GOVERNMENT TAXES AND AIDS

AND

ESTIMATED GOVERNMENT REVENUE FROM COPPER-NICKEL DEVELOPMENT

Minnesota Environmental Quality Board
Regional Copper-Nickel Study

Date: November, 1978

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VOLUME 5 - CHAPTER 12

GOVERNMENT TAXES AND AIDS AND ESTIMATED GOVERNMENT REVENUE FROM COPPER-NICKEL DEVELOPMENT

12.1 INTRODUCTION AND SUMMARY OF FINDINGS

Taxes and the impact associated with their payment and distribution can be examined from several vantage points.

State taxation policy and the impact of mineral development on the tax revenue to various units of government are of vital interest to governmental officials and potential resource developers. Projection of tax revenue is crucial to local government and school district officials, for it is at this level that the primary interplay between tax revenue and public expenditures takes place. Estimates of tax-generated revenue are necessary to determine the ultimate municipal and school district fiscal impact due to new service demands such as increased sewer, water, streets, classrooms and police protection, etc. caused by the population growth associated with potential copper-nickel development. Volume 5 - Chapter 13 presents a comparison of estimated government service costs and revenues associated with copper-nickel development.

State tax policy can also be a significant factor affecting the profitability and future viability of copper-nickel development. While this chapter presents information which can be used to examine the equity of Minnesota's mineral tax laws as it relates to minimizing the impacts upon government services, growth

and development precipitated by such development, Volume 5-Chapter 14 examines the financial impact of such taxes and federal taxes on the corporations proposing to develop Minnesota's copper-nickel resources. This chapter also examines taxing approaches used in Wisconsin, Arizona, New Mexico, Montana and Utah and the variations they have on mining profits over the life of an hypothesized operation.

The reader is cautioned that the tax and government revenue analysis presented in this chapter is largely based on hypothetical copper-nickel operations, described in Volume 2-Chapter 5 in detail. Deviation from the "development model" or tax analysis model conditions and assumptions could significantly change analysis results. In certain cases sensitivity analysis is presented to show the implications of changes in model variables. If results from this chapter and other chapters pertaining to tax analysis are applied to operations not specifically analyzed, incorrect results are likely. Sufficient information is presented in this report and in supporting technical reports (1st level reports) for independent analysis of specific copper-nickel development proposals, if all necessary input data is available for the case being analyzed.

The cases presented in this chapter are reasonable estimates of what could happen in the area of government revenues should copper-nickel development occur. As specific mining and processing proposals are submitted for state and local government consideration, comparison can be made with the cases presented in this report and general impacts can be assessed.

Governments will receive revenue from two sources as a result of copper-nickel development; directly from the mining operation, hereafter called direct taxes or revenues, and indirectly from the earnings of copper-nickel employees and the

induced growth in the economy resulting from development, herein called indirect taxes or revenues. A firm engaged in mining copper-nickel ores will be liable for taxes at the state level and to a small degree at the local level. It must pay the taxes common to all corporate entities; an income tax, unemployment insurance and workman's compensation. In addition, a mining firm would be liable for a series of taxes applicable only to the mineral industry in Minnesota, including an occupation tax, a production tax, a tax on royalties paid to the private sector, an ad valorem tax to local units of government on mineral rights and property not being actualy mined, rent on government-leased lands and royalties for the minerals removed from government lands.

Sources of indirect revenue to governments as a result of copper-nickel development are the income, sales and excise taxes paid by a mining company's employees to the state government and the ad valorem taxes paid to local governments on employees' property. In addition, the ancillary employment and business activity induced by the original mining development will contribute tax revenues to state and local governments.

Taxes on corporations in Minnesota can be sorted into five broad general categories: income taxes, sales taxes, property taxes, taxes on special activities, and miscellaneous taxes.

A tax on income earned in Minnesota is a leading source of revenue for the state of Minnesota. Minnesota's corporations are taxed at a flat rate, while its individuals are progressively taxed. In 1976, corporate income taxes generated 5 percent of total state and local tax collections and individual income taxes contributed 25 percent of total collections (DED 1976).

As part of a policy to shift the tax burden away from property owners, Minnesota in 1967 imposed a tax on most sales transactions. By exempting the sales of food, clothing, and drugs from the tax, Minnesota reduced the regressivity of its sales tax. In 1976, 13 percent of total state and local tax collections were from the sales and use tax.

Property taxes, paid exclusively to local governments, are the largest source of total state and local tax collections, accounting for 35 percent of total 1976 collections. Presently, corporations in Minnesota are exempt from property taxes on all personal property, inventory, and tools and machinery. In addition, real and personal property associated with abatement of air and water pollution are exempted from taxation.

Table 1 shows Minnesota's mineral taxes as they pertain to copper-nickel mining within the generic framework described above.

Table 1

Notable in their absence from state and local mineral taxes are the state sales tax and local property tax on mine and milling operations associated with copper-nickel development. Laws of Minnesota, 1967, Chapter 671, Section 298.62 exempts copper-nickel mining operations from paying the state sales tax and eliminates the mine and all facilities used in mining and production from the local property tax rolls. In lieu of property tax revenues from the mining operation, the revenues of the production tax are distributed to the local governments of the taconite mining area of Minnesota.

Treatment of a SMELTER/REFINERY complex for tax purposes is not clear and may be unlike that of the mine/mill portion of a mineral development. State statutes

Table 1. Present Minnesota tax (1978) applicable to the copper-nickel mining industry

	INCOME	PROPERTY	SALES	SPECIAL[1]	OTHER
STATE	Corp. Income		Equipment, Supplies (S/R)	Occupation Production Royalty Tax Royalties Rents	Unemployment Ins. Workmen's Comp.
LOCAL		Smelter/ Refinery Unmined Land		Mineral Rights on Unmined Land	

[1]Special taxes which apply to the mineral industry only.

describing the mineral taxation policies of Minnesota refer explicitly to the functions of mining and milling (production of concentrates) with no mention of the smelter and refinery processes. For the purposes of this analysis the smelter/refinery is treated as a manufacturing unit subject to taxes completely unlike those of a mining operation. This assumption is made because these facilities can be completely isolated from the mining operation and could receive concentrate and/or anodes from operations located in other states. Therefore, a smelter/refinery would be subject to an ad valorem property tax levied by local units of government. The complex would be taxed on the basis of its assessed value of 43 percent of the market value of the plant buildings and land. It would also be subject to Minnesota's sales tax on purchases of supplies, equipment and building materials and the corporate income tax.

Minnesota Statutes, Section 272.02 (15) exempts real and personal property used primarily for the abatement and control of air, water, or land pollution from ad valorem property taxation. Definitions and standards for pollution-related equipment are established by the Minnesota Pollution Control Agency. In order to claim a property tax exemption equipment must meet these standards.

Copper-Nickel development would result in large inputs of tax dollars to the state treasury. Whether a large net tax revenue increase would occur is dependent upon the location of the mineral development operation, its economic viability and the degree of vertical integration of the mineral development process within the state. The cumulative state tax revenue from a large mine/mill operation would be approximately $90 million over the life of the operation. Between 58 and 94 percent of these revenues would be returned to the mining region in the form of local government aids. The large variation in aid payments corresponds to mine location which becomes a major factor affecting net

benefit to the state. A mine located near Ely (Resource Zones 1 & 2) would result in the lowest net tax revenue benefit to the general fund while a mine located near Hoyt Lakes (Resource Zones 6 & 7) would have the largest benefit. A mine located near Babbitt (Resource Zone 4) would produce benefits between these extremes.

A large smelter/refinery operation would produce almost $200 million in state tax revenues and only 16 percent of these revenues would be returned to the development area (smelter/refinery location) as aids if Babbitt is used as a test case. Comparing the net state revenue benefits, a smelter/refinery operation in the state would generate from 4 to 28 times more net revenue to the general fund than would the mine and mill required to produce the concentrate for such an operation. From 49 to 64 percent of the total state tax revenues resulting from copper-nickel development will come from the employees of the mine and mill, while only 11 percent come from the smelter/refinery employees. Estimates of net tax benefits to the state from a mine/mill operation could be high if a large perentage of Cu-Ni employees were previously employed in Minnesota.

Local governments in Minnesota are presently less dependent on property taxes than was true ten years ago. Income and sales taxes presently assume a greater burden of local government finance as the source of revenues provided by the state to local governments in the form of municipal, school district, and county aids. In addition to the aids available to all Minnesota local governments, the local governments of the taconite mining area (which includes the Study Area) receive special aids funded by revenues from the taconite and copper-nickel production tax.

The result is a myriad of revenue sources for local units of government, most of which are distributed by the state and supported by general income and sales taxes and, in the case of the taconite area, mineral taxes. Most state aids are distributed according to need, which is related to population. If copper-nickel development occurs, tax revenues will flow to the state as a result of mineral production. Population increases related to development will result in a flow of state aids to local governments as well as an increase in the local property tax base. Following is a table (Table 2) showing the taxes and aids which will go to each level of government as a result of copper-nickel development. Each will be discussed in detail below.

Table 2

Total cumulative tax revenues to local govenments from a mine/mill operation could range from $63 million to $106 million over the life of the operation, of which, approximately 82 percent will go to local government indirectly as state aids. In contrast, a large smelter/refinery complex could generate 100 to 200 million in local revenues, of which, only 15 to 30 percent will be in the form of state aids. This is because a smelter/refinery would pay local property taxes and would have an estimated assessed valuation of $37.6 million.

The mine/mill operation pays production taxes in lieu of property taxes. Depending upon local mill levy rates, production taxes are 29 to 84 percent the amount that would be paid by the mine/mill operator if they were not exempt from such taxes. Assuming an assessed valuation between $12 million and $16 million, the wide variation is due to large deviations in local mill rates used for analysis purposes.

Table 2. Taxes and government aids related to copper-nickel development.

STATE	COUNTY	SCHOOL DISTRICT	CITY
CORPORATION			
Corp. Income Tax	Property Taxes: Unmined Land and Smelter/Refinery	Property Taxes: Unmined Land and Smelter/Refinery	Property Taxes Unmined Land and Smelter/Refinery
Occupation Tax			
Production Tax	Mineral Rights Tax Unmined Land	Mineral Rights Tax Unmined Land	Mineral Rights Tax Unmined Land
Royalty Tax			
Royalties	Homestead Prop. Tax Credits	Homestead Property Tax Credits	Homestead Prop. Tax Credits
Rent			
Mineral Rights Tax	Taconite Prop. Tax Credits	Taconite Property Tax Credits	Taconite Prop. Tax Credits
Unemployment Insurance			
Workmen's Compensation	Production Tax	Production Tax	Production Tax
		Taconite School District Aid	Taconite Municipal Aid
Sales Tax (S/R)			
INDIVIDUAL			
Personal Income Tax	Property Tax	Property Tax	Property Tax
Sales Tax			
Liquor Tax			
Tobacco Tax			
Gasoline Tax			
Auto License Tax			
Auto Excise Tax			
Driver's License Tax			

The distribution of copper-nickel mine/mill related local government revenue between county, school district and municipal levels is largely determined by state aid distribution which make up 80 to 85 percent of local revenues related to Cu-Ni mining development. School districts receive the great majority of total state aids (70 to 80%), while the balance is split betwen county and city governments. In contrast, local government revenue distribution resulting from the siting of a smelter/refinery operation is affected by both state aids and property tax distributions. Variations in mill rates have major impacts on revenue distributions, so in the case of a smelter located near Babbitt which has very low city and school district mill rates, 63 percent of local revenues go to the county, 31 percent to the region's schools and 6 percent to the region's cities. If the same smelter were located in Duluth, which has higher mill rates, 38 percent goes to the county, 38 percent to the school district, and 24 percent to the city. Remember that in the case of the smelter, only 15 to 30 percent of the local revenues are from state aid distributions which are broadly distributed over the region as a whole, while the property taxes go to the specific taxing district where the facility is located. See Volume 5-Chapter 13 for a detailed discussion of this situation.

Total government tax revenues (state and local) generated by a large 100,000 mtpy Smelter/Refinery complex should be two to three times greater than the tax revenues generated by the mine/mill complex required to support a smelter of the capacity evaluated. If the number of jobs is a relative measure of potential government service costs associated with new development; then, taking into consideration the labor extensive nature of mining operations, a smelter/refinery complex would generate 7 to 10 times more government tax revenues per employee than the mine/mill operation.

Tax analyses presented in this chapter assumes level production rates over the life of the operation with brief start-up and shut-down periods. This is an optimistic condition which seldom occurs. Variation from this assumption will result in significant alteration in tax proceeds. While sudden government revenue changes will occur as a result of strikes and major market recessions, most variations will be the result of equipment failures, operating problems, labor productivity changes and scheduling production rates to meet overall industry production requirements. Impacts of these variations can be partially mitigated by using an averaging procedure for assessing production and occupation taxes. Some of the impacts on local government can also be mitigated by maintaining minimum aid payments with accumulated revenues from the special ecnomic and environmental funds established by the legislature in 1977. A single large copper-nickel mine could pay $7.5 million into these funds over its operating life, assuming a 5 percent annual increase in the Wholesale Price Index.

Identical copper-nickel operations taxed under both current copper-nickel and taconite law would pay considerably less taxes under copper-nickel tax law than if taconite tax rates were applied to the operation. Annual taxes under taconite law would be more than eight times greater than annual taxes paid using the present copper-nickel tax rates.

Royalties could be a large non-tax source of government revenue from copper-nickel development depending upon the location of the mining operation. State ownership of mineral resource results in the largest revenue receipts, but indirect revenues are also generated from royalty payments to federal mineral and private mineral owners. While 100 percent state mineral ownership is unlikely at a single mining operation, a one-third state ownership of minerals could result in royalty revenues 2.5 times larger than the total state and local tax

payments made over the life of the mine. Mineral ownership in the region is highly variable (See Volume 5-Chapter 4--- Lands and Minerals Ownership) and it would take a detailed site specific examination in order to determine specific revenue receipts and distributions. Factors to be considered in such an analysis include ore grade and quantity, mine production and ore recovery rate, lease provisions involving bid rates, mineral ownership, and method of land or mineral acquisition (e.g. school trust, acquired forestry lands, county tax forfit, etc.).

12.2 ALTERNATIVE METHODS OF TAXING

At present, Minnesota's system of taxing the mineral industry is dominated by special taxes aimed only at the mineral industry. Across the country there are three general types of taxes imposed by state governments on the mineral industry. These are an ad volorem property tax, a severance tax, and a tax on corporate income; and are used in various combinations to generate state government revenues. Minnesota's occupation tax is related to the generic income tax in that it is determined as a function of corporate revenues and expenses. The production tax imposed on Minnesota mining operations is a pure severance tax.

State tax policy can have a strong influence on the development of its mineral resources, especially in situations where a potential operation has only marginal resources and requires large capital expenditures to develop a sound investment. Corporate decisions are made on the basis of return on investment and state tax policy can often influence these decisions favorably or unfavorably. A sound, steady investment climate--including state tax policy--is preferred by large corporations. Given a variety of equally potential investment projects, a corporation most likely would opt for a location which offers a favorable tax

structure and thus a better return on investment. See Volume 5 - Chapter 14 for a more detailed discussion on the impacts of taxes on the mining operation.

Each of the three types of taxes has two general factors which are common to the determination of tax liability. First, a tax base is established. This varies according to type of tax. For example, the tax base for the severance tax is most often the number of tons of ore produced during the period, but for the ad valorem property tax the tax base is the market value of the property. Secondly, a predetermined tax rate is applied to the tax base to calculate tax liability. The tax rate can either be flat, 2.5 cents per ton of ore produced, or can be graduated such as the federal individual income tax rate, placing a higher percentage tax burden on those with greater incomes.

The three general taxes are presently being used in various combinations in all the mining states in the country. Minnesota, for example, has taxes which fit in each of the three categories. The tax on unmined ore is an ad valorem tax, the production tax on taconite and copper-nickel is a severance tax, and the occupation tax on taconite and copper-nickel could be classified as a proceeds tax. Arizona levies an ad valorem property tax against all mining property, a transactions privilege tax which is a severance tax on the gross proceeds of mineral production, and a state corporate income tax. On the other hand, Colorado does not levy any severance taxes, while Wyoming levies no corporate income tax. Nevada levies only one tax on the mining industry, a property tax which uses net semi-annual proceeds as the tax base and state-wide ad valorem tax rates.

12.21 Ad Valorem Property Tax

The ad valorem property tax is based on the principle that property owners should pay a share of taxes which reflects their relative property values . A major source of local revenue, theoretically the property tax is levied to approximate the benefit of government services realized by the property holder. In most cases where large industrial developments dominate a community, the property tax burden is shifted away from the residential property owners of the taxing district, resulting in lower levies for residents and the larger share of property tax levy going to the industrial development.

Article X of the Minnesota Constitution requires uniform and equal taxation for each "class of subjects". To accomplish this, the tax base for ad valorem taxes is the fair market value of the property. In cases of residential or commercial buildings which frequently change hands, assessing the property value is a relatively easy process. A mining property, because it is not often bought or sold, is a much different situation.

Two methods for determining the value of an ore deposit are commonly used. The taxable value can: (1) be set equal to the current proceeds from the property; or (2) be set equal to the present value of the expected future earnings of the mining operation. Current proceeds can be calculated on an annual or semi-annual basis or be an average of previous years proceeds. The tax base may be either gross proceeds or net proceeds, deducting designated production costs. Formulas to calculate the present value of the mining operation's future earnings include factors for mine life, rates of return, price of metals, and opportunity costs; thus, this is a more uncertain valuation method and is not as easy to administer.

The tax base can be adjusted through exemptions of certain types of property or assessment at a variable percentage of market value to reflect the state's

policy toward mineral development. By exempting property, the state acts to reduce the property tax burden of the industry and thus provide an incentive for development. Adjusting the assessment rate would have the same effect. Minnesota currently assesses unmined ore at 50 percent of its market value, determined by state officials using a Hoskold-type formula. Real property such as industrial or manufacturing buildings and land is assessed at 43 percent and agricultural land at 33 1/3 percent.

In Minnesota, the state does not collect any ad valorem property taxes; it is collected only by local units of government. The tax levy for a property is based on the cumulative mill rate of each of the jurisdictions which have the power to levy a tax. The tax is administered by the county which, after collection, distributes the rightful share of the tax revenue to each of the taxing jurisdictions.

Ad valorem taxes have impacts both to the mining operation and to the units of government. Ad valorem taxes based on gross values have the effect of adding to the fixed cost of an operation without increasing its profitability. It thus serves to lower the rate of return which can be made with the mining investment. In marginally profitable operations, the property tax can have the effect of high-grading the ore, selectively mining only the ore which has a higher mineral content. Thus, the ore which is not above the high cut-off grade is lost as a mineral resource, the operation faces a shorter mine life, and employment opportunities are lost. If the value of the ore body is determined on the basis of future earnings, the mine operation could minimize its tax liability by shifting production toward the present. This would lead to a larger scale mine for a shorter period of time, and provide a catalyst for a potential fluctuating boom and bust economy.

However, if net proceeds is the tax base, the mine operation is not induced to shift operations to the present, nor is the tax a fixed cost (it becomes tied to profitability). This would effectively act to lower the cut-off grade of the mine operation and would extend its life, thus serving to conserve resources.

From the government's point of view, the property tax is viewed with more favor. The tax provides a relatively steady and predictable source of revenue. If administered at the local level, it serves to provide revenue in the area where the impact of the mining operation on government service costs is the greatest, but also tends to concentrate the economic benefits to a small region. Fluctuations of tax revenue during periods of low prices or strikes could occur as a result of using the net proceeds concept, but these can be minimized by using an average of several year's proceeds.

The use of a net proceeds valuation with a three or five year averaging period in addition to market value assessment of mine plant and land surface as the property tax base for the mineral industry provides a steady tax revenue to local government which is easily determined and provides what some consider an equitable method of taxing the mineral industry relative to other industries (Laing 1977).

12.22 Severance Tax

Severance taxes find their rationale in the theory that the state should be compensated for the loss of its non-renewable natural resources. The tax may be defined as a tax for the privilege of extracting natural resources from the soil and water. It thus is peculiar only to the extractive industries, most particularly the mineral industry.

The tax base for determining the severance tax liability is most commonly the number of units of output produced during the tax period. It may also be the net value of the output produced or sold.

The tax rate, either a flat or graduated rate, is applied to the tax base to determine an operation's tax liability. A flat rate would tax each unit of production the same, while a graduated rate would change as some characteristic of the product changes. In Minnesota, for example, the production tax rate changes in relation to the mineral content of the ore.

Tax liability of a mine operation can be altered to accommodate state tax policy by granting exemptions or credits. Credits for other taxes paid, exemptions for small operations or for a minimum level of production are examples.

Severance taxes can be viewed as a direct operating cost for the mining operation, thus reducing the profitability of the venture volumes. (see Volume 5-Chapter 14 for discussion of impact of taxes on profitability). Because its market is national or international, a mining operation may not be able to pass the cost of the tax on to its consumers. A higher cut-off grade and loss of resource may result from increased operating cost. As well, severance taxes treat a highly profitable operation and one that is only marginally profitable equally, thus is contrary to the "ability to pay" concept of taxation.

Severance taxes, though easily determined and administered, can result in fluctuations of tax revenue during periods of production curtailment. State governments have used severance taxes to determine the rate at which mining takes place. A high tax drives mining operations to alternative locations, while a relatively low severance tax (or no tax at all) minimizes the disincentives to develop the state's resources. See Volume 5-Chapter 14 for a comparison of mineral taxation of various U.S. mineral producing states.

The mining industry views the severance tax as unfair because it is applicable only to extractive industries, and easily changed to shift state tax burden to the mineral industry as legislators see fit (Laing 1977). From the government's viewpoint, the severance tax is unpredictable and results in loss of mineral resource.

12.23 Income Tax

Based on the principle of "ability to pay" the income tax is the most significant tax corporations and individuals pay at the federal level. Most states pattern their corporate income tax policy after that of the federal government, but with significantly lower rates.

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Federal net taxable income is commonly used as the tax base for state income tax calculations. The states, however, generally tax only that portion of a mining operation's income which is attributable to the state. Minnesota uses a three factor formula including the state's share of the operation's sales, employment, and property holdings to determine that portion of an operation's income which was earned in Minnesota. Other states use different formulas. Of course, if a company operates entirely within the state this is no problem.

The state may impose its tax policy decisions through specific deductions from the tax base. Deductions of federal tax liabilities, specific operating

expenses, reclamation and pollution control expenses, in addition to standard income deductions can be specified to alter the net state income tax base.

A tax rate is applied to the tax base to determine the mining operation's income tax liability. Generally, state income tax rates are significantly lower than the federal tax rates. Minnesota's rate is currently 12 percent, other mineral producing states have tax rates in the 5 to 10 percent range. The rate may be either flat or graduated. A flat rate would remain constant in spite of changes in an operation's net taxable income. A graduated tax rate would vary according to profitability, taxing operations which make greater profits at a higher rate than would be paid by an operation with lower profits. The rate could also be designed to tax marginal portions of net income at rates greater than a base income. For example, the first $1 million in profit could be taxed at X percent, while anything over $1 million is taxed at 2X percent.

Once an operation's tax liability is determined, the state may further exercise its policy regarding taxes and the mineral industry through the use of specific credits against the liability. For example, other taxes paid can be credited, as could the expenditures for reclamation or pollution control facilities. A credit once the tax liability has been determined has a more powerful impact than does a deduction before the tax rate is applied.

