

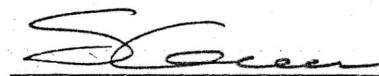
THE IMPACT OF CYPRUS ANVIL ON YUKON

019366

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Conclusions and Executive Summary

Cyprus Anvil has exported lead and zinc concentrates valued at between \$157 and \$235 million in each of the last three years. With the full-time operation of the expanded mill, it is expected to export \$228.7 million less shipping and transportation charges of \$76.8 million, this will contribute \$151.9 million to Canadian exports in 1982. Its principal market, Japan is reliant upon Cyprus Anvil for roughly 19 per cent of its zinc concentrates and 38 per cent of its lead concentrates. From the Canadian perspective, these compared with export levels in 1980 for; flour made from wheat at \$113.8 million, live animals of \$254.0 million, whiskey of \$309.0 million, aircraft of \$255.5 million and total zinc exports of \$428.3 million (Canada b). In 1981 national zinc exports will be nearly \$400 million while Cyprus Anvil anticipates exports of zinc concentrates in 1982 of \$94.8 million or nearly 25% of Canada's export sales. Thus, Cyprus Anvil contributes significantly to this aspect of Canadian trade from its Yukon operations that constitute the economic linchpin of Yukon's economy.

The Yukon economy is small even by provincial standards. The demographic structure contains a high concentration of people in the young labour force age brackets. Historically, Yukon has been dependent upon resource projects. Because cyclical impacts are felt strongly by this sector, the economy has been particularly vulnerable to declines in world prices for its products. The central adjustment mechanism has involved the out-migration in tough times and in-migration in good times.

The prevalence of this adjustment mechanism suggests that the chain reactions from any closure of a mine impacts not only indirectly on the suppliers of materials and services to mines but also via induced mechanisms including the expenditure of earnings from both miners and employees of the various supporting industries in Yukon.

Chapters II and III take marginally different approaches to the quantification of the direct, indirect, induced and construction impacts for employment and wages and salaries. The results are summarized in Table 1. Leaving aside the dependency of government employees on revenues generated by Cyprus Anvil and its related employees, but including government employees actually stationed in Faro, the employment impact ranges between 17.1 and 17.9 per cent of total Yukon employment and 26.9 and 28.2 per cent of the private sector employment. The employment multipliers relative to Cyprus Anvil's direct employment ranged from 2.7 to 2.9.

Because wage and salary levels paid by both Cyprus Anvil and White Pass and Yukon are well above territorial levels, the wage and salary impacts tend to be larger than the employment ones. These amounted to between 20.0 and 21.4 per cent of total wages and

what if we export the one unit in the value added of small refinery

foreign funded

salaries paid in Yukon. Due to the relatively high wage and salary rates of Cyprus Anvil compared to the rest of Yukon the wage and salary multipliers were smaller than the employment ones at 2.1 and 2.2.

The above multipliers and impacts are downward biased in that relatively small linkages are ignored. Further, tenuous linkages, such as exploration generated by the example of Cyprus Anvil as an operating mine, were not quantified nor were secondary rounds of induced expenditures related to service workers. The impacts on government employment levels are covered separately.

Table 1

Employment and Wage and Salary Impacts
of Cyprus Anvil In Yukon (1981)

	Annual Average Employment		Total Annual Wages and Salaries (millions \$)	
	Low	High	Low	High
Direct	700	700	28.2	28.2
Indirect	462	502	13.4	16.4
Induced	596	647	12.8	13.8
Construction	166	166	4.2	4.2
Totals	1924	2016	58.6	62.6
Multiplier	2.7	2.9	2.1	2.2

Source: Informetrica Limited

Various key industries in Yukon, directly and indirectly rely upon Cyprus Anvil for a large percentage of their business. 36.4 per cent of all electricity produced by the NCPC was consumed in Faro. Between 22.5 and 27.5 per cent of White Pass and Yukon's fuel business was dependent upon the perpetuation of Cyprus Anvil. Further, the Cyprus Anvil and related activities accounted for 36.8 per cent of its freight revenues. About one third of the staff of TNTA devoted to scheduled flights was allocated to the Faro run.

Cyprus Anvil's operations and expenditures by related employees directly and indirectly contribute tax revenues to Yukon in excess of \$9.4 million or about 12 per cent of the revenues raised from its own sources by Yukon or 7.1 per cent of total revenues for the Yukon Territorial government. In proportional employment terms, about 148 territorial government employees depend on these revenues for their livelihood.

An outstanding issue relating to taxes centres on the budget proposals to place personal taxes on various perquisites. Based upon Cyprus Anvil's staff as of December 31, 1981, such a policy shift would increase the taxable income of the average Cyprus Anvil employee by \$12,016 to \$12,652 depending upon how the

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+ YTG*

costs of housing are evaluated. If the 1975 precedent between the Treasury Board and Revenue Canada is followed, the lower number would be correct. If full costs of housing are taken into consideration the higher one would prevail. If nominal disposable income is to be maintained, Cyprus Anvil would be required to pay employees an extra \$6,798,672 or \$9,138 each to cover the taxes payable on the extra income over and above the \$12,642 in income in kind. In short, if Cyprus Anvil were to increase wages sufficiently to offset entirely the budgets elimination of perquisites, average wages and salaries would have to rise by \$21,690 to cover existing perquisites and increased taxes. In addition, should other tax increases on income in kind by related workers also be covered off in higher charges, suppliers costs would rise by a further \$1.5 million.

The sheer magnitudes of these adjustments suggest a need for fiscal review and if a decision is made to proceed, that change be introduced gradually. Perpetuation of the moratorium aside, the Treasury Board-Revenue Canada precedent, under which Whitehorse rents adjusted for the lack of amenities act as a proxy for rents in Faro, would appear to be the lowest cost means of setting an eventual target estimate of income in kind. The company could plea to use the monthly costs of a trip to Whitehorse as an indicator of the amenities foregone by those living in Faro relative to Whitehorse. The company should also try to isolate itself from the impact of higher rents in Whitehorse during the building of the Alaska Highway Natural Gas Pipeline. Union/company negotiations may entail some considerable discussion about the incidence of cancelling the perquisites.

