direct plus indirect economic change resulting from an initial change in economic activity. The multiplier measures the cumulative economic activity resulting from the multiple rounds of activity stemming from an initial economic stimulus.

For analysis purposes, the Ely area economy was categorized into 15 industrial and 2 additional final demand sectors (Table 1). Households are included in the interindustry transactions computations so that the sales to and purchases from households may be included in the interindustry multiplier determination. However, an income or employment multiplier is not derived for Households.

Households have the dual role of being included in the interindustry, or intermediate, transactions and also making an important contribution, especially in the residential consumer-oriented Ely economy, to final demand of the area. At the intermediate level, households trade labor and skills for wages while adding to final demand through their purchases.

An attempt was made to define the sectors to assure that all Ely area firms could be classified as being in one of the categories, each category would be as homogenous as possible in terms of outputs and production techniques, a reasonable sample size could be obtained from each category and the activities of any one firm would not be disclosed. It should also be noted that any firm with multiple economic activities was placed in the industry category that accounted for the largest share of its income or sales. This process resulted in the identification of several consumer oriented sectors and but a very few sectors that were involved in the manufacture of semi-finished or final stage products.

A survey was administered to a sample of firms in each identified sector to obtain sales, employment, and related economic data for use in economic base analysis. The information was then summarized into an input-output framework depicting local economic interaction through the various firms' purchases and sales to and from one another as well as to final demand categories. Only the results of this analysis will be highlighted in this chapter.

The input-output tables used and the data presented in this paper are based on the value of total sales in Ely rather than the more traditional value-added orientation of input-output analysis. The multipliers presented here are, therefore, sales multipliers rather than local output multipliers. This concept is not uncommon in nonurban areas where the manufacturing sector is less dominant and the economy is based on the sale of retail goods and services rather than the value-added process of manufacturing.

The results of the survey and following analysis are summarized in Tables 2 and 3. Export sales by each sector and, in turn, the percentage of purchases from local sources (important in the determination of the interindustry multiplier) for each industrial sector are shown in Table 2. Export sales of over \$31 million represent about 54 percent of all Ely area economic output. Sales to residents and local government account for the remainder, 46 percent. Export sales can be either physically exported from the region to be sold or sold to visitors, such as tourists, who come to the area and make purchases. More than 38 percent of all export sales are made through the professional services sector, indicating the influence of federal transfer payments in the area of health care. Presumably, then, as far as export sales are concerned, health care is the leading industry of the Ely area and the federal government, through transfer payments to Ely residents, is its largest export consumer.

The percentage of purchases within the Ely area by each of the economic sectors gives a rough indication of the multiplier effect each sector has on the total economy. The higher the percentage of local purchases, the greater the degree of inter-relation with other local businesses and the greater the multiplier value.

Table 2

The interindustry, income, and employment multipliers derived from the survey data are shown in Table 3. The interindustry multiplier points out those sectors which interact the strongest with other local sectors (see Table 2 for comparison). The stronger the interaction, the larger the multiplier effect on the economy. The income multiplier, closely related to the interindustry transactions of the economy, shows the relationship between the income generated by a change in demand in a particular sector and the total change in income throughout the entire system stemming from the initial economic impulse. The employment multiplier indicates the relationship between the employment per dollar of sales in a particular sector caused by a change in output and the employment per dollar of sales induced throughout the economy as other sectors adjust their output to support the initial change. The size of the multiplier for a particular sector will be related to its labor intensity and the labor intensity of those sectors with which it interacts.

Table 3

16.3.1 Application of Interindustry Multipliers to Export Base Logic

The notion of how economic base and industrial multipliers relate to one another can be demonstrated by looking at two representative sectors that have different

Table 2. Levels of exports and percentage of purchases for Ely area economic sectors, 1976.

INDUSTRIAL CATEGORY	DOLLAR VALUE OF EXPORTS (000's of dollars)	PERCENTAGE OF ALL PURCHASES MADE WITHIN ELY AREA
1. Construction	\$ 135	79.495%
2. Lumber and Wood Products	2,940	14.466
3. Communications, Trans- portation, Utilities	27	49.417
4. Wholesale Trade	456	21.283
5. Durable Retail	1,342	82.194
6. Non-Durable Retail	754	44.464
7. Grocery	586	44.027
8. Cafes and Taverns	747	31.789
9. Automotive, Service Stations	704	57.672
10. Finance and Insurance	2,600	84.238
11. Lodging	1,114	76.383
12. Personal and Recreational Services	473	79.346
13. Professional Services	11,935	85.913
14. Other Services	2,985	71.538
15. Households	<u>4,382</u>	37.597
TOTAL	\$31,180	

SOURCE: 1977 survey data.