Minnesota's occupation tax for taconite and copper-nickel operations is a form of the income tax. The occupation tax allows specific deductions from the value of an operation's output, taxes it at a flat rate, and allows credits for in-state refining and research and exploration. A net proceeds tax, though described as a method for valuating an operation's mining property, is in essence an income tax. Wisconsin's new net proceeds tax (Volume 5-Chapter 14)

deducts from gross revenue specified operating expenses and applies a graduated tax rate to determine tax liability.

From the point of view of the mining operation, an income tax encourages development of maximum resources over an extended mine life and provides incentive for exploration and development because it does not tax ore reserves in the ground. The tax is not viewed as an addition to fixed costs are as an additional operating cost which is independent of profitability. This allows the characteristics of the ore body to determine the tax cost to the mine operation.

For the state, the income tax is relatively easy to administer and an equitable form of taxation. Tax revenues, however, may be less predictable than other forms of taxation due to the relationship of tax revenue to income of the operation, which may be subject to periodic slowdowns because of faltering price and demand or strikes. Widely fluctuating revenues as a result of price and production variations, which are fairly common in the mineral industry, can be minimized by allowing an average income of the past several years to be used for any determination of annual taxable income. This method would serve to smooth out the impact of volatile mining income and make revenues to the state more predictable.

12.3 THE TAX MODEL USED TO ESTIMATE GOVERNMENT REVENUE RESULTING FROM COPPER-NICKEL DEVELOPMENT

To better understand the potential tax revenue implications of copper-nickel development, a computerized model capable of estimating the tax revenues generated by mineralized development (mine, mill, and/or smelter/refinery) was developed. The primary objective of the model (Tax Model) is to follow the path of tax-generated dollars from the origin at the mine development to the final

destination at local units of government or state tax accounts and funds. This will provide a means to estimate the municipal, county, and school district revenues in the Regional Copper-Nickel Study Area (Study Area) related to copper-nickel mining. In addition, the model is capable of estimating the change in state revenues from copper-nickel mineral development.

The Tax Model is a series of mathematical equations depicting the mineral taxation policy and laws of Minnesota as they existed in 1977. The user of the model can alter inputs to the model, the tax rates of the specified mineral taxes or, alternatively, create a limited number of new taxation schemes. The model also depicts the taxation policy which applies to the employees of the hypothesized mineral development so that taxes paid by mine employees may be estimated.

The model makes many assumptions about characteristics of the population, typical spending patterns, housing preferences, etc. In all cases these assumptions are explicitly stated and documented within the computer program. In many cases the documentation is a result of a household survey conducted in the Study Area for the Regional Copper-Nickel Study by the State Demographer's office. For each tax in the model the computer program references the specific state statute in which the tax is documented.

Inputs to the tax model are a description of a hypothesized mining operation, including mine, mill, and/or refinery output, capital and operating costs, prices of outputs, employment, housing values, and others.

The model produces tables which show the development-related revenue for each unit of government within the Study Area which might be impacted by a mining development.

City of Aurora	Aurora - Hoyt Lakes School District
City of Babbitt	Babbitt School District
City of Biwabik	Biwabik School District
City of Ely	Ely School District
City of Eveleth	Eveleth School District
City of Gilbert	Gilbert School District
City of Hoyt Lakes	Virginia School District
City of Virginia	Lake County
	St. Louis County
	State of Minnesota

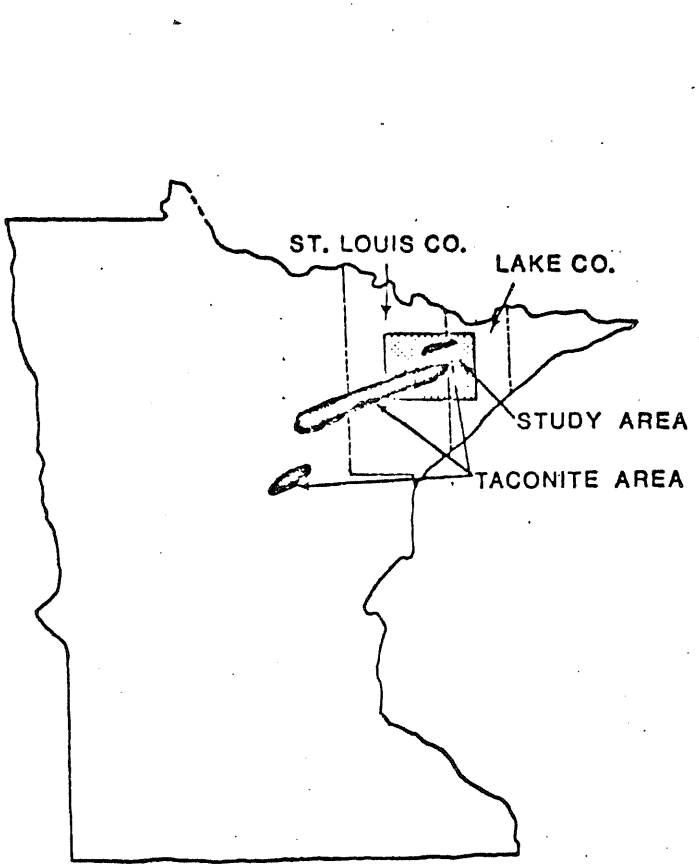
Figure 1

The tables produced by the model show tax revenue according to source for each year of analysis, up to a maximum of fifty years. For example, a community might receive revenue from employees in the form of property taxes and from the mining company as property taxes and the city's share of production taxes. In addition it may receive homestead property taxes, increased municipal aid from the state plus its share of the taconite municipal aid fund.

Detailed information on the design, assumptions and operation of the tax model can be found in USERS GUIDE TO CNICK, Thomas Stinson, Andrea Lubvov, and Kweiwu Fang and data files of the Regional Copper-Nickel Study.

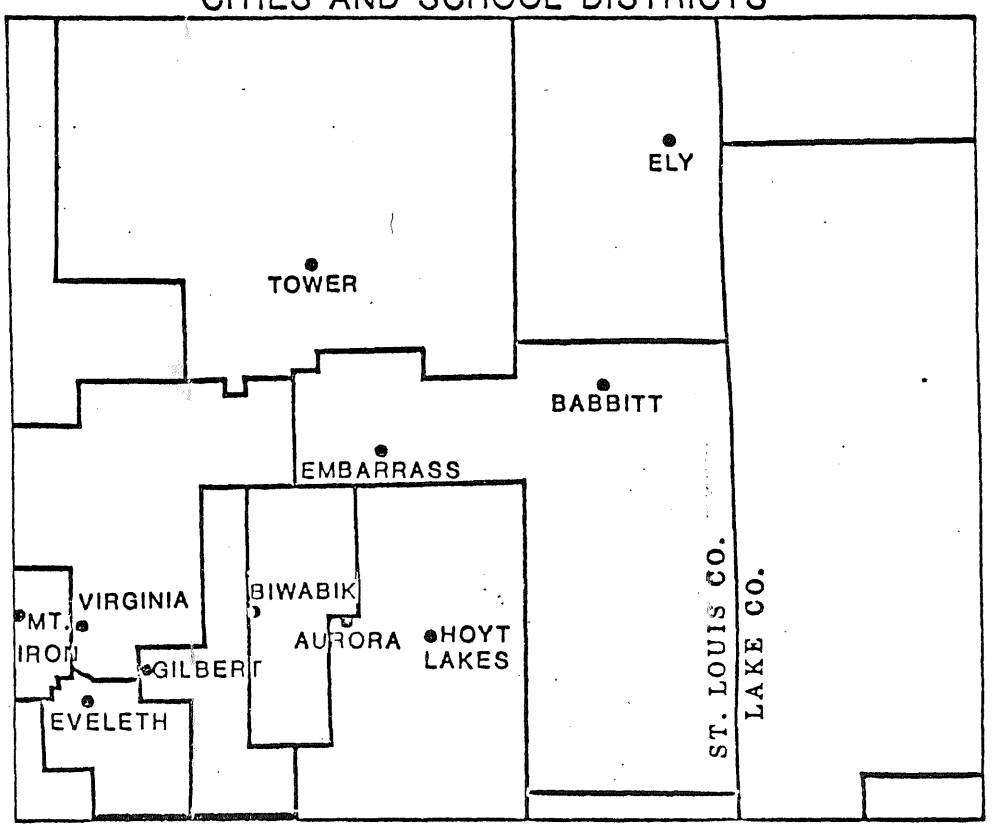
12.4 DEVELOPMENT SCENARIOS

Three mine/mill development scenarios plus an associated smelter/refinery scenario are used in the Tax Model as base cases to analyze the generic impact of copper-nickel mining on governmental revenues. These four scenarios



MINNESOTA

CITIES AND SCHOOL DISTRICTS



REGIONAL COPPER-NICKEL STUDY AREA

STATE AND LOCAL UNITS OF GOVERNMENT

demonstrate the range of expected impacts on revenue. They vary in location of development as well as in size and type of development. However, each mine/mill scenario produces an identical amount of copper, nickel, and precious metals which are treated by the smelter/refinery.

One scenario locates an underground mine and associated mill which produces 12,350,000 metric tons of ore per year in the northern portion of the Duluth Contact near Ely, Minnesota. In this area the mine would be located in Lake County while most employment would locate residences in the communities and rural area of St. Louis County, principally in the Ely area. This area also has a high concentration of federally-owned land with virtually no state-held lands. Mineral ownership determines the amount of government revenue generated through royalty payments. For purposes of this analysis, 80 percent of mineral ownership is assumed to be federally held, with the remaining 20 percent equally divided between state and private ownership. These figures represent the distribution of current land ownership for Resource Zone 2 of the mineralized area (see Volume 5-Chapter 4).

A combination open pit and underground mine/mill operation producing 16,680,000 metric tons of ore per year is analyzed in the middle portion of the Duluth Contact (Resource Zone 4). This area is located within the Babbitt municipal limits and has the highest concentration of state-controlled lands. For analysis purposes, 33 percent of land ownership is assigned to the state, while 60 percent is privately-held with the remaining 7 percent controled by the federal government.

An open pit mine producing 20,000,000 metric tons of ore per year and associated mill is analyzed in the southern portion of the Study Area. This area is almost

entirely privately-owned and is not within the municipal boundary of any city, but is nearest the city of Hoyt Lakes (Resource Zone 7). For this scenario 20 percent of land ownership is assumed to be held by the state, with 20 percent and 60 percent assigned to the federal government and private sectors, respectively.

The smelter/refinery scenario is located in the same area as is the 16,680,000 combination open pit and underground mine/mill, within the Babbitt municipal boundaries near the middle of the Study Area. The smelter/refinery is capable of handling the output of each of the three mine/mill scenarios and produces 84,600 metric tons of copper and 15,400 metric tons of nickel annually at full production. Since a smelter/refinery would be taxed as a manufacturing unit (unlike the mine/mill portion of an integrated complex) it is subject to a local property tax. For this analysis, the taxable valuation for property tax purposes is set equal to 90 percent of the initial capital cost of the plant (an estimate furnished by the Department of Revenue) times the assessment rate, 43 percent, applicable to industrial property, class 4.

Table 3 presents for each scenario the major factors which are important for tax analysis purposes. Figures are for a year in which each operation is at a steady-state level of production.

Additional details concerning each of these scenarios can be found in Volume 2-Chapter 5 of this report.

Table 3

12.5 STATE TAXES AND ESTIMATED REVENUE RESULTING FROM COPPER-NICKEL DEVELOPMENT

Table 3. Summary of major parameters for mine/mill and smelter/refinery scenarios.

	UNDERGROUND	COMBINATION	OPEN PIT	SMELTER/REFINERY
Ore produced	12,350,000 mtpy	16,680,000 mtpy	20,000,000 mtpy	
Concentrate produced	635,000 mtpy	635,000 mtpy	635,000 mtpy	
Copper produced				84,600 mtpy
Nickel produced				15,400 mtpy
Value of ore[1]	$ 26.11/mt	$ 19.34/mt	$ 16.13/mt	
Value of concentrate[3]	$244.11/mt	$247.07/mt	$240.25/mt	
Value of copper				$ .91/lb
Value of nickel				$2.10/lb
Value of ore[2]	$ 21.24/mt	$ 15.75/mt	$ 13.14/mt	
Employment	1,857	1,599	1,378	621
Employee compensation	$40.2 X 10^6	$33.6 X 10^6	$28.1 X 10^6	$12.7 X 10^6
Total initial capital cost	$244 X 10^6	$302 X 10^6	$300 X 10^6	$324 X 10^6
Operating cost	$8.23/mt ore	$4.28/mt ore	$4.21/mt ore	$33.27/mt cathode
Cost of concentrate				$190 X 10^6
Depreciation[4]	$15 X 10^6	$20 X 10^6	$21 X 10^6	$21 X 10^6
Depletion	$47.3 X 10^6	$47.3 X 10^6	$47.3 X 10^6	
Royalties	$15.7 X 10^6	$15.7 X 10^6	$15.7 X 10^6	

[1]Used in determining occupation tax liability; value of minerals removed from earth.
[2]Used in determining royalties; value of minerals recovered in concentrate.
[3]Used in determining mine/mill income tax liability; shadow price reflecting value-added and economic rent of mine and mill stages of production.
[4]Will vary from year to year.

The Constitution of the State of Minnesota, in Section 6 of Article X specifically refers to copper-nickel mineral taxation in what is commonly called the "taconite amendment." The amendment states that the Laws of Minnesota 1963, Chapter 81 generally relating to the taxation of taconite and semi-taconite mining production and beneficiation shall not be repealed, modified, or amended prior to November 4, 1989. Written before tax laws had been instituted relating to copper-nickel mining, the amendment provides that taxes regarding copper-nickel mining, production, and beneficiating may be fixed or limited for a specific period of time not extending beyond 1990. The amendment is permissive regarding copper-nickel taxation so it does not prevent the repeal, modification, or amendment of the copper-nickel tax laws prior to 1990.

Section 298.66 of the Laws of Minnesota 1967 declares the state policy regarding the taxation of copper-nickel operations. It states that during the period prescribed in the taconite amendment to the Minnesota Constitution the occupation, royalty and income taxes may be changed only in proportion to the change in taxes imposed on manufacturing corporations. It does not restrict the legislature;s power to change the production taxes imposed on copper-nickel operations. However, because this policy is stated in the Laws of Minnesota and not in the Constitution, changing the State's copper-nickel policy, if necessary, should not pose procedural problems for the legislature.

Laws regarding the production and occupation taxation of copper-nickel mining operations are found in Laws of Minnesota 1967, Chapter 671.

There are many provisions in the Laws which could generate revenues directly to the state from the operation of an enterprise mining copper-nickel ores in Minnesota. These include:

an occupation tax

a production tax

a corporate income tax

a tax on royalty receipts of private parties

unemployment insurance and worker compensation provisions

a mineral rights tax

rent from state-held mineral leases

royalties from the production of state-owned minerals

In addition, there are taxes which will contribute revenue to the state indirectly from the mining of copper-nickel ores in Minnesota. These include the tax on mining employees' income, sales and excise taxes paid by these employees and, in the event of privately-held mining leases, an income tax on royalty receipts.

Revenues to the state government from copper-nickel development will come directly from the mining operation itself and indirectly from mine employees and any ancillary development which may occur. Estimated revenues to the state directly from the three mine/mill development scenarios, as projected by the tax model, are summarized in Table 4. These figures represent the cumulative revenues from the operations over their hypothesized 30 year life.

Table 4

As demonstrated in Table 4, royalties from minerals owned by the state provide the largest share of revenue from development. Even though the estimated percentages of minerals owned or held in trust by the state are relatively low, ranging from 10 percent for the underground mine to 33 percent for the combined operation, royalties from these mineral holdings contribute 46 percent of total

Table 4. Cumulative revenue to the state from various copper-nickel mine/mill operations, over a 30 year mine life (smelter/refinery not included) ($\$10^6$)

	12,350,000 mt/yr UNDERGROUND	16,680,000 mt/yr COMBINATION	20,000,000 mt/yr OPEN PIT
Royalties	36.2	126.4	78.8
Production Tax	13.0	18.6	22.9
Occupation Tax	19.1	20.3	22.2
Royalty Tax	.4	2.5	2.5
Income Tax	-	-	-
Unemployment Insurance	10.6	9.6	8.4
TOTAL	79.3	177.4	134.8

direct revenues in the case of the underground mine, 71 percent for the combined operation, and 58 percent for the open pit mine. The amount of royalties received varies among the scenarios according to the mineral land ownership pattern.

The revenues to the state from the production and occupation taxes on mining operations are of relatively equal magnitudes. The production tax varies among the scenarios according to the amount of ore removed, with the largest revenues from the open pit mine producing 20 x 10^6 mtpy of ore. The structure of this tax, in effect, penalizes those operations which mine large quantities of low-grade ore relative to those which mine smaller quantities of higher-grade ore. The revenues from the occupation tax, which are related to the net earnings of the mining operations, indicate that the open pit mining method is more profitable than those operations which employ underground methods. It must be remembered that each mine model is designed to generate indentical amounts of copper and nickel metal, but have different capital and operating costs associated with each scenario (see Table 3).

Revenues from the tax on royalties paid to the private sector are related to the mineral ownership pattern assumed for each scenario. The underground mine, with only 10 percent private ownership, generates very little revenue from this source (less than $400,000 over the life of the operation). Examination of the royalty tax revenue from the other scenarios shows the difference due to the timing of the operation. Although both scenarios assume 60 percent private ownership and both pay the same amount of royalties at full production, the open pit operation reaches full production much more quickly than does the combination operation and over the life of the operation generates about $70,000 additional revenue.

Revenue from the tax on corporate income is difficult to project. For this analysis, it has been assumed that the operation is a wholly owned corporation doing business only in Minnesota. A subsidiary of an international company doing business in many states would be treated much differently. It also must be pointed out that the revenues to the state shown in Table 4 are those from a mine and mill operation only. The smelter/refinery complex, which generates the greatest share of value-added and thus more corporate income tax, is treated seperately (See Table 5).

Although none of the scenarios show any income tax payments over the life of the mine, this does not mean that the operations do not have positive net incomes. Because of credits granted by the state for other taxes paid and research and development expenses, net corporate income tax liability can disappear as these are subtracted.

Unemployment insurance payments to the state are sizable, about one-half the amount of the production or occupation taxes in the three scenarios. The payments are related to the size of the operation's payroll and vary accordingly among the scenarios.

Total direct revenues to the state generated from copper-nickel mining development vary greatly from scenario to scenario. Because royalty revenues make up such a large percentage of total revenues received, mine location and land ownership pattern are critical for the projection of revenue. Revenues to the state other than royalties (which are not a tax, per se) are much more constant across each of the scenarios. Without royalties, "life of mine" cumulative revenues range from $43.1 million for the underground mine, $51 million for the combination operation, to $56 million for the open pit operation.

Revenues to the state generated from a smelter/refinery complex located within the municipal boundaries of Babbitt, the same loction as the 16,680,000 mtpy combined open pit and underground mine/mill operation are summarized as "life of facility" cumulative totals in Table 5.

Table 5

Based on a Minnesota Department of Revenue interpretation of present Minnesota tax laws a copper-nickel smelter/refinery complex would be taxed like a manufacturing unit. It is thusly subject to local property tax, state sales tax and state corporate income tax as well as unemployment insurance payments.

The revenues accruing to the state from the smelter/refinery scenario are of significantly larger magnitude than the revenues estimated for each of the mine/mill scenarios, especially if revenues from royalties are not considered. Mine/mill revenues excluding royalties range from $43 million to $56 million, less than one-third the estimated smelter/refinery revenues.

Far and away the largest source of state revenue from the smelter/refinery is the state income tax. This illustrates an interesting feature of Minnesota's mineral tax policy as it relates to the copper-nickel production process. The state has two tax policies which apply to parts of a single integrated industrial complex. The mine/mill operation is taxed as a mineral operation, while the smelter/refinery complex is taxed as an industrial operation. If a steel blast furnace were located at a taconite mine site, the tax treatment would be the same.

Several problems arise relative to this issue. As shown above, the mine/mill operations are not projected to pay any corporate income tax what-so-ever. This

Table 5. Cumulative revenue to the state from a copper-nickel smelter/refinery complex over a 30 year facility-life (mine/mill not included) ($\$10^6$).

State Corporate Income Tax	152.5
Sales Tax	23.0
Unemployment Insurance	4.0
TOTAL	179.5

is questionable, to be sure, due to the fact that since there is no active market for copper-nickel concentrate, in order to make an estimate of income for the mine/mill operation, a shadow price must be used. This price reflects the value-added and economic rent attributable to the mine/mill operation. It was derived by subtracting from the producer price for copper and nickel the value-added and rent accruing to the product during the smelter/refinery stage of production. The difficulty in determining a suitable price for copper-nickel concentrate indicates that a wide margin of prices is likely to be encountered in actual tax applications. By adjusting the price for concentrate a mine/mill opertion can effectively eliminate its income tax liability.

Related to the problem of value determination for the concentrate is the situation wherein the smelter/refinery portion of the production process of a corporation is located outside the state of Minnesota. By assigning a relatively low value to its concentrate, an operation could eliminate its Minnesota state income tax liability, pass on its value-added to the smelter/refinery process, and minimize its state income tax liability by locating its smelter/refinery in a lower income-tax state.

If such a situation should arise, where the smelter/refinery is not located in Minnesota, the occupation tax liability of the mine/mill operation would triple to about $60 million over the life of the operation because MS 298.51 provides for a lower occupation tax rate if smelting occurs in Minnesota. But this $40 million increase in occupation tax revenue, would fall very short of making up for the $176 million lost income and sales taxes, estimated to be generated from the smelter/refinery operation.

12.6 SENSITIVITY OF STATE MINERAL TAXES AND ESTIMATED REVENUE

By varying the data base which is used in the Tax Model (i.e. changing the assumptions about the mine/mill scenarios) further insight as to the working of Minnesota's mineral taxes is gained. Each of the mineral taxes can be examined in terms of its sensitivity to changing assumptions.

In general, the revenue from the occupation tax is the most sensitive to changes in the mine scenario assumptions. This is because the occupation tax is dependent on price of ore, level of production, refinery location and all the expenses of the operation. Changes in any one of these variables result in a change in tax revenues. Corporate income tax revenue would be equally sensitive were it not tempered by the credit of occupation taxes. Base case scenarios show no income taxes paid by the mine/mill operations. However, many alternative Tax Model runs show a positive income tax, in particular when occupation taxes are decreased by adjusting the assigned value of ore or when production of concentrate is increased past 635,000 mtpy for the open pit scenario.

The production and royalty taxes, as well as royalties, vary according to the amount of production from the mine/mill operation. As production increases, so does tax revenue. When production slumps, revenue from these sources follows suit. Royalty and royalty taxes also vary according to the mineral ownership of the operation. An operation based exclusively on state minerals, for example would produce huge royalty receipts to the state and no royalty tax revenues.

Unemployment insurance payments vary directly according to the payroll paid by the operation. Examination of the three mine/mill base case scenarios (see Table 4) gives an indication of this relationship.

Following is discussion of each of the sources of state copper-nickel generated revenue. The purpose is to show the characteristics of each tax and the impact

on tax revenue due to some important changing conditions within a hypothetical copper-nickel operation or within the mineral industry.