Because of the monopoly or competitive monopoly position of several key suppliers to Cyprus Anvil, care must be taken in negotiations with them. The NCPC is in the position of having to meet additional demands largely by diesel generation. The increasing use of diesel may lead to at least one 30 per cent increase in rates in 1982. The proposed rates, however, reflect NCPC's desire to subsidize government activities by a lower than cost collection system at Johnson's Crossing and in Dawson. Given the fuel price escalators as well as the increasing price of fuel in the North, additional increases may be anticipated. The only reprieve in sight to reduce the demand for electricity is the likely cessation of operations at United Keno and Whitehorse Copper. Conservation techniques could also contribute to savings on diesel-generated electricity.

The most obvious method of reducing railway costs per ton would be to expand the use of the railway and its terminals so as to spread fixed costs. Anticipated output by Cyprus Anvil should contribute to this process with rate negotiations reflecting this aspect of railway economics.

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THE IMPACT OF CYPRUS ANVIL ON YUKON

Chapter I

The Economic Setting

The Yukon's economy is small by both national and provincial standards. Its population of 25,121-25,955 (YTG p11&12) is less than one quarter of that of Prince Edward Island, although the territory's land base of 536 thousand km² (Canada b p3) is several times the size of Canada's smallest province.

The demographic structure differs significantly from the rest of the country in that there are few people of "retirement" age. In September 1981, 5.3 per cent of the population of Yukon was over 65 years of age compared with 9.1 per cent for Canada. Only 17.4 per cent of Yukoners were 14 or under, while 24 per cent of Canadians fell into this age bracket. As a result, an especially large proportion of Yukon's population was of labour force age which is defined as the population 15 and over or an aggregate of 21,443.

In contrast to its population data, the Yukon Territorial Government states there are only 17,444 of labour force age (YTG pg. 17). Of these 13,676 were in the labour force in September of 1981.

Monthly data for the first 9 months indicates that given a normal autumn downturn, there will be 10,500 full time employees in Yukon and a further 1,500 part time workers for the estimated equivalent of 11,250 full time employees or man years (YTG p 15-17). Much of the existing employment is based on the government hirings. Federal and territorial levels are estimated at 4,121

employees leaving 7,129 employees in the private sector. The data in Table 1.1 indicate recent growth in employment by both orders of government.

This central role in the economy by government in general and the federal government's expenditures on wages and salaries leads to a greater reliance on the public sector than generally prevails throughout the rest of the country. The interprovincial accounts indicate that the net federal flows of funds into Yukon and Northwest Territories exceeded outflows in 1979 by \$302 million (Canada a p 10). Rising fuel subsidies since that time are expected to have increased rather than decreased these flows. The parliamentary task force estimates the per capita gross transfers to Yukoners in 1981-82 fiscal year will be \$3,857 (Canada c p. 65).

There are, however, clear signals emanating from Ottawa that the federal government is becoming increasingly hesitant of this policy thrust. In particular, the November 12, 1981 budget warned of taxes on income in kind that could jeopardize existing businesses and add cost push elements to accelerate inflation. It is possible, however, that the resulting increase in taxes will lead to shut-downs, thereby at least partially offsetting the increased tax revenues.

The Mining Sector

The value of goods produced in the private sector is dominated by mining and mining-related activities. From 1972-77, 34 per cent of the total value of goods produced in Yukon (as shown in Table 1.2) came from the mining sector. From 1979 to 1981

Table 1.1

Federal Government Employment*
and Earnings: Yukon

	General Government**		Enterprises***		Total	
	<u>Employed</u>	<u>Average Wage</u>	<u>Employed</u>	<u>Average Wage</u>	<u>Employed</u>	<u>Average Wage</u>
1976	1546	10,948	292	15,253	1838	11,632
1977	1537	12,657	273	17,520	1810	13,391
1978	1434	13,801	285	18,628	1719	14,602
1979	1453	14,992	425	18,774	1878	15,848
1980	1373	16,950	491	19,963	1864	17,744
1981	1459	18,533	492	22,726	1951	19,590

Provincial Government
Employment* and Earnings: Yukon

	General Government		Enterprises		Total	
	<u>Employed</u>	<u>Average Wage</u>	<u>Employed</u>	<u>Average Wage</u>	<u>Employed</u>	<u>Average Wage</u>
1976	1652	11,857	42	11,571	1694	11,850
1977	1711	13,612	47	12,085	1758	13,581
1978	1795	14,832	47	14,043	1842	14,812
1979	1907	15,904	63	15,635	1970	15,895
1980	2039	15,696	73	16,699	2112	15,731
1981	2096	18,367	75	18,436	2171	18,365

Sources: Federal Government Employment Statistics Canada catalogue 72-004
Provincial government Employment, Statistics Canada catalogue 72-007

* Employed as of September

** Includes military, overtime, retroactive and other payments

*** Excludes retroactive, overtime and other payments

Table 1.2

Value of Mineral Production by Type of Mineral
Yukon Territory, 1971-1978

MINERAL	1971		1972		1973		1974	
	\$'000	%	\$'000	%	\$'000	%	\$'000	%
Gold	511	0.6	235	0.2	2,032	1.4	4,112	2.4
Silver	8,966	9.6	8,332	7.8	15,343	10.2	26,801	15.6
Lead	29,340	31.6	34,392	32.3	38,013	25.2	41,195	24.0
Copper	2,710	2.9	890	0.8	14,792	9.8	15,571	9.2
Zinc	39,033	41.9	45,341	42.5	61,167	40.6	60,900	35.5
Cadmium	115	0.1	83	0.1	46	-	17	-
Asbestos	12,374	13.3	13,006	12.2	13,915	9.2	22,752	13.3
Nickel	-	-	3,997	3.8	5,210	3.5	-	-
Platinum	-	-	326	0.3	149	0.1	-	-
Total								
Yukon	93,019	100.0	106,602	100.0	150,667	100.0	171,348	100.0
Cyprus								
Anvil	61,524		70,734		107,048		136,870	

Percentage
Change from
previous year

Yukon	14.6	41.3	13.7
Cyprus Anvil	15.0	51.3	27.9

MINERAL	1975		1976		1977		1978	
	\$'000	%	\$'000	%	\$'000	%	\$'000	%
Gold	5,255	2.3	4,401	3.6	4,656	2.2	8,519	3.9
Silver	28,531	12.5	12,809	10.4	20,155	9.6	28,463	13.0
Lead	54,889	24.0	15,999	12.9	47,628	22.7	64,322	29.4
Copper	11,929	5.2	16,046	13.0	8,954	4.3	16,474	7.5
Zinc	95,400	41.7	39,234	31.6	80,562	38.5	74,077	33.9
Cadmium	15	-	13	-	11	.05	-	-
Asbestos	32,821	14.3	35,311	28.5	47,494	17.7	26,949	2.3
Nickel	-	-	-	-	-	-	-	-
Platinum	-	-	-	-	-	-	-	-
Total								
Yukon	228,840	100.0	123,813	100.0	209,460	100.0	218,804	100.0
Cyprus								
Anvil	137,612		59,563		128,667		145,661	