Table 3. Calculated multiplier values for Ely area economic sectors, 1976.

INDUSTRIAL CATEGORY	INTERINDUSTRY MULTIPLIER	INCOME MULTIPLIER	EMPLOYMENT MULTIPLIER
1. Construction	2.58	1.73	2.58
2. Lumber & Wood Products	1.28	1.75	1.28
3. Communications, Trans- portation, Utilities	1.94	1.50	1.94
4. Wholesale Trade	1.40	1.40	1.40
5. Durable Retail	2.53	1.32	2.53
6. Non-Durable Retail	1.83	1.66	1.83
7. Grocery	1.81	1.37	1.81
8. Cafes and Taverns	1.61	1.84	1.61
9. Automotive, Service Stations	2.18	1.96	2.18
10. Finance and Insurance	2.58	1.34	2.58
11. Lodging	2.67	6.36	2.67
12. Personal and Recreational Services	2.47	1.40	2.47
13. Professional Services	2.61	1.37	2.35
14. Other Services	2.35	1.37	2.35
15. Households	1.84		

SOURCE: 1977 survey data.

multipliers and export levels. They are compared to see how they are different in their effects on the Ely economy. The two sectors chosen for this comparison are Professional Services (the Ely region's leading exporters) and Lodging (with the largest calculated values for each type of multiplier).

Interindustry Multipliers--The interindustry coefficients (taken from the Input-Output table) are shown in Table 4 to show for the two example sectors the distribution of the total interindustry multiplier value among each of the economic sectors. Also shown are the impacts of a \$10,000 change in final demand (through sales to tourists or increased medical care in the area, for example).

Table 4

To illustrate, for every dollar of sales by Lodging to final users (e.g. sales to tourists), Construction sells \$.009 due to multiple rounds of sales that are generated between industries and households in the region. Lumber and Wood Products sells \$.001 due to these induced rounds of spending, Communications-Transportation-Utilities sells \$.277, and so on. The total \$2.670 change in total sales (including the initial dollar) is distributed over all of the sectors in this manner. Table 4 demonstrates that an increase in export sales of these two industries by the same amount would result in the Lodging sector exerting a total impact on the area's sales that is 2.75 percent greater than that of the Professional Services sector. This is due to the higher interindustry multiplier value for Lodging.

Income Multipliers--Total regional household income from a \$10,000 increase in demand is shown in Table 4 to be \$10,350 ($1.035 \times \$10,000$) for the Professional Services sector and \$6,180 for the Lodging sector. Applying the income

Table 4. Interindustry coefficients and the effects of a \$10,000 change in final demand for the Professional Services and Lodging sectors of the Ely area economy, 1976

INDUSTRIAL CATEGORY	PROFESSIONAL SERVICES		LODGING	
	INTERINDUSTRY COEFFICIENTS	EFFECT OF \$10,000 CHANGE IN FINAL DEMAND	INTERINDUSTRY COEFFICIENTS	EFFECT OF \$10,000 CHANGE IN FINAL DEMAND
1. Construction	.016	\$ 160	.009	\$ 900
2. Lumber and Wood Products	--	--	.001	10
3. Communications, Transportation, Utilities	.058	580	.227	2,270
4. Wholesale Trade	.021	210	.010	100
5. Durable Retail	.052	520	.120	1,200
6. Non-Durable Retail	.024	240	.069	690
7. Grocery	.095	950	.104	1,040
8. Cafes and Taverns	.010	100	.006	60
9. Automotive Service Stations	.111	1,110	.159	1,590
10. Finance and Insurance	.102	1,020	.200	2,000
11. Lodging	.006	60	1.043	10,430
12. Personal and Recreational Services	.012	120	.058	580
13. Professional Services	1.032	10,320	.021	210
14. Other Services	.028	280	.024	240
15. Households	<u>1.035</u>	<u>10,350</u>	<u>.618</u>	<u>6,180</u>
TOTAL	2.607	\$26,020	2.670	\$26,690

SOURCE: 1977 survey data.

multiplier to these figures results in the breakdown between direct and all other income. For Professional Services, \$7,555 would be generated within its own sector while from the initial \$10,000 change in final demand \$2,795 would be generated in all other sectors of the economy. Lodging presents a much different picture with only \$972 of household income resulting within the sector, but \$5,208 of household income generated in all of the other sectors. This indicates the apparent fact that a dollar's worth of sales does not really add much to the income of the households that are working in the Lodging sector, but that it means a significant change to the rest of the economy's household income level.