12.61 Occupation Tax

Laws of Minnesota, 1967, Chapter 671, Section 298.51 states that "Every person engaged in the business of mining or producing copper-nickel ores in this state...shall pay to the state of Minnesota an occupation tax equal to one percent of the valuation of all such ores mined or produced" (Figure 2). The valuation of the ores is determined in Section 298.52. This allows the expenses incurred in bringing the ore to the surface of the earth--reasonable cost of supplies used and labor performed, the cost of removing the overburden if the ore is taken from an open pit mine or the cost of sinking shafts and running drifts if the ore is taken from an underground mine, the amount of royalties paid during the year, and the tax payable under Section 298.61 (the production tax)--to be deducted from the value of the ore produced. This, in essence, means that the tax is a "net proceeds" tax on the mining operation. The gross tax liability is equal to one percent of the value of the ore produced during the year after the deduction of expenses.

Two credits are allowed against the gross tax liability. Section 298.54 states that "There shall be allowed a credit against the occupation tax assessed under section 298.51 against any mine of two thirds of one percent of the amount of such tax for each one percent of the total production of copper-nickel ore from said mine which is converted into semi-refined or refined metal, blister copper, copper powder, nickel powder, ferronickel, nickel sinter, or other primary or intermediate forms of copper, nickel, or copper-nickel metals within the state of Minnesota." This means that for the copper-nickel ores of a mining operation

processed within Minnesota the effective occupation tax rate is one third of one percent of the valuation determined by Section 298.52. The tax rate remains one percent for that ore which is processed outside Minnesota.

A credit for research, experimentation, and exploration is allowed in Section 298.55. Credit "for the cost of all research, experimentation, pilot plant tests, and exploration work performed in Minnesota in such year for the express purpose of furthering the discovery, development, or beneficiation of Minnesota copper-nickel ores" is computed by applying to such costs the net effective rate of the occupation tax after consideration of the provisions of Section 298.54 (the refining credit). The credit is applied against the tax as determined by Sections 298.51, 298.52, and 298.54. The credit is allowed to be carried forward if in excess of current tax liability for up to two years.

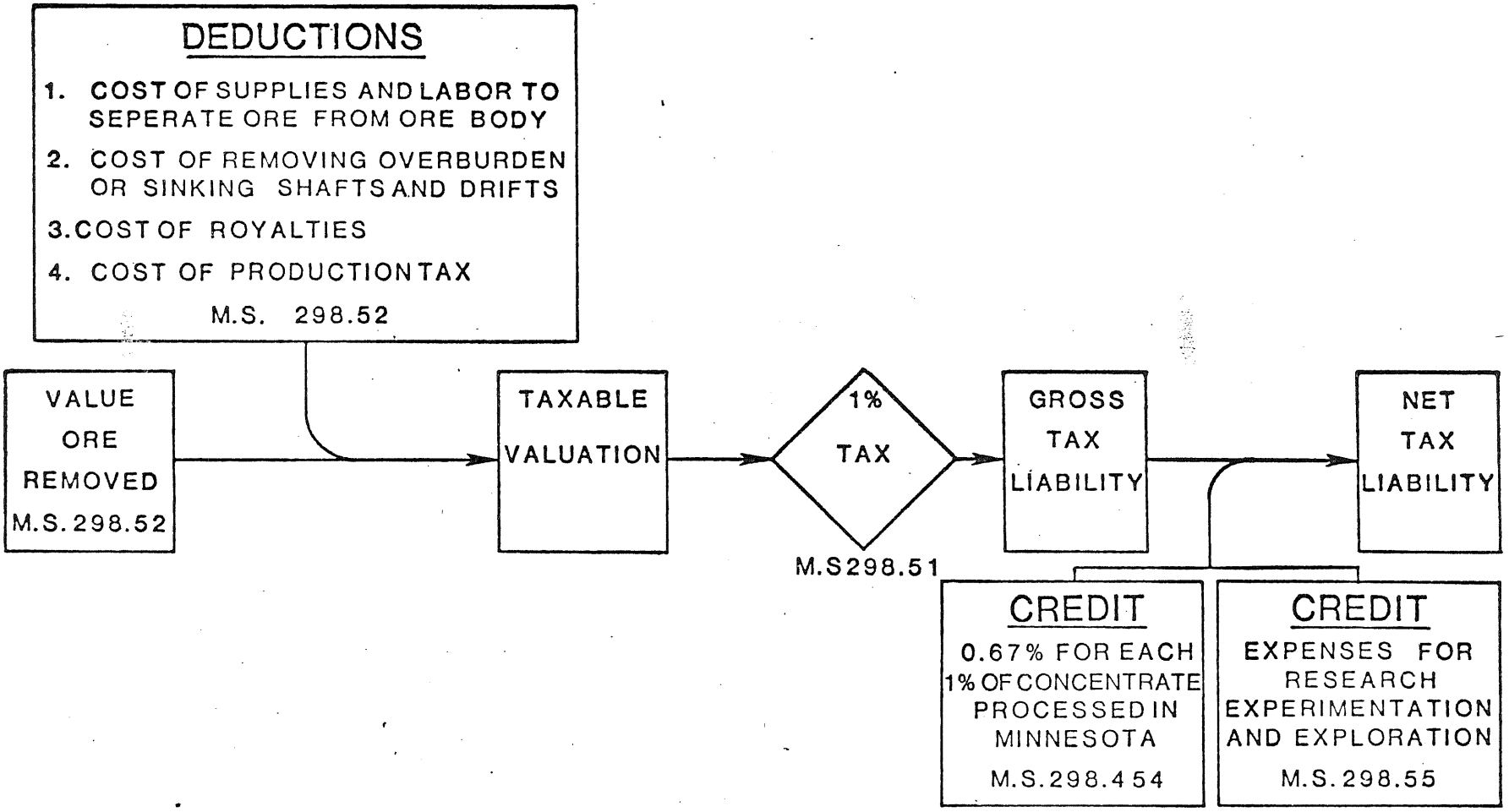
The revenue generated by the occupation tax is deposited in the state treasury and distributed as follows:

50 percent to the general fund,
40 percent for the support of elementary and secondary schools,
10 percent for the general support of the university.

Figure 2

The occupation tax is the most sensitive of Minnesota's mineral taxes. The revenues from this source will vary according to changes in an operation's revenue (the value of its ore and the level of production), its expenses (any deductions or credits which are used to determine net tax liability for the mine/mill operation) and perhaps most importantly the location of the operation's smelter/refinery processing facility.

OCCUPATION TAX
M.S.298.51-298.55



As discussed above, the occupation tax is actually a tax on a mine/mill operation's net proceeds. In order to calculate annual operation revenues the value per ton of ore produced as determined by the Commissioner of Revenue is the most important, and most discretionary, decision regarding mineral taxes. It is discretionary because there is no discernible market for copper-nickel ore. Being of relatively low grade, copper-nickel ores are universally concentrated to a higher grade product at the site of the mine. Hence, there is no commonly accepted value for copper-nickel ore.

Figure 3 gives an indication of the range of ore values which can be chosen by the Commissioner of Revenue and its relation to the amount of occupation tax generated over the life of the open pit base scenario. At the high end of the range of values is the value of the minerals contained in the ore (point A). This is the value used in the base scenario but is certainly high for several reasons. This value does not reflect the loss of value due to recovery losses during further processing, so that revenues to the mine using this value would be greater than revenues to the refinery using producer prices. The value also does not reflect the value-added during further production stages. There can be no question that a ton of copper billets from a copper refinery has more value to a consumer than a ton of copper mineral sprinkled throughout 200 tons of ore. The mineral content value (point A) is analgous to the method used to determine taconite occupation taxes and to the method used to determine state royalty payments, explicity stated in DNR rules (NR 94), except that the former refers to ore, whereas the latter pertains to mineral content of concentrate.

At the opposite end of the range shown in Figure 3 is a value of ore (point C on the curve) determined as a shadow price. This value is derived by determining the value of minerals produced from the refinery and subtracting the value-added

and economic rent furnished by the refinery, smelter, and mill stages of production. This leaves the value of the ore, the product of the mine stage, and is perhaps closer to a true value for ore were it openly traded in a market. This is discouraging from a state revenue point of view as it would produce only $100,000 in occupation tax revenue over the life of the base case operation, compared to $22.2 million using the value of minerals contained in the ore.

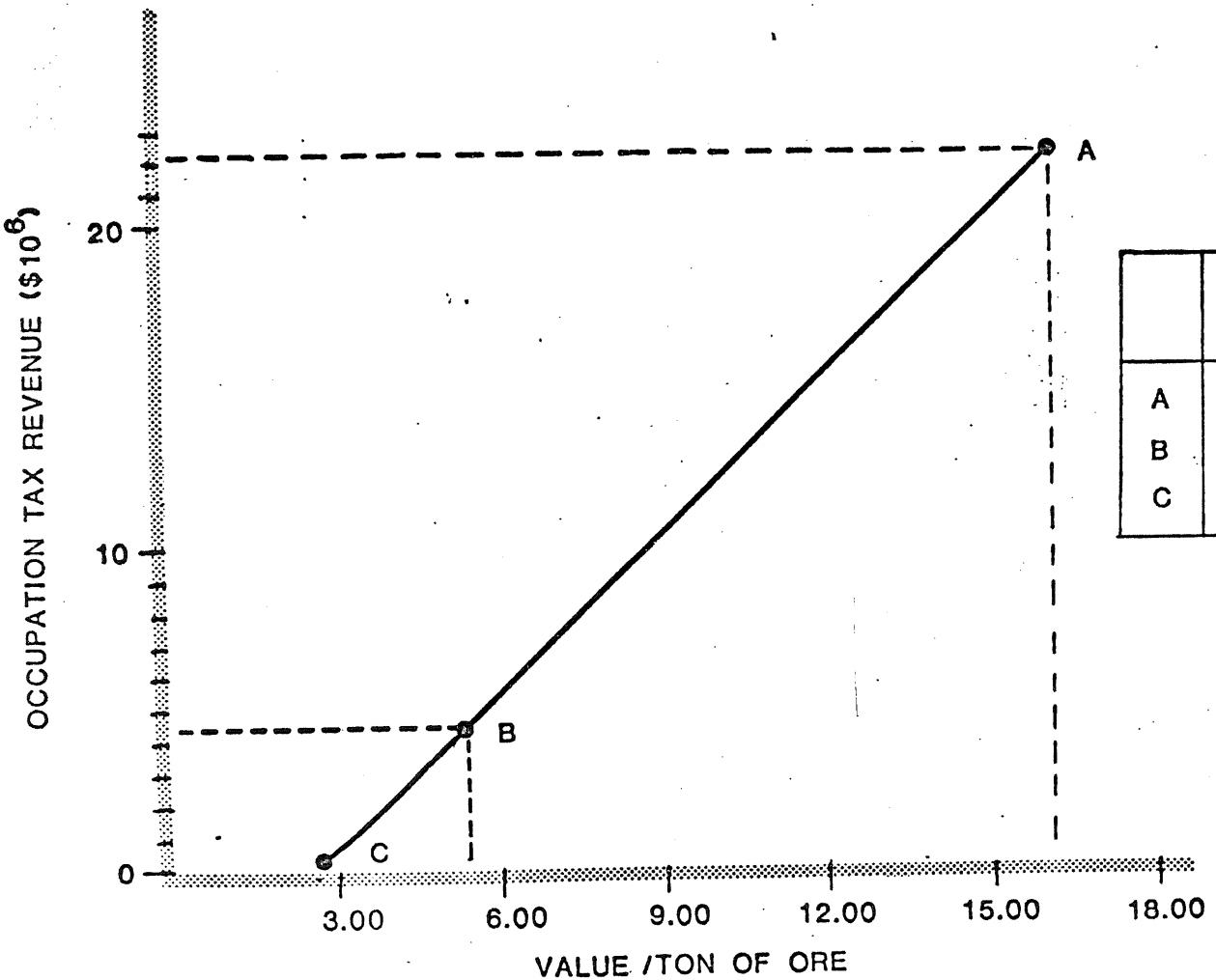
Point B on the curve in Figure 3 is a value 1/3 the mineral value of the ore. It is analagous to the value for ore as used in a federal lease negotiated with the International Nickel Company in the late 1960's.

Figure 3

Since the occupation tax is a net proceeds tax, it will be sensitive to changes in profitability. For example if annual production of ore under the open pit scenario is allowed to grow at the rate of .8 percent per year and all other variables except operating expenses and royalty payments are held constant, the occupation tax revenue over the life increass from $22.2 million in the base case to $24.6 million, an increase of 11 percent (see Figure 10). During this period total production increased by 9 percent. With increased production coupled with constant capital costs the operation would undoubtedly be more profitable.

A mine/mill operation is allowed to credit against its occupation tax liability a portion of the expenses it makes for research and development. Two alternative runs of the Tax Model were made using $1,000,000 annual research expenses in one case and $5,000,000 in the other. There are no research expenses in the base case. Figure 4 shows the results, indicating that for every $1,000 of cre-

CHANGES IN MINE-LIFE OCCUPATION TAX REVENUE RELATIVE TO CHANGING ORE VALUE



	ORE VALUE	OCCUPATION TAX REVENUE (10^6)
A	$16.13	22.2
B	5.38	4.3
C	2.73	.1

dit claimed by an operation (research or development expenses) each year the state will give up $3.33 in annual occupation tax revenue.

Figure 4

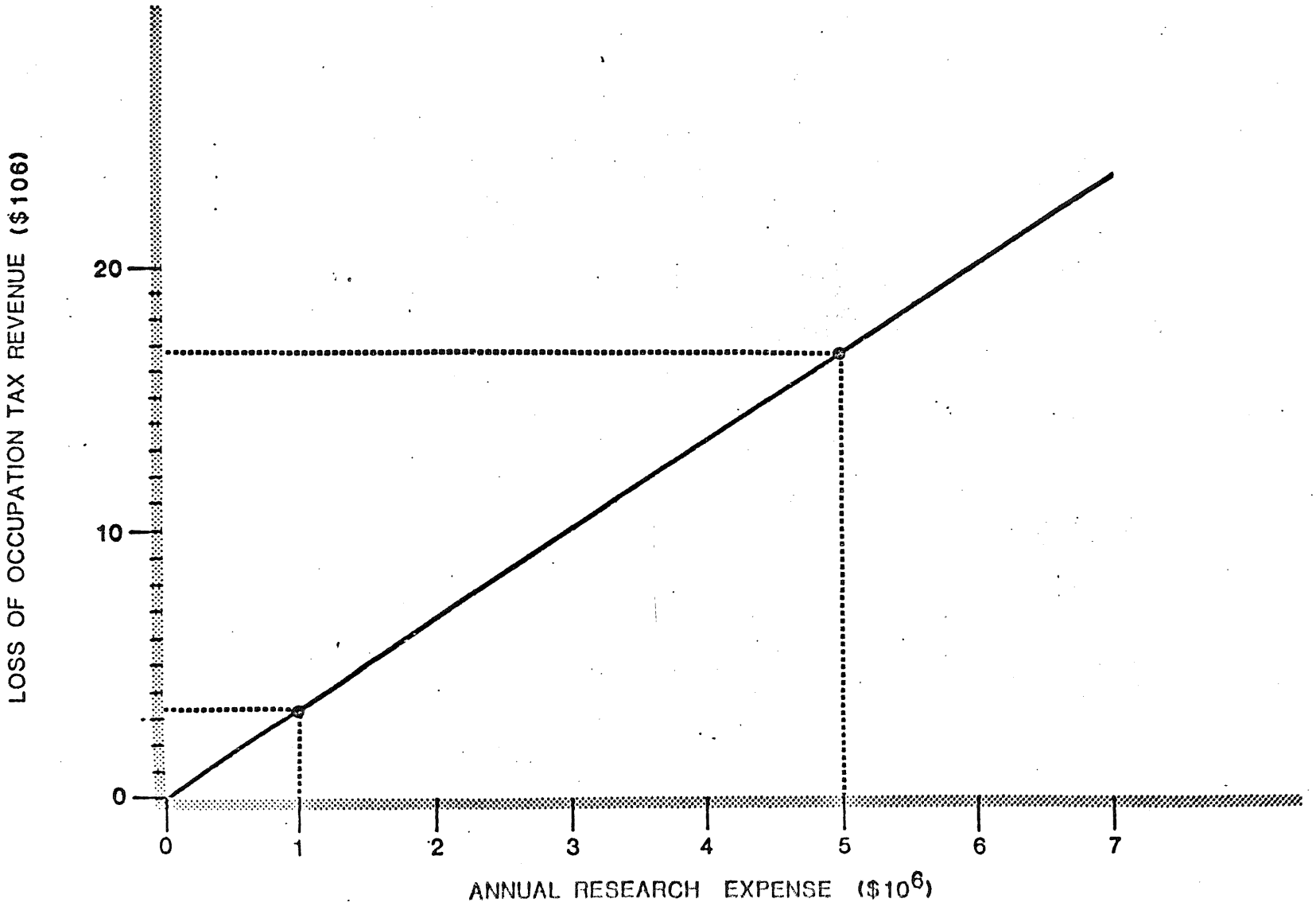
Most important in terms of potential occuption tax revenue to the state is the location of the smelter/refinery stage of production. The occupation tax rate is one percent of net proceeds, with a two-thirds of one percent credit against tax liability for each percent of ore production which is refined within the state. This makes the effective tax rate 1/3 percent if all ore is refined in Minnesota. The base case scenario assumes a Minnesota smelter/refinery and results in $22.2 million in occupation tax revenues over the life of the operation. If it is assumed the smelter/refinery is located outside Minnesota, the occupation tax revenue from the operation is tripled to $66.7 million over its life. This, of course, would be more than offset by the loss of tax revenues from the displaced smelter/refinery.

12.62 Production Tax

Laws of Minnesota, 1967, Chapter 671, Section 298.61 states that copper-nickel ore is subject to a severance tax (Figure 5). The statute provides for a "base tax of 2.5 cents per gross ton of copper-nickel ore transported to and entering the concentrating mill plus ten percent of the base tax per ton for each one-tenth of a percent that the average copper-nickel content...exceeds one percent..." The rate is increased in accordance with the index of Wholesale Prices from a base of 1967 by Section 298.61 (2).

Section 298.62 states that the production tax is imposed in addition to the occupation tax (Section 298.51), the royalty tax (Section 299.013), and the

LOSS OF ANNUAL OCCUPATION TAX REVENUE AS A RESULT OF RESEACH CREDIT



income tax (Section 290), and in lieu of all other taxes upon the copper-nickel ores, the land in which they are contained, the mining or producing of ores, or upon the facilities used in connection with such mining or production.

Figure 5

The proceeds of the base production tax are distributed as follows (according to Section 298.64), assuming a tax of $1.25 per ton of taconite production.

2 percent to city or town of mine location

10 percent to Taconite Municipal Aid account

4.8 percent to school district of mine location

18.4 percent to be distributed to all Iron Range School Districts

15.6 percent to general fund of county of mine location

3.2 percent to road and bridge fund of county of mine location

20.6 percent to Taconite Property Tax Relief account

.8 percent to state treasury

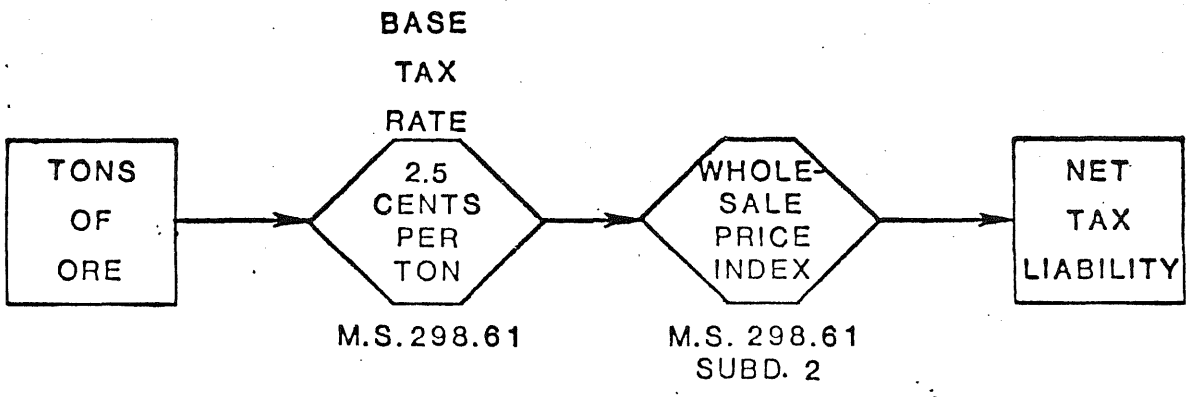
2.4 percent to Iron Range Resources and Rehabilitation account

Remainder to the taconite area environmental protection and economic development fund and the northeast Minnesota economic protection fund

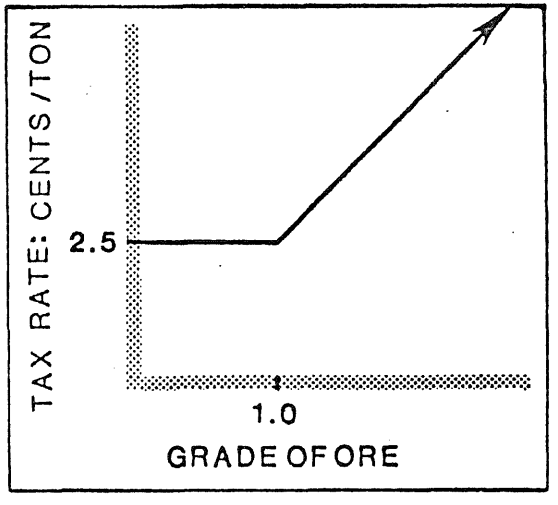
Actual distributions are fixed by law on the basis of so many cents per ton of production and the percent distributions were calculated based on the assumption mentioned above.

Two funds created during the 1977 legislative session which receive revenue from the production tax paid by taconite, iron ore, and copper-nickel mining companies deserve amplification. The TACONITE AREA ENVIRONMENTAL PROTECTION AND

PRODUCTION TAX
M.S. 298.61



BASE TAX IS 2.5 CENTS PER TON FOR ORE WITH A COMBINED CU-NI GRADE OF 1.0%. FOR EVERY 0.1% ABOVE 1.0%, THE TAX RATE INCREASES BY 10 PERCENT OF THE BASE



ECONOMIC DEVELOPMENT FUND was created for the purpose of reclaiming and enhancing the area adversely affected by mining and for the purpose of promoting the economic development of northeast Minnesota. The fund is administered by the Iron Range Resources and Rehabilitation Board and with the consent of the legislature can be used for the following purposes:

1) investigate areas of study and determine problems requiring action
2) reclamation of minelands
3) local economic development projects including sewer and water and other public works
4) monitoring of mining-related health problems

Proposals for projects are submitted to the governor and the Senate Finance Committee and the House Appropriations Committee by November 15 of each year. These committees then prepare bills to appropriate funds from the taconite area environmental protection and economic development account for those projects recommended by the committees.

While it is explicitly stated in the Laws of Minnesota that copper-nickel production taxes would be paid into this fund, it is not clear that copper-nickel related projects could be funded from this account since copper-nickel is not specifically mentioned in the enabling legislation. Section 16 of M.S. 298.282 says "a fund...is created for the purpose of reclaiming, restoring, and enhancing those areas of northeast Minnesota adversely affected by the environmentally damaging operations involved in mining taconite and iron ore and producing iron ore concentrate..."

