

User's Guide to CNICK

by

Thomas F. Stinson
Andrea Lubov
Kweiwu Fang

September 1, 1978

CNICK is a computer program which can be used to simulate the fiscal impact of mineral development in certain communities in Lake and St. Louis Counties, Minnesota. The program was written under contract with the Minnesota Copper Nickel Study to assist their evaluation of the advisability of mining and smelting copper and nickel in that region. Tax revenues accruing from a copper nickel mine and beneficiation plant, a copper-nickel smelter, or a taconite mine and beneficiation plant can be estimated.

CNICK allows the user to estimate the amounts of specific taxes the workers and the mineral development firm would pay the State, school districts, cities, and counties in which a plant, mine, workers are located during each year of the facility's life. In addition, the user is able to estimate the intergovernmental aid attributable to development.

The program makes these estimates assuming the tax and aid system in effect in Minnesota in 1977. The user also has the opportunity to change tax and intergovernmental aid parameters, making it possible to compare alternative tax and aid programs.

To use CNICK, the user must supply information about the mine and its workers and millage rates in the impacted communities. The specific data requirements for analysis of each type of development, copper-nickel mine and beneficiation plant, copper-nickel smelter, or taconite mine and beneficiation plant, will be considered in sections describing each individual program.

The output is available in five separate forms, the "regular" form, which includes all taxes and aids, a "short" summary form, a "plot" form

where the output data may be used as input to a plot program, and a list of the program. Estimates of state taxes and new taxes can also be obtained in a format for a CRT terminal. Each of these output options will be discussed in the section called "Output Options."

Assumptions Underlying the Model

Some assumptions about the workers and their families had to be made in order to perform some calculations. These assumptions are reported in this section according to type of tax. The assumptions as well as citations to applicable Minnesota taxation and aid statutes may be obtained by exercising the "List Entire Program" print option.

Automobile-related taxes.--Revenues from four different motor vehicle-related taxes (driver's licenses, motor vehicle licenses, motor vehicle excise taxes, and gasoline taxes) are estimated and reported separately. Specific assumptions made to calculate revenue from these taxes were as follows. All workers are licensed drivers and are married to licensed drivers. Families own two cars with an average age of six years, and each is driven 10,000 miles per year and obtains 15 miles per gallon of gasoline. Drivers' licenses cost \$5.50 and must be renewed every four years. Motor vehicle license fees of \$30 per vehicle are paid annually, and automobile excise taxes of \$80 are paid when the family obtains a new automobile. These figures are consistent with Department of Motor Vehicles estimates.

Personal income taxes.--All workers are assumed to be married, file joint returns, have a non-working spouse and 2 children. Income taxes paid are calculated by income class and then summed. Annual income ranges from \$8,000 to \$30,000 in \$1,000 increments.

The actual estimates of taxes paid are based on reported 1974 federal tax returns. These are the most recent available.

Sales taxes.--The same income information and assumptions about family size are used to calculate sales taxes payable. The estimates are based on a 1974 University of Minnesota M.A. thesis.

Alcohol and Tobacco Taxes.--The State of Minnesota calculates total and per capita revenues from both of these taxes. To use the State's per capita figure, requires an assumption about family size. The family size for copper nickel workers is assumed to be 3.87, the average family size for coal miners in North Dakota. This parameter can be easily changed, however.

Property taxes.--Property taxes payable to the city, the county, and the school district are calculated and reported separately.

The following estimates of the assessor's determination of value are appropriate for 1975:

<u>Dwelling Type</u>	<u>Assessor's - Limited Market Value</u>
New Mobile Home	\$10,000
Old Mobile Home	\$ 4,000
Single Family Dwelling	\$30,000
Small Apartment Building	\$20,000 per unit
Large Apartment Building	\$11,000 per unit

Mobile homes are assumed to be owner-occupied and are assessed at 18 percent, and apartment buildings at one-third of market value. The first \$17,000, called the "homestead base value," of an owner-occupied

single family dwelling is assessed at 18 percent and the balance at one-third of market value.

The property taxes reported are the property taxes actually paid; that is, property taxes assessed less the taconite and the "regular" homestead credits.

Workers are distributed among localities in any manner chosen by the user. Similarly, the user can control the choice of dwelling by workers. Separate distributions are allowed for the workers directly employed by the mine and the ancillary workers.

The remainder of the manual considers the following aspects of the model. Data requirements unique to the copper-nickel mine and beneficiation plant, data requirements unique to the copper-nickel smelter, data requirements unique to the taconite mine and beneficiation plant, data requirements common to all three types of developments, data requirements for ancillary development, how to change tax parameters, print and output options, and system control cards for running both CNICK and CRT. Detailed flow charts of the model are provided as an appendix.

Data Requirements

General Comments

To use CNICK program, the user must provide specific information about the mine and its workers for each year for which analysis is desired. CNICK requires three types of data: data about the facility and its workers that are specific to the type of development (e.g., copper-nickel mine and beneficiation plant or copper-nickel smelter or taconite mine and beneficiation plant), data about the community that are not development specific, and data about the expected ancillary developments. The development-specific data requirements will be considered first.

All data supplied by the user are entered on standard 80 column punch cards. Unless otherwise noted, the first ten columns of each card are not read by the program and so may be used for identification. Each data element is presumed to occupy ten columns, beginning with column 11. Within each ten column field the data element must contain a decimal point.

DATA MUST BE ENTERED IN THE EXACT ORDER SPECIFIED!!

Data for the Copper Nickel Mine and Beneficiation Plant

The first two cards of this program tell the program that taxes for a copper-nickel mine and beneficiation plant are being computed and how many years of information are being supplied. These cards begin in column 1. The first card must contain the following "CNM+BP." The second card contains the number of years of data supplied. Assuming the user wants analysis of the fiscal impact of a copper-nickel mine and beneficiation plant for 50 years (through 2024) under the present tax structure, the first two data cards would appear as follows:

CARD 1: CNM+BP

CARD 2: 50

The third card allows the user to delete calculation of state corporate income tax payments by the mine. If corporate income taxes are to be deleted the word BRANCH should be placed in columns 1-6. Card 3 should be blank otherwise.

The rest of the data cards needed to estimate taxes paid by a copper-nickel mine and beneficiation plant are prepared in the format described in the general data requirements section. Each card may contain up to seven data elements. Unless otherwise noted, data for 1975 is entered in columns 11-20 of the first card; for 1976, in columns 21-30, ...;

for 1982, in columns 11-20 of the second card; and so on. If analysis is required through 2024, 8 data cards will be required for all those variables that require annual updating.

After the first three special data cards, the remaining data are entered in the following order. All required types of data must be supplied. Recall that the first ten columns of each card are not read by the computer, so they may be used for identification.

1. Annual production of copper-nickel ore in tons.
2. Annual production of copper-nickel concentrate, in tons.
3. Annual market value of mine and beneficiation plant land and structures.
4. Annual operating costs of mining the ore.
5. Annual operating costs of extracting the ore.
6. Annual operating costs of the concentrating plant.
7. Annual royalties paid to state and local governments for mineral rights.
8. Annual royalties to private parties for copper-nickel mineral rights.
9. Annual royalties paid to private parties for precious metals mineral rights (If there are none, enter "0." for each year.)
10. Percent of ore refined annually in the state. Whenever a percent is required it must be expressed as a percent and not as a decimal (i.e., 10. not .1).
11. Annual percent mineral content of the ore.
12. Annual price per ton of copper-nickel ore.

13. Annual price per ton of copper-nickel concentrate.
14. Annual copper-nickel mine depletion charge.
15. Annual research expenses.
16. Annual development expenses.
17. Annual mine depreciation.
18. Annual beneficiation plant depreciation.
19. Current year millage rates for the cities, counties, and school district in the study area. Millage rates must be expressed in fractions of a cent (i.e., .028 not 28.). Prepare data cards according to instructions in Table 1.
20. Annual number of acres subject to copper nickel mineral rights tax.
21. Annual number of acres of mine and tailing basin.
22. Annual tax value for surface property rights tax.
23. Current year millage rates in jurisdictions where the mine is located. Use columns 11-20 for the county's millage rate, 21-30 for the school district's millage rate, and 31-40 for the city's millage rate. If the mine is not located within the city limits of any city, enter 0.
24. Annual manning table by wage. A separate set of data must be entered for each year for which the analysis is desired. The manning table by income class must be prepared in accordance with the instructions in Table 2.
25. Average annual market value of a single unit of each of five different dwelling types. Enter these market values in accordance with the instructions in Table 3.

Table 1. Millage Rates in Various Jurisdictions

Enter the millage rate, in mills (i.e. .028, not 28.) for the jurisdictions in the columns indicated in this table. Only one set of these data is required.

Card	Cols 1-10	Cols 11-20	Cols 21-30	Cols 31-40	Cols 41-50	Cols 51-60	Cols 61-70	Cols 71-80
1	Identifi- cation	St. Louis County Millage rate	Lake County Millage rate	Virginia School Dist Millage rate	Gilbert School Dist Millage rate	Eveleth School Dist Millage rate	Ely School Dist Millage rate	Biwabik School Dist Millage rate
2	Identifi- cation	Babbitt School Dist. Millage rate	Aurora-Hoyt Lakes School Dist. Millage rate	City of Virginia Millage rate	City of Gilbert Millage rate	City of Eveleth Millage rate	City of Ely Millage rate	City of Biwabik Millage rate
3	Identifi- cation	City of Babbitt Millage rate	City of Aurora Millage rate	City of Hoyt Lakes Millage rate	blank	blank	blank	blank

y Income Class

tion. These instructions are for one year's analysis.
Each analysis is desired. Enter the number of workers
is number must end with a decimal point.

ls 31-40	Cols 41-50	Cols 51-60	Cols 61- 70	Cols 71-80
),000-\$10,999	\$11,000-\$11,999	\$12,000-\$12,999	\$13,000- \$13,999	\$14,000-\$14,999
7,000-\$17,999	\$18,000-\$18,999	\$19,000-\$19,999	\$20,000- \$20,999	\$21,000-\$21,999
4,000-\$24,999	\$25,000-\$25,999	\$26,000-\$26,999	\$27,000- \$27,999	\$28,000-\$28,999
blank	blank	blank	blank	blank

Table 3

Market Values for Dwelling Types

The first ten columns of each card may be used for identification. These instructions are for one year's analysis. A separate card must be prepared for each year for which analysis is desired.