Percentage
Change from
previous year

Yukon	33.5	-45.9	69.7	8.5
Cyprus				
Anvil	0.5	-56.7	116.0	13.2

MINERAL	1979		1980		1981*	
	\$'000	%	\$'000	%	\$'000	%
Gold	13,749	4.6	58,830	16.3	53,964	18.1
Silver	54,218	18.1	114,120	31.7	69,528	23.3
Lead	103,374	34.5	71,558	19.9	50,706	17.0
Copper	18,442	6.2	27,082	7.5	20,192	6.8
Zinc	109,460	36.6	88,313	24.5	103,783	34.8
Cadmium	-	-	-	-	-	-
Asbestos	-	-	-	-	-	-
Nickel	-	-	-	-	-	-
Platinum	-	-	-	-	-	-
Yukon	299,243	100	359,903	100	298,173	100
Cyprus						
Anvil	235,500		199,700		157,400	
Percentage Change from Previous Years						
Yukon	36.7		20.2		-17.1	
Cyprus						
Anvil	61.6		-15.4		-21.2	

Source: Statistics Canada, Preliminary Estimates Catalogue 26-202

* 1981 is preliminary based on unpublished data

** Closed during 1978

*** Based on company data

preliminary figures indicate that the value of mineral production fell slightly from \$299 million to \$298 million. Due to its capital intensive nature and demands for services, the direct employment impact of mining from 1972-77 was only 17 per cent or half that of the sector's impact on the total value produced. (See Table 1.3.) The high level of wages relative to those in the service sector, however, meant that mining accounted for 22 per cent of payroll expenditures in the Yukon from 1972-77. By 1978, this percentage had fallen to 17.9 per cent. Lead and zinc production dominated the mining sector with products worth \$141 million in 1978 or nearly two thirds of the region's total mineral production. With the closure of Clinton Creek in 1978, the dominance of lead and zinc has been even stronger in subsequent years. This closure, lower prices and the diversification of the economy have led to a reduced role for mining in the entire Yukon economy in the last two years.

Cyprus Anvil

As Table 1.2 indicates, Cyprus Anvil has traditionally produced two thirds to three quarters of the total value of output from all Yukon mines. The exception occurred in 1976 during the infamous AIB strike and during two most recent years. Cyprus Anvil then dominated Yukon's mining output from the late 1960's to the late 1970's. With the possible closure of Whitehorse Copper within the next two years and the uncertainties surrounding United Keno, as well as the completion of alterations to its mill, Cyprus Anvil's role is expected to expand.

Table 1.3

The Structure of the Economy and Industrial
Distribution of Economic Activity
1972-1977

	<u>Northwest Territories</u>			<u>Yukon</u>		
	Total Value of	Labour Force* (Total Employed)	Value of Payroll	Total Value of Goods	Labour Force* (Total Employed)	Value of Payroll
	%	%	%	%	%	%
Mining	33	19	16	34	17	22
Services	17	22	21	27	36	27
Government	43	46	56	32	35	41
Other Industries (Oil and Gas Const., Manufacturing and Forestry)	7	13	7	7	12	10

Source: Unpublished Department of Indian and Northern Affairs

* Unemployed have not been included in labour force

During 1980-81, \$75 million was invested primarily to more finely grind the ore to enhance recovery and to create future ore handling facilities. The advances within the mill will lead to an increase in output of all products from 1981 to 1982. Output in 1981 was down largely due to the disruption of output during major adjustments to the mill. During the first full year of operation in 1982 and thereafter, the new facility is expected to lead to a further increase to \$228.7 million based on 121.3 thousand DMT of lead and 237.7 thousand DMT of zinc.

By the end of December 1981, the mine and processing facilities in Yukon employed 744 persons, a growth from 656 at the beginning of the year. Over 6 per cent of Yukon employment was at Cyprus Anvil. During 1981 Cyprus Anvil employees in Yukon earned \$28.2 million or 8.9 per cent of wages and salaries. While these figures are significant they take no account of the indirect employment and incomes created by the mine.

Chapter II

Impacts

In 1943, Nicholas Fagan made the rather acid comment that nothing so completely verifies our perception of a thing as our killing of it (Findley p. 191). Fortunately, tools of economic analysis have been developed to delineate the impact of key resources, industries on local and territorial economies without suffering the consequences of closing them down. This chapter delineates the importance of Cyprus Anvil in Yukon's economy.

Methodology

Economists generally categorize linked employment opportunities into subgroups, indirect and induced. Indirect employment occurs when demands for materials, supplies and services by the business itself require labour. For example, electrical workers are employed to produce electricity from diesel generators which in turn require oil with labour embodied in them. Both those employed to produce diesel generated electricity and those required to transport diesel fuel are indirectly employed in Cyprus Anvil's activities.

Induced employment results from the expenditures of earnings by those who are employed as well as by investors. For example, those employed in selling groceries which people buy out of earnings from Cyprus Anvil or other related employment are part of the induced employment.

It is not always legitimate to assume that no economic activity would be undertaken by employees of a project or those industries linked to it if the project were not operating. If a nation is operating at full employment, then a project will draw labour away from alternative employment opportunities by offering higher wages. It is then, the higher wages and the induced effects of their incremental expenditure that is relevant in such a system. That is not the case when unemployment is as prevalent as it is today. It is simply not correct to assume that individuals would be fully utilized elsewhere should Cyprus Anvil not require their services.

More germane to this analysis of the impacts in Faro and Yukon, alternative opportunities are not readily at hand within the territory. Thus, the local impacts are stronger than would be the case in a larger, more diversified economy with several avenues for absorption of any labour that might be freed-up if Cyprus Anvil did not exist. Given an average net out-migration of 6.9 per cent relative to the population during the late 1970's (Canada d), there is strong evidence to support the hypothesis that whatever employees who would be made surplus by the closure of the mine would leave Yukon. Those who might remain would face unemployment given existing high unemployment rates and the pending closure of two other mines.