The NORTHEAST MINNESOTA ECONOMIC PROTECTION FUND was created to aid in economic rehabilitation and diversification of industrial enterprises in northeastern

Minnesota. This fund's monies may not be expended prior to January 1, 2002, and may be spent only in those areas presently receiving taconite property tax relief and taconite municipal aid. As with the taconite area environmental protection and economic development fund, the northeast Minnesota economic protection fund must be appropriated to designated projects by the legislature.

The research office of the Minnesota Department of Revenue estimates that by the year 2001 approximately $750,000,000 will have been received in each of the two accounts. If these receipts are allowed to earn 5 percent interest per year each of the accounts would grow to an excess of $1 billion, assuming no expenditures from the funds.

Since the production tax rate is pegged to the wholesale price index and will be inflated over time, the amount of production tax revenues remaining after disbursement to statutorially designated accounts will increase each year, barring changes on the distribution formula, because the distribution to other accounts is fixed in the laws, not by percent of receipts, but by cents per ton of ore produced. The two funds, then, will receive all of the increase in production tax revenues due to inflation. The estimates presented above by the Department of Revenue reflect a 5 percent per year increase in the wholesale price index.

consider distribution by RDCs, via comp. plan

These two special funds are in effect additional distributions back to the local level, but decisions as to the use of these revenues are determined by the state legislature and not by the county commission, city council or school board. This being the case, over 99 percent of all proceeds from the production tax eventually return to the taconite mining region at the state.

Production tax revenue, given a constant ore grade less than 1 percent combined copper-nickel mineralization, varies directly according to the level of produc-

tion. Figure 6 summarizes the effects of changing levels of ore production on estimated production tax revenue.

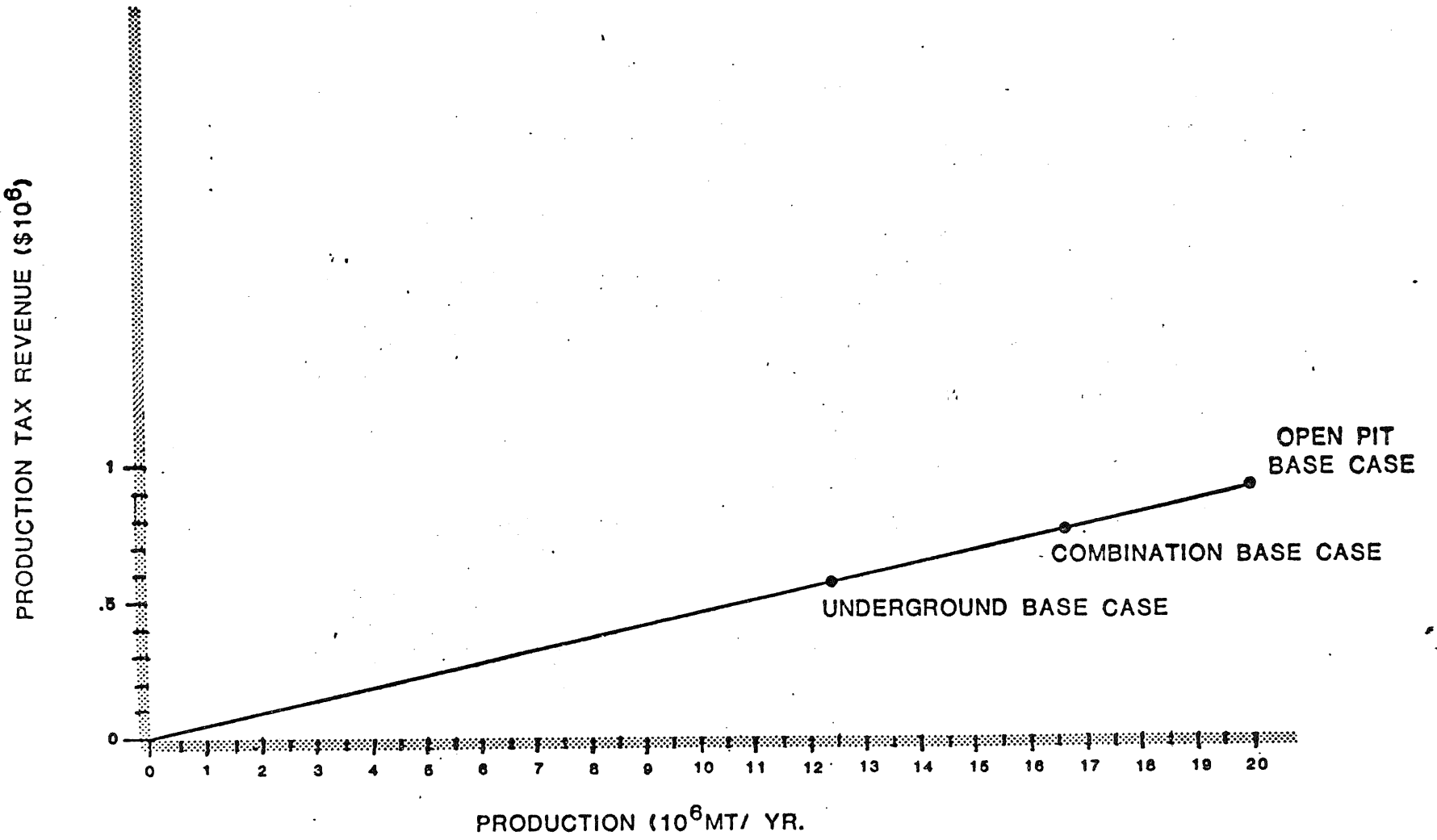
Figure 6

Revenue from the production tax can change as a result of variation in the grade of ore being mined, all other variables held constant. Should the combined copper-nickel ore grade exceed 1 percent mineralization, the production tax rate is "indexed" so that the tax rate is increased by 10 percent for every .1 percent in the ore grade above 1.0 percent combined copper-nickel metal. Figure 7 the effect of decreasing the ore grade in .2 percent increments, starting at 1.40 percent, and holding all other variables constant. Operations historically begin with higher grade ore and gradually mine lower and lower grade ores as prices increase and technology advances to allow production of lower average ore grades.

Figure 7

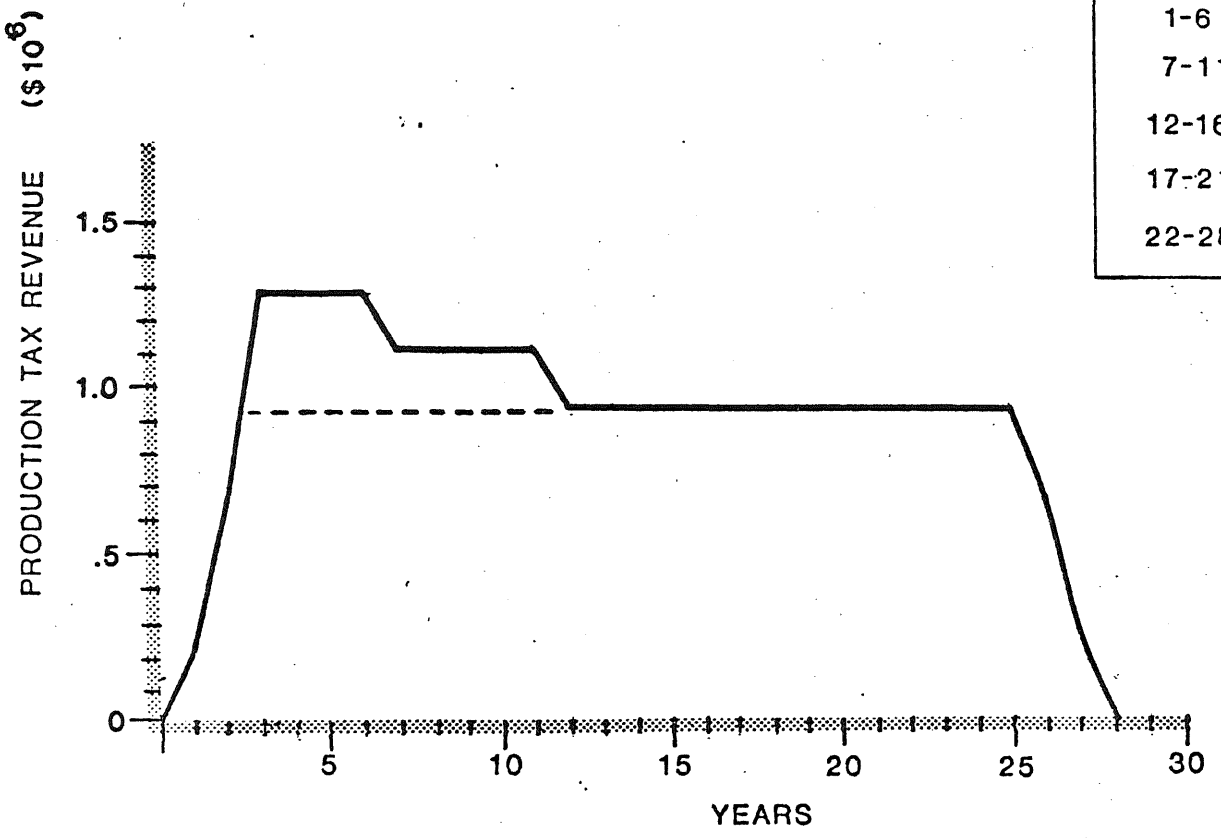
The production tax is also "indexed" in a finer sense. The tax rate is tied to the wholesale price index (WPI) with 1967 as its base. The Tax Model, holding everything in constant 1977 dollars, has a WPI value of 1.83 so that the effective production tax rate is 4.575 cents per ton of ore produced. The effect of inflation is important in the distribution of production tax revenue to various accounts due to the nature of the distribution formula. The distribution of production taxes to local units of government and to the state general fund is a fixed amount per ton of ore produced. Except for legislative action, this won't change over time. However, total revenues generated from production taxes will change automatically as the WPI changes. Invariably the WPI has increased. As

ANNUAL PRODUCTION TAX REVENUE GENERATED BY VARIOUS LEVELS OF PRODUCTION



THE EFFECT OF CHANGING ORE GRADE ON ANNAUL PRODUCTION TAX REVENUE

YEAR	CU-NI ORE GRADE	PEAK ANNUAL REVENUE(10^6)
1-6	1.4%	1.28
7-11	1.2%	1.10
12-16	1.0%	.92
17-21	.8%	.92
22-28	.6%	.92



previously mentioned, two funds created by the 1977 legislature are the recipients of the excess of total revenues less statutorily fixed revenues. These are the Taconite Area Environmental Protection and Economic Development Fund and the Northeast Minnesota Economic Protection Fund. Figure 8 shows the effects of inflation (assumed here to be a modest 5 percent annual increase) on the base case full production scenario. The Tax Model is in constant 1977 dollars so regular model output will not reflect the effects of inflation.

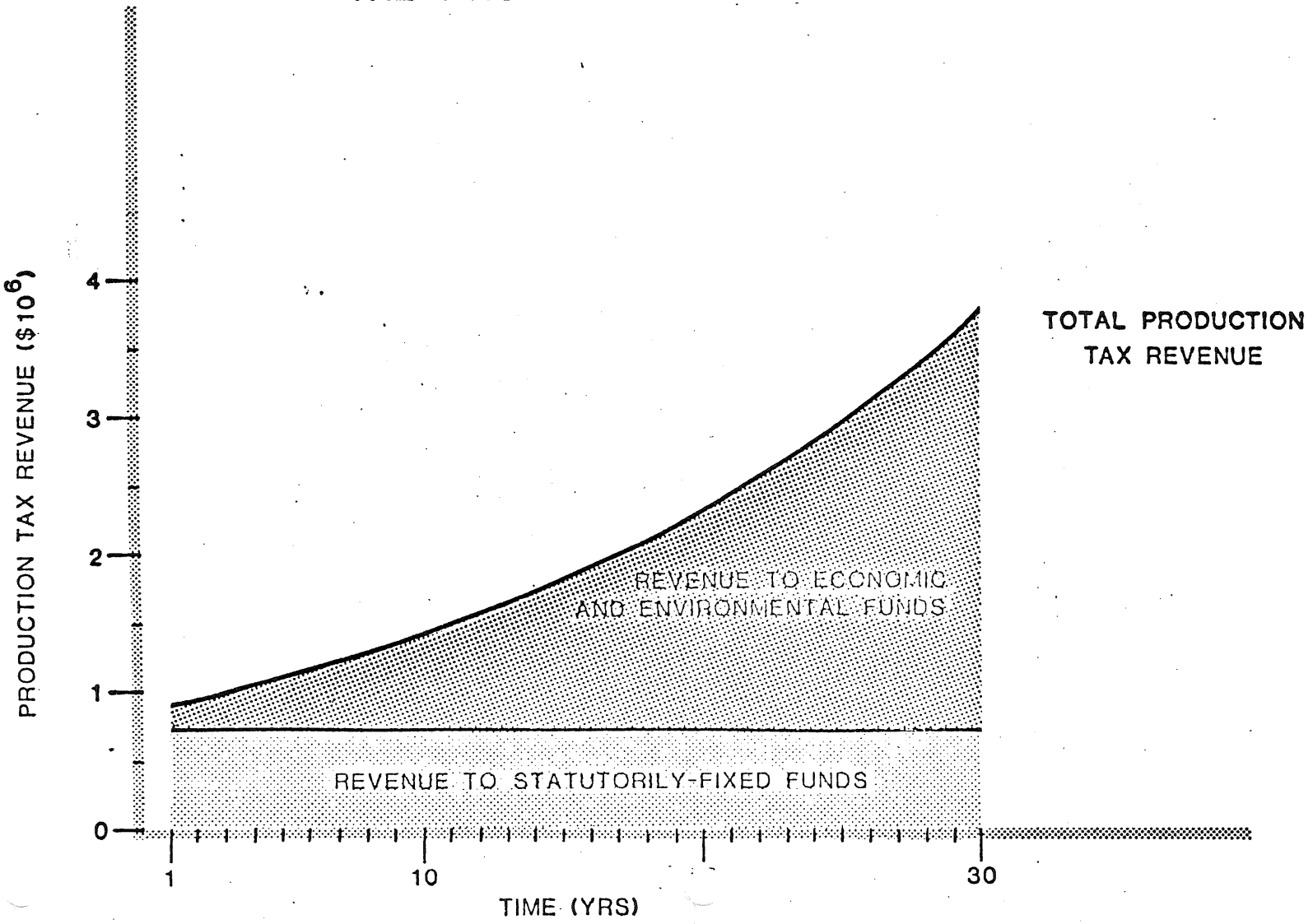
Figure 8

12.63 Corporate Income Tax

According to Laws of Minnesota, 1965, Chapter 290, Section 290.06, "the income taxes imposed upon corporations shall be computed by applying to its taxable net income in excess of the applicable credits the rate of 12 percent" (Figure 9). Under Section 290.19 deductions set forth in Section 290.09 are allowed to be subtracted from gross income of the enterprise to yield taxable net income. Three deductions relate explicitly to mining and are calculated according to the federal Internal Revenue Code of 1954, as amended. These are: exploration prior to mine development (Section 290.09, Subd. 25a), development of mines (Section 290.09, Subd. 25b), and mineral depletion (Section 290.09, Subd. 8b). Also subtracted from gross income are deductions of more general application such as business expenses, interest payments, losses, depreciation, etc. as stated in Section 290.09.

If an enterprise is not headquartered in Minnesota, its share of total corporate taxable net income which is theoretically equivalent to the net income of a Minnesota-based enterprise doing business only in Minnesota must be determined. Three calculations are made:

ANNUAL PRODUCTION TAX REVENUE (IN CURRENT DOLLARS) ASSUMING A 5 PERCENT ANNUAL INCREASE IN THE WHOLESALE PRICE INDEX



1) the percentage of sales made within Minnesota,

2) the percentage of rented or owned real or personal property in Minnesota, and

3) the percentage of the firm's payroll paid in Minnesota.

The percentage of the enterprise's income which is allocated to Minnesota as taxable net income is either the arithmetic mean of (1), (2), and (3), or 70 percent of (1) plus 15 percent of (2) plus 15 percent of (3). The firm may choose the lesser of the two.

Several credits are allowed to be subtracted from gross tax liability according to Section 290.21. These include standard credits of $500 for each corporation (Section 290.21, Subd. 2), gifts and charitable contributions (Section 290.21, Subd. 3), and 85 percent of dividends received from other corporations (Section 290.21, Subd. 4). Section 290.082 allows the payment of copper-nickel occupation taxes to be credited against the income tax liability, with carry-over provisions for three years.

Section 290.09 provides that a credit against income tax liability may be claimed for equipment operated within the state for the prevention, control, or abatement of air, land, or water pollution. This credit may be 5 percent of the cost of equipment purchased after January 31, 1969, up to a maximum of $50,000 annually.

Since taconite operations are not liable for a corporate income tax (they are exempted in Laws of Minnesota, 1965, Chapter 290, Section 290.05) copper-nickel corporations may object to the corporate income tax. However, Laws of Minnesota, Chapter 671, Section 298.62 explicitly includes "the income tax under Laws of Minnesota, 1965, Chapter 290" as a tax for which copper-nickel opera-

tions are liable. The Minnesota Department of Revenue concurs with this interpretation (Busacker 1978).

Figure 9

As is the case for occupation tax revenue, revenues from the corporate income tax are more sensitive to changes in the assumptions about the mine/mill operation than are the other taxes paid by the operation. In addition, income tax revenue is sensitive to the occupation tax as well.

Figures 10 and 11 show the effects of an .8 percent annual increase in production and price, respectively. In the case of production increases, all variables except operating costs and royalty payments were held constant. For the analysis of price increase, all other variables remain the same as for the base case Tax Model run.

To analyze the effect of an annual increase in production, Figure 10 shows the change in the level of tons of concentrate produced. In year 3 of the base case, 635,000 metric tons were mined. This is the origin of the horizontal axis in Figure 10. By year 28, with an .8 percent annual productivity increase, the mine produces 757,000 metric tons of concentrate. This represents about a 20 percent increase in productivity over the life of the mine, typical for operations of this kind according to the RCNS Technical Assessment Group.

In Figure 11, the origin of the horizontal axis represents $240.25 per ton of concentrate, the price used in the base case open pit scenario. The price is then increased by .8 percent annually through the life of the operation so that it reaches $295.55 in year 30.

CORPORATE INCOME TAX

M.S. 290.06 - 290.21

DEDUCTIONS

1 COST OF EXPLORATION PRIOR TO MINING

2 COST OF MINE DEVELOPMENT

3 MINERAL DEPLETION ALLOWANCE

4 BUSINESS EXPENSES, LOSSES, INTEREST COSTS, DEPRECIATION AND OTHERS

M.S. 290.09

CORPORATE GROSS INCOME → TAXABLE INCOME → 12% TAX RATE → GROSS TAX LIABILITY → NET TAX LIABILITY

CREDITS

1. OCCUPATION TAX WITH 3 YEARS CARRYOVER
2. $500 CORPORATE EXEMPTION
3. GIFTS AND CHARITIES
4. 85% PERCENT OF DIVIDENDS RECEIVED FROM OTHER CORPORATIONS

M.S. 290.21

IF CORPORATION IS NOT DOMICILED IN MINNESOTA

.7(A) &.15(B) &.15(C) EQUALS PERCENT OF CORPORATE INCOME THAT IS MINNESOTA TAXABLE INCOME

WHERE

(A) IS THE PERCENT OF SALES MADE WITHIN MINNESOTA

(B) IS THE PERCENT OF PROPERTY HELD IN MINNESOTA

(C) IS THE PERCENT OF PAYROLL PAID IN MINNESOTA

In each case, the mine/mill operation reaches a level of annual revenues great enough to incur income tax liabilities in the same year, 15 years or midway through the mine-life. Income tax payments occur when annual revenues reach $168 million in the case of production increases and $171 million for price increases. This level of revenue represents about an 11 percent increase over the base case revenue of $153 million.

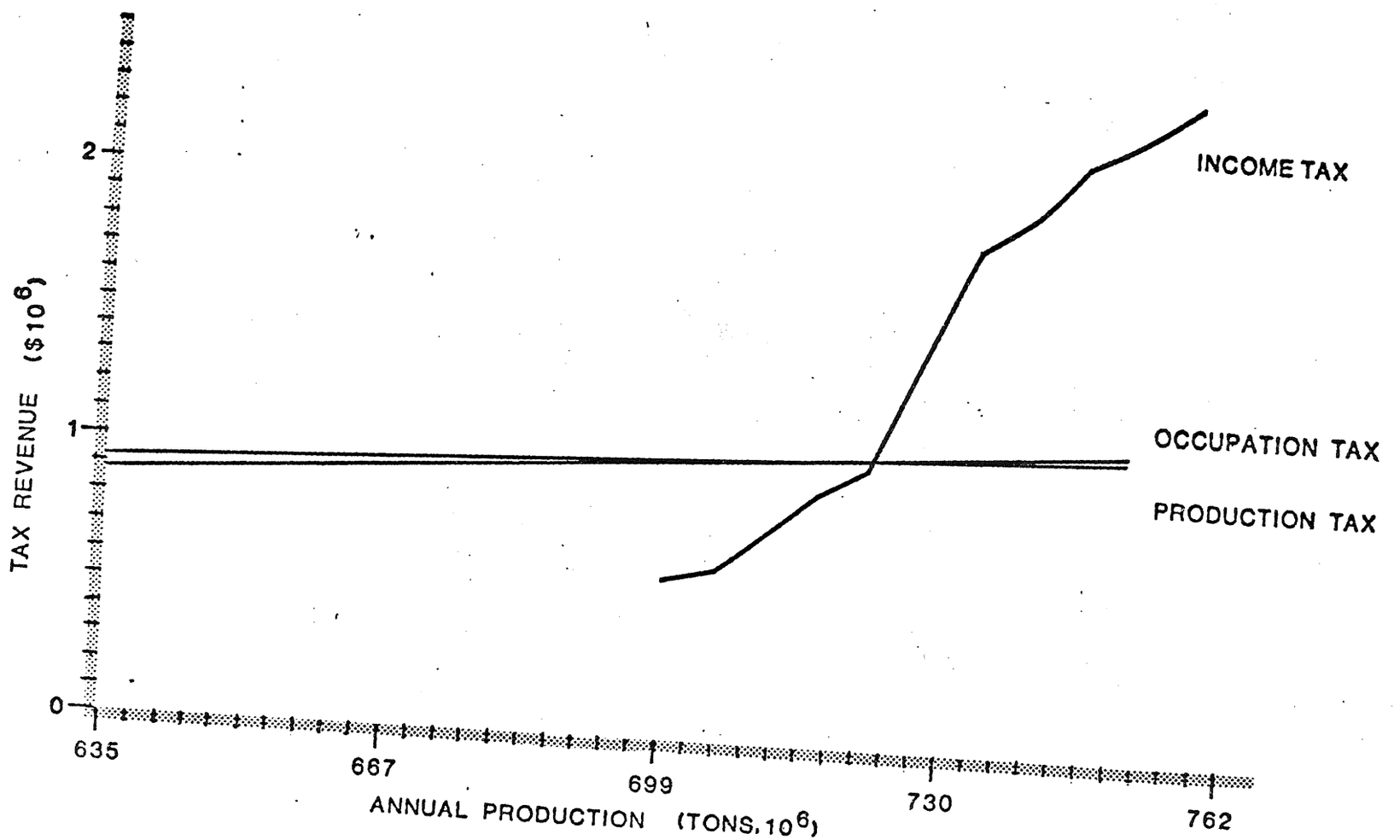
It appears, then, that the assumptions about price, production and expenses incorporated in the base case mine model produce revenues and profitability just below that threshold necessary to generate income tax revenue from the mine/mill operation. Of course, the base cases also indicate that a smelter/refinery, if it were located in Minnesota, would contribute $153 million in income taxes to the state coffers.