<u>Dwelling Type</u>	<u>Enter Value in Columns:</u>
Used Mobile Home	11-20
New Mobile Home	21-30
Single Family Dwelling	31-40
Small (4 or fewer units) Apartment Building	41-50
Large (more than 4 units) Apartment Building	51-60

26. Annual total compensation paid to all workers. This number should be larger than total annual wages implied by the manning table since compensation includes fringe benefits and F.I.C.A. employer contributions. There is no internal check to assure that compensation and total annual wages are consistent.
27. If state corporate income taxes are not to be calculated internally (if card3 is BRANCH), expected annual state corporate income tax payments should be included in the data set at this point. If income taxes are to be simulated as equal to zero, 0. should be included in the data for each of the appropriate years. If state corporate income taxes are to be calculated internally, no data should be supplied.

Direction for supplying the remaining data needed to estimate taxes from a copper-nickel mine can be found in the section titled, "Community Data Requirements."

Data for the Copper-Nickel Smelter

The first two data cards are for identification and begin in column 1. The word "SMELTER" must appear on the first data card, the number of years for which data will be supplied appears on the second. The third card allows omission of state income tax calculations. If income tax is to be determined outside the simulation, the word BRANCH should be placed in columns 1-6. If the model is to calculate state corporate income taxes, the card should be left blank. Assuming 30 years of smelter data is to be supplied, and the analysis will be performed under existing law, the first three cards will appear as follows:

CARD 1: SMELTER

CARD 2: 30

CARD 3: blank or BRANCH

The rest of the data cards follow the same conventions used for the copper nickel mine and beneficiation plant:

- the first ten columns may be used for identification.
- each data element is presumed to occupy ten spaces.
- each data element must contain a decimal point.
- data for each year for which analysis is desired must be entered.
- data must be entered in the order specified.

Following the three identification cards, the data are entered in the following order:

1. Annual production of smelted or refined metal -- or matte in tons.
2. Annual market value of land and structures for the smelter.
3. Annual inventory value.
4. Price of copper-nickel concentrate, final product, or matte.
5. Annual millage rates for counties, school districts and cities.
See #20, copper nickel mine and beneficiation plant.
6. Annual manning table by wage. A separate table must be prepared for each year. See #24, copper-nickel mine and beneficiation plant.
7. Average annual market value of a single unit of each of five different dwelling types. See #25, copper-nickel mine and beneficiation plant.
8. Annual operating cost of the smelter.

9. Annual depreciation for the smelter.
10. Annual purchases of machinery and equipment subject to sales tax.
11. Annual purchases of supplies subject to sales tax.
12. Annual compensation. See #26 copper-nickel mine and beneficiation plant.
13. Annual millage rates in jurisdictions where the smelter is located. See #23, copper-nickel mine and beneficiation plant.
14. Annual state corporate income tax payments if supplied externally. See #27, copper nickel mine and beneficiation plant.

Directions for supplying the remaining data needed to estimate the fiscal impact of a copper-nickel smelter can be found in the section titled "Community Data Requirements."

Taconite Mine and Beneficiation Plant

The first three data cards are for identification and begin in column 1. The word "TACONITE" must appear on the first data card, the number of years for which data will be supplied appears on the second. A third special identification card is required for the taconite mine and beneficiation plant. Enter the word "YES" on the third card if the mine is subject to the unmined ore tax. This is administered by the county on an elective basis. Enter "NO" on that card if the county does not elect to impose the tax.

Assuming 30 years of taconite mine and beneficiation plant data is to be supplied, and the county in which the mine is located does not impose the tax on unmined ore and iron sulphides, the first three data cards would appear as follows:

CARD 1: TACONITE

CARD 2: 30

CARD 3: NO

The rest of the data cards follow the same conventions used to enter data for both the copper-nickel mine and beneficiation plant and the copper-nickel smelter.

Following the four identification cards the remaining data are entered in the following order:

1. Annual value per ton of ore.
2. Annual royalties paid to private individuals.
3. Percent mineral content of the ore. (See #10, copper-nickel mine and beneficiation plant).
4. Annual research expenses.
5. Annual development expenses.
6. Acres of taconite mine subject to unmined ore tax. (If the mine is located in a county that does not tax unmined ore, enter 0. for each year).
7. Millage rates for counties, school districts and cities. See #19, copper-nickel mine and beneficiation plant.
8. Annual manning table by wage. A separate table must be supplied for each year. See #24, copper-nickel mine and beneficiation plant.
9. Annual market value of a single unit of each of five different dwelling types. See #25, copper-nickel mine and beneficiation plant.
10. Annual cost of mining and extracting the ore.

11. Annual total compensation. See #26, copper-nickel mine and beneficiation plant.
12. Initial year millage rates in the jurisdiction in which the mine and/or beneficiation plant is located. See #23, copper-nickel mine and beneficiation plant.
13. Annual tons of ore.
14. Annual tons of concentrate.
15. Annual tax value per acre (for surface property taxes).

Directions for supplying the remaining data needed to estimate the fiscal impact of a taconite mine and beneficiation plant can be found in the next section titled "Community Data Requirements."

Community Data Requirements

There are some data entries that are common to all three types of development. The requirements for entering these data are considered in this section. When entering data for analysis, the development-specific data precede the community data. This will be discussed in greater detail in this section, "Creating a Data File." The format for general data follows the same conventions used for the facility data. Data are entered in the following order:

1. Population in each jurisdiction mentioned in Table 1. These population figures are entered in the same order as prescribed by Table 1. (See #19, copper-nickel mine and beneficiation plant.)
2. Annual total population of cities eligible for taconite municipal aids, excluding the eight cities (that is Virginia, Gilbert, Eveleth, Ely, Biwabit, Babbitt, Aurora, and Hoyt Lakes) in the model.

3. The ratio of assessors' limited market value to the actual market value in each of the eight cities in the base year. The information must be in the form shown in Table 4.
4. The average annual ratio of assessor's limited market value to the actual market value for St. Louis County.
5. For smelter only. The expected annual copper nickel production tax collections. For the mine skip to #6.
6. Annual city millage rates in the eight cities in the model. Use the format of Table 4. Enter the data in decimal form, i.e. .028, not 28.
7. Annual average millage rates for cities eligible for taconite aids, excluding the eight cities listed in Table 4.
8. Annual assessed valuation in the seven school districts in the model. Enter this information in the spaces indicated below.

Column

1-10	Identification
11-20	Virginia School District
21-30	Gilbert School District
31-40	Eveleth School District
41-50	Ely School District
51-60	Biwabik School District
61-70	Babbitt School District
71-80	Aurora-Hoyt Lakes School District

9. Total annual production tax, collections by the state for 1975, 1976, and 1977 taconite. Enter these totals as follows:

<u>Columns</u>	<u>Entry</u>
1-10	Identification
11-20	Total production tax collections in fiscal 1975
21-30	Total production tax collections in fiscal 1976
31-40	Total production tax collections in fiscal 1977.

10. Total permitted levy for each study area school district.
Permitted levies should be entered in the same manner as assessed values are in 8 above. Data is required for each school district for 3 years: the 1975-76, 1976-77, and 1977-78 school years.

11. This next entry tells the program whether a mine or beneficiation plant is located in a particular jurisdiction. It is made according to the following codes:

- 0 = No production at all
- 1 = Both mine and beneficiation plant
- 2 = Mine only
- 3 = Beneficiation plant only

These production codes are entered as shown below. NO DECIMAL POINT MAY APPEAR ON A CARD. It is important to be accurate in placing mine's location within or outside city boundaries. A separate card must be prepared for each year for which analysis is desired.

<u>Column</u>	<u>Production code for</u>
2	St. Louis County
4	Lake County
6	Virginia School District
8	Gilbert School District
10	Eveleth School District
12	Ely School District
14	Biwabik School District
16	Babbitt School District
18	Aurora-Hoyt Lakes School District
20	Virginia
22	Gilbert
24	Eveleth
26	Ely
28	Biwabik
30	Babbitt
32	Aurora
34	Hoyt Lakes

For example, a mine and beneficiation plant located within the Virginia School District but outside the city limits would be indicated by a "1" in columns 2 and 6 and a "0" in column 20.

Ancillary Activity Data Requirements

CNICK also calculates the changes in state and local revenues attributable to changes in the ancillary activity which accompanies a mining development. A separate data set is required for these calculations. The data on ancillary activity must always be available to the program for a simulation to be run. If a run without ancillary activity is desired, zeroes should be placed in all the data elements.

Ancillary data are entered in the following order:

1. Average annual income for ancillary employees: Col 1-10 Blank; Col 11-20, for men; Col 21-30, for single women; Col. 31-40, for married women. Only one data card is required.
2. The increase in male ancillary employment by age of worker from the baseline level, for each year of the simulation. Data should be entered following the format described in table 5.
3. The increase in female ancillary employment by age of worker from the baseline level. Data should be entered following the format described in table 5.
4. The change from the baseline in the earnings by ancillary businesses. A separate data item is required for each year of the simulation.

Using the COPNICKL Program

Creating a Data Set

Before the program can be executed it is necessary to have two data sets for the appropriate type of development, a copper nickel mine, a copper nickel smelter, or a taconite mine and beneficiation plant. All cards except data cards begin in column 1, and punctuation on the cards must

Table 5

Ancillary Employment by Age Class

The first 10 columns of each card may be used for identification. These instructions are for a single year of analysis. A separate card must be prepared for each year of the simulation.