This estimate of the employment and wage impacts is then based on the hypothesis that all direct, indirect and induced employment that is now reliant on Cyprus Anvil would be eliminated should the mine close. This estimate remains downward biased

because some linkages within Yukon's economy have not been completely captured in this brief study. More significantly it assumes that all suppliers would continue to operate and service other existing customers so that they only suffer a proportional cutback in their operations.

Given the heavy reliance of key service sectors on Cyprus Anvil's operations, it is doubtful that they would continue to operate in their present guise. Either they would cease or alter their present structure so as to be unrecognizable. Such major disruptions would lead to higher estimates of the impact of Cyprus Anvil on Yukon and are explained in the subsequent chapter.

This chapter delineates the employment and wage and salary impacts on Faro and the rest of Yukon as direct, indirect and induced. The starting point for the data base has been the company's procurement records and those of the town of Faro. These have been supplemented by Transnorth Turbo Air, White Pass and Yukon Railroad, The Northern Canada Power Commission and the Yukon Territorial Government. Given the poor specification of linkages within Statistics Canada's provincial input-output coefficients for Yukon and the Northwest Territories, it has not been used.

Faro

Estimates for the population of the town of Faro June 1, 1981, vary from 1700+ by Statistics Canada to 1,867 by the Yukon Territorial Government. The census data is likely too low given that some individuals who were present at the time would designate their old (non-Faro) residence as their domicile. The Yukon

Territorial Government (YTG) numbers are based on health records and involve a three month lag prior to people becoming registered. Thus, during periods of town expansion they also underestimate actual population; the opposite is true during contraction.

In addition to these two sources, the town of Faro finished a population count at the end of January 1982; its total is 2,127. There is strong evidence to suggest that it is the most accurate. Estimates by the YTG indicate a level of 1,984 by September so that the Town's estimate is consistent with the growth pattern and the use of health records by YTG. The employment numbers set out below indicate that the equivalent of 1030 man years of employment were in Faro not including overtime at Cyprus Anvil. There are 487 enrolled in school and 95 expected for kindergarten in 1983. The YTG estimate of 112 children from 0-4 is at variance with the town's estimates of expected kindergarten enrolment. Given some non-working spouses and part-time employees that share the equivalent of a full-time position, the census of Canada estimate appears to be low and that of the town quite reasonable.

Faro is the second largest centre in Yukon with about 8 per cent of the population. It is wholly dependent upon the mine for its existence. The mine is the key employer with 757 direct employees as of February 4, 1982. Average direct annual employment in 1981 was 700 while in 1980 it equalled 584. These figures are by man years but exclusive of overtime.

Faro's economy is structured to service the mine and provide for its employees and visitors. Table 2.1 contains Faro

Table 2.1

Man Years of
Faro Employment

	Indirect	Induced	Total	
Airport	1	1	2	
Canadian Industries	6	-	6	
Canadian Satellite Systems	-	1	1	
Jimmy Douglas	1		1	
E & L Maintenance	4	-	4	
F & B Market	-	7	7	
Faro Catering	26	-	26	
Faro Chevron	1	2	3	
Faro Dental	-	3	3	
Faro Electrical	2	1	3	
Faro Janitorial	1		1	
Northwestel	4	7	11	
Faro Medical Clinic	1	3	4	
Faro Recreation	-	7	7	
Faro 66	1	3	4	
Faro Travel	2	4	6	
Fireweed Sports		1	1	
Hairdresser	1	1	2	
Hogans		15	15	
Rosemountain Cleaners	3	-	3	
R.C.M.P.	-	5	5	
School	-	36	36	YTG
Other Government	5	5	10	YTG
Hospital	3	9	12	
Murdocks of Faro	2	-	2	
Hotel	3	9	12	
Canada Post	2	1	3	
Pelly River Taxi	6	-	6+	
Sears	-	3	3	
Stitch in Time	-	2	2	
T.D. Bank	1	14	15	
Town	-	10	10	
Vangorda Transport	5	-	5+	
White Pass Terminal	6	-	6	
Kolody Construction	2	3	5	
Yukon Service & Supplies	2	-	2	
Yukon Explosives	3	-	3	
	<u>93</u>	<u>154</u>	<u>247</u>	

Source: Cyprus Anvil

employment levels organized by indirect and induced effects. In aggregate, 247 people are employed in Faro in addition to those at the mine. Of these, 93 are indirect and 154 induced.

During 1981, extensive construction occurred at the mine with the extra employment of 252 persons at the mine and mill sites for an average of eleven months with a further 60 people working in the town site for five months. This amounts to 252 man years of employment of which 66 per cent were undertaken by Yukoners, so that a further 166 Yukoners were employed in this manner. Given the construction period, most construction employees would appear on health records as residents of the Yukon. Many actually residing elsewhere would appear in Faro's health statistics. Thus, for comparison with the YTG data in September, total employment in Faro would be 1,199. More realistically, slightly less than a third of the construction labour force should be considered to be Faro residents so that the equivalent full-time employment that is dependent on the mine in Faro is 1,030 or 9.16 per cent of Yukon's total compared with 8.5 per cent of the population. Because the proportion of those employed relative to Yukon is greater than its proportion of the population, a greater proportion of Faro's population was employed than was that of Yukon's.

Leaving aside income in kind for later discussion, Cyprus Anvil's payroll in 1981 was \$28.2 million in Yukon. Given that over all average weekly wages and salaries in Yukon are expected to be five hundred dollars, annual wages and salaries would be expected to be \$26,000 (Canada g) inclusive of Cyprus Anvil employees who average \$40,000. Given the importance of Cyprus

Anvil employees to Yukon's economy, the figures imply that average income level for non-Cyprus Anvil full-time employment is \$25,052 implying that \$9.3 million is earned in Faro by non-mine employees, so that total wages and salaries earned by Faro residents are \$36.5 million out of total wages and salaries of \$292.5 million. Thus, 12.5 per cent of the wages and salaries earned in Yukon is earned by Faro residents.

In terms of private sector employment and earnings, Faro is clearly a key centre. Of the employed man-years listed in Table 2.1, only 75 are employed by government, the rest are in the private sector. Thus, the vast majority of Faro's income is private sector income.

Faro's raison d'etre is the mine. Without the mine, the employment discussed in this chapter would not exist in Yukon. Given the lack of alternative employment opportunities in Yukon and the traditionally high emigration rates, it is reasonable to assert that closure of the mine would create an exodus.

That exodus from Faro alone would entail a reduction in employment in Yukon of 1030 employees whose incomes presently constitute one-eighth of all wages and salaries in Yukon. Given the relatively high salaries of the mine, an even larger percentage of the personal income tax base would be impacted.