Employment Multipliers--To calculate the employment multiplier, the interindustry coefficients must be modified to reflect the employment to output relationship of each sector. Space requirements preclude that analysis here. However, a \$10,000 change in Lodging final demand would result in 3.4 employees in the Lodging sector and an additional 3.3 employees throughout the remainder of the economy. The ratio of new employees in the Lodging sector to total new employment ($3.4/6.7 = 1.96$) is not the same value as the employment multiplier due to the adjustments to reflect employment per dollar of sales.

16.4 THE ECONOMICS OF TOURISM IN ELY

Because the Ely area is a major focus of tourist activity in northeastern Minnesota, especially wilderness recreation types of activities, no study of its economy would be complete without some analysis of the economic role of tourism in the area. Constant reference is made by public officials, trade associations and others to the "tourist industry" of northeast Minnesota. The fact is, there is no homogeneous industry that is strictly tourist oriented. Rather, there are

a number of sectors which serve local residents, local industries and tourists. Cafes and taverns, for example, cater to a large variety of customers, certainly a portion of which are local residents. For the purposes of this work, a tourist is someone who is not a full-time year-around resident of Ely. This includes business travelers and second-home owners as well as "tourists".

Analysis of tourism can be accomplished by isolating those local economic sectors which serve tourists and determining that portion of final demand which is made by non-residents. Seven of the 15 economic sectors used in previous analysis are appropriate for examination of tourism. These are:

- Grocery
- Cafes and Taverns
- Automotive, Service Stations
- Durable Retail Trade
- Non Durable Retail Trade
- Recreation Services
- Lodging

To be sure, other sectors will certainly receive some amount of final demand from tourists. For example, doctor's services will occasionally be required by vacationers and construction services are often used by second-home owners. But the seven sectors identified above represent the significant economic thrust of tourism in the Ely area.

The multipliers that were presented earlier in this chapter represent an improvement over more aggregated approaches to tourism analysis in that the effect of sales to and by each identified industry can be analyzed. The only additional requirement for impact analysis is the proportion of sales that these industries

make to resident customers versus non-resident customers. In the context of export base logic (discussed above), a sale to a non-resident requires that the selling firm purchase intermediate products and resources from other area firms and from households. This leads to the multiplier process.

Two surveys were taken for the purpose of identifying the proportion of sales of a sample of firms in the Ely area that were made to resident and tourist customers. The first was a questionnaire, administered directly to Ely area establishments, which asked each firm to estimate the percentage of its sales made to resident and non-resident customers.

A second approach involved leaving a survey instrument at the counter of cooperating establishments, requesting that customers identify their permanent residence location and the dollar value of their purchase. At the end of each working day, the proportion of that day's sales going to Ely resident customers versus tourists was calculated. An average of the survey period's results was then obtained and used to estimate tourist expenditure levels.

There was a strong correspondence between the two approaches. The difference in the estimates was ten percent in the aggregate. The percentage breakdown for each industry was close for every economic sector. Since the previous analysis in this chapter was reported on the basis of the survey of firms, these figures are used in this analysis. Table 5 presents the estimated expenditures by residents and tourists for selected Ely economic sectors.

Table 5

Total 1976 sales to tourists were estimated to be about \$5.7 million. Table 6 shows the multiplier effect which results from these sales. The multiplier

Table 5. Estimated annual sales (\$10³) to residents and visitors for selected Ely area economic sectors, 1976.