<u>Age Class</u>	<u>Enter Number of Workers in Column</u>
16-17	11-20
18-19	21-30
20-24	31-40
25-34	41-50
35-44	51-60
45-64	61-70
65+	71-80

be correct. Capital letters will be used to indicate what must be punched as specified, lower case indicates user-supplied arguments. To enter store, and print out a set of data requires the following cards:

CARD 1: your name,T5.

CARD 2: ACCOUNT,xxxxxxx,password.

CARD 3: RLF,60000.

CARD 4: CCR,INPUT,dataset.

CARD 5: SAVE,dataset.

CARD 6: CCR,INPUT,dataset2.

CARD 7: CCR,dataset2.

CARD 8: 7-8-9 (all punched in column 1)

development specific data cards

7-8-9 (all punched in column 1)

ancillary data cards

6-7-8-9 all punched in column 1.

6-7-8-9 prepunched orange cards are available at all UCC installations.

Instructions for preparing the first two of these cards may be obtained from the UCC. The word "dataset" refers to the name given the data for a particular type of development. A separate data set must be prepared for each type of development, and each projection of ancillary activity. Each set of data should have a unique name.

There are two ways that changes in the data set can be made. (Such changes might be necessary if, say, an error is discovered when the data

set is printed out). The first way to make changes is by inserting the following card between cards 2 and 3 above and reentering the data:

PURGE, dataset.

The second way to make changes in the data set is to use the UCC editing program XEDIT. The XEDIT program is designed to be used from a keyboard terminal. Instructions for using XEDIT can be obtained from UCC.

Running the Program -- Print Options -- Batch Entry

Standard Form with No Changes. -- This version produces the year-by-year analysis under the present legal system. It includes information on taxes paid to the State and local governments by the mine, the workers and all intergovernmental aids. Cards 1 through 12 begin in column 1. To run this version requires the following cards:

CARD 1: yourname,T20.

CARD 2: ACCOUNT,xxxxxxx,password.

CARD 3: RFL,70000.

CARD 4: LOADER(CYBER).

CARD 5: REDUCE(-).

CARD 6: GET,CNICK.

CARD 7: GET,TAPE1=dataset1,TAPE2=dataset2.

CARD 8: MNF(Z,E=4,R=0,L=0,I=CNICK).

CARD 9: R,TAPE4.

CARD 10: CCR,TAPE4,OUTPUT.

CARD 11: 6-7-8-9 punched in column 1.

CARD 12: 6-7-8=9 punched in column 1.

Short Version with No Changes. -- This version produces a year-by-year analysis under the present legal system in a slightly different format. To run this version requires the following cards. Again all cards begin in Column 1.

CARD 1: yourname,T20.

CARD 2: ACCOUNT,xxxxx,password.

CARD 3: RFL,70000.

CARD 4: LOADER(CYBER)

CARD 5: REDUCE(-)

CARD 6: GET,CNICK.

CARD 7: GET,TAPE1=dataset1,TAPE2=dataset2. (These are the datasets created above)

CARD 8: MNF(Z,E=4,R=0,L=0,I=CNICK)

CARD 9: R,TAPE3.

CARD 10: CCR,TAPE3,OUTPUT.

CARD 11: 6-7-8-9 punched in column 1.

CARD 12: 6-7-8-9 punched in column 1.

To obtain both the short and long versions in a single run use the first 10 cards above and add the following:

CARD 11: R,TAPE4.

CARD 12: CRR, TAPE4,OUTPUT.

CARD 13: 6-7-8-9 punched in column 1.

CARD 14: 6-7-8-9 punched in column 1.

Obtaining a Copy of the Program

Since the program itself contains references to all applicable Minnesota Statutes as well as a complete list of assumptions underlying the model, some users may wish a copy, or listing, of the program. The listing can be obtained with or without output.

Obtaining a list with output. -- To obtain a list of the program along with year by year analysis, change card 8 above to the following:

MNF(Z,E=4,R=0,I=CNICK)

The resulting list and output exceeds the print limits for medium speed terminals, and will be diverted to the computer center at Lauderdale.

List only. -- To obtain a list of the program without any analysis requires the following cards, all of which begin in column 1:

CARD 1: yourname,T5.

CARD 2: ACCOUNT,xxxxxxx,password.

CARD 3: RFL,2000.

CARD 4: GET,CNICK.

CARD 5: CSF,CNICK.

CARD 6: 6-7-8-9 punched in column 1.

CARD 7: 6-7-8-9 punched in column 1.

To obtain the output in a file ready for use in plotting, use the first 9 cards above, and add the following:

CARD 10: R,TAPE5.

CARD 10: CCR,TAPE5, yourfile. (where your file is any file name)

CARD 11: SAVE,yourfile.

CARD 12: 6-7-8-9 punched in column 1.

CARD 13: 6-7-8-9 punched in column 1.

The data in "yourfile" is formatted as follows:

For Copper-Nickel Mine

1. YEAR 14I5
2. Occupation tax 6F12.0
3. Production tax 6F12.0
4. Royalty Tax 6F12.0
5. Income Tax 6F12.0
6. Unemployment Tax 6F12.0
7. Employers excise tax 6F12.0
8. Fees 6F12.0
9. State Royalties 6F12.0
10. Total State Revenue 6F12.0
11. YEAR 14I5
12. Surface Property Tax County 6F12.0
13. Surface Property Tax School District 6F12.0
14. Surface Property Tax City 6F12.0
15. Mineral Rights Property Tax County 6F12.0
16. Mineral Rights Property Tax School District 6F12.0
17. Mineral Rights Property Tax City 6F12.0

For Smelter

1. YEAR 14I5
2. Income tax 6F12.0
3. Unemployment tax 6F12.0
4. Employers excise tax 6F12.0
5. Sales tax on equipment 6F12.0
6. Sales tax on supplies 6F12.0
7. Total sales tax 6F12.0

8. Total State taxes 6F12.0
9. YEAR 14I5
10. Property tax county 6F12.0
11. Property tax school district 6F12.0
12. Property tax city 6F12.0
13. Inventory property tax county 6F12.0
14. Inventory property tax school district 6F12.0
15. Inventory property tax city 6F12.0
16. Total local taxes 6F12.0

For taconite mine and beneficiation plant

1. YEAR 14I5
2. Occupation tax 6F12.0
3. Production tax 6F12.0
4. Royalty tax 6F12.0
5. Unemployment tax 6F12.0
6. Employers excise tax 6F12.0
7. FEE 6F12.0
8. Total state taxes 6F12.0
9. YEAR 14I5
10. Surface value property tax (county) 6F12.0
11. Surface value property tax (school district) 6F12.0
12. Surface value property tax (city) 6F12.0
13. Property tax on mineral rights (county) 6F12.0
14. Property tax on mineral rights (school district) 6F12.0
15. Property tax on mineral rights (city) 6F12.0

The data for the copper-nickel mine, smelter or taconite mine are followed by a set of data on taxes paid by households. This data is written in the following order:

1. YEAR 14I5
2. Total state taxes paid by direct employees 6F12.0
3. Total state taxes paid by ancillary employees 6F12.0
4. Total state taxes paid by ancillary business 6F12.0
5. Total new taxes paid by mine or smelter 6F12.0
6. Total state taxes paid by mine or smelter 6F12.0
7. Total state taxes paid by employees and mine or smelter 6F12.0

This data is followed by a set of data on each city in the model. Information is provided on each city separately. The cities are in the order listed in Table 1.

Data on city revenues is given in the following order:

1. YEAR 14I5
2. Total property taxes paid by direct employees 6F12.0
3. Total city property taxes paid by ancillary employees 6F12.0
4. Total city property taxes paid by ancillary business 6F12.0
5. Total city property taxes paid by the mine or smelter 6F12.0
6. The change in homestead and taconite credits in the city 6F12.0
7. Total new taxes for the city 6F12.0
8. The change in city basic aid due to the mine 6F12.0
9. The change in taconite municipal aid 6F12.0
10. The change in production tax aid 6F12.0
11. The change in new aids 6F12.0
12. The change in total city revenue 6F12.0

Data on eight cities in the model is followed by data on the seven school districts in the region. School districts are in the same order as Table 1. The data on their revenues is printed in the following order.

1. YEAR 1415
2. Total school district property taxes paid by direct employees 6F12.0
3. Total school district property taxes paid by ancillary employees 6F12.0
4. Total school district property taxes paid by ancillary businesses 6F12.0
5. Total school district taxes paid by the mine or smelter 6F12.0
6. The change in direct mineral tax aids to the school district 6F12.0
7. The total new tax revenues to the school district 6F12.0
8. The change in general mineral tax aids to the school district 6F12.0
9. The change in school foundation aid 6F12.0
10. The change in taconite and homestead credits 6F12.0
11. Total new aids available to the district 6F12.0
12. Total new revenues available to the district 6F12.0

Data on the two counties follows the data on schools. Information is provided on St. Louis County first, then Lake County. The data is in the following order:

1. YEAR 1415
2. Total county property taxes paid by direct employees 6F12.0
3. Total county property taxes paid by ancillary employees 6F12.0
4. Total county property taxes paid by ancillary businesses 6F12.0
5. Total county property taxes paid by the firm 6F12.0
6. The change in taconite and homestead credits in the county. 6F12.0
7. Total new tax revenues in the county 6F12.0

8. The total new aids to the county 6F12.0
9. The change in basic aid to the county 6F12.0
10. The change in mineral tax aid to the county 6F12.0
11. The change in total county revenue 6F12.0

Summary data on employee's tax payments follows the county data. The order and format are:

1. YEAR 14I5
2. State income tax paid by the employees 6F12.0
3. State sales taxes paid by employees 6F12.0
4. Other state taxes paid by employees 6F12.0
5. Local property tax payments by employees 6F12.0
6. Total state and local tax payments by employees 6F12.0

Running the program with changes in tax laws or aid formulas:

CNICK has been programmed to allow the user to simulate the effects of alternative tax and aid systems and modifications of the present system in addition to simulating the one currently in place. Knowledge of FORTRAN programming and the use of XEDIT are extremely useful, but not essential to make changes in the tax system. Minnesota's aid formulas are quite complex, however, so users without programming experience will probably need assistance to change them.