Yukon

In order to stimulate development of Yukon, Cyprus Anvil has a policy of purchasing as many materials and supplies in Yukon as possible. Given the large equipment involved in a mining and

milling operation, however, it is not possible for the small Yukon economy to meet all needs. This section delineates those related employment effects in proportion to the total revenues of key firms that service Cyprus Anvil and Faro.

Data on procurement in the Yukon appears in Table 2.2 for Faro, and Yukon except Faro, by operations and construction for 1981. Employment in operations outside of Faro is dominated by White Pass and Yukon which provided fuel worth \$6.7 million and freight worth a further \$16.2 million. Of the \$16.2 million, \$9.7 million was spent on trucking, \$5.2 million on rail and \$1.3 million for marine. Of White Pass and Yukon's 751 employees, 200 are in highway operations, 41 at the terminals for Cyprus Anvil, 203 on railway operations and 307 on other functions.

White Pass and Yukon Freight

Because the railway is an international one, its employees operate on both sides of the border. Thus, Yukon employment on the railway operations per se has been set at 102 or about half of the total of 203. Since the head office is in Whitehorse, the support employees have all been assumed to live in Yukon.

For purposes of this study, trucking is defined to include terminals. Then nearly one-third of the employees at White Pass and Yukon are involved directly with trucking operations. A further 30 out of the "other groups" have also been allocated to service this aspect of the business, leading to an estimated 274 people in the trucking operation. Direct demands by Cyprus Anvil

Table 2.2

Cyprus Anvil Yukon Procurement (\$000)

<u>OPERATIONS</u>	<u>1981</u>	<u>No. of Man-Years Related to Cyprus Anvil Procurement</u>
CIL	3,928	6
E & L Maintenance	267	2
Faro Electric	312	2
Faro Recreation Assoc.	385	7
Faro Catering	3,815	26
Faro Travel	378	2
Jerry's Bobcat Services	262	2
Northwest Tel	246	4
Kolody Const.	921	-
Pelly River Taxi	411	6
Rose Cleaners	171	3
Town of Faro	1,426	10
United Steel Workers (Includes Dental)	284	-
Vangorda Transport	402	5
Yukon Explosives	<u>1,105</u>	<u>3</u>
Total	14,313	78
<u>Yukon Outside of Faro</u>		
Auto Marine Electric	397	3
Bailey Richardson	156	1
Beaver Lumber	230	1
Arctic Diamond Drilling	248	-
Canomet Sales	129	1
Interiors	157	2
Done Right	191	2
Elvins	130	2
Frontier Freight	523	9
General Enterprises	1,968	11
Gulf	843	3
NCPC	5,856	24
Northern Metallic	1,112	5
Taylor Chev.	268	2
Transnorth Turbo Prop	129	27
Tundra	168	3
Waterous - GM Diesel	549	7
Whitepass and Yukon Trans.	16,220	207
Fuel	6,666	3
Workmens' Compensation	548	7
Yukon Freight	251	5
Yukon Healthcare	144	2
Yukon Homes	113	1
Finning	1,252	14
Rivquip	<u>1,362</u>	<u>14</u>
Total	<u>39,610</u>	<u>297</u>
Operations Total	<u>53,923</u>	<u>375</u>

	<u>1980</u>	<u>1981</u>	<u>No. of Man-years</u>
<u>CONSTRUCTION</u>			
B & K Electric		286	4
Arctic Sheet Metal		236	2
Kolodi Enterprises		254	1
General Enterprises		9800	200
Midnight Sun Drillings		197	2
D.B. Drywall		571	8
O.K. Concrete		259	4
Taylor Chev		269	4
Total Construction		<u>11,872</u>	<u>225</u>
Grand Total		65,795	600

Source: Cyprus Anvil

constitute \$16.2 million out of White Pass and Yukon's freight revenues of \$44 million. The \$44 million may be broken out roughly as one-third for each of trucking, rail and marine. Given Cyprus Anvil's expenditures for each and allocating other employees as in the brackets in Table 2.4, 207 full-time employees are involved with freight for Cyprus Anvil.

Table 2.3
Cyprus-Anvil Impact on White Pass and Yukon Freight
Employment

	WP&Y Revenues	C-A Use	Employees	C-A Share
Truck	14.6	9.7	200 (30)	152
Rail	14.6	5.2	102 (30)	47
Marine	<u>14.6</u>	1.3	80 (10)	<u>8</u>
	44			207

Source: Informetrica based on an interview with White Pass and Yukon.

The wages and salaries tied to traffic provided by Cyprus Anvil for White Pass and Yukon, net of northern benefits, may also be estimated. Including benefits, White Pass and Yukon paid salaries worth \$30 million in 1980. Because most of its employees own their own houses in Whitehorse, special benefits over and above those normally included in wages and salaries are minimal. Average wages and salaries at White Pass and Yukon are then \$37,284 or \$7.7 million for those indirectly employed from Cyprus Anvil's business.

The figures under estimate the overall reliance of White Pass and Yukon on Cyprus Anvil. Rail and trucking are required through additional rounds of indirect linkages. Faro food stores are estimated to have required \$240,000. This level of detail on further rounds of expenditures is ignored.

NCPC

By utilizing similar procedures, employment at NCPC that is reliant on Cyprus Anvil and Faro was also calculated. Direct payment of \$5.8 million worth of electricity by Cyprus Anvil in 1981 was augmented by a further \$600,000 in other consumption in Faro so that \$6.4 million out of the \$17.6 million produced by the NCPC was consumed by Cyprus Anvil and Faro residents (NCPC Dec. 3 pg. 11-15*). This amounts to 36.4 per cent of the revenues of NCPC. The NCPC employed 48 full-time people in 1981 with total incomes of \$1,432,000. Allocating 36.4% of these to service Cyprus Anvil's demands indicates an indirect and induced employment of 17 people with 2 of these being allocated to induced and the rest to indirect with estimated salaries of \$521 thousand.

TNTA

The impact of Transnorth Turbo Air (TNTA) on employment relates to both scheduled and unscheduled flights. Because scheduled passenger service is labour intensive, the company

* The relative importance of Cyprus Anvil to revenues is underestimated because the expanded mill is using more electricity, some of which was billed in late 1981 but not paid for until 1982.

estimates that 40 personnel operate on the service side with the remaining 110 full-time people operating in a pool across all activities. Given that 37 per cent of the revenue is from scheduled trips, it is assumed that 40 people from the pool are dedicated to scheduled activities, leading to a total staff of 80. Since one third of the scheduled revenue emanates from the Faro route, one third of the 80 or 27 full-time positions are allocated to the Faro run at wages and salaries of \$660,000.