Sector	TOTAL SECTOR SALES	LOCAL SALES	(%)	TOURIST SALES	(%)
Grocery	4,788	4,202	(88)	586	(12)
Cafes and Taverns	1,296	549	(42)	747	(58)
Automotive, Service Stations	6,048	5,344	(88)	704	(12)
Durable Retail Trade	4,605	3,263	(71)	1,342	(29)
Non-Durable Retail Trade	1,725	971	(56)	754	(44)
Recreation Services	1,254	781	(62)	473	(38)
Lodging	<u>1,554</u>	<u>440</u>	<u>(28)</u>	<u>1,114</u>	<u>(72)</u>
Total	21,770	15,550	(73)	5,720	(27)

SOURCE: 1977 survey data.

effect in this case is due to the interaction between each of the tourist-related sectors and all other sectors of the economy. By relating the direct tourist sales to total direct plus indirect sales (\$12.7 million/\$5.7 million) a "tourist" industry multiplier of 2.22 is calculated. This indicates that for each dollar value of sales in the Ely area made to non-residents, an additional \$1.22 of sales activity will occur as various Ely economic sectors adjust to meet the indirect demand created by the initial tourist expenditure.

Table 6

Another view of the impact of direct sales to tourists is taken by utilizing the income and employment multipliers that were presented earlier in this chapter. Table 7 presents the estimated direct employment effects of tourist sales, the employment multiplier and the estimated employment impacts of these sales on the Ely area economy. The estimated direct employment resulting from the tourist sales (calculated from Ely area employment/sales data) is seen to be about 357 employees. The total effect on the economy is estimated to be 720 employees. The difference, or 363 employees, is due to the indirect effect of multiple rounds of spending discussed earlier. These figures represent an employment multiplier for the "tourist" sectors of 2.02 and indicates that for each tourist-related job in the Ely area there is an additional job in the economy which is supported by the tourism sector. Taking tourism employment data from Table 6 and tourism sales data from Table 5, a sales per employee figure of \$16,918 is calculated, indicating that a new tourist-related job plus one additional job elsewhere in the economy would be created with each additional \$17,000 of tourist sales.

Table 7

Table 6. Sector multipliers, sales ($\$10^3$) to tourists, and resulting multiplier effect on Ely area economy, 1976.

SECTOR	INTERINDUSTRY MULTIPLIER VALUE	DIRECT SALES TO TOURISTS	ESTIMATED DIRECT PLUS INDIRECT SALES
Grocery	1.81	\$586	\$1,061
Cafes and Taverns	1.61	747	1,203
Automotive-Service Stations	2.18	704	1,535
Durable Retail Trade	2.53	1,342	3,395
Non-Durable Retail Trade	1.83	754	1,380
Recreation Services	2.47	473	1,168
Lodging	<u>2.67</u>	<u>1,114</u>	<u>2,974</u>
TOTAL	2.22	\$5,720	\$12,716

SOURCE: 1977 survey data.

Table 7. Sector employment multipliers, direct tourism-related employment and estimated employment impacts on Ely area economy from sales to tourists, 1976.

SECTOR	EMPLOYMENT MULTIPLIER	TOURISM-RELATED DIRECT EMPLOYMENT	ESTIMATED TOTAL TOURISM-RELATED EMPLOYMENT IMPACT
Grocery	1.81	6.6	11.9
Cafes and Taverns	1.61	149.1	240.1
Automotive-Service Stations	2.18	8.6	18.7
Durable Retail Trade	2.53	23.2	58.7
Non-Durable Retail Trade	1.83	63.8	116.8
Recreation Services	2.47	41.4	102.3
Lodging	<u>2.67</u>	<u>64.1</u>	<u>171.1</u>
Total	2.02	356.8	719.6

SOURCE: 1977 survey data.

Table 8 presents estimates in terms of the area income that is generated from the estimated sales to tourists. The direct income that is estimated to result from these sales is \$2,314,840. The indirect effect that is generated is \$1,559,000 (\$3,873,840 minus \$2,314,840). The average income multiplier of sales to tourists is 1.67. Thus, for every new dollar of household income that is generated in the Ely area from sales to tourists, an additional sixty-seven cents of income comes from the indirect and household induced effects.

Table 8

Included in the sales and final demand estimates are the contributions of an often neglected component of tourism, the second-home, or seasonal homeowner. A survey of a sample of second-home owners in the Ely area was conducted by the Regional Copper-Nickel Study during the winter of 1977-1978.

Results of the survey indicate that about \$2,050 of expenditures per seasonal household were made in the Ely area during the 1977 calendar year. Table 9 shows the breakdown of these purchases according to economic sector.

Table 9

This represents expenditures of \$6.40 per user-day by seasonal homeowners and their families.