The same general procedure is followed to change any tax or aid formula. The user calls a separate subroutine, inserts the desired changes in the subroutine through the use of XEDIT or some other text editor, compiles the new file, and places it in the main program. The main program is then run using the same data files as used when no changes were made.

Two types of changes can be made. An existing tax can be altered or a new tax may be added. If an existing tax is to be modified the user makes the modification leaving the name of the tax unchanged. If a new tax is to be added the modification is made naming the new taxes NEWTAX1 through NEWTAX6. Both types of changes are illustrated below.

There are six separate subroutines for changes. The user must make changes in the appropriate subroutine. A list of the subroutines and the taxes or aids which they contain is given below.

1. DECK1 Taxes on the copper-nickel mine and beneficiation plant.
2. DECK2 Taxes on the smelter.
3. DECK3 Taxes on the taconite mine and plant.
4. DECK4 Aids affecting cities.
5. DECK5 Aids affecting school districts.
6. DECK6 Aids affecting county government.

Two examples of the process are given below.

Problem 1: Change the production tax from \$.025 per ton to \$.10 per ton. This is a modification of an existing tax. (For ease in exposition the wholesale price index and the ore content provisions in the current law will be ignored).

Problem 2: Tax mining lands \$50 per year for reclamation. This is a new tax.

It is easiest to make tax and aid changes using the time sharing system even if the program itself is to be run in the batch mode. After connection to the CYBER74 time sharing system the following instructions are entered.

1. GET,DECK1
2. XEDIT,DECK1

This calls a text editing routine which allows the user to insert, delete, or modify commands in the program file.

3. N45

This causes the edit program to skip to the section of DECK1 that will accept commands.

The terminal will print

```
DO 100 I = 1,NYEAR
```

The program is now ready to accept modification commands.

Table 6 lists the names and descriptions of variables that can be modified or used to modify other variables. Any standard FORTRAN expression can be inserted into the program. All statements must begin in column 7 and not extend beyond column 72. Statements may be continued to the next line by placing a 1 in column 6 of the continuation line. All statements must be in the form $x = a(+,-,*,/)b$. Only a single variable is allowed to the left of the equals sign. In the expression above, x is the answer obtained from the calculation.

4. Insert modification statements. To modify the production tax and tax land \$50 per acre would require the following:

I2 (This is an XEDIT command allowing the user to insert 2 statements)

```
PRODTAX(I)=.1*ORETON(I)
```

```
NEWTAX1(I)=50*(SURFACE(I)+UNDER(I))
```

Q

The computer will print

DECK1 is a local file

5. REWIND,DECK1
6. BATCH,55000
7. X,MNF(Z,E=4,R=0,L=0,I=DECK1,B=CHANGE1)

The computer will print

TIME USED = xxx seconds

8. REWIND,CHANGE1
9. SAVE, CHANGE1

Now the file CHANGE1 will be used in place of the original instructions to run the simulation. The actual simulation is performed by entering the following cards on a medium speed batch terminal. The program is run by submitting the following cards:

1. Jobcard.
2. Account card.
3. RFL,70000.
4. GET,CHANGE1,CNICK.
5. MNF(Z,E=4,R=0,L=0,I=CNICK,B=MAIN)
6. REWIND, MAIN
7. LIBEDIT (I=0, L=0, P = MAIN, B = CHANGE1, N = NEWMAIN)

The machine will print editing complete.

8. RETAIN, NEWMAIN=your file name

Then using your file name and your data files either a short or a long report can be generated by following the instructions in the earlier sections using the new file name in place of CNICK.

9. PURGE,CHANGE1

Some useful things to remember about the change routine:

1. When new taxes or new aids are generated they should be named after an existing tax or aid (see table 5) or newtax1, through newtax5 or newaid or newaid2.
2. The advantage of replacing an existing tax with a new tax using the same name as before, is that the aid distributions will reflect the new level of taxes.
3. If a newtax is to replace an existing tax the existing tax should be set equal to zero in the change section.
i.e. $PRODTAX(I)=0$.
4. Changes in the aid system are more complicated and will in most instances require familiarity with fortran programming. Users wishing to change new aid should consult the beginning of the main program for a list of variable names and definitions.

Running the CRT Version of CNICK

A shorter version of CNICK, suitable for use on a time sharing system, is also available. This program--called CRT--estimates only the existing state taxes paid by the firm and any new taxes defined by the user. Taxes paid by new employees and ancillary businesses, and the intergovernmental aids paid by the state to local governments are not computed.

Less input data is required to run CRT. Only the data about the specific facility--copper-nickel mine, smelter, or taconite mine-- is necessary. The community data and ancillary data are not required.

To use CRT the following procedure should be followed.

1. Connect the terminal to the CYBER74 time sharing system allowing memory of 55000.
2. GET,CRT,yourdata.

Table 6

Names of variables available for change routines

for copper nickel mine

VARIABLE	NAME
Acres - Surface rights	SURFACE(I)
Acres - Underground rights	UNDER(I)
Cost of extracting	COSTEXT(I)
Cost of operating mine	COSTMOS(I)
Cost of operating mill	COSTCON(I)
Depreciation expense (mine)	DEPRECM(I)
Depreciation expense (mill)	DEPRECP(I)
Development expenses	DEVELOP(I)
Employers Excise tax	EXCISE(I)
Income Tax (state)	INCOME(I)
Millage Rate - county	CNMILL(I)
Millage Rate - school district	SDMILL(I)
Millage Rate - city	CYMILL(I)
Mineral rights tax - county	MNRTCN(I)
Mineral rights tax - school district	MNRTSD(I)
Mineral rights tax - city	MNRTCY(I)
Occupation tax	OCCUTAX(I)
Price - ton of ore	CNPRICE(I)
Price - ton of concentrate	CPPRICE(I)
Production tax	PRODTAX(I)

VARIABLE	NAME
Research expenses	RESEAR(I)
Royalty paid to state	ROYALTI(I)
Royalty paid on copper nickel (private	CNROYAL(I)
Royalty paid on precious metals	PMROYAL(I)
Surface value property tax	
paid to county	SURPTCN(I)
paid to school district	SURPTSD(I)
paid to city	SURPTCY(I)
Tons of ore	ORETON(I)
Tons of Concentrate	CONTON(I)
Unemployment tax	UITAX(I)
Value of land - total	VALUE(I)

for smelter

VARIABLE	NAME
Cost of smelting	COSTSMT(I)
Depreciation of smelter	DEPRECM(I)
Employers excise tax	EXCISE(I)
Income tax	INCOME(I)
Inventory property tax	
county	INVTXCN(I)
school district	INVTXSD(I)
city	INVTXCY(I)

VARIABLE	NAME
Land and structures property tax	
county	LSTAXCN(I)
school district	LSTAXSD(I)
city	LSTAXCY(I)
Price of metal	PRICESM(I)
Sales tax on equipment	SALETX1(I)
Sales tax on supplies	SALETX2(I)
Tons of metal	TONMETL(I)
Total state taxes	TOTAL(I)

for taconite mine

VARIABLE	NAME
Acres - surface rights	SURFACE(I)
Acres - underground	UNDER(I)
Cost of extracting	COSTEXT(I)
Cost of mining	COSTMOS(I)
Cost of milling	COSTCON(I)
Depletion expense	DEPLET(I)
Depreciation on mine	DEPREM(I)
Depreciation on mill	DEPREP(I)
Development expense	DEVELOP(I)
Employers excise tax	EXCISE(I)
Income tax	INCOME(I)
Millage rates - county	CNMILL(I)
Millage rates - school district	SDMILL(I)

VARIABLE	NAME
Millage rates - city	CYMILL(I)
Mineral rights tax	
county	PTXMRCN(I)
school district	PTXMRSN(I)
city	PTXMRCY(I)
Occupation tax	OCCUTAX(I)
Price of concentrate	PRICEC(I)
Production tax	PRODTAX(I)
Research expenses	RESEAR(I)
Royalty to state	ROYALTI(I)
Royalty to individuals	ROYALTC(I)
Royalty tax	ROYALTX(I)
Tons of ore	ORETON(I)
Tons of concentrate	CONTON(I)
Unemployment tax	UITAX(I)
Unmined ore property tax	
county	PTXICN(I)
school district	PTXISD(I)
city	PTXICY(I)

3. RENAME,INPUT = yourdata
4. X,MNF(Z,E=4,R=0,L=0,I=CRT)

The computer will then print

HELLO

Run no.1 is finished

.xxx CP seconds execution time

Print outs from the run can then be obtained in the following manner.

5. REWIND, TAPE4, TAPE5
6. LIST, F=TAPE4
7. LIST, F=TAPE5

TAPE4 prints out taxes paid under the existing tax structure.

TAPE5 prints out any new taxes the user may have inserted. If no new taxes are used, there is no reason to list TAPE5.

Making Changes on CRT

The same general procedure is used for making changes in CRT as is used for CNICK. The only differences are the names of the subroutines that changes may be made in. Before attempting changes in CRT the user should read the section of this manual dealing with changes. It should also be remembered that only changes in state taxes on the firm can be done on CRT.

There are three separate subroutines for changes. The user must make the change in the appropriate subroutine. A list of the subroutines and the taxes or aids which they contain is given below.

1. SOURCE1: Taxes on the copper-nickel mine and beneficiation plant.
2. SOURCE2: Taxes on the smelter.
3. SOURCE3: Taxes on the taconite mine and beneficiation plant.