White Pass and Yukon Fuel

White Pass and Yukon is also the key distributor of fuel to Yukon. Cyprus Anvil uses fuel directly as well as indirectly through the purchases of diesel generated electricity and the use of airline and trucking services. To get back to the importance of Cyprus Anvil on White Pass and Yukon's fuel markets entails tracing all these primary and secondary impacts. Once they are established the indirect effects on White Pass and Yukon's fuel division may be determined.

Cyprus Anvil purchased fuel worth \$6.7 million from White Pass and Yukon as well as \$842,000 from Gulf. These direct purchases of \$7.5 million were augmented by NCPC and TNTA. During 1980/81 the NCPC consumed 2.7 million gallons of fuel in the Whitehorse - Faro system. At weighted monthly prices, this would be valued at \$3.5 million with Cyprus Anvil's and Faro's consumption of fuel indirectly via NCPC worth \$1.2 million.

The second indirect use of fuel comes through Transnorth Turbo Air. Although procurement policies indicate that only \$129,000 was spent by Cyprus Anvil directly with the airline, other

funds appeared indirectly under Faro Travel. Transnorth Turbo Air records show that the Faro run yielded revenues of \$1.3 million or one third of its total earnings from scheduled operations of \$3.7 million out of a total revenue stream of \$10 million. Faro is clearly central to this organization's operations which required \$1.5 million in fuel in 1981. The fuel used to service the Faro run was worth \$170 thousand.

During 1979, 26 per cent of national trucking costs were for fuel. Given rising of fuel costs since then, fuel is expected to comprise one third of trucking costs of \$3.3 million by White Pass and Yukon to service Cyprus Anvil as well as a further \$200,000 for fuel usage by other truckers to Cyprus Anvil.

Direct and indirect uses of fuel by Cyprus Anvil and towns people for electricity, trucking and air transportation amounted to something in excess of \$12.4 million or over 22.5 per cent of White Pass and Yukon's fuel operations. Given the relative remoteness of Faro, residents would be expected to spend at least their per capita annual share on gasoline or about \$2.5 million so that the induced effect adds substantially to the demand for fuel from White Pass and Yukon rail services. Given that several linkages have not been exhausted, it would appear that about 25 per cent of White Pass and Yukon's fuel business is dependent upon the mine remaining open. This volume of fuel is also significant for the trucking and rail aspects of White Pass and Yukon when the indirect and induced effects are taken into account. Given that fuel, aside from gasoline, comes to Whitehorse by pipeline, only 50 employees are allocated to operating and administrating fuel sales; 13 of these are allocated to servicing Cyprus Anvil with wages of \$485 thousand.

Construction

Construction workers who reside in Yukon but outside of Faro need to be added to those dependent upon Cyprus Anvil for their livelihood. Nearly a third of the construction labour force is assumed to follow this pattern so that a further 83 full-time equivalents are involved with wages and salaries equal to \$2.1 million. There are other indirect employment effects from Cyprus Anvil procurement in Yukon but outside of Faro. Using Faro industry numbers for employment and value of work as rough proxies, these estimates appear in Charts 2.1 and 2.2 and amount to 95 employees with anticipated incomes of \$2.4 million.

Induced Services

The resulting aggregates for employment outside of Faro are 442. These are identifiable indirect employment linkages as well as those induced by electrical demands of Faro residents. Wage and salary earnings would be expected to reach \$14.2 million in addition to earnings within Faro of \$36.5 million. Thus the wages and salaries at or readily linked to the mine and its dependent town Faro amount to \$50.3 million, or more than one sixth of all wages and salaries in Yukon.

Assuming a normal propensity to consume among these income earners that is the same as other Yukoner's, a further 18.1 per cent of retail trade in Yukon is devoted to servicing their induced demand. Since employment in the service sector during January and February, when tourism is minimal, was 2400, an extra 416 people would be employed, thereby leading to a further increase

in Yukon wages and salaries of \$10.4 million at average non-Cyprus Anvil rates. More realistically, service sector salaries are normally lower than average wages and salaries so that a more realistic annual wage and salary level is \$20,000 with a total bill of \$8.3 million. Thus, total wages and salaries in Yukon, dependent upon Cyprus Anvil, amount to \$58.6 million out of a total wages and salaries of \$292 million.