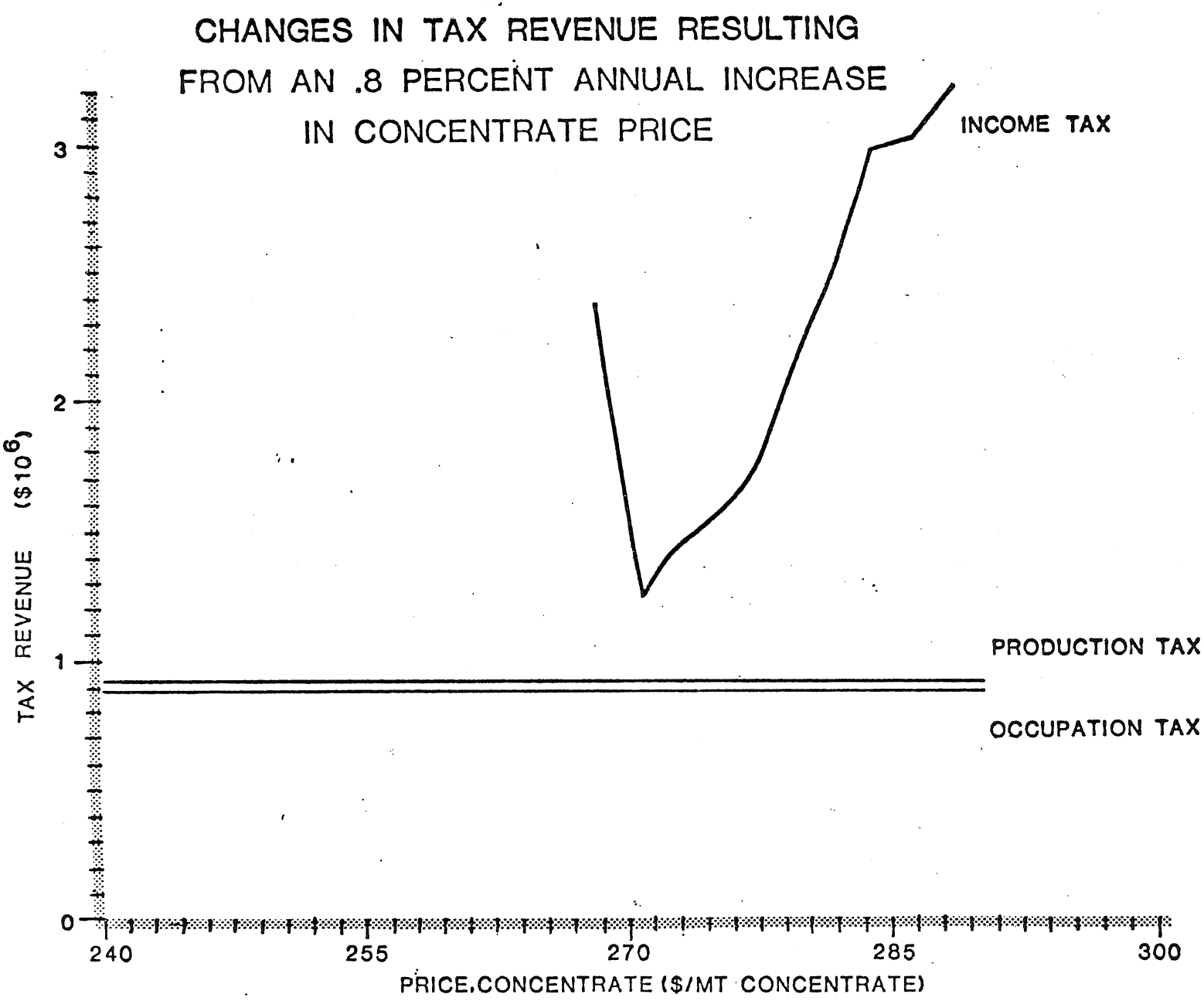
Over the life of the mine/mill operation, an .8 percent annual production increase would result in $17.6 million of income tax revenue to the state as well as an additional (greater than the base case) $5 million in occupation, production, and royalty tax revenues. When the concentrate price is allowed to increase, the result is $27.3 million in income taxes and no change in any other tax revenue.

The severe drop in income tax revenue shown in Figure 11 is largely due to depreciation credits from a large equity cost of replacement equipment at that time. If the dip in the income tax curve is disregarded, the general trend of rapidly increasing income tax revenue, once a threshold of corporate income is reached, as a result of increases in the price of concentrate is clearly shown.

Figures 10 and 11

CHANGES IN TAX REVENUE RESULTING FROM AN .8 PERCENT ANNUAL INCREASE IN CONCENTRATE PRODUCTION




CHANGES IN TAX REVENUE RESULTING
FROM AN .8 PERCENT ANNUAL INCREASE
IN CONCENTRATE PRICE
INCOME TAX
PRODUCTION TAX
OCCUPATION TAX
TAX REVENUE (10^6)
3
2
1
0
240
255
270
285
300
PRICE.CONCENTRATE ($/MT CONCENTRATE)

The lack of income tax from the base case does not mean the mine/mill would not be profitable. It appears to be a case of the occupation tax credit "eating up" any income tax liability incurred by the operation. Figure 12 shows how the income tax is sensitive to changes in the occupation tax. It indicates that in the middle portion of the curve there is a one for one tax dollar trade-off, with total revenues from these sources summing to $12.9 million over the life of the scenario. When the occupation tax reaches $22 million, the income tax revenue from the operation is zero.

Figures 12

12.64 Royalty Tax

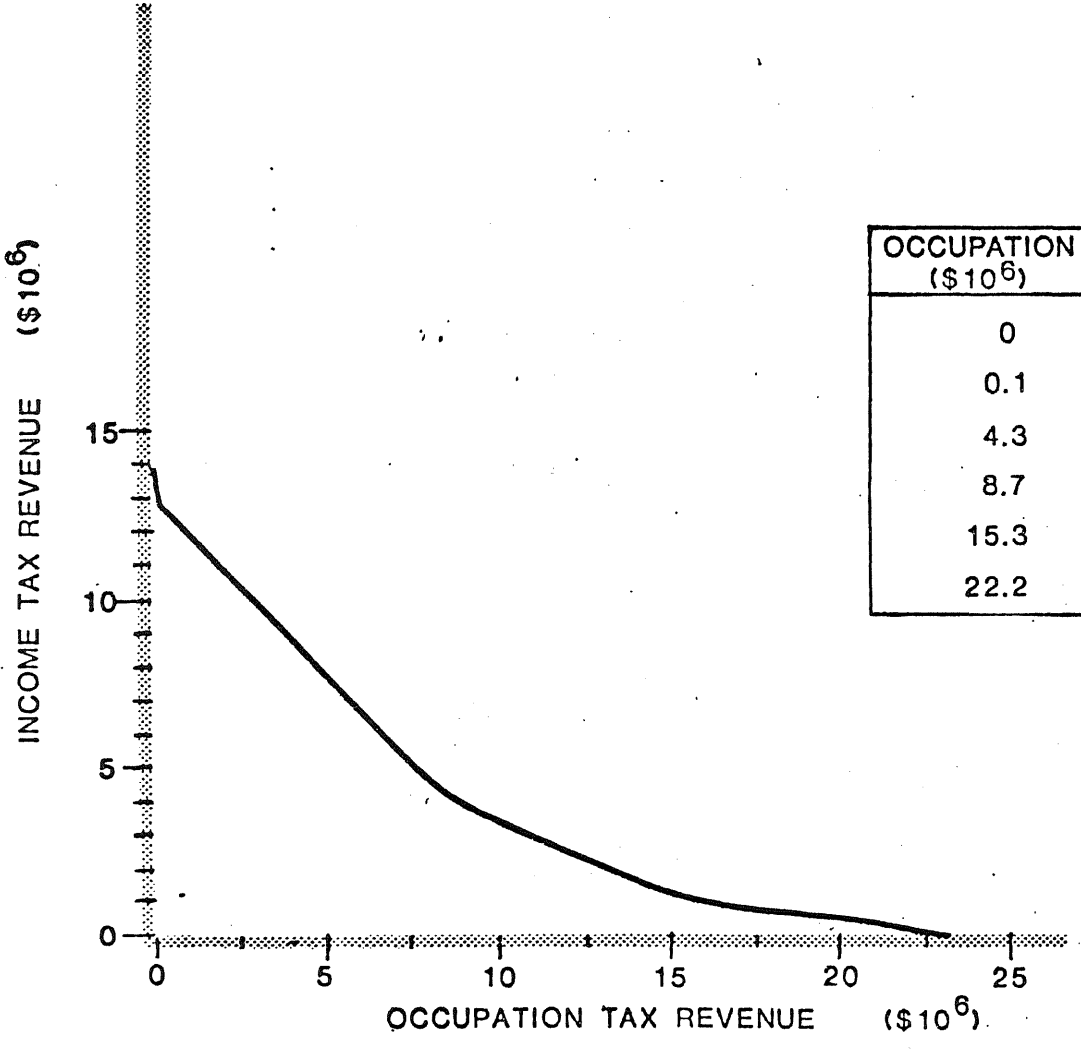
According to Laws of Minnesota, 1967, Chapter 671, Sections 299.013 and 299.02, royalties received by any "person" (including individuals, copartnerships, associations, companies, and corporations--implicitly not governments) to "explore, mine, take out, and remove copper-nickel ore" are subject to a tax of one percent of the royalty payment plus an additional one percent of the amount of royalty paid on gold, silver, platinum, and other precious metals (Figure 13).

Section 299.13 states that all taxes collected under chapter 299 shall be credited to the general fund of the state treasury.

Figure 13

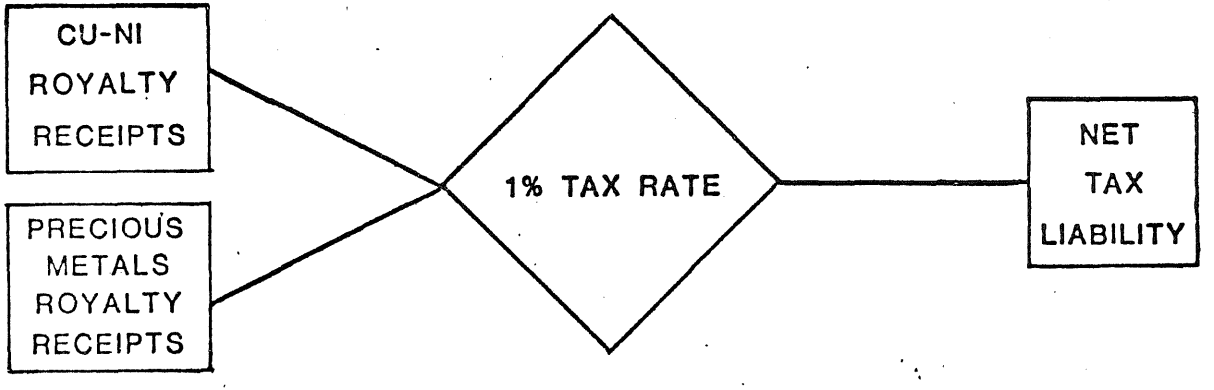
State revenue from royalty tax payments by private mineral rights owners will vary according to the amount of private ownership of each operation. Figure 14 shows the royalty tax payments from each of the base case scenarios and a case of 100 percent private ownership.

GENERALIZED RELATIONSHIP BETWEEN OCCUPATION TAX REVENUE AND INCOME TAX REVENUE



OCCUPATION TAX (10^6)	INCOME TAX (10^6)
0	13.8
0.1	12.8
4.3	8.6
8.7	4.0
15.3	1.1
22.2	0

ROYALTY TAX
M.S. 299.013-299.13



Revenues from the royalty tax depend on the value of the minerals recovered. As the value increases or decreases from that of the base cases the slope of the curve in Figure 14 would increase or decrease.

Figure 14

12.65 Unemployment Insurance and Worker's Compensation

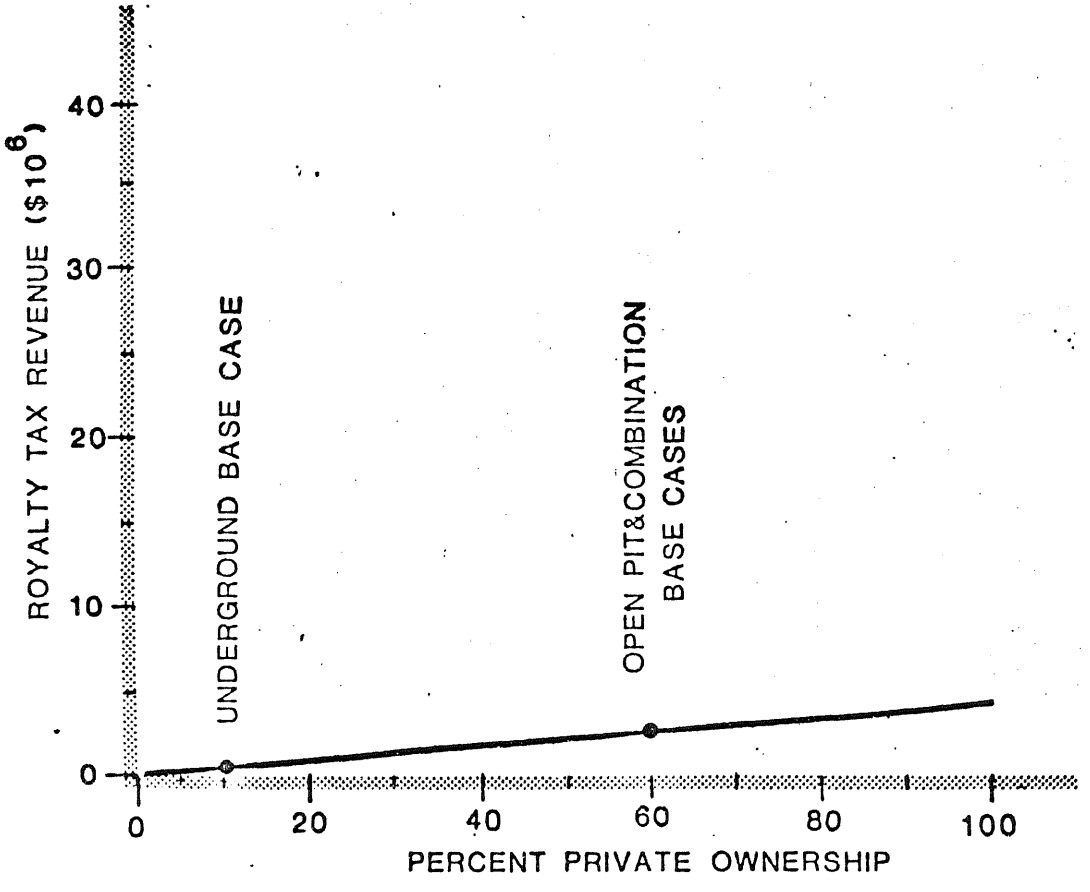
Employers such as a mining corporation are taxed under the Minnesota Employment Services Law on a portion of the wages paid to every worker. For years after 1976, 70 percent of the state's average annual wage, limited to $6500, is taxable. These wages are taxed at a rate of 2.7 percent for new employers. Tax rates are adjusted (between a minimum of 1.0 percent and a maximum of 7.5 percent) for individual companies to reflect experience as to benefit charges.

An individual company may reduce its tax rate simply by paying back a portion of the charges its company has made against the unemployment fund. It is therefore difficult to generalize on an industry-wide basis. The taconite industry, for example, had rates in 1977 which went from the minimum 1.0 percent up to 6.7 percent. The state average rate is 2.7 percent.

Revenues received from the companies are placed in the Unemployment Trust Fund. Benefit charges against the fund do not necessarily equal the payments made to the trust fund for any one year; but the rates are adjusted annually to reflect the difference between a company's benefit charges and contributions from the previous year.

Employers in Minnesota are also required to provide workers compensation coverage for their workers. Rates are established according to work classification and can be adjusted by the Minnesota Compensation Rating Bureau.

PRIVATE MINERALS OWENERSHIP
AS A SOURCE OF GOVERNMENT REVENUE
(ROYALTY TAX)



PERCENT OWNERSHIP	ROYALTY TAX (10^6)
0	0
10	.4
60	2.5
100	4.2

Revenues to the unemployment insurance fund are difficult to predict, as the rate at which an individual company is charged is determined by its past history with regard to unemployment claims. Also, a company can virtually pick the rate at which it is charged by paying back any or all of the charges it has made against the fund. The tax model is calibrated at a 2.7 percent tax rate, the rate for new employers. With a constant rate, the revenue from unemployment insurance taxes is based directly on the payroll of the operation.

12.66 Severed Mineral Interests

Mineral or similar interests in real estate owned separately from the interest in surface real estate may be assessed and taxed separately from the surface interests, according to Laws 1969, Chapter 829, Section 93.52. These interests are classified as Class 1B property and taxed at an annual rate of 25 cents per acre, with a minimum tax of $2. Interests which are taxed under other laws concerning such interests and interests which are statutorily or constitutionally exempt from taxation are not subject to the tax.

Eighty percent of the proceeds of this tax are distributed in the same manner as general property taxes. The remaining 20 percent of the tax revenue received is deposited in the state general fund and credited to the Indian reservation residents loan accounts and the nonreservation residents loan accounts. These funds are used to provide loans to Indians for the purpose of starting or expanding a business. In the Regional Copper-Nickel Study Area, approximately 28 percent of the surface area have copper-nickel mineral interests claimed. On many parcels of land, mineral rights are claimed by more than one party. Conflicts resulting from multiple mineral claimants represent a substantial part of total mineral interests (see Volume 5 - Chapter 4 for further detail).

The confusion resulting from the separation of mineral rights from the surface rights (severed mineral interests) led to the passage of the Mineral Interest Taxation Law. Minnesota's severed mineral tax policy is currently before the Minnesota Supreme Court on the grounds that the procedures for providing notice to holders of mineral interests regarding the forfeiture of those interests to the state in the event the tax is not paid is insufficient and would result in a taking without just compensation, and therefore would be unconstitutional.

12.67 State Taxes on Individuals

The Minnesota Income Tax Act requires that a tax return be filed for individuals who have Minnesota taxable income. The graduated tax rate reaches 15 percent of taxable income over $20,000.

In addition to individual income tax, residents of Minnesota must also pay a variety of sales and excise taxes. Table 6 presents the estimated average annual taxes paid by each copper-nickel employee. These were taken from a number of state agency sources, listed in the model.

These taxes are representative of the income, sales, and excise taxes typically paid by an average household in Minnesota. Based on state per capita data these taxes amount to about $1,150 per employee.

Table 6

Indirectly from copper-nickel development the state receives revenue from the income, sales and excise taxes paid by mining operating employees. Summarized in Table 7 are the cumulative taxes paid to the state by the copper-nickel employees over the lives of the mine/mill and smelter/refinery operations.

Table 6. Average annual employee tax payments.

Income Tax	$ 671
Sales Tax	159
Liquor Tax	39
Tobacco Tax	63
Gasoline Tax	120
Auto License Tax	60
Auto Excise Tax	27
Driver License Fee	3
TOTAL	$1142

SOURCE: State agencies listed in Tax Model.

Table 7

Interestingly, the revenue generated from copper-nickel payrolls is greater than the revenue to the state from the operation itself, if royalties are disregarded, for two of the four scenarios presented. The exception is the open pit operation for which mineral tax revenues (non-royalty) were the highest and employee payroll the lowest of the three mine/mill scenarios and the smelter/refinery scenario. (For comparison refer to tables 4 and 5).

12.8 A LOOK AT TWO HYPOTHETICAL PRODUCTION SCENARIOS

The hypothetical mine models used in the base case tax analysis previously discussed assumed steady production at full capacity over the life of the mine. Such an assumption is needed for economic analysis purposes but does not reflect typical conditions for such an industrial activity. Market conditions, strikes, equipment failure, management problems, and a host of other factors greatly affect mine and mill production and could significantly impact government revenues which are production dependent.

Two scenarios which are relatively common in the mineral industry and could have great impact on the state budget are, on the one hand, the case where there is a single, unpredictable, dramatic aberration in mine production and, on the other hand, the case where mine production flucuates cyclically. The former may be the result of a strike, for example, or part of an operation's policy to regulate its total corporate mineral output. The latter is typical of the mineral industry; individual copper and nickel operations seldom operate in a stable, level output manner.

Table 7. Cumulative revenue to the state from copper-nickel operation employees over a 30 year mine life (10^6).

12,350,000 mt/yr UNDERGROUND	16,680,000 mt/yr COMBINATION	20,000,000 mt/yr OPEN PIT	100,000 mt/yr SMELTER/REFINERY
57.3	52.1	45.7	21.8

Figure 15 shows the effect on a single mine and mill of a slump in production and price for a period of three years with a partial recovery in the fourth year before returning to "normal" base case conditions. Both production and price are reduced 50 percent for three years, resulting in annual revenues less than half the level of the normal state.

An even and predictable flow of tax revenue is important in the governmental planning and budgeting process. A slump in mining activity can have significant impacts on the units of governmental and, in particular, funds which are dependent on mining related revenue, even though the impact on total state revenues may be relatively minor. Under this scenario production taxes are reduced by one-half (a loss of $458,000 in aids going to local governments). Meanwhile, unless people suddenly move away from the area, the demands for government services continue.

State mine/mill generated revenues, under this scenerio would appear as in Figure 14, dropping from $5.4 million per year prior to the slump to $2.6 million during the loss of production and price drop. If employment of the mine/mill was reduced in an identical pattern, revenues to the state from this source would drop from $1.6 million ($1,142 per employee times 1,378 employees) per year before the slump to $.8 million during the employment reduction.

The ultimate impact of this production cutback would be on the local units of government which depend on mine/mill generated revenues as an important factor in their budgets. Laws of Minnesota, 1977, Chapter 298, Section 298.282, however, provides the process whereby the impact from this type of situation is minimized. The law guarantees, for two years, a local unit of government's revenue receipts from mine/mill sources during the last full production year. Funds

needed to make these payments are to be appropriated from the taconite area environmental protection and economic development fund. Further, the law provides that in any year the taconite property tax account is not sufficient to pay the specified property tax relief, additional funds may be appropriated from the environmental protection and economic development fund as needed.