In the immediate Ely area there is evidence of at least 250 seasonal owners who do not live permanently within the Study Area (according to records of seasonal interruption by Northern Electric Cooperative, an electrical power company).

Chances are there are many more. The annual expenditures of these 250 families represent over \$500,000.

Table 8. Sector income multipliers, direct tourism-related income and estimated income effects from sales to tourists, 1976.

SECTOR	INCOME MULTIPLIER	DIRECT INCOME IMPACT (000)	ESTIMATED TOTAL INCOME IMPACT (000)
Grocery	1.37	\$217.11	\$297.44
Cafes and Taverns	1.84	50.95	93.75
Automotive-Service Stations	1.96	198.58	389.22
Durable Retail Trade	1.32	1,049.99	1,385.99
Non-Durable Retail Trade	1.66	204.12	338.84
Recreation Services	1.40	485.85	680.19
Lodging	<u>6.36</u>	<u>108.24</u>	<u>688.41</u>
Total	1.67	\$2,314.84	\$3,873.84

SOURCE: 1977 survey data.

Table 9. Estimated expenditures for Ely area seasonal homeowners, 1977.

Lumber and Wood Products	\$ 621
Durable Retail	168
Non-Durable Retail	104
Grocery	466
Cafes and Taverns	104
Automotive, Service Stations	274
Recreation Services	192
Personal Services	56
Professional Services	<u>66</u>
TOTAL	\$2,051

SOURCE: 1978 survey data.

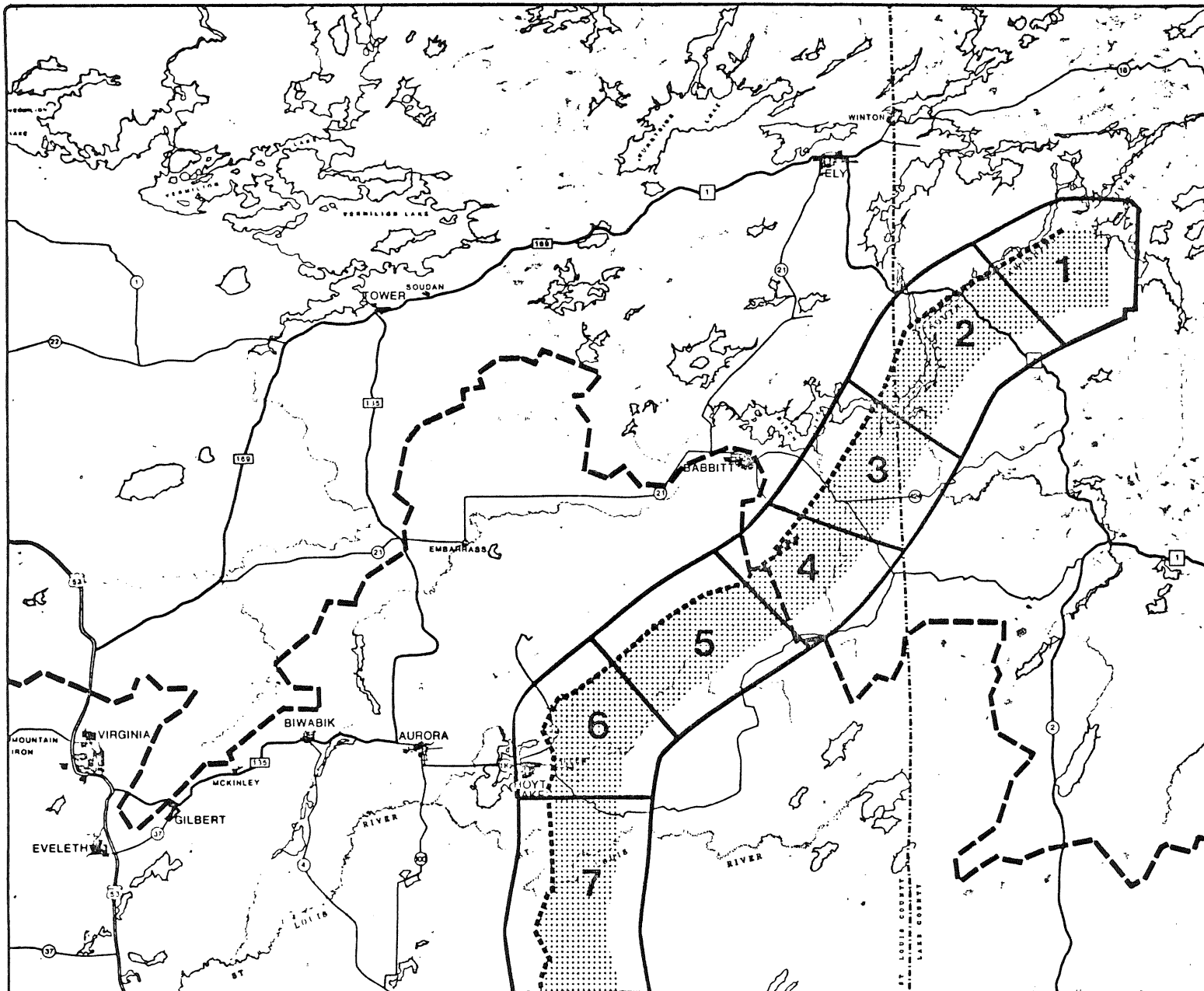
From the above analysis it can be seen that tourist expenditures exert a powerful force in the economy of the Ely area. Sales to tourists (\$5.7 million) represent 35 percent of the activity of those sectors identified as tourist-related, about 20 percent of all export sales and 10 percent of total estimated 1976 sales in Ely (\$57.7 million). The impact multipliers for the tourist-related sectors indicate the effects which tourist expenditures have on the economy. For each one dollar increase in tourist sales in the Ely area, an additional \$1.22 in interindustrial sales is generated. For every direct tourism-related employee in the area there is an additional employee supported by the tourist activity. Further, for every dollar of household income in the Ely area generated by tourist-related sales, an additional .67 of income is generated throughout the remainder of the economy.