The procedure to run a simulation which includes a change in state taxes is as follows:

1. Connect the terminal to the CYBER74 time sharing system allowing memory of 55000.
2. GET,SOURCE1 (if simulation is to be on a copper nickel mine, for simulations on smelters use SOURCE2, for simulations on taconite, SOURCE3.)
3. XEDIT,SOURCE1 Then following the instructions contained in the change section, insert the desired changes.

After the computer prints SOURCE1 is a local file.

4. REWIND,SOURCE1
5. X,MNF(Z,E=4,R=0,L=0,I=SOURCE1,B=CHANGE)
6. GET,CRT
7. X,MNF(Z,E=4,R=0,L=0,I=CRT,B=MAIN)
8. X,LIBEDIT(I=0,L=0,P=MAIN,B=CHANGE,N=NEWMAIN)
9. GET,yourdata
10. RENAME,INPUT=yourdata
11. NEWMAIN

The computer will then print the same messages as in the no change sample shown above. Printouts of the simulation can be obtained in the same manner as shown above. The changed taxes will be on tape5.

To obtain a printout of existing state taxes

12. REWIND,TAPE4
13. CCR,OUTPUT,TAPE4
14. REWIND TAPE4

To obtain a printout of new tax revenues

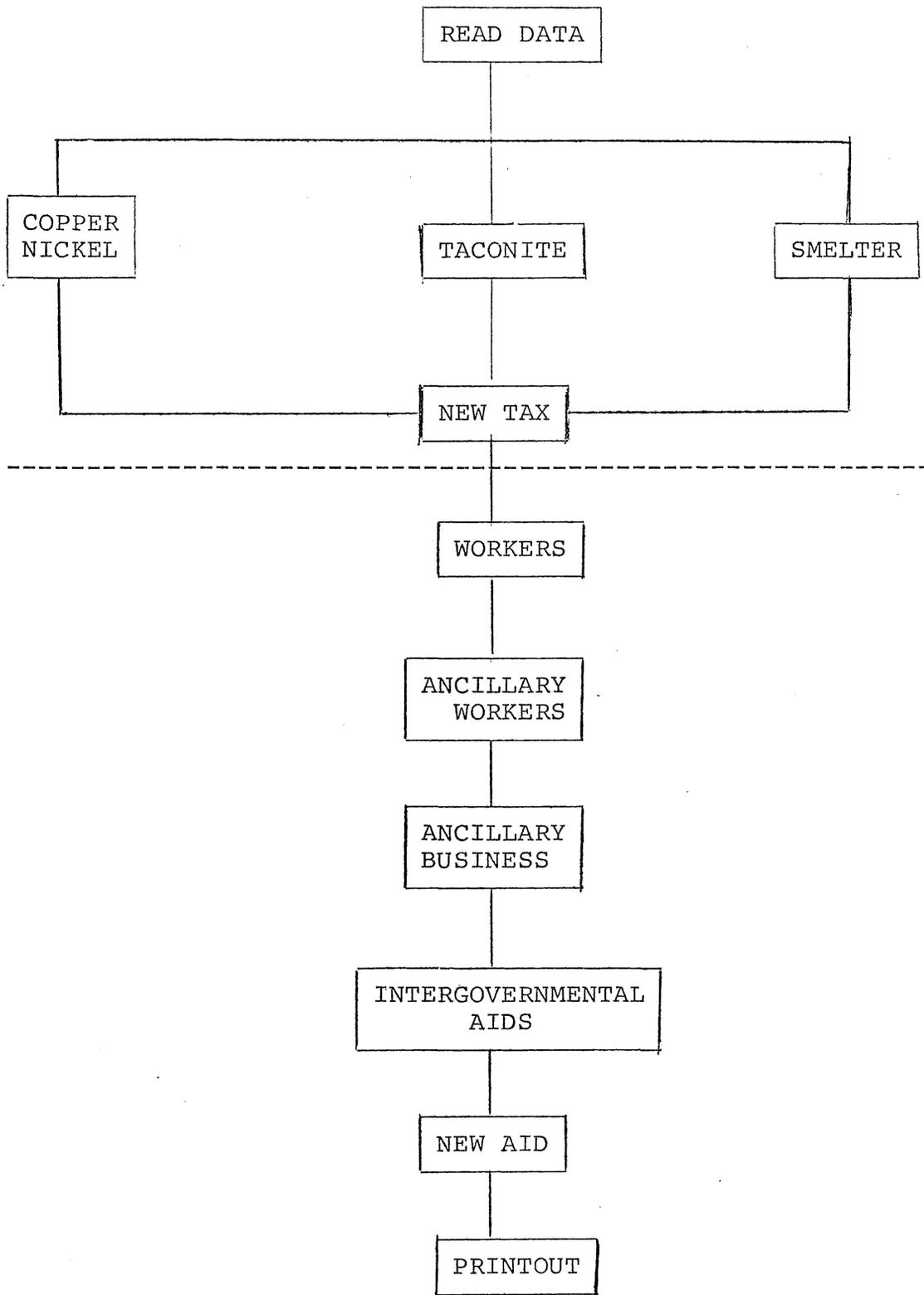
15. REWIND, TAPE5

16. CCR, OUTPUT, TAPE5

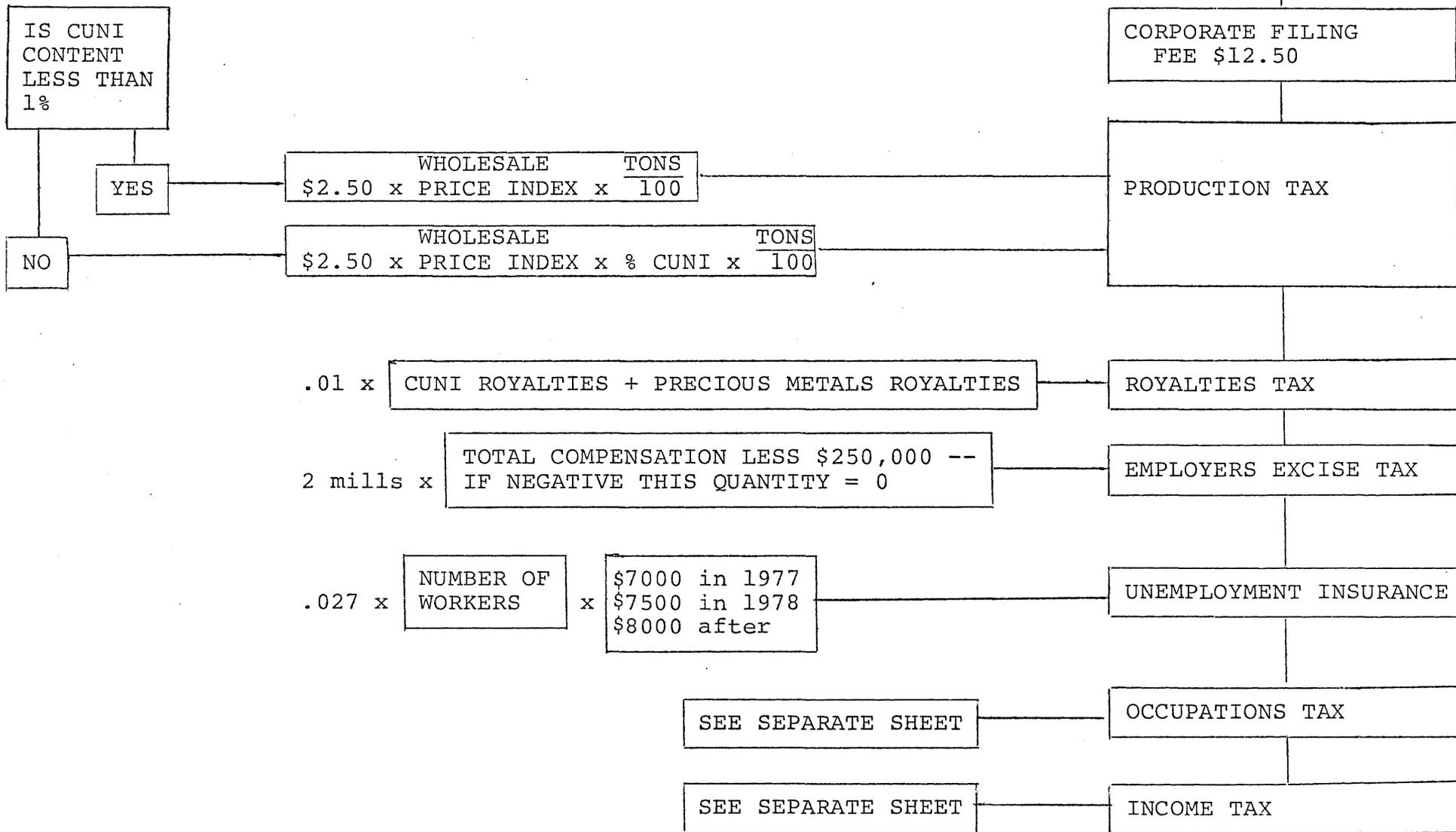
Following printout of new taxes

17. REWIND TAPE5

CNICK FLOW CHART

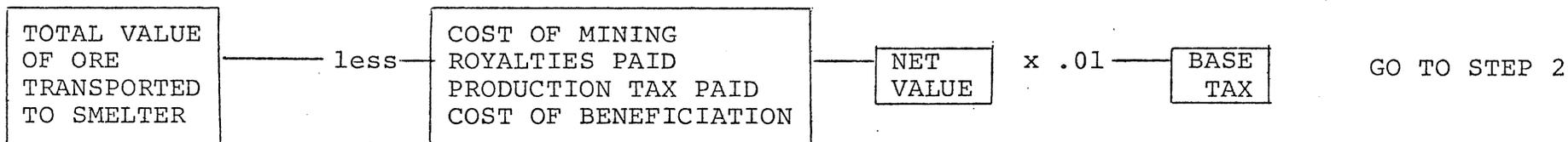


TAXES PAID TO STATE BY
CUNI MINE AND
BENEFICIATION PLANT

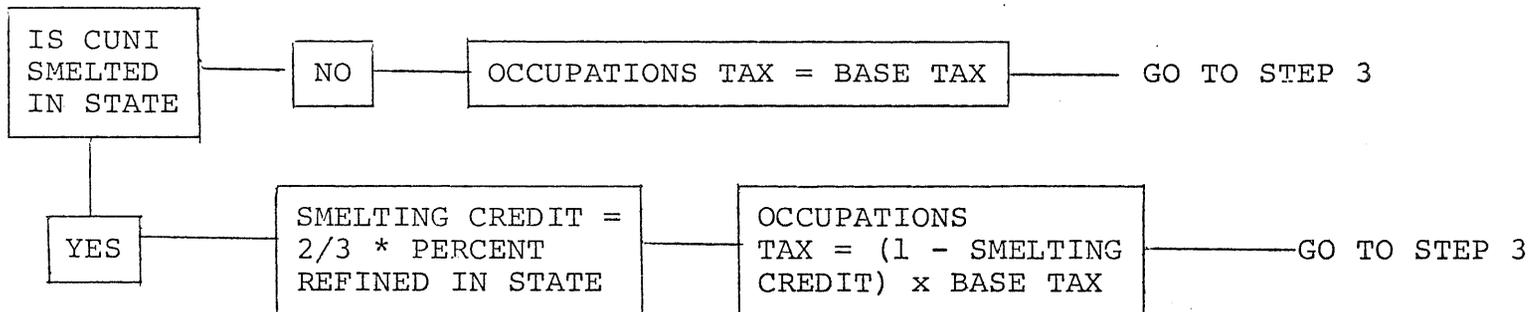


CALCULATION OF OCCUPATIONS TAX

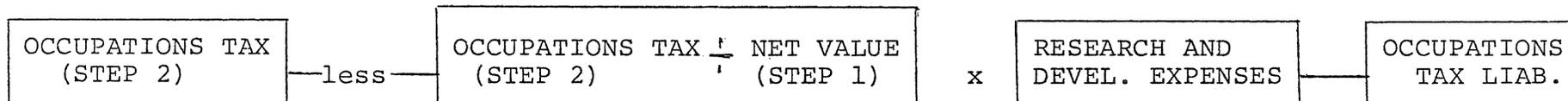
STEP 1:



STEP 2:



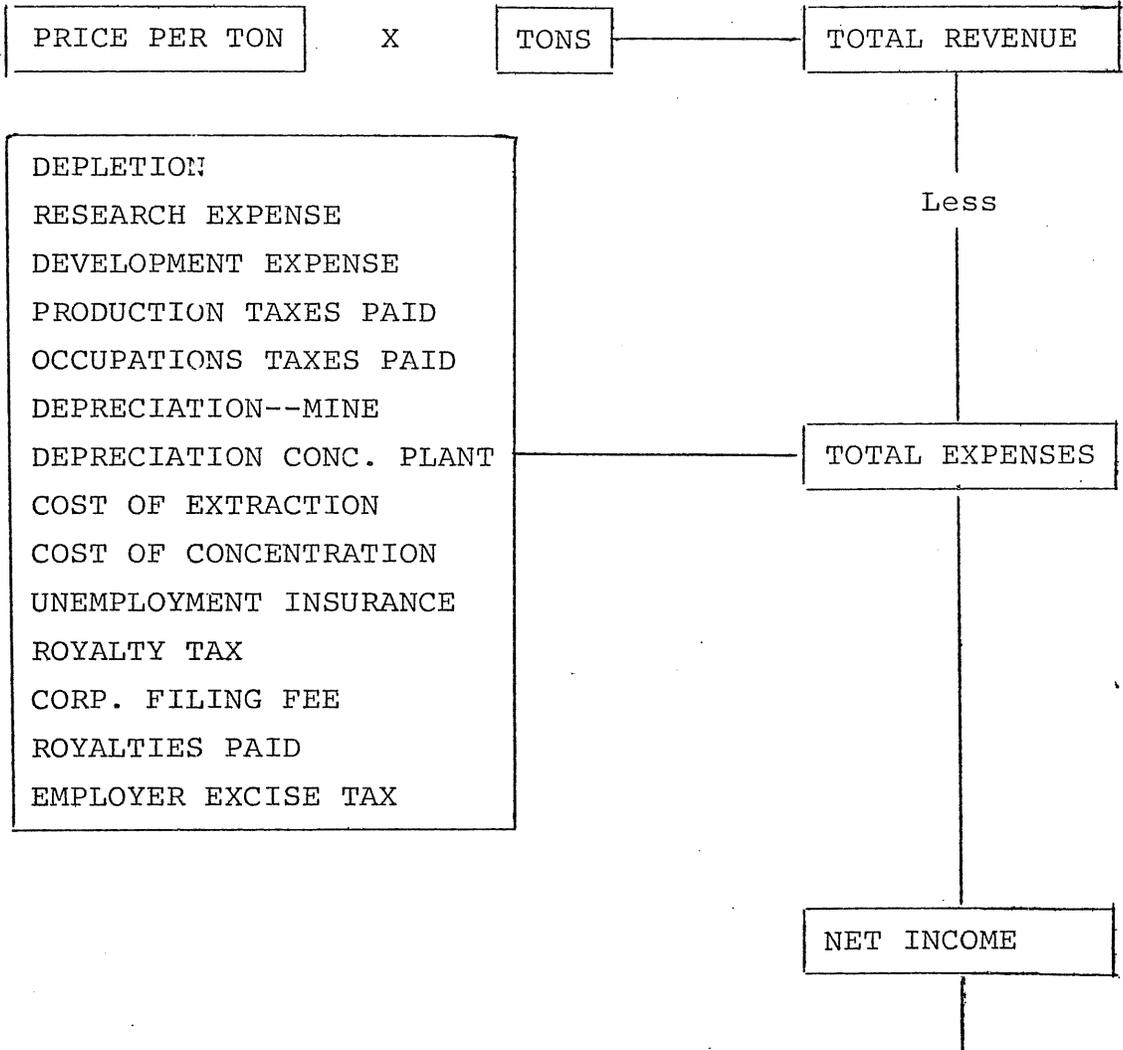
STEP 3



IF THE OCCUPATIONS TAX LIAB IN STEP 3 IS NEGATIVE, THE RESEARCH CREDIT MAY BE CARRIED FORWARD FOR 2 YEARS.

CALCULATION OF INCOME TAX

STEP 1



GO TO STEP 2

CALCULATION OF INCOME TAX

STEP 2

$$\boxed{\text{NET INCOME}} * .12 = \boxed{\text{TAX LIABILITY}}$$

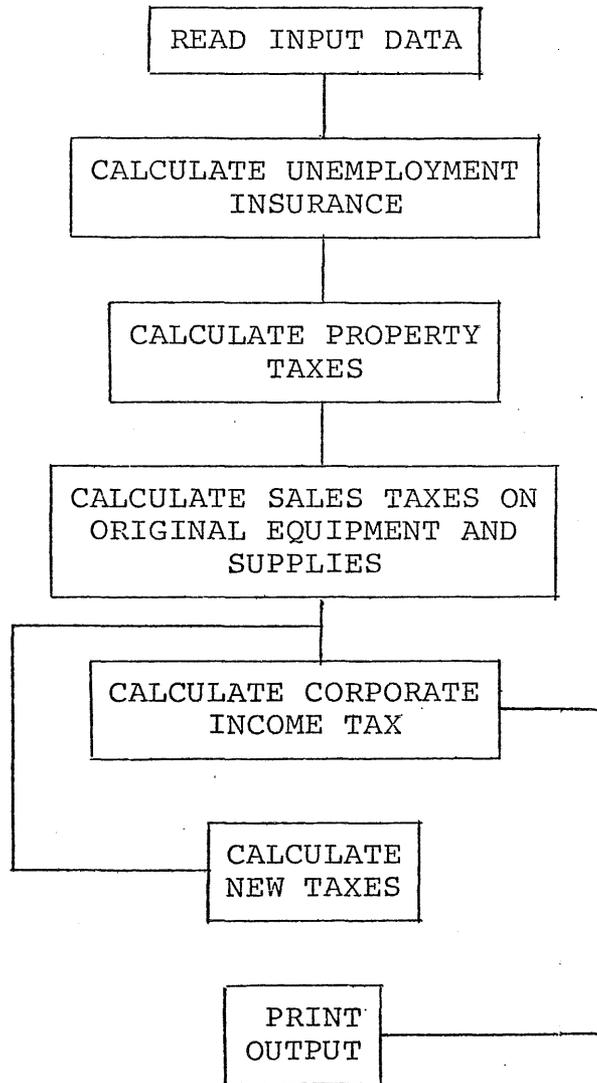
$$\boxed{\text{TAX LIABILITY}} - \boxed{\text{OCCUPATION TAX CARRY FORWARD}} - \boxed{\text{OCCUPATION TAX T}}$$