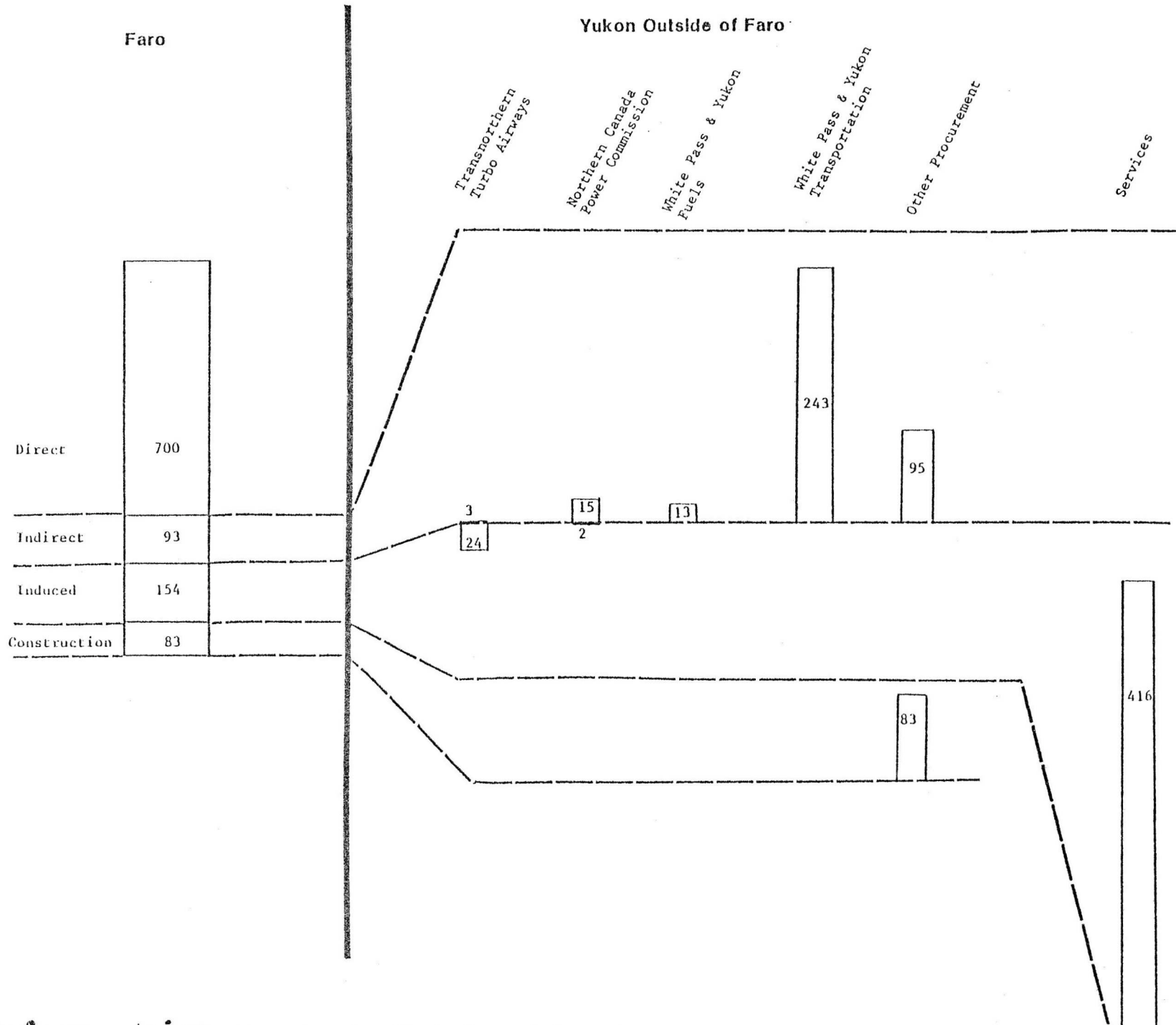
Implied Multipliers

These results are summarized by the areas of the bars in Chart 2.1 and 2.2 which refer to the employment as well as and wage and salaries paid first in Faro and then in the rest of Yukon. They are by direct, indirect, induced and construction. Construction is given separately because 1981 was an exceptional year during which mill investment was abnormally high. Readers may then want to adjust those figures downward accordingly. Inclusive of the construction labour force the implied employment multiplier is 2.7 with total employment constituting 17.1 per cent of Yukon's man years. Because of higher than average wages among Cyprus Anvil employees the wage and salary multiplier is 2.1.

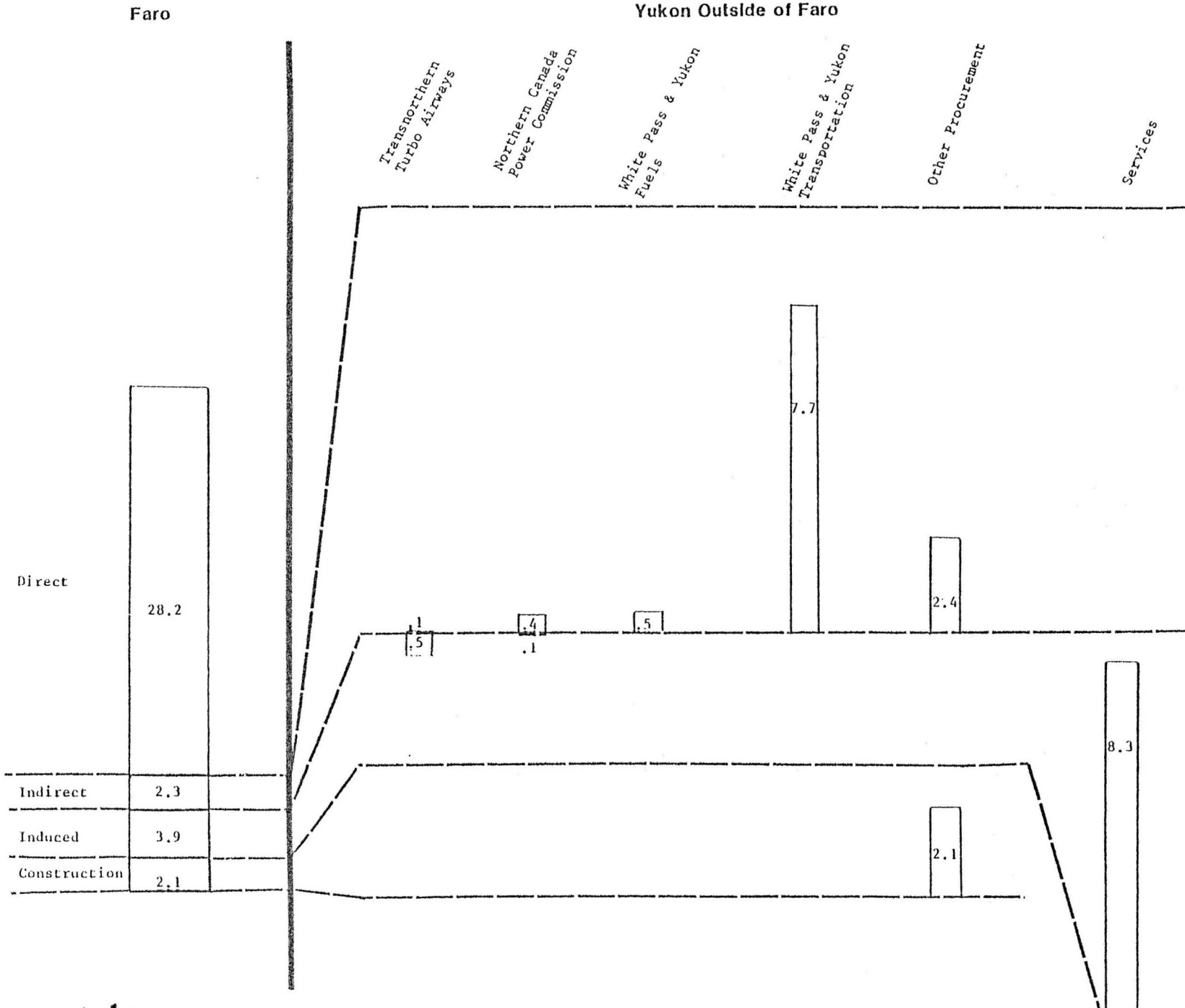
Canada

The impacts on the Canadian economy are radically different from those of Yukon. Given a closure of the mine, many Cyprus Anvil and related workers, who would become unemployed in Yukon, would emigrate to jobs elsewhere in Canada. Thus, the losses to them arising out of closure of the mine would be the

MAN YEARS OF EMPLOYMENT 1981



WAGES AND SALARIES



adjustment costs and perhaps, the differential between their income from Cyprus Anvil and a lower income elsewhere. The resulting induced effects in Canada are correspondingly less because the alternative employment also provides alternative spending power. Offsetting these limiting factors on impacts is the more integrated nature of the Canadian economy which facilitates greater linkages among all producers than exists in the smaller economy of Yukon.