In each case the three multipliers developed for the "tourist" sector rank about in the middle of those for all Ely area economic sectors.

16.5 POTENTIAL IMPACT OF COPPER-NICKEL DEVELOPMENT IN THE ELY AREA

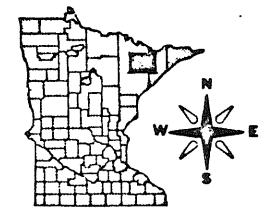
A fully integrated (mine/mill/smelter/refinery) copper-nickel development located in resource zones 1 or 2 of the Study Area (Figure 3) would certainly have a significant impact on the Ely area. The primary impact on the community would be transmitted through the employees of the copper-nickel operation and the payroll these employees would disperse throughout the economy of the area. A fully integrated operation with an underground mine is expected to have employment during periods of full production of about 2500 persons with an annual payroll of about \$53 million.

Figure 3



LEGEND

- LAURENTIAN DIVIDE
- DULUTH CONTACT
- DEVELOPMENT ZONES
- RESOURCE ZONES



KEY MAP

1 422,400



MEQB REGIONAL COPPER-NICKEL STUDY

MN CU-NI DEVELOPMENT AND RESOURCE ZONES

A copper-nickel operation located in either Resource Zone 1 or 2 would be within 10 miles of Ely and, as presented in Volume 5-Chapter 7, about 69 percent of the employees of the operation, 1,725 employees, would locate within the Ely area (approximately the area of the Ely school district and adjacent area in Lake County). [Note: The figures presented in Volume 5-Chapter 7, Residential Settlement, may differ to a small degree because of "fine-tuning" of the model. The differences are not substantial and will in no way alter the magnitude of the development impact.] If this is the case, the annual contributions to the household sector of the Ely economy would be nearly \$37 million (an average of about \$21,100 per employee). The employees of the operation and their families would have a disposable income of about 70 percent of total payroll, or \$25.9 million. From the Ely area survey, there is indication that about 70 percent, or \$18.1 million, of the copper-nickel employees' disposable income would be spent in the local area. This would be about \$10,500 of local expenditures annually per copper-nickel household. If an average interindustry multiplier of 2.11 is applied to this figure, the total direct and indirect impact of the copper-nickel payroll could reach \$38 million, or about 66 percent of total 1976 sales in Ely.

The 1,725 copper-nickel employees and \$18 million of Ely area expenditures would add an additional 510 indirect employees to the Ely economy (using one additional employee per \$35,500 in Ely area sales, the 1976 estimate). The estimated work force of the Ely area would then approach 4,600 persons. Of this, 2,425, or 53 percent, would be copper-nickel and taconite employees. In 1970, about 35 percent of the work force was in the taconite industry, and in 1976 the taconite employment was estimated at about 30 percent of the work force.