$$- \boxed{\$500} = \boxed{\text{INCOME TAX DUE}}$$

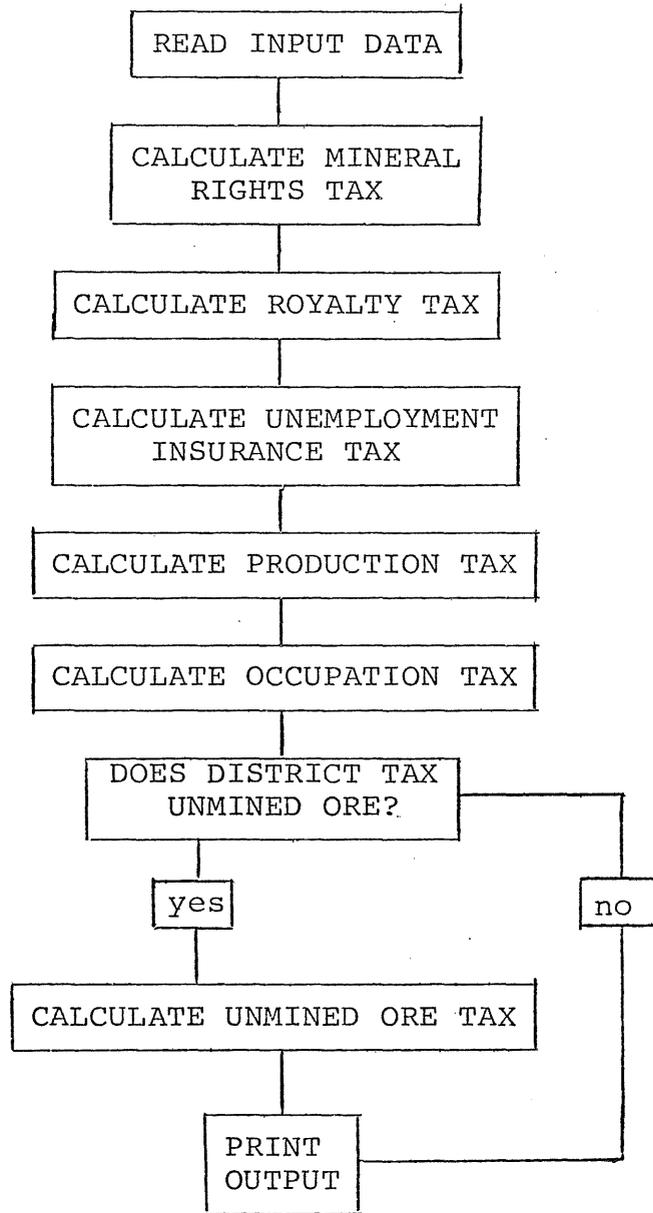
IF INCOME TAX DUE < \$100

TAX DUE = \$100

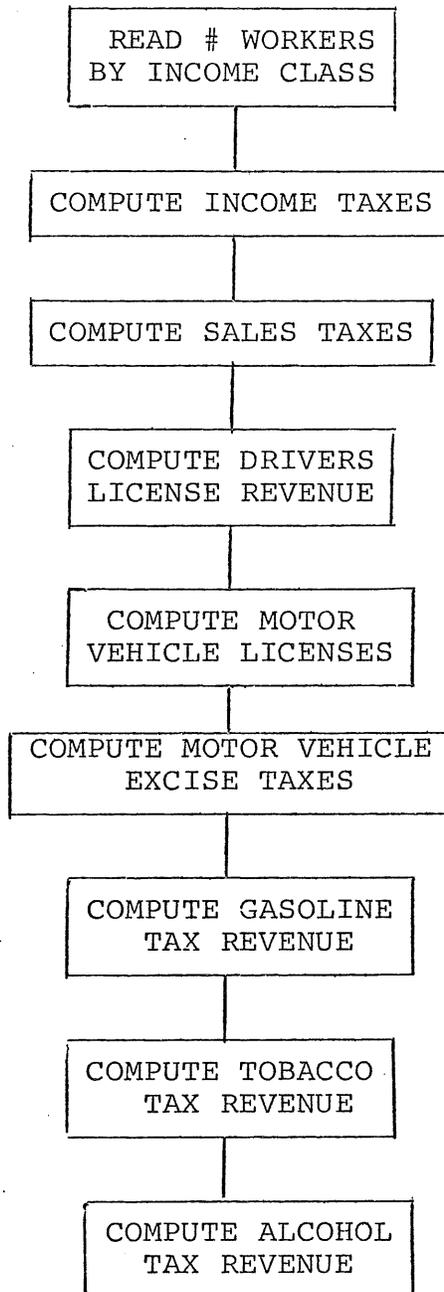
SMELTER



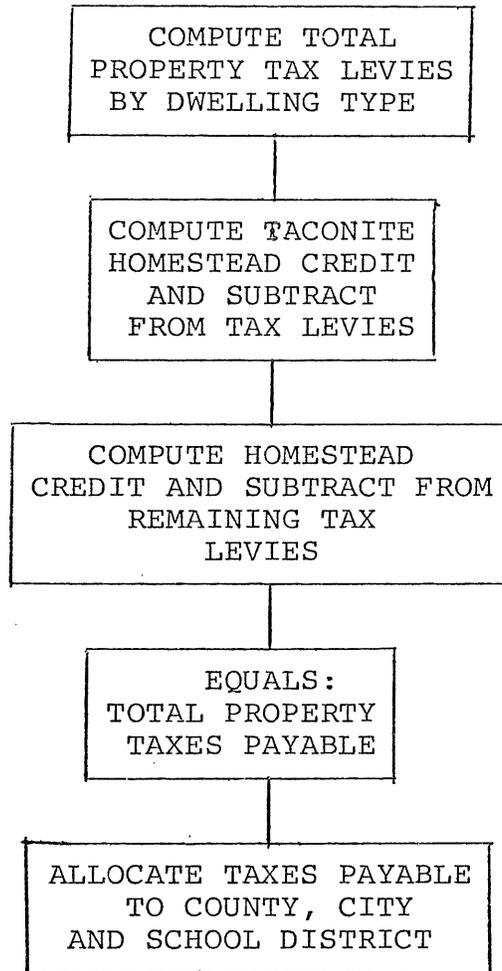
TACONITE



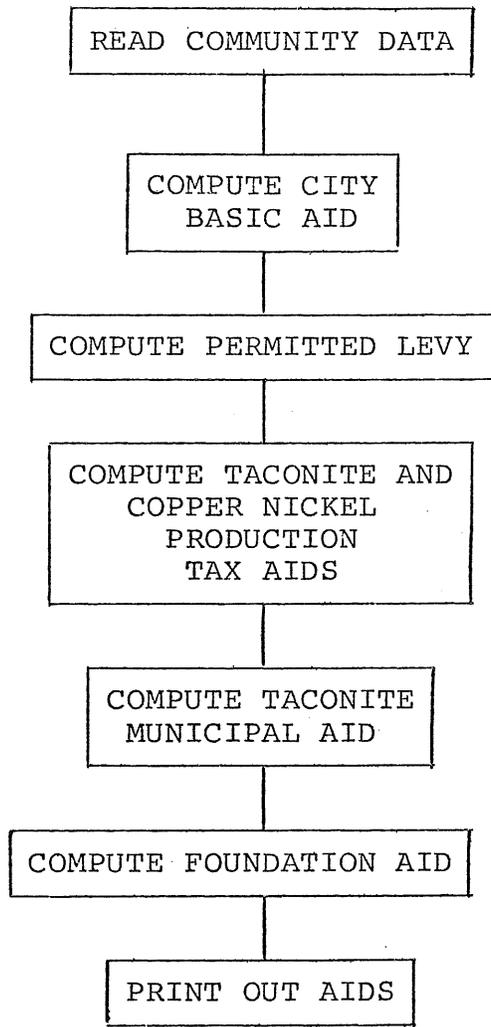
WORKER TAXES: STATE
DO ONCE FOR PRIMARY AND
ONCE FOR SERVICE WORKERS



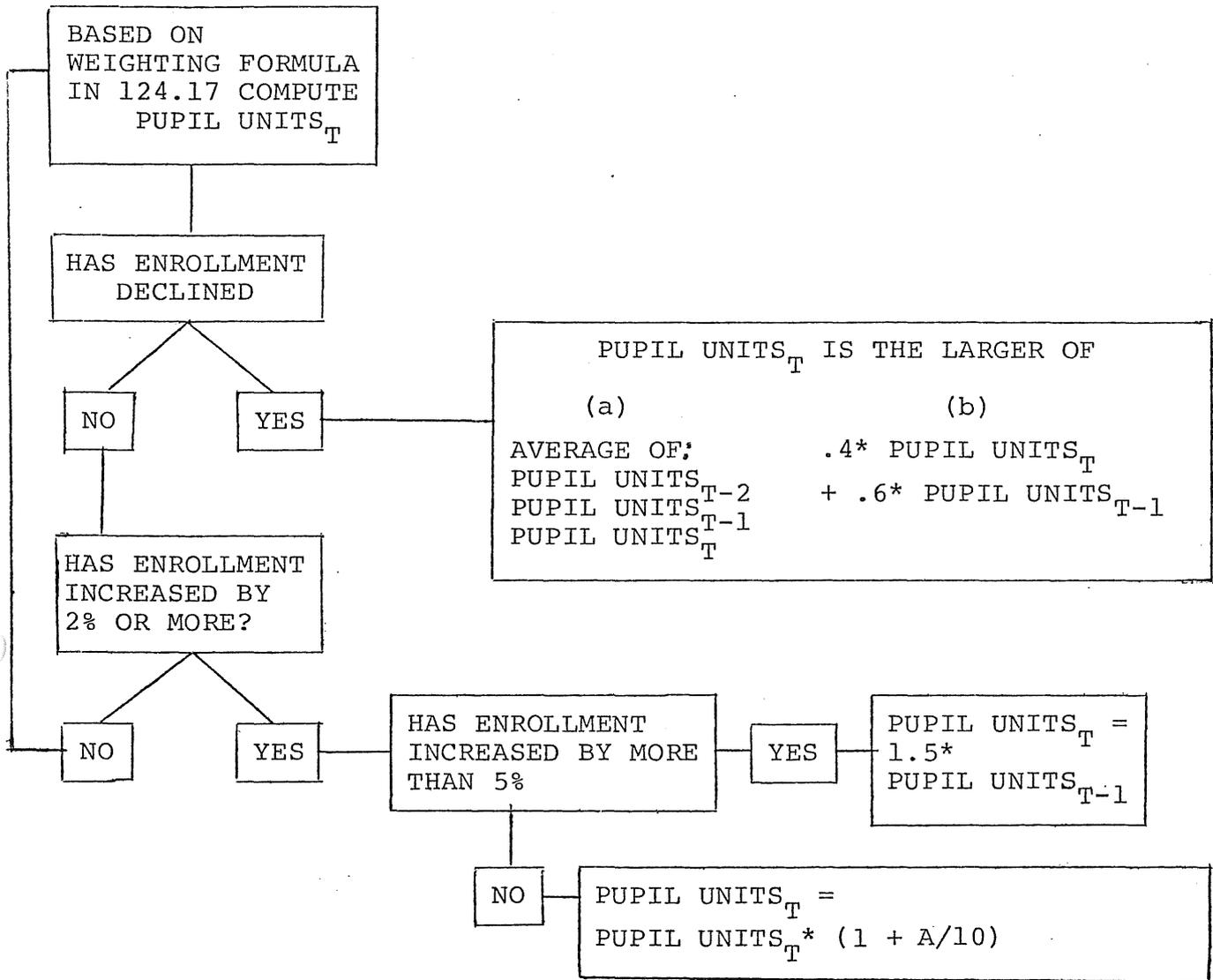
WORKER TAXES: LOCAL
DO ONCE FOR PRIMARY AND
ONCE FOR SERVICE WORKERS



INTERGOVERNMENTAL AIDS



CALCULATION OF FOUNDATION AID
PART 1: CALCULATION OF PUPIL UNITS



NOTE: Let $A = \frac{\text{PUPIL UNITS}_T - \text{PUPIL UNITS}_{T-1}}{\text{PUPIL UNITS}_{T-1}} * 100$