The Informetrica Model (TIM), which simulates the Canadian economy dynamically with 4,500 equations gives multipliers for impacts of resource exports on GNP in the vicinity of 1.7. The anticipated sales by commodity appearing in Table 2.4 suggest that the national impact of Cyprus Anvil's output over the next ten years would grow from \$388.8 million in 1982 to \$632.3 million in expected 1982 prices for lead and zinc.

To those accustomed to viewing multipliers based upon input/output analysis, the multiplier of 1.7 may appear to be too low. Input/output analysis assumes that no alternative use will be found for any of the factors of production or any of the materials and supplies used by a firm that is stopping production. This extreme assumption is unwarranted in the national context of Cyprus Anvil. Of the employees who have returned to work at the mine or the mill, none have had a record of unemployment. Further, the extensive search costs that go into finding scarce labour factors suggest that many skilled employees are rarely found among the ranks of the unemployed. In short, the market facts belie the assumptions behind input/output multipliers and suggest the results of such analyses would be upward biased. TIM allows the adjustment mechanisms to work and gives a more realistic appraisal.

Table 2.4

Cyprus Anvil Anticipated Sales 1982-1991
(million of \$ 1982)

Year	Lead	Zinc	Silver	Gold	Total
1982	66.019	141.216	21.492	.000	228.726
1983	80.182	154.086	28.169	.000	262.438
1984	80.851	149.862	27.080	.000	257.793
1985	99.016	172.873	34.007	.000	305.896
1986	111.999	178.908	40.642	.000	331.549
1987	113.333	195.551	37.485	.000	346.369
1988	117.196	200.260	45.108	.000	362.564
1989	92.083	174.747	34.558	.000	301.388
1990	110.299	175.668	46.278	18.950	351.195
1991	106.667	196.730	58.599	9.958	371.995
1992	82.894	159.936	41.190	5.657	289.676
1993	82.894	156.737	41.190	5.657	286.477
1994	78.883	150.339	39.197	5.383	273.802
1995	54.668	99.458	27.164	3.731	185.021

Source: Cyprus Anvil, not including underground mining.

Japan

Canada remains the most important foreign supplier of lead concentrates to Japan. During the late 1970's it was also the most important supplier of zinc concentrates. It was, however, surpassed in this race by Australia in 1980. The Australians are expected to maintain this leadership.

Table 2.5 illustrates the importance not only of Canada but also Cyprus Anvil specifically to Japanese imports of lead and zinc concentrates. All of Cyprus Anvil's output is exported; about 80-85 per cent of it to Japan. This table differs from Cyprus Anvil's production data because it is by year of entry into Japan and by wet tonnes rather than dry tons. As Table 2.5 suggests, Canada's market share has been declining in both products. This shrinkage is due to Australian competition in zinc and Peruvian competition in lead. Expansions underway among Pacific rim competitors suggest that should Cyprus Anvil close, Canada would lose these export markets and therefore support the national multiplier analysis on the previous section.

The use of zinc in automobiles to reduce rust as well as the use of lead in batteries ties Cyprus Anvil to world wide Japanese automotive trade. Recent trade restrictions may have indirectly limited the Japanese market.

Table 2.5

Japanese Imports From Canada and Cyprus Anvil
(000 Wet Tonnes)

	Lead Concentrates			Zinc Concentrates		
	Total Imports	Imports from Canada	Imports from Cyprus Anvil	Total Imports	Imports from Canada	Imports from Cyprus Anvil
1978	222.4	153.8	102.1	936.6	366.1	204.7
%		(69)	(46)		(39)	(22)
1979	218.5	143.7	102.5	959.2	358.6	179.1
%		(66)	(47)		(37)	(19)
1980	258.6	164.9	97.9	804.9	259.2	205.8
%		(64)	(38)		(32)	(26)
1981*	118.4	92.4	69.3	654.4	200.7	123.3
%		(51)	(38)		(31)	(19)

Sources: Japan Ministry of Finance "Japan Exports and Imports: Official Trade Statistics of Japan" and Cyprus Anvil. The Cyprus Anvil data has been adjusted to reflect shipping time and wet tonnes rather than the dry tons that are in the production statistics. The numbers in the () refer to percentage shares of the Japanese markets for concentrates of either lead or zinc.

International and National Linkages

The chapter has illustrated that Cyprus Anvil is an important producer of lead and zinc for Japan for Canada which has been steadily losing its market shares to other suppliers. Expansions which are now underway in Pacific Rim will heighten competition. Combined with anticipated production figures for Cyprus Anvil, this internationally competitive situation suggests that should Cyprus Anvil shut down, further markets will be lost culminating in a lower Canadian GNP by 388.8 to over 600 million a year in 1981 dollars. The impact on the Yukon would have been extensive because of the emigration that would have resulted last year from the loss of 700 direct jobs and a further 1224 related positions. Faro would become a ghost town.

Chapter III

Likely Adjustments By Key Suppliers

The Railway

The previous chapter essentially utilized proportions of revenues with NCPC and White Pass and Yukon to distribute the employment and fuel consumption impacts of Cyprus Anvil's operations. Such an approach usually underestimates the likely total impact.

Cyprus Anvil's operations in normal years constitute about two thirds of the mining activity in Yukon. Further, because mining constitutes 84.6 per cent of Yukon's resource output, Cyprus Anvil is a key resource producer. It can be argued that without its presence that the railway simply could not operate, NCPC would cutback diesel generation of electricity without reducing hydro generation capability so that the fuel requirements of NCPC would be more than simply proportionately reduced while manpower could not be reduced by as much as the previous chapter suggested.

Impact

As Yukon moves closer to the closure of Whitehorse Copper and faces up to problems at United Keno, the importance of Cyprus Anvil's output as the key outward bound traffic looms larger. During an interview on the importance of Cyprus Anvil to the White Pass and Yukon railroad, Gary Gurtz was frank about the high probability of closure without