A certain, but difficult to quantify with any degree of certainty, impact of a copper-nickel operation in the Ely area would be the construction boom to satisfy the demand by the operation's employees for new housing. An impact on the Ely economy can be estimated by using housing probabilities, generated from the State Demographer's survey of 1977, average housing values of the area and the number of new families expected to move into the Ely area. From the 1977 survey, the propensity of housing type was shown to be 87 percent single family, 8 percent multiple family, and 5 percent mobile homes. About 64 percent of the new development's employees are expected to be immigrant heads-of-households, indicating that, when combined with the 69 percent probability of employees locating in the Ely area, about 1100 new families will locate in the Ely area. If it is assumed that all new employees occupy new housing units and these units have construction values of \$40,000 for single-family, \$30,000 for multiple-family and \$15,000 for mobile homes, the estimated value of new copper-nickel related housing construction in the Ely area would be about \$42 million. The prevailing pattern of housing throughout the Study Area indicates a high percentage of mobile home development in the rural area. This could be expected in the Ely area as well.

The housing values used above are very modest. As experienced during the tacornite expansion of the early 1970s, housing values during a period of development can be driven extremely high. The sociological and economic pressures of this can cause extreme hardships on the existing population.

The demand for mortgage financing could pose potential problems for Ely during the rapid growth period of copper-nickel development. Assuming mortgages of 80 percent of the \$42 million in housing construction indicates a demand for nearly \$34 million in financing. In 1976, the First National Bank of Ely had

total deposits of only \$21 million while two credit unions in Ely had combined assets of \$2.5 million. Certainly, the federal government, through its insured mortgages programs, would be a source for a great deal of the mortgage requirements, but pressures on the local banks and credit institutions may develop.

The indirect impact of a \$42 million increase in Ely area construction would be about \$66 million (calculated by using the 2.58 interindustry multiplier for the construction sector as shown in Table 3). The additional economic activity would be distributed among the remainder of Ely's 15 economic sectors according to the interindustry trading pattern of the construction sector.

The construction of mine-related facilities would occur over a relatively short period of time and is more or less a one-time event. If an underground mining operation is developed nearby the employment demands will very quickly peak during construction of the mine, mill, smelter and refinery facilities, valued at nearly \$ 570 million. However, the construction employment boom will be relatively short-lived (about 5 years) and the housing demand during this period will be temporary. While it is expected that most of the construction work will be done by major firms located outside the Ely area, there certainly will be employment and smaller sub-contracting opportunities available to local concerns. If mine development (more than a single operation) occurs in a carefully controlled sequence the construction boom can be prolonged over a longer period of time and the local economic and governmental systems will be given more time to flex and absorb the peaks in demand for jobs, housing and municipal services.

The demand for housing will fluctuate wildly during the construction phase of the mine operation. During the early years temporary housing for migratory construction workers will be at a premium. As more and more of the permanent

operation work force is established the construction of new housing will become more necessary. The permanent work force is expected to peak 8 years after the start of construction, but the demand for new housing could be expected to continue well past that time as adjustments in living arrangements among employees settle into some sort of equilibrium (see Volume 5-Chapter 7 for more information on settlement fluctuations). In the event of multiple mine developments, as in the case of mine-related construction, the dramatic peaks in new housing demand can be minimized and steady construction activity prolonged through carefully planned development.

The construction industry is particularly subject to the boom/bust cycle of events. Construction demands occur almost instantaneously and are of a one-time nature for any given individual or operation. Tremendous construction activity is expected through the first 10 to 12 years of development but once the mining operation's capital facilities have been constructed and the demand for new housing has peaked, the industry can very quickly slide into a "bust" situation.

The increase in assessed valuation as a result of newly constructed housing more than likely would not benefit the existing taxpayers through a reduction in area mill rates. As demonstrated in Volume 5-Chapter 13 (Government Fiscal Impact), the taxes generated from copper-nickel related development will be sufficient to cover only the estimated operating costs necessary to satisfy new service demands. If a large amount of capital infrastructure must be constructed to meet the demands of new people in the area, the increase in population could, in fact, result in an increased tax burden on the existing population.

The county, school district, and township in which the smelter/refinery complex is located would receive significant revenues from the operation's property

taxes. However, this part of the integrated complex is more than likely to be located at the mine/mill site and would not affect the property taxes of the city of Ely, given its present boundaries.