- If $0 < A < 2$ $A = 0$
- If $2 \leq A \leq 3$ $A = 3$
- If $3 < A \leq 4$ $A = 4$
- $A > 4$ $A = 5$

CALCULATION OF FOUNDATION AID
 PART 2: CALCULATION OF PERMISSIBLE LEVY
 (1978-79 SCHOOL YEAR AND THEREAFTER)

$$\begin{aligned}
 \text{PERMISSIBLE LEVY}_T &= 27 \text{ mills} * \left[\text{ASSESSED VALUE} \right]_{T-2} - .5 * \left[\text{TAX EXEMPT LAND AID} \right]_{T-1} - .5 * \left[\text{VARIOUS MINERAL AIDS} \right]_{T-1} + \\
 &\left[\text{EXCESS LEVY} \right] + \left[\text{TRANS. LEVY} \right] + \left[\text{COMM. LEVY} \right] + \left[\text{CAPITAL LEVY} \right] + \left[\text{DEBT LEVY} \right] + \left[\text{AVTI LEVY} \right]
 \end{aligned}$$

$$\left[\text{PERMISSIBLE LEVY RATE} \right]_T = \frac{\text{PERMISSIBLE LEVY}_T}{\text{ASSESSED VALUE}_{T-2}}$$

NOTE: The permissible levy rate must be at least 10 mills.

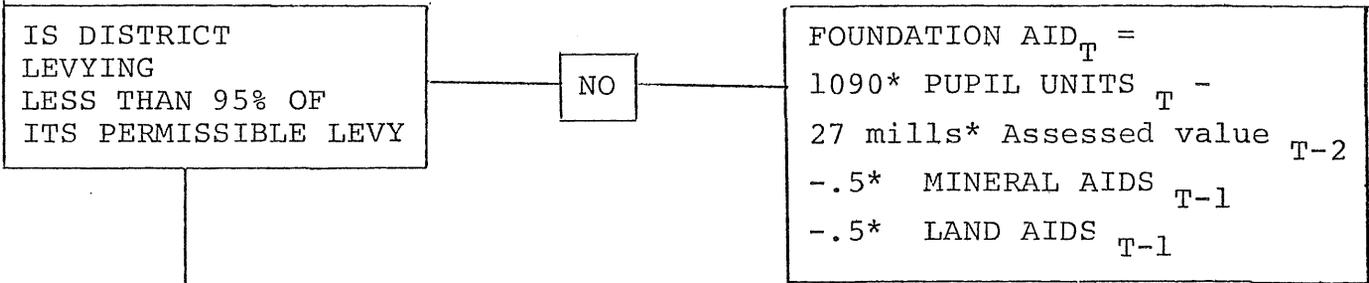
The permissible levy and permissible levy rate are used:

1) In computing the distribution of taconite and copper nickel general school aids. They are distributed in proportion to permissible levy rates.

2) To limit the property tax levied for schools.

CALCULATION OF FOUNDATION AID

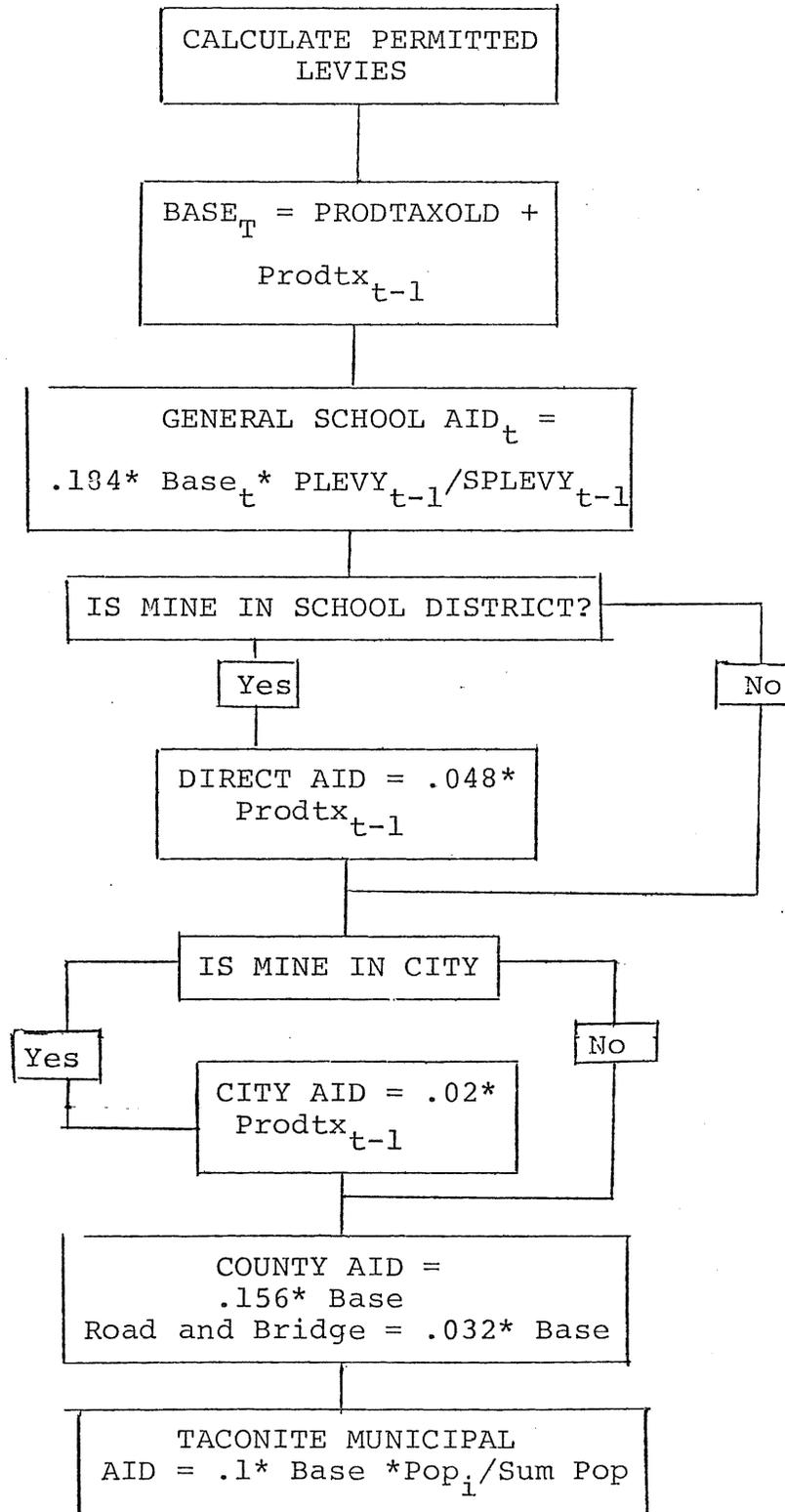
PART 3: CALCULATION OF AID PAYMENTS
(1978-79 AND THEREAFTER)



YES

$$\begin{aligned}
 \text{FOUNDATION AID} &= 1090 * \left[\text{PUPIL UNITS} \right]_T - 27 \text{ mills} * \left[\text{ASSESSED VALUE} \right]_{T-2} \\
 &\quad - .5 * \left[\text{MINERAL AIDS} \right]_{T-1} - .5 * \left[\text{LAND AIDS} \right]_{T-1} \\
 &= \left[\text{PERMISSABLE LEVY RATE}_T - \text{ACTUAL LEVY RATE}_T \right] * .5 * \left[\text{ASSESSED VALUE} \right]_T
 \end{aligned}$$

PRODUCTION TAX AID



CALCULATE PERMITTED LEVIES

$$\text{BASE}_T = \text{PRODTAXOLD} + \text{Prodtx}_{t-1}$$

$$\text{GENERAL SCHOOL AID}_t = .134 * \text{Base}_t * \text{PLEVY}_{t-1} / \text{SPLEVY}_{t-1}$$

IS MINE IN SCHOOL DISTRICT?

Yes

No

$$\text{DIRECT AID} = .048 * \text{Prodtx}_{t-1}$$

IS MINE IN CITY

Yes

No

$$\text{CITY AID} = .02 * \text{Prodtx}_{t-1}$$

$$\begin{aligned} \text{COUNTY AID} &= .156 * \text{Base} \\ \text{Road and Bridge} &= .032 * \text{Base} \end{aligned}$$

$$\text{TACONITE MUNICIPAL AID} = .1 * \text{Base} * \text{Pop}_i / \text{Sum Pop}$$