Figure 15

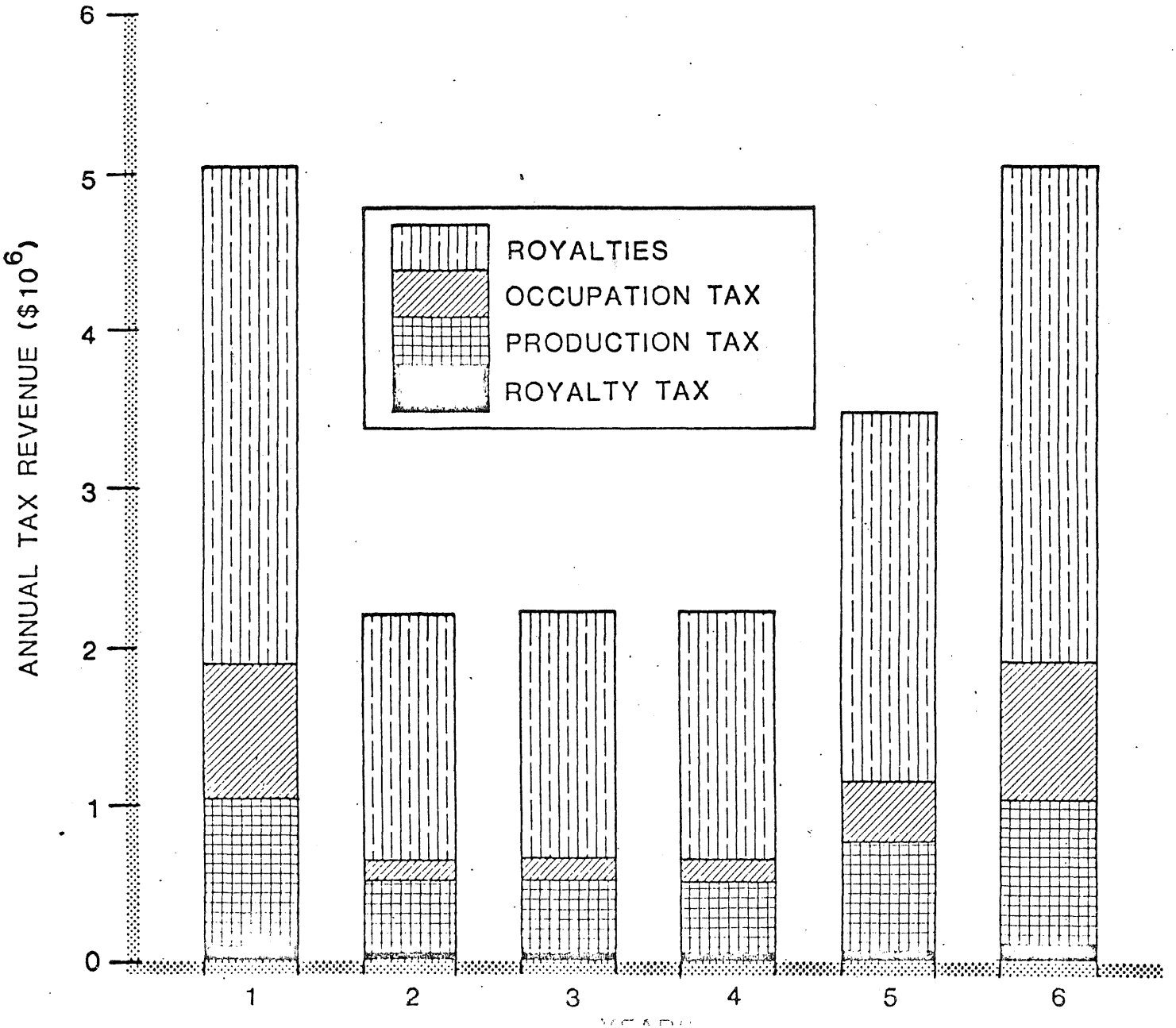
The case of flucuating production is less severe, particulary if the state implements a policy of production averaging for tax assessment purposes. Figure 16 shows the annual tax revenues from a cyclical but gradually rising production scenario plus the effect of allowing the operation to use an average of the five previous years production for tax purposes. The end result is that under the averaging scenario the state collects $2.2 million more in tax revenue than under the fluctuating scenario.

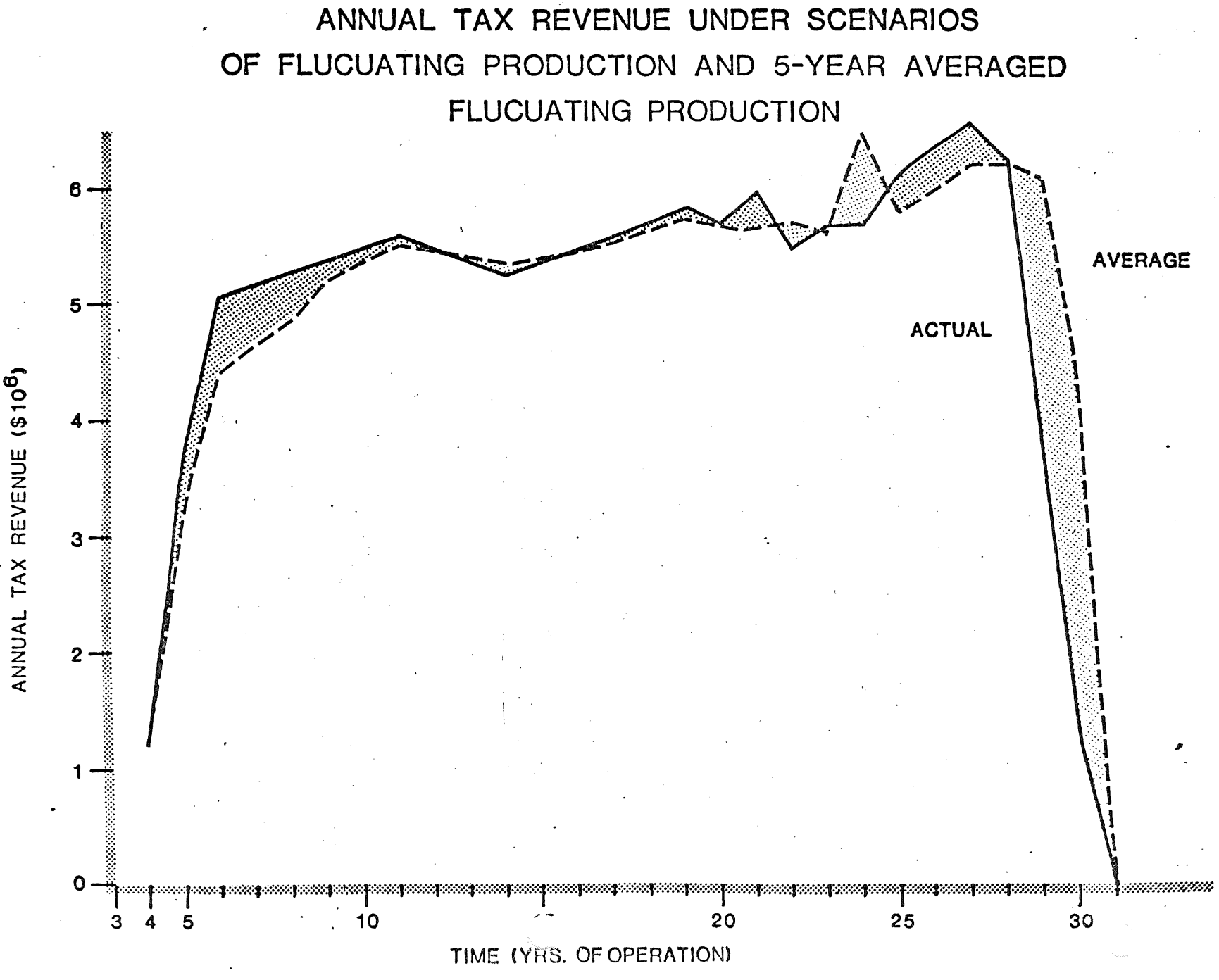
If the state were to allow an operation to choose, on an annual basis, between the two methods it would forfeit the colored portion of the figure. As is, the averaging method results in a benefit to the state during the shut down stage of the mine/mill life but would result in less tax revenue during the initial years of operation. It would also smooth the peaks and valleys of the fluctuating production.

The wildly vacilating revenue near the end of the mine life is due to the appearance of income tax revenue as production becomes great enough to overcome the occupation tax credit against income tax liability.

Figure 16

EFFECTS OF A THREE YEAR SLUMP IN PRODUCTION AND PRICES ON ANNUAL STATE REVENUES




ANNUAL TAX REVENUE UNDER SCENARIOS
OF FLUCUATING PRODUCTION AND 5-YEAR AVERAGED
FLUCUATING PRODUCTION
ANNUAL TAX REVENUE (10^6)
0
1
2
3
4
5
6
3
4
5
10
20
25
30
TIME (YRS. OF OPERATION)
AVERAGE
ACTUAL

12.9 LOCAL TAXES AND AIDS AND ESTIMATED REVENUES RESULTING FROM COPPER-NICKEL DEVELOPMENT

Though mining operations (not including smelter/refinery operations) are exempt from local property tax liability on property actively engaged in mining, the scenarios used in this tax analysis assume that the operations control 10,000 acres, not all of which is actually part of the mine complex. Local governments would collect the payments made by the operation for severed mineral rights of mineral-bearing land prior to actual mining and on land which is never brought into operation. These payments from mine/mill operations to local governments are summarized for each scenario in Table 8.

Table 8

The underground operation would make the greatest property tax payments to local governments because less land for actual operations would be subtracted from the 10,000 acre holding. An underground operation does not produce extensive wasterock and overburden piles and does not require a huge open pit disturbed area.

In lieu of the large property tax payments which would be received from mining operations were they not exempted by state law, local governments receive a portion of the production tax payments made by the mining operation (discussed in detail below). If the property tax payments which would have been paid by the mining operations without the exemption are compared with the total production tax payment made by the mining operation, the equity of this part of the state's mineral tax policy can be determined. The problem with the property tax has always been in the determination of the value of the property. Two methods can

Table 8. Cumulative revenue to Study Area local governments from various copper-nickel mine/mill operations over a 30 year mine life (smelter/refinery not included) (10^6).

	12,350,000 mt/yr UNDERGROUND	16,680,000 mt/yr COMBINATION	20,000,000 mt/yr OPEN PIT
Property Tax	4.388	1.141	1.289
Mineral Rights Tax	.043	.031	.021
TOTAL	4.4	1.2	1.3

be used to derive a taxable valuation: a Hoskold type of formula to discount to present value the stream of benefits expected from the operations or an annual determination of net proceeds of the mining operations.

The net proceeds method is used here for two reasons. It is relatively easy to apply, given the data from the mine model scenarios, and it is the prevalent method used by mineral-producing states such as Arizona to determine property valuation. In fact, six of eight western mining states use this method (Laing 1977). The annual property tax which would be paid by each full-production mining scenario is presented in Table 9, using the 1976 mill rates for the location indicated in the table.

Table 9

When compared with the projected hypothetical property tax payments, the annual production tax payments at full production fall short. The size of the difference is related to the difference in the mill rates at each of the locations. The Ely area with the highest total mill rate of the three locations has the largest difference, while the Babbit area, with extremely small city and school district mill rates, would have the smallest difference.

The production tax is different from property taxation in terms of the geographic impact of its revenues as well as the magnitude of revenues. While the revenues generated by a property tax accrue only to those govenments in which jurisdiction the property lies, the revenues from Minnesota's production tax on mineral operations are shared by each unit of government in an area defined as the Taconite Area by state statute, (M.S. 298.64) as well as setting aside a portion of revenue for future purposes. This makes the production tax

Table 9. Hypothetical annual property tax payments for varius copper-nickel operations and comparison to annual production taxes (smelter/refinery not included)(10^3).

	12,350,000 mt/yr UNDERGROUND Ely	16,680,000 mt/yr COMBINATION Babbitt	20,000,000 mt/yr OPEN PIT Hoyt Lakes
Gross earnings	155,010	156,900	152,560
Total deductions[a]	127,190	122,140	114,530
Net Earnings	27,190	34,760	38,030
Assessment rate	.43	.43	.43
Taxable valuation	11,960	14,950	16,350
City property tax levy	573	59	393
School district property tax levy	902	55	412
County property tax levy	554	799	874
Annual Property Tax Levy	2,029	913	1,679
Annual Production Taxes	565	763	915
Difference	1,464	150	764

[a]Deductions include operating costs, depreciation, and royalty payments.

similar in concept to the fiscal disparities law instituted in the Twin Cities Metropolitan Area. In the scenarios described above, the production tax in effect penalizes the governments nearest the development to the benefit of all other governments within a prescribed region. This concept acknowledges that impacts for which revenues may be used to mitigate occur beyond the immediate sphere of development influence and are more regional in nature. However, if the magnitude of revenues is not sufficient, this spreading of benefits from the development may guarantee that those units of government which are hardest hit in terms of cost-generating impacts do not have sufficient funds to deal with these impacts without penalizing their existing populations (see Volume 5-Chapter 13 for an analysis of this problem).

Revenue to local government from a smelter/refinery complex would be relatively large compared to mine/mill production tax for example. However, because of the extremely low mill rates at Babbitt (the site of the smelter/refinery complex for tax analysis) property tax payments are not as large as they would be in any other location. Therefore, the analysis is also shown using Duluth's mill rates and the State average mill rates. Table 10 summarizes the property taxes paid over the life of the hypothetical smelter/refinery scenario.

Table 10

Property tax revenue depends upon two factors: the assessed taxable valuation of the property in question and the mill rates of the units of government in which the property is located, in this case the county, school district, and city. Changes in property tax revenue are directly related to changes in either of these factors. An increase in assessed valuation will result in increased tax revenues and a proportionate increase in the mill rate will produce the same

Table 10. Cumulative revenue to Study Area local governments from copper-nickel smelter/refinery property tax over operating life ($\$10^6$).

	SMELTER/REFINERY PROPERTY TAXES		
	Babbitt	Duluth	Ave. State Mill Rates
City	4.3	38.8	32.3
School district	4.0	58.3	57.2
County	58.3	58.3	29.2
Total Property Tax	66.7	155.4	118.7

Annual Property Tax Algorithm

Total Construction Cost

times .30 (factor for isolating plant cost)

Plant Construction Cost

times .90 (factor to determine market value)

Taxable Value

times .43 (assessment rate)

Assessed Taxable Value

times Local Mill Rate

Annual Property Tax Levy

result. Figure 17 shows the relationship between property tax revenue to local governments from the smelter/refinery complex and total local government mill rates. In this case, the assessed value of the property is held constant while the mill rate is represented on the horizontal axis.

Figure 17

Copper-nickel development would contribute to the revenues of local government indirectly through the property taxes paid by employees of copper-nickel operations. The magnitude of employee property tax revenues depends on the mill rates of the areas in which they settle and also on the settlement pattern of these employees. Thusly, the scenario such as the combination mine/mill operation which has a large portion of the settlement (see Volume 5-Chapter 7 for details) occuring in an area of very small mill rates (Babbitt) has significantly smaller revenues to local government than does the underground scenario, in which a large portion of settlement occurs in a relatively high mill rate area (Ely). Because of the low mill rates at Babbitt and the much smaller work force, the cumulative total revenue from S/R employees will be smaller relative to other locations. The cumulative projections of employee property tax revenues to local governments are summarized in Table 11. The impact of these revenues will be felt across the entire Study Area [see Volume 5-Chapter 7 (residential settlement) and Volume 5-Chapter 13 (community fiscal impacts) for more detail].

Table 11

12.10 STATE AIDS TO LOCAL GOVERNMENTS AS A RESULT OF DEVELOPMENT-RELATED POPULATION

RELATIONSHIP BETWEEN LOCAL GOVERNMENT PROPERTY TAX REVENUE AND TOTAL LOCAL GOVERNMENT MILL RATE FOR THE SMELTER/REFINERY COMPLEX OVER THE LIFE OF THE OPERATION

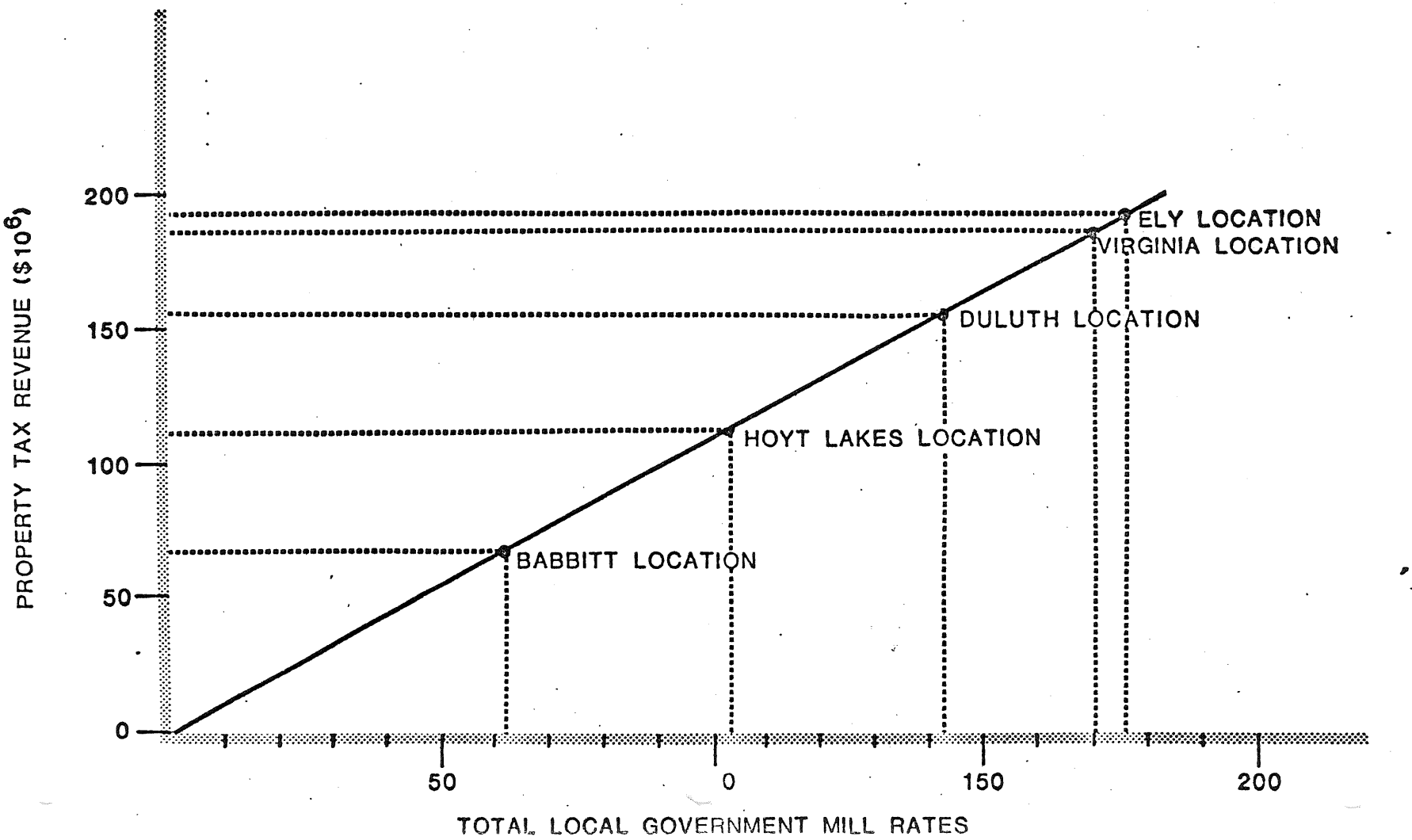


Table 11. Cumulative revenue to Study Area local governments from various copper-nickel operations' employee property tax (10^6).

12,350,000 mt/yr UNDERGROUND	16,680,000 mt/yr COMBINATION	20,000,000 mt/yr OPEN PIT	100,000 mt/yr SMELTER/REFINERY
17.6	9.1	8.2	3.8

Since the tax reform of the early 1970's, the state government has assumed a greater role in providing financial aids to local units of government. By increasing the magnitude and type of aids to local governments, the state has been responsible for a shift of tax burden away from the property tax, a relatively regressive form of taxation administered by the local governments, toward the more progressive state income and sales tax structure. Therefore, state aids and distribution of funds administered by state government are extremely important to local government budgets. The types of local government aids from the state are numerous. Below are summaries of the cumulative aids transfered from the state to the various levels of government over the life of each mining scenario. Figures represent the aid resulting directly from copper-nickel development going to all units of government within the Study Area which are treated in the Tax Model. These are presented as summaries for the three levels of government: county, school district, and municipal.

12.10.1 County Taxes and Aids

The county governments of the Study Area (Lake and St. Louis counties) will receive revenue primarily as a result of smelter/refinery development and population growth related to copper-nickel development. Because of its property tax-exempt nature, a mining operation will contribute directly to the county government only through the production tax which is distributed to the county and the property and mineral rights taxes paid on unmined land. The largest share of mining related revenue to the county will be generated by the property taxes paid by a smelter/refinery complex. Following is a more detailed review of county revenue sources.

12.10.11 Property Tax--Local units of government, county government included, depend heavily on property taxes as a source of governmental revenue. All pro-

perty, unless specifically exempted by state constitution or statute, is subject to an ad valorem tax. County governments will receive property taxes from four sources as a result of copper-nickel development: the copper-nickel firm, its employees, and population growth and business expansion from associated development.

The copper-nickel mining and milling operation, while exempt from tax on actively-mined property holdings (Section 298.62,) will be liable for ad valorem taxes for that portion of its property which is not a part of the mine and mill complex. AMAX, Inc. in 1978 preliminary plans indicates a buffer area of up to 10,000 acres.

A smelter complex, however, would receive treatment different from the mine and mill part of a copper-nickel operation. According to the Department of Revenue, (Busacker 1978) a smelter will be taxed as if it were a manufacturing unit and thus be subject to an ad valorem tax.

Local units of government may levy an ad valorem tax, with a limitation of $10 per acre, against the unmined mineral deposits within their boundaries. The unmined mineral properties are assessed by the state using the Hoskold formula (Guessford 1978) to determine the value of the ore body. This formula is basically a discounted net profit formula which depends on market prices, mining costs, interest rates, mine life, and reasonable rate of return as factors in the calculation. The valuation derived using this method is then assessed at 50 percent for local property tax purposes.

The unmined ore tax is administered by the county, as are all ad valorem taxes, and levied according to the cumulative mill rate of all jurisdictions in which the property is located. Currently, most Iron Range taxing districts receive revenue from this source as a result of iron ore and taconite deposits.

Population growth, whether direct or indirect, will be taxed on its associated property holdings, as will expansion within the business sector.

The market value of each property is assessed at least every four years by the county government, except for mineral properties which are assessed by the state. After the levy requirements of a local unit of government are determined this tax burden is spread against the assessed valuation of the taxing district to derive the mill rate required to support the levy requirement. The mill rate is then applied to the assessed value of property to generate the individual property tax burden. See the Level One report on the Tax Model for 1976 mill rates of taxing districts in the Study Area.

12.10.12 Severed Mineral Interests Tax--As discussed above, mineral interests which are owned separately from the surface interests of a property are assessed a $.25 per acre tax, with a minimum of $2. Eighty percent of the revenue collected from severed mineral interests within a county are returned to the county to be distributed in the same manner as property taxes. The balance (20 percent) is deposited in the general fund to be credited to the Indian reservation and nonreservation loan accounts.

12.10.13 Homestead Property Tax Credits--Starting in 1974 the property tax on homesteads was reduced statewide by up to 45 percent, with a maximum credit of $325. An additional taconite homestead credit of 52 to 60 percent is allowed in Iron Range areas. The revenue lost to local units of government by granting the taconite homestead credit to property homesteads is reimbursed by the state from the taconite area property tax relief fund. The statewide credit is reimbursed from the state general fund.