With Ely's present array of businesses and services, it is unlikely that the copper-nickel operation will make a significant amount of purchases of goods and services in the local area. However, because of Ely's relative isolation and in the event the demand for mining support services is strong (say, if two or more developments are established in the area) the supporting infrastructure of businesses could develop in Ely. In this event, the copper-nickel operation would make purchases of goods and services in the local area and the representative interindustry, income and employment multipliers would begin to work in the economy.

On the negative side of development is the impact one or several copper-nickel operations may have on the "tourism" industry of the area. A quantitative analysis about the relationships between tourism and development-related environmental parameters is beyond the scope of this study but does merit study. Indeed, it is not altogether certain that copper-nickel development will have a negative impact on tourism. It could be argued that the gains in tourists interested in copper-nickel mining may offset the loss of tourists who feel that mining has a negative influence on their recreation experience.

A certain economic impact would result from the loss of seasonal homes which are directly taken by the mining operation itself. For every "lost" seasonal home, more than \$2000 in direct final demand and an additional \$3,220 in indirectly generated economic activity would be taken from the region. In addition, property taxes to local governments would be lost because the mining operation is

not liable for property taxation. Instead, the area would receive a portion of the operations' property taxes. If eight seasonal homes, representing \$16,400 in final demand for Ely goods and services, are taken, a loss of one tourist-related job plus one additional job which is indirectly supported by tourist expenditures could occur.

An additional negative impact which often rises in rapidly developing communities is the effect that the inflationary forces of the "boom" cycle may have on the economy. The rapid escalation of the demand for housing, in particular, can force housing costs skyward. For renters on a fixed income (note the large percentage of elderly in Ely) the impact of increased housing costs can be devastating.

As copper-nickel related jobs appear in the local economy, the competition for workers will intensify. A common result is inflation of salaries of the existing businesses in a development area as they must compete with the attractive salaries offered by the mining and construction industries. Table 10 shows the relative salaries among the various Ely economic sectors. It shows that, in St. Louis County in 1974, construction and mining salaries rank at the top, while the trade and services sectors (which dominate the Ely area employment) are among the lowest. The temptation for workers to jump to the mining and construction employment opportunities will be strong and the resulting competition for workers will more than likely increase the salaries (and business operating costs) throughout the economy.

Table 10

The economic impact of copper-nickel development can be simply summarized as below. The most significant annual contribution to the Ely economy is expected

Table 10. Average salaries for various economic sectors, 1974.

	<u>SALARY/WORKER</u>
Construction	\$16,962
Mining	14,502
Transportation	10,925
Communication	10,119
Manufacturing	9,459
Finance, Insurance, Real Estate	8,017
Agriculture, Forestry	7,746
Services	6,472
Trade	6,432

SOURCE: 1974 St. Louis County Business Patterns.

to be through the \$18 million of consumer expenditures generated in the area through the operation's payroll payments to area employees. This income to the area will, in turn, generate sizable indirect economic activity throughout all of the economic sectors of the area. The construction industry, on the other hand, will be the recipient of tremendous activity through the construction of the mining operation's facilities and to meet the demands of the expected immigrant population. This, too, would have a multiplier effect on the area economy.

Among the negative impacts on the Ely economy would be the possible loss of tourism and seasonal homeowners if copper-nickel development results in serious degradation of the local environment. Whether environmental impacts are real or are merely perceived to be real by the tourist, the development of the area's copper-nickel resources may come at the expense of Ely's other resource-based economies, particularly tourism. As well, the "boom town" effects of development may exert inflationary forces throughout the economy which may be particularly harmful to Ely's large number of residents on fixed incomes and to its marginal businesses.

However, the positive economic impacts of copper-nickel may be very large. To forego mineral development and in its place establish policies to stimulate the existing resource based economies (tourism and timber) could prove to be monumental. In terms of employment (over 1,700 Ely area jobs), timber activity would have to be increased on the order of 16 or 17 times, while tourist-related economic activity would have to increase about five-fold. To equal the impact on final demand of the copper-nickel employees' expenditures (about \$18 million) tourism activity would have to be increased four times and timber export sales would have to increase by seven times. Whether or not these objectives can be

fulfilled through changes in governmental policy is beyond the scope of this study.

16.6 REFERENCES

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