12.10.14 Production Tax--The county in which the mine development is located receives 18.8 percent of the base production tax levied against the mine enterprise. These revenues are directed to two accounts; 15.6 percent to the county general fund, and 3.2 percent to the county road and bridge fund.

Except in the case of the smelter/refinery which results in no direct production tax revenue, distribution of copper-nickel production tax revenue is a greater portion of state aids to county government than is true for city or school districts. The amount of aid is directly related to the ore production of each mining scenario. A portion of this revenue is designated for the county road and bridge fund with the remainder going to the general fund of the county. Since direct copper-nickel production tax revenues go to the county in which the mine/mill development is located, Lake County would receive this aid in the case of the Underground mine while St. Louis County would be the recipient for the other hypothetical developments (Table 12). This raises questions in terms of equity because most all of the population growth is expected to occur in St. Louis County (see Volume 5-Chapter 7) which would presumably use these funds to help mitigate the impact of population growth. St. Louis County does receive other aid in the form of property tax credits.

Table 12

Because it is a county with a first class city (over 100,000 population), St. Louis County is excluded from direct state aid to counties. Lake County is eligible for aid, based on a per capita payment and pegged at the aid received in 1975 by legislative statute. Since this aid is fixed in amount, there will be no change in the amount of county aid received by Lake County as a result of copper-nickel development.

Table 12. Cumulative state aids to Study Area county governments resulting from various copper-nickel developments (10^6).

	12,350,000 mt UNDERGROUND	16,680,000 mt COMBINATION	20,000,000 mt OPEN PIT	100,000 mt SMELTER/REFINERY
Direct copper-nickel aid	1.3	1.9	2.4	--
Homestead property tax credit	3.1	2.4	2.3	1.1
Taconite property tax credit	5.2	6.3	3.9	2.9
Total	9.6	10.6	8.6	4.0

The remainder of state aid to counties is in the form of property tax credits, the statewide homestead property tax credit, and the special taconite area property tax credit funded with taconite and copper-nickel production tax revenues. This aid is reimbursed to the county to make up for property tax credits given by the county to homeowners.

12.10.2 School District Taxes and Aids

School district revenues originate from a wide range of sources. Since passage of the 1971 Omnibus Tax Bill, the state, through foundation aids to schools, has become the primary financial support of Minnesota's school districts. Local property taxes, though playing a diminished role since 1971, also contribute significantly to school revenues. School districts, as with other local governments, are reimbursed by the state for property tax credits given to homeowners. If the school district is the location of a copper-nickel or taconite operation, it receives a direct allocation from production tax revenues. As well, all taconite area school districts share a general allocation of the production tax. Property taxes will be a significant source of revenue for the school district in which a smelter/refinery is located. No other schools will share this revenue. Following is a more detailed review of school district revenue sources. Table 13 shows the 1975-1976 revenue sources as a percentage of total school district revenues for Ely, Babbitt, Aurora-Hoyt Lakes, and a statewide average.

Table 13

12.10.21 Property Taxes--As with county government, a school district will receive property tax revenue as a result of increased assessed valuation within its respective tax district. The copper-nickel enterprise (inactive mine land

Table 13. Revenue sources for various Study Area school districts and the state average 1975-1976.

	Ely	Babbitt	Aurora-HL	State
	percentage			
State	74	86	78	56
Federal	3	2	2	6
Local	23	12	20	38

and smelter-refinery complex), direct and associated population growth and business expansion will contribute to the tax revenue of the school district in which it is located. Similarly, a school district will receive a share of the revenue generated by the Severed Mineral Interests Tax should this type of interest exist within its tax boundary. School districts also receive their share of the ad valorem tax on unmined ore, explained in the section on county taxes and aids.

12.10.22 Homestead Property Tax Credits--Related to the property tax are the homestead and special taconite homestead credits. The state reimburses the school districts for the amount of revenue equal to the homestead credits it makes to local property owners.

12.10.23 General Aid--The taconite and copper-nickel production tax statutes distribute 18.4 percent of the revenue generated by the base tax to a fund for all school districts of the Iron Range. This fund is distributed to individual Iron Range school districts on the basis of the ratio of an individual school district's permitted levy of the previous year to the total permitted levy of the Iron Range school districts.

Under this scheme all Iron Range school districts share the wealth of a portion of tax revenues in a general and equitable manner.

12.10.24 Direct Aid--The Copper-Nickel production tax provides direct revenue to the school district in which the mine and mill are located. The revenue to the school district is equal to two percent of the base production tax collected from mining enterprises operating within the district boundaries. In the event a mine and its associated mill are located in different taxing districts, 40 percent of the production tax proceeds go to the district in which the mine is

located, and 60 percent goes to the district of the mill. School district costs are proportional to employment levels and since the copper-nickel mine is significantly more labor intensive than the mill, the present distribution of direct aids could cause disparities.

12.10.25 Foundation Aid--School districts receive state foundation aids based on the maximum aid amount adjusted to reflect the local school district's tax support, its amount of aids (other than local property tax and foundation), and the relative nature of school costs. A basic principle of the foundation concept is to equalize educational opportunities for students throughout the state. In 1977 the maximum foundation aid was set equal to $960 per pupil unit. The foundation aid from the state serves to "dampen" or mitigate any local changes in school district finance which may result from abrupt changes in pupil units or local or other contributions to district revenues.

The foundation aid to school districts, based on the change in enrollment, accounts for the largest portion (about 80-90 percent) of school district aids transferred from the state to the local school districts as a result of copper-nickel related growth. The size of the foundation aid is the reason state aids to school districts are so much greater than aid to city and county government. Without them, school district aid is of the same magnitude as the aid to the other levels of government. Under the four scenarios, the total aid to school districts within the Study Area, because it is dominated by the enrollment-related foundation aid, is closely tied to the relative size of the population growth projected for each of the mining developments (Table 14).

Table 14

Table 14. Cumulative state aids to Study Area school districts resulting from various copper-nickel developments (10^6).

	12,350,000 mt UNDERGROUND	16,680,000 mt COMBINATION	20,000,000 mt OPEN PIT	100,000 mt SMELTER/REFINERY
Foundation aid	55.1	49.6	31.5	23.5
General taconite school aid	1.9	1.5	.9	.7
Direct copper-nickel school aid	.2	.5	.6	---
General copper-nickel school aid	.2	.4	.4	---
Homestead property tax credit	3.9	1.5	2.1	.8
Taconite property tax credit	5.0	2.4	3.6	1.1
Total	66.3	55.9	39.1	26.1

School district aid distributed from copper-nickel production tax revenues is a relatively small part of the total aid received within the Study Area. This aid varies among scenarios according to ore production. The general copper-nickel aid, though a larger percentage of the distributed production tax than direct copper-nickel aid, is shared by the entire taconite area resulting in a smaller amount of aid within the Study Area. Direct copper-nickel aid is received by the school district in which the mining development is located.

The general taconite school district aid represents a shift of revenue from school districts in the taconite area but outside the Study Area to school districts within the Study Area. This is due to the copper-nickel related population which settles in the Study Area causing the Study Area school districts to increase their share of total taconite area population and is analogous to the Study Area receiving a larger share of a pie which is fixed in size.

Property tax credits to the school districts to reimburse them for reduced property taxes received as a result of statewide homestead and special taconite area property tax credits make up the remainder of state aids to school districts within the Study Area.

In summary, state aids to Study Area school districts are dominated by the enrollment-related foundation aid so that total aids under each development scenario reflect the size of the work force and population growth associated with each of the mine models.

12.10.3 Municipal Government Taxes and Aids

The sources of revenue for municipal governments are nearly identical to those for school districts. The state aid to municipal governments, called basic aid

in the Tax Model and financed through statewide income and sales tax collections, is a source of revenue which will result from copper-nickel related population growth. Additionally, municipal governments will receive revenues from property taxes, severed mineral interest taxes if applicable, property tax credit reimbursements from the state, and direct and general production tax allocations.

12.10.31 Property Tax--As with county government and school districts, municipal and town governments depend on the property tax as a major revenue producer. A community will increase its property tax base in direct relation to the population and business expansion which should result from mineral development. The taxing district in which a copper-nickel smelter/refinery locates will also add to its tax base.

Of particular interest, a city may levy ad valorem taxes against surface property holdings of a mining company which aren't used directly in the mining process and on the mineral value of unmined ore. As discussed previously, the state establishes a value for unmined ore deposits and this is included in the local ad valorem tax base.

12.10.32 Severed Mineral Tax--Related to the property tax as a source of municipal government revenue is the tax on severed mineral rights. A tax of 25 cents per acre is charged against holders of severed mineral rights by the county administration. The community receives its share of 80 percent of such revenues collected on the basis of its mill rate in relation to the total (county, school district, city) mill rate with which property owners are faced.

12.10.33 Homestead Property Tax Credits--The community governments receive (as do county and school district units) reimbursement from the state in the amount

of the homestead and special taconite homestead property tax credits which are granted by the local taxing districts. The payment compensates the local government for the amount of revenue it would have gained had it levied its property tax without the credits to homeowners. The amount of the payment is related to the homestead property tax base; as the tax base grows, so will the state reimbursement for property tax credits.

12.10.34 Direct Aid--The city or town in which a mining operation is located receives two percent of the base production tax paid by the mining operation. In the event the mine and mill are located in separate communities, the community in which the mine is located would receive 40 percent of the production taxes allocated for direct distribution to the city in which the operation is located, and the city in which the mill is located would receive 60 percent. (Here again, this distribution is not consistent with the distribution of copper-nickel mine and mill workers that will stimulate municipal service costs.) Should a mine or mill be partially located in one community and partially in another, the Commissioner of Revenue would determine the allocation of prodution tax revenues. In the past this decision has been made on the basis of location of actual tons of ore mined in the case of a mine and location of person-hours worked in the case of a mill.

12.10.35 General Aid--As a result of any population growth due to nearby copper-nickel development, a community will share in the general taconite and copper-nickel municipal aid. Because the revenues from the taconite production tax will not change as a result of copper-nickel development, a city may actually lose aid from this source if its share of total Iron Range population is less as a result of copper-nickel development than was its original share of Iron Range population. Conversely, a city will gain general aid from this

source if its population as a result of copper-nickel development is a greater share of Iron Range population than it was originally.

Each city on the Iron Range will receive general copper-nickel municipal aid as a result of copper-nickel development. Ten percent of the copper-nickel base production tax is distributed to the communities of the Iron Range on the basis of population. Each city will receive a share of this revenue equal to its share of total Iron Range population.

12.10.36 Local Government Aid--Counties, with the exception of St. Louis County, receive a flat per capita aid from the state government. In 1977 this aid was $45 per capita. The aid is distributed by the county to the various cities and townships within its boundary, after the county and any special taxing districts have received their allocations, on the basis of a formula which includes population, mill rate, and sales ratio factors. Cities which gain population as a result of copper-nickel development will not necessarily gain additional local government aid because the population factor described in the statutory formula is based on the latest available census, not the current population estimate of the city. Changes in the amount of local aid would be related to changes in the mill rate and sales ratio factors. St. Louis County is excluded from this aid because it is a part of a Standard Metropolitan Statistical Area.

12.10.37 Other Sources--The Revenue-Sharing program of the federal government is becoming an increasingly important part of municipal government revenue. Should population of a community expand as a result of copper-nickel development, revenue-sharing receipts for that community would grow accordingly.

In the event a city or town government owns the mineral rights to property which is to be mined by a copper-nickel development, it would receive royalties from the company in exchange for the right to mine its ores. These are negotiated fees based normally on the value of ore removed or recovered from the mine. Royalties in the neighborhood of six percent are common in Minnesota.

The total aids received by municipal governments in the Study Area (Table 15) reflect the impact of the municipal mill rate and levy and the settlement patterns resulting under the three development scenarios. The Combination scenario results in the lowest amount of state aids due in part to the exceedingly low mill rate at Babbitt, while the Underground scenario results in more aid because of Ely's relatively high municipal mill rate.

Table 15

Basic aids to cities are distributed according to a ratio of each city's 1970 population or average of present and 1970 population, average mill rate over previous three years, and ratio of assessed to actual market value of property. Among the four scenarios is a wide range of aids to municipalities. The Underground scenario results in $2 million in basic aids, while the smelter/refinery development would result in about $.4 million. In terms of percentage of total municipal aid, the range for Basic Aids is 25 percent for the Underground, 20 percent for the smelter/refinery, 18 percent for the Open Pit, and 17 percent for the Combination scenarios.

Property tax credits, the statewide homestead property tax credit, and the special taconite area property tax credit make up a sizeable piece of the total aid package. This aid varies according to the vagaries of community population

Table 15. Cumulative state aids to Study Area municipal governments resulting from various copper-nickel developments (10^6).

	12,350,000 mt UNDERGROUND	16,680,000 mt COMBINATION	20,000,000 mt OPEN PIT	100,000 mt SMELTER/REFINERY
Basic aid	2.0	.8	1.2	.4
Taconite municipal aid	1.9	1.8	1.7	.6
Direct copper-nickel aid	.14	.20	.25	—
Homestead property tax credit	1.8	.8	1.4	.4
Taconite property tax credit	2.3	1.2	2.2	.6
Total	8.14	4.80	6.75	2.0

growth as a result of copper-nickel development, mill rates, and assessed valuations. The aids received vary widely from scenario to scenario.

The direct payment of production tax revenues to the city in which the operation is located is relatively small. The aid varies according to the number of tons of ore mined under each scenario.

Taconite municipal aid, distributed among all taconite area cities according to the city's share of total taconite area population, is relatively constant among the three scenarios. It therefore makes up a larger share for the Combination operation (38%) than it does for the Underground (23%).

The Taconite property tax credit, Taconite municipal aid, and Copper-Nickel production tax aid are distributed from funds receiving both taconite and copper-nickel production tax revenues. If the cities of the Study Area gain in their share of taconite area population as a result of copper-nickel development and this gain in population is great enough to offset gains in distributed revenue from new copper-nickel production, cities outside the Study Area stand to actually lose state aid as a result of copper-nickel development. In fact, this phenomenon can be seen within the Study Area if individual accounts are examined (see Volume 5-Chapter 13).

In summary, cities of the Study Area could receive from $2 million to $8 million over the life of any single opertion of the size modeled as a result of the development and its associated population growth. The actual distribution of state aids depends a great deal on the pattern of settlement and the relative population base, mill rate, and assessed value of the cities which receive additional population. There is every likelihood of a shift of taconite and copper-nickel generated monies away from the remainder of the taconite area to the Study Area.

12.10.4 Comparison of State Tax Revenues to State Aid Payments to Local Government as a Result of Copper-Nickel Development

Table 16 shows the amount of tax revenue received by the state as a result of copper-nickel development over the life of each mine/mill scenario and the amount of state aids received by local units of government within the Study Area as a result of copper-nickel mine development and its associated population growth. The figures presented for the Underground operation in the Ely area show that this is an area of concern as state aid to local government approaches the magnitude of state copper-nickel related revenues. The other scenarios show a larger net gain to the state. Royalty revenues are not included in this comparison because they are not taxes and because in many cases the distribution of these revenues is fixed by law and may not be able to be used to offset the cost of state aids to local government. Unemployment insurance and 10 percent of the Occupation tax revenues are excluded for the same reason (e.g. revenue goes to dedicated fund and cannot be used to offset aid payments to local government).

The Underground scenario results in a smaller benefit from the state's point of view for two principal reasons.

The Underground scenario results in the highest level of state aids to local units of government. Because of its relative isolation, a large concentration of population is projected to settle in Ely as a result of the copper-nickel development of the Underground scenario. Both the concentration of people in the principal area of settlement (Ely for the Underground, Babbitt for the Combination, and Hoyt Lakes for the Open Pit), and the total mill rate of that area of concentration are the largest for the Underground scenario, resulting in a high level of property tax credits and basic municipal aid to the Ely area.

Finally, the Underground scenario, though it results in the smallest revenues to the state, has associated with it the largest work force and population growth. This results in a higher level of basic municipal aid and foundation aid to school districts (the largest single aid category).

The revenue-aid relationship for the Underground scenario can be explained in simplified terms by the high level of school district foundation aid (the largest form of state aid to local governments).

Table 16

Comparing state aid disbursements paid to local governments as a result of smelter/refinery related population growth to the revenues which accrue to the state from this type of development illustrates the fiscal benefits of having the smelter/refinery operation located within the state (Table 17).

Table 17

12.11 COPPER-NICKEL VERSUS TACONITE TAXES

A comparison of Minnesota's mineral taxation policy as it affects taconite operations versus a copper-nickel operation can be limited to the occupation, production, income, and royalty taxes. The types of taxes paid are identical for the two minerals with the exception of the income tax. A taconite operation is not liable for a corporate income tax, whereas a copper-nickel operation would have to pay a tax on its Minnesota net taxable income.

The rates at which the occupation, production, and royalty taxes are applied vary significantly from copper-nickel to taconite as shown in Table 18 below.

Table 16. Summary of state tax revenue and state aid distribution to Study Area local governments as a result of copper-nickel mine/mill development (10^6).

	12,350,000 mt/yr UNDERGROUND	16,680,000 mt/yr COMBINATION	20,000,000 mt/yr OPEN PIT
State Tax Revenue[1]			
From firm[2]	30.6	39.4	45.4
From employees	57.3	52.1	45.7
Total	87.9	91.5	91.1
State Disbursements			
City aids	8.1	4.8	6.8
School aids	66.3	55.9	39.1
County aids	9.6	10.6	8.6
Total	84.0	71.3	54.5
Difference	+ 3.9	+ 20.2	+ 36.6

[1]Does not include Royalty Receipts.
[2]Does not include Unemployment Insurance Payments and 10 percent of Occupation Tax Payments.

Table 17. Summary of state tax revenue and disbursements to Study Area local governments as a result of copper-nickel smelter/refinery development (10^6).

State Tax Revenue		197.3
From firm[1]	175.5	
From employees	21.8	
State Disbursements		32.1
City aids	2.0	
School aids	26.1	
County aids	4.0	
Difference		+169.2

[1]Does not include Unemployment Insurance Payments.

Table 18. Copper-nickel taxes vs. taconite taxes.

OCCUPATION TAX	RATE
Copper-Nickel	1 percent of valuation of ore mined or produced
Taconite	15 percent of valuation of ore mined or produced

PRODUCTION TAX	RATE
Copper-Nickel	2.5 cents per gross ton of ore inflated by the wholesale price index plus 10 percent of base tax for each .1 percent over 1 percent ore content (for the open pit model, this is equivalent to 87 cents per gross ton of bulk copper-nickel concentrate)
Taconite	1.25 dollars per gross ton of concentrate inflated by the wholesale price index plus 1.6 percent of the base rate for each 1 percent over 62 percent ore content

ROYALTY TAX	RATE
Copper-Nickel	1 percent of royalties received for copper-nickel plus 1 percent of royalties for precious metals
Taconite	15 percent of royalties received for taconite operations

The rates for the occupation tax and royalty tax, both of which are based on the value of the mineral products, are 15 times higher for taconite than the rate for copper-nickel. The production tax base rate for taconite is 50 times that

of copper-nickel; however, the rates apply to different phases of production, ore in the case of copper-nickel and concentrate in the case of taconite. If the production tax is stated in terms of its percentage of unit value, the difference between the two taxes is reduced by about one-half. The copper-nickel production tax base rate is .15 percent of the value of the minerals per ton of ore, while the taconite production tax is 3.5 percent of the value per ton of taconite pellets. In these terms, the taconite tax rate is 23 times greater than the copper-nickel tax rate, a significant divergence.

If the taconite tax rates are applied to the Tax Model input parameters for the open pit scenario, the difference between the taconite and copper-nickel tax laws can be analyzed. Annual tax liability of a copper-nickel operation taxed under the taconite tax laws would be about $16.4 million, compared to $1.9 million under present copper-nickel law, a more than eight-fold increase. Individually, the occupation and royalty taxes represent a 15-fold increase, from $900,000 to $13.5 million for occupation taxes and from $100,000 to $1,500,000 for royalty taxes. The production tax would increase from $900,000 under copper-nickel law to $1.5 million under taconite law, a 67 percent increase. The increase in production tax liability is smaller because the tax base is shifted from tons of ore in the case of copper-nickel production taxes to tons of concentrate in the case of taconite production taxes.

The revenues received from the tax on both taconite and copper-nickel are distributed to various accounts at the state and local level according to the same distribution formulas. The production tax distribution, which acts to allocate revenue back to local governments in lieu of property tax payments by the mineral operations, acts identically for each of the minerals. Copper-nickel production tax revenues are allocated to taconite municipal and

taconite homestead property tax relief accounts and thus are distributed to each of the cities which receive taconite aids. Cities along each of the historical iron ranges will receive benefits from copper-nickel development (see Figure 1).

See Volume 5-Chapter 14 (Mineral Economics) for an additional comparison of taconite and copper-nickel taxing approaches and their impact on mining corporation profits.

12.12 CHARACTERISTICS OF ROYALTIES

Within the Study Area, the Minnesota Department of Natural Resources estimates that there is 4.4 billion tons of copper-nickel ore with an average grade of .66 percent copper, assuming a cut-off grade of .50 percent copper (DNR 1977). Associated with the copper is nickel of an average .20 percent grade. At average 1977 market prices of $.68 per pound of copper and $2.30 per pound of nickel and recovery rates of .86 to .66 for copper and .68 to .52 for nickel, this represents a value of about $50 billion for the recovered minerals (not including precious metals and cobalt) within the Study Area (see Volume 3-Chapter 2 on mineral resources for further detail).

Table 19 shows that about 15 percent of the copper-nickel mineral rights are owned by the state of Minnesota. Assuming an even distribution of minerals over the mineralized portion of the Study Area, the state's share of the total copper-nickel value would be $7.5 billion. If an average royalty rate of 6 percent is used for state lands, the potential royalty payments to the state would amount to $450 million. In addition, the tax on royalties which would be paid to the 32 percent of mineral ownership in the private sector would amount to nearly $9.6 million.

The distribution and grade of minerals in the Study Area varies significantly from area to area. It is known that the northern area of the Duluth Complex contains a disproportionate share of potential mineral production (see Table 19 and Figure 18). The federal government owns a large percentage of the mineral rights of this area. Royalties to the state will be directly related to the specific characteristics of the land and/or minerals it owns. Therefore, the figures presented above are only indicative of the significance of royalties if the state is the owner of the resources in question, but not a true picture of the projected total state receipts from royalties.

Table 19, Figure 18

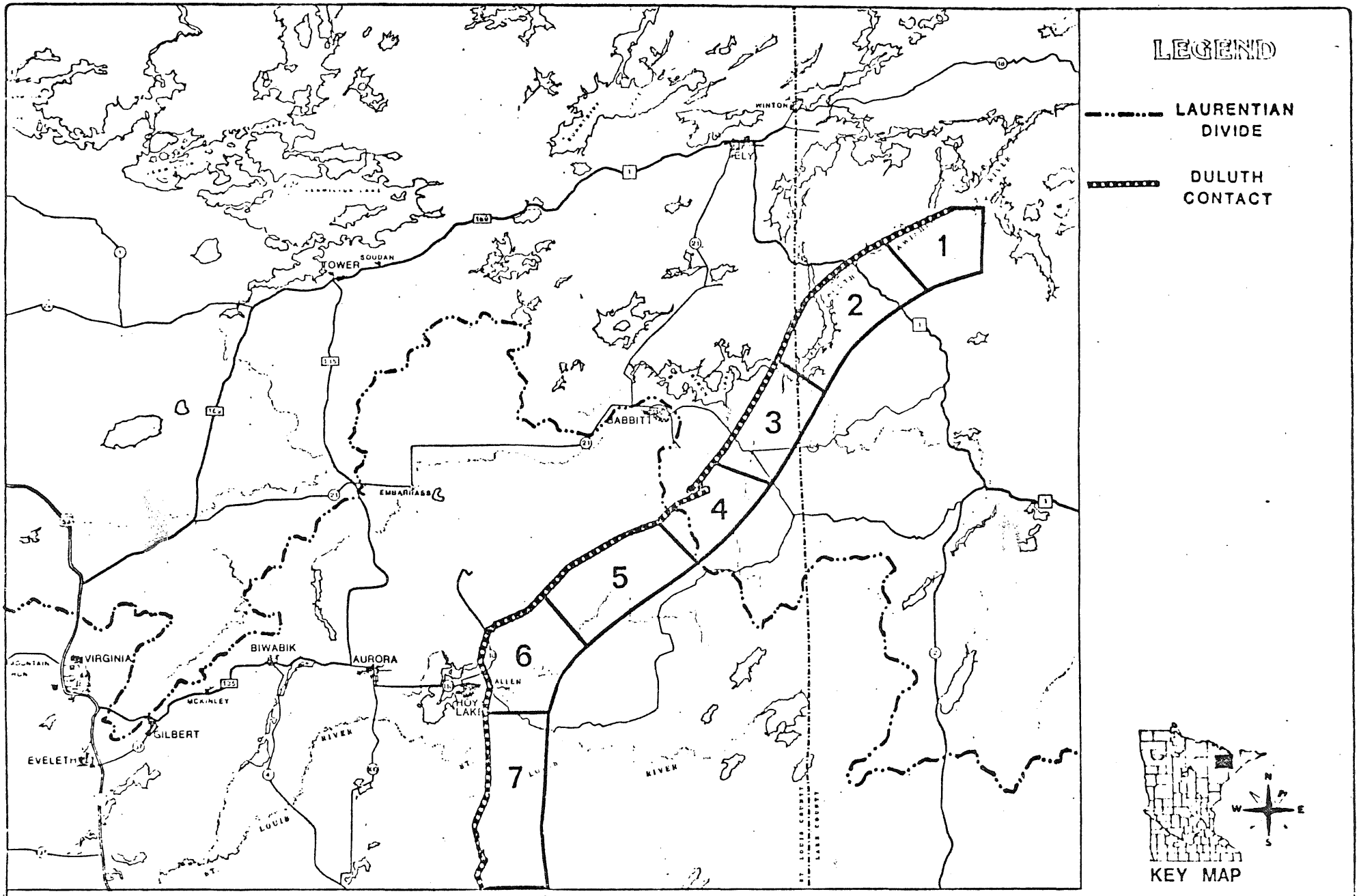
The federal permitting and leasing process is generally less democratic than that of the state. While the state establishes clearly defined mining units which are bid upon in public sales, the federal process allows prospective lease-holders to acquire mineral leases on a first-come-first-serve basis. The state sets a minimum royalty rate for leases and sells the lease to the highest of the sealed bid rates it receives on the particular mining unit. The federal process, on the other hand, is completely negotiated between the prospective lease-holder and the representative of the federal government.

In terms of impact on the state of Minnesota, federal leases will result in a flow of revenue into the state, though not as great as would result from state ownership of the minerals. The leasing process requires 25 percent of the royalties received by the federal government to be returned to the county from which it originated. In contrast, a lease for privately controlled minerals will result in state revenues from the Royalty Tax (1 percent of private royalties) and from taxes on the income of royalty recipients. Again, this

Table 19. Potential copper production and mineral ownership by Study Area mineralized zone.

LOCATION / MINERALIZATION	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	ZONE 6	ZONE 7	TOTAL AREA
Potential Copper Mineral Production[1] (10^6 metric tonnes)	4.0	7.9	1.2	3.2	1.5	0.7	0.1	18.6
Mineral Ownership								
Federal	77.33	60.74	17.50	8.30	4.29	8.67	14.89	23.97
State	0	6.28	23.76	29.64	10.99	9.29	20.33	14.86
County	0	0	0	0	0	0	0	0
Private	2.0	6.28	49.50	55.34	73.19	26.32	7.33	31.99
Conflicts	15.34	15.97	7.26	6.32	8.85	55.72	56.50	26.00
Part Federal Part Private	2.67	0	0	0	2.41	0	0	0.59
Inf. not Available	0	0.26	0	0.40	0.27	0	0.95	0.32
Over 50% Water	2.67	10.47	0.98	0	0	0	0	2.27
TOTAL	100	100	100	100	100	100	100	100

[1]Includes copper resources greater than 0.25 percent copper content and and 85.6 percent copper recovery from open pit mines and 65.9 percent copper recovery from underground mines.



MEQB REGIONAL COPPER-NICKEL STUDY

RESOURCE ZONES

source of income to the state is significantly less than if the state controlled the minerals.

If we assume 100 percent ownership of the mineral rights leased by a mining operation for each of the potential owners (state, private, federal), the magnitude of potential state revenue flows with each scenario can be compared. Table 20 shows the revenues received by the state under each case.

Table 20

Table 20 indicates that the state receives significantly more benefit from mineral rights owned by the federal government than it does from privately-held mineral rights.

Table 21

12.12.1 State Permits and Leases

Minnesota's rules and regulations pertaining to prospecting permits and mining leases for copper, nickel, and associated minerals on state lands are set forth in Minnesota Department of Natural Resources regulations, NR 94. The purpose of these regulations is to promote and regulate the prospecting, mining, and removal of copper, nickel, and associated minerals in Minnesota. Leases are required on lands "wherein an interest in the minerals is owned by the state, including trust fund lands, lands forfeited for nonpayment of taxes and held in trust by the state, the beds of public waters, and lands otherwise acquired that have been designated by the Commissioner as mining units."

Leases are generally issued upon public sale authorized by the commissioner with at least 30 days notice in designated newspapers and trade magazines. The

Table 20. State royalty revenue[1] from three ownership cases (10^6).

	100% STATE	100% PRIVATE	100% FEDERAL
Royalties	394	zero	zero
Royalty Tax	zero	4	zero
Income Tax[2]	zero	59	zero
Distributed Aid	zero	zero	148
TOTAL	394	63	148

[1]Revenue received over the life of the operation, as estimated by the tax model, assuming prices of $.91 and $2.10 for copper and nickel, respectively.

[2]Assuming all royalties are paid to Minnesota residents and each recipient pays Minnesota's maximum 15 percent income tax.

Table 21. Comparison of state and federal royalty regulations.

	STATE	FEDERAL
Royalty Rate	Base rate according to Table 22 plus a bid rate	Negotiated on a case-by-case basis
Rental Payment	Years 1-5: $1 per acre Years 6-10: $5 per acre Thereafter: $25 per acre	$1 per acre with a minimum of $20 annual rent
Unit Size	Mining units established by MDNR	Maximum of 2560 acres
Method of Sale	Public sale with sealed bids	Permits granted to first applicant. Leases to permit holders if wanted
Distribution of Revenue	According to land fund, see Table 23	25 percent returned to state, remainder to general reclamation fund and U.S. Treasury

leases are granted on the basis of highest bid for each mining unit with the state reserving the right, through the executive council, to reject any or all bids. No lease shall be issued for more than 50 years (see Volume 5-Chapter 4 for information on the location of leases and state minerals in the Study Area).

The state earns revenue through the issuance of mining leases by two principal means. A rental fee per acre of land leased is paid by the lessee according to a schedule set forth in NR 94 (g)(6). In addition, the lessee pays the state a royalty per ton of crude ore recovered from the mining unit.

In NR 94 (g)(8) the royalty rates are described as follows: "The royalty rate to be paid to the state by the lessee for the copper, nickel, and associated metals and mineral products recovered from each ton of ore mined from said mining unit shall be the base rate described hereinafter, plus an additional per cent of the value of the metals and mineral products recovered in the mill concentrate from each ton of dried crude ore." The bids must exceed the base rate described in Table 22.

Table 22. Base royalty rate.

	If Mine is Underground	If Mine is Open Pit
Years 1-10	2%	2%
Years 11-20	2 1/4%	3%
Years 21-30	2 1/2%	3 1/3%
Years 31-40	2 3/4%	3 2/3%
Years 41-50	3%	4%

1) Rates are a percentage of the value of the metals and mineral products recovered in the mill concentrate from each ton of dried crude ore.

2) The rate is doubled on that portion of the value of metals and mineral products recovered which exceeds $17 per ton of dried crude ore.

As of January, 1977, active state leases held in St. Louis County by the Bear Creek Mining Company ranged from 5.0 percent royalty rates to 5.6 percent. In Lake County the Duval Corporation holds state leases with royalty rates of 7.0 percent. Although bid rates are fixed through the life of any particular lease, as leases on properties change hands over time, the bid rate has tended to rise. For example, a state lease in St. Louis County formerly held by AMAX Exploration, Inc. with a bid rate of 2.31 percent was purchased in 1971 by the American Shield Corporation at a bid rate of 2.72 percent. Similar increases are common (DNR 1977).

The value of metals and mineral products is determined each month by multiplying the total pounds of copper, nickel, and other metal products recovered during the month by the average market price per pound for each respective metal. The value of the metals and mineral products recovered from each ton of dried crude ore is determined by adding the values for each metal and mineral product and dividing the sum by the total number of tons of dried crude ore.

The average market price of copper will be that which is "quoted for domestic refinery electrolytic copper in carload lots, f.o.b. Atlantic Seaboard Refineries as reported in the 'Metals and Mineral Markets' section of the Engineering and Mining Journal." Other market values are determined monthly from the same source. Royalty payments are paid to the state by the lessee on or before the 20th day of May, August, November, and February for the previous calendar quarters.

The rental fee paid to the state by the lessee as set forth in 94 (g)(6) is as follows:

	ANNUAL RENTAL RATE
Years 1-5	$1 per acre
Years 6-10	$5 per acre
Thereafter	$25 per acre

The rate shall not exceed $5 per acre per year for any year in which the lessee produces not less than 100,000 tons of ore.

Rental fees are payable according to the same schedule as royalty payments. Any amount paid for rental shall be allocated to the proper fund as determined by the mineral ownership.

An additional source of revenue to the state due to reservations in granting leases for copper-nickel operations is through the sale of timber off state-controlled lands which are so leased. According to NR 94 (g)(5), the state reserves the right to sell or dispose of all the timber upon any mining units pursuant to the law governing the sale of timber on state lands. The state also reserves the rights to all iron ores, including taconite, and may lease these rights to other enterprises. Both reservations must be made so as not to hinder the operations of the copper-nickel lessee.

According to NR 94 (f), the Commissioner of Natural Resources, with the approval of the executive council, may issue a lease to any qualified enterprise without a public sale. This may occur any time the commissioner finds it is impractical to hold a public sale on any mining unit because of its location, size, or the

extent of the state's interest in the minerals therein. The rental and royalty rates so negotiated shall be not less than those prescribed in NR 94 (g). If the mining unit has been advertised according to NR 94 (e), no lease shall be negotiated until after the public sale has been held. No lease shall be negotiated until at least one public sale has been held on the mining unit in question.

Any amount paid for royalties or rental of leased mineral rights shall be allocated to the proper fund as determined by mineral ownership (Table 23). If the lands are consolidated conservation lands, 50 percent of the proceeds go to the con-solidated conservation fund to be used for conservation purposes and 50 percent is returned to the county. For acquired forestry lands 50 percent of revenues go to the county and 50 percent go to the state general revenue fund. Mineral leases of tax forfeited lands return 80 percent of the proceeds to the county for distribution (3/9 to county, 2/9 to city or town, and 4/9 to school district) and the remaining 20 percent to the state general fund. In the case of trust fund lands, all revenues are credited to the designated trust fund.

Table 23

Royalties, while providing revenue to the state, are not a tax in the general sense on the mineral development operation. If a tax is viewed as a levy upon persons to defray public expenses, royalties are clearly different. A royalty represents the share of the value of a property received by its owner for the right of the operation to mine its lands. As such, a key variable in addition to production levels, in the forecasting of state royalty revenue from copper-nickel development, is the pattern of mineral rights ownership in the Study Area.

Table 23. Distribution of proceeds from state-owned mineral resources.

CONSOLIDATED CONSERVATION LANDS	ACQUIRED FORESTRY LANDS	TAX FORFEITED LAND	TRUST FUND LANDS
50 percent to county	50 percent to county	26 percent to county 18 percent to city 35 percent to school district	all revenues are distributed to designated trust fund
50 percent to consolidated conservation fund	50 percent to state general fund	20 percent to state general fund	

Taxes from the three hypothetical development scenarios are estimated to be relatively equal in magnitude over the lives of the operations. Without royalties, the underground scenrio is shown in Table 24 to produce tax revenues which barely match the state aids disbursed to the Study Area as a result of copper-nickel development. The other scenarios produce larger state benefits due to lower levels of state disbursements. The table shows that the underground scenario which has the lowest amount of revenue and highest level of state disbursements associated with it, none the less results in a positive benefit to the state, albeit small. This indicates that any revenue received by the state on royalty payments will represent exactly what it is meant to be, a share of the value of the mineral holdings, and will not have to be used to defray local government expenses.

Table 24

As discussed above the royalty revenue to the state varies according to production level (value of minerals produced) as well as ownership of mineral rights. By holding constant the value of minerals produced, as is the case for the three basic scenarios, a curve of estimated royalty revenue can be developed showing the relationship between royalty revenue and mineral ownership (Figure 19).

The figure shows that with zero mineral ownership, the state would, of course, receive no royalty revenue. But if a development were on mineral rights owned entirely by the state nearly $400 million would be received over the thirty year life of the operation (under the assumptions incorporated in the Tax Model). This is about $16 million per year during years of peak production under each of the mine/mill scenarios. The scenarios, given their assumed state ownerships, are seen as points on the curve.

Table 24. Estimated state disbursements and revenues resulting from various copper-nickel developments (10^6)

	12,350,000 mt/yr underground	16,680,000 mt/yr combination	20,000,000 mt/yr open pit
State revenue[1] with no royalties	87.9	91.5	91.1
Estimated state disbursements	84.0	71.3	54.5
State benefit with no royalties	3.9	20.2	36.6

[1]Includes production, occupation, royalty, corporate income tax and personal income, sales and excise revenue. Does not include unemployment insurance payments and 10 percent of occupation tax which cannot be used to make state aid disbursements.

Figure 19

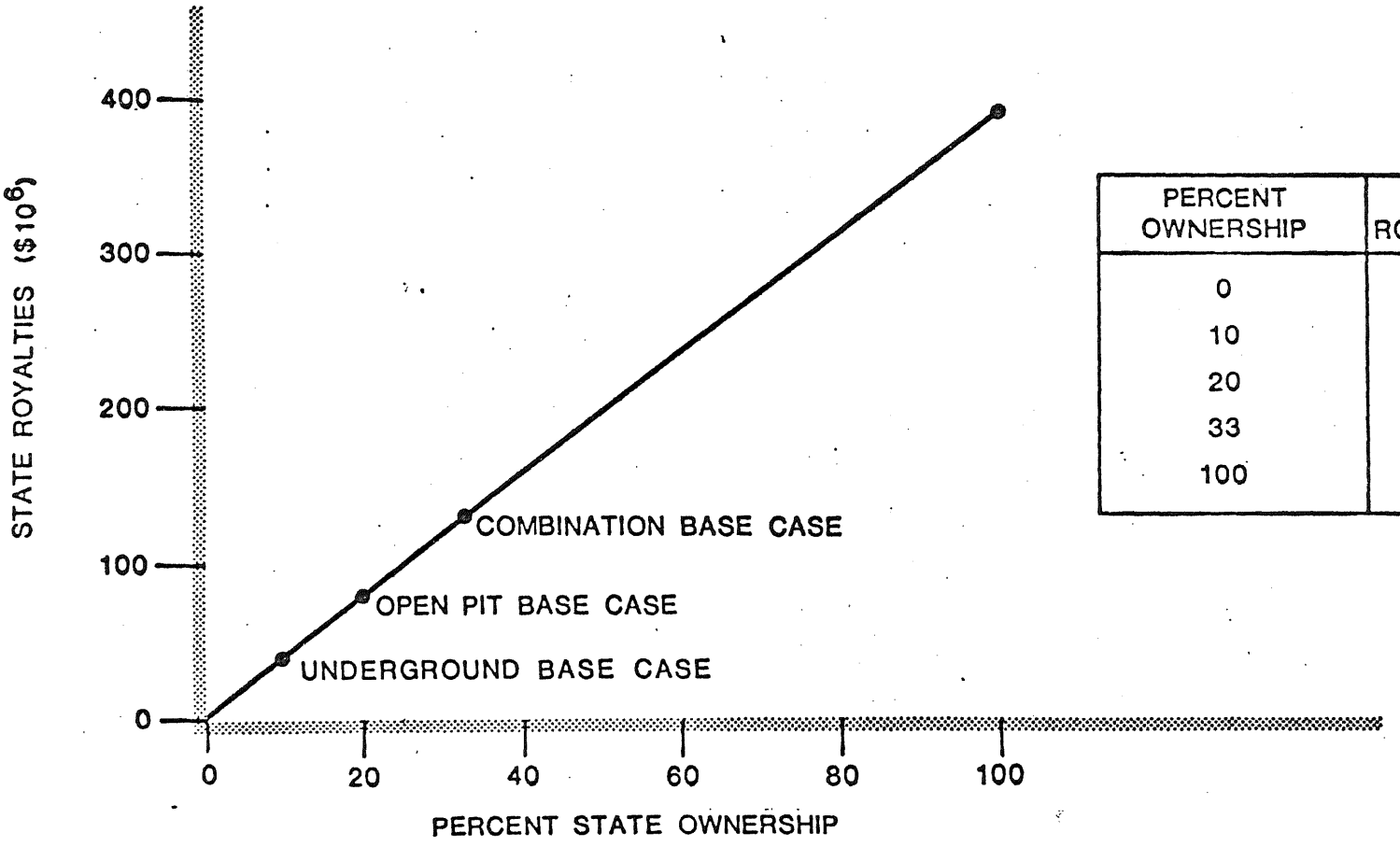
12.12.2 Federal Permits and Leases

The federal government owns approximately 24 percent of the mineralized zone of the Study Area (see Figure 18). At 1977 prices of $.68 per pound and $2.30 per pound for copper and nickel respectively and copper and nickel recovery rates of 86 to 66 percent and 68 to 52 percent, respectively, and assuming equal distribution of the minerals throughout the ore body, the value of federally controlled minerals would be $12 billion.

The value of the federally controlled minerals would depend on the specific characteristics of the ore body. Table 19 indicates that the federal government controls lands which have the largest share of the mineral resources thus, the value of the federally controlled lands is likely to be greater than indicated above.

Federal regulations pertaining to leasing of minerals other than oil and gas as contained in Title 43 of the Code of Federal Regulations are set forth in Circular No. 2321, published by the Bureau of Land Management, U.S. Department of the Interior, in March, 1972. The statutory authority for leasing the minerals of the public domain is contained in the act of February 25, 1920 (41 Stat. 437; 30 U.S.C.,181 et seq.) as amended. The authority for leasing minerals of acquired lands is stated in the Mineral Leasing Act of August 7, 1947 (61 Stat. 913; 30 U.S.C. 351-359). Special laws of June 30, 1950 [64 Stat. 311; 16 U.S.C. 508(b)] relate to leasing certain National Forest lands in Minnesota. The granting of a permit or lease for the prospecting, development, or production of any one mineral does not preclude the issuance of permits or leases for other minerals for the same land.

STATE MINERALS OWNERSHIP
AS A SOUCE OF GOVERNMENT REVENUE (ROYALTIES)



PERCENT OWNERSHIP	STATE ROYALTIES (10^6)
0	0
10	36.2
20	78.8
33	126.5
100	392.6

Leases of the public domain must be in a reasonably compact area no more than six miles square. The amount of acquired Federal acreage under lease shall not exceed the amount of public domain acreage permitted to be held. A prospecting permit can be no larger than 2560 acres or 6 miles on each side and is issued to the first qualified applicant. Permits and leases are issued only with the consent of the head of the jurisdiction holding control of the lands (Supervisor of the Superior National Forest in the case of the Study Area) and are subject to any conditions prescribed to adequately utilize the lands to their intended purpose. Surface owners must be properly notified of pending mineral leases or permits.

Mineral prospecting permits may be obtained only by citizens of the U.S., associations of U.S. citizens, or corporations organized under the laws of the U.S. All applicants must file a statement of qualification and evidence thereof in the proper land office. A corporation must file statements showing in which state it is incorporated, that it is authorized to hold mineral leases, names of officers, the percentage of stock owned by aliens, and the names and addresses of any stockholder owning more than ten percent of stock.

Prospecting permits require an annual rental payment of $.25 per acre with a minimum annual payment of $20. The first year's rental fee plus a small filing fee must accompany the permit application. Leases, which are available first to permit holders for each land unit, require an annual rental fee of $1 per acre with a minimum payment of $20 per year. First year rental payment must accompany the application for a preference right lease.

Subpart 3503.3-2 of the regulations states that "royalty rates will be determined on an individual case basis prior to lease issuance. Such rates will be

set out in the notice of competitive lease offer. The lease describes a minimum production requirement which can be altered or suspended only after showing the need and filing application with the appropriate Regional Mining Supervisor. If operations are suspended a rental fee of not less than $1 per acre is established in lieu of royalty payments.

The lease negotiated between the Bureau of Land Management, representing the federal government, and the International Nickel Company, Inc. (INCO) in 1966 for an area in northwestern Lake County (located in Resource Zone 1) is indicative of the terms of potential federal leases. INCO agreed to pay a royalty of 4 percent of the value of the copper-nickel minerals mined for the first ten years and 4 1/2 percent thereafter. The value of the minerals mined was set equal to one third the equivalent amount of minerals at market prices quoted in current literature. In addition, INCO agreed to pay .3 percent royalty on the value of any associated products. If the associated products exceeded 20 percent of the aggregate market value as refined metals, an additional 1 percent royalty would be paid.

Corporate or personal surety bonds are required for the protection of the owner of surface rights. An applicant for a prospecting permit must furnish a bond in an amount determined by the authorized officer, but not less than $1000. A lease applicant must also furnish a bond in an amount determined by the authorized officer, but not less than $500 for hardrock mineral leases. Bonds extend through the life of the lease.

The authorized officer may, at his discretion, "approve operating or development contracts or processing or milling arrangements for the conservation of natural products" or in the interests of the U.S. If operations at a large scale are

justified for the discovery, development, production, or transportation of ores, subpart 3505.3-3 exempts contracts from the acreage limitations established in subpart 3501.2-5.

Permits and leases may be transferred in whole or in part according to the requirements of subpart 3506.

Federal policy is to return 25 percent of all revenues received from a particular unit of land to the county of origin. The remaining royalty revenues would be credited to the mineland reclamation fund and the U.S. Treasury.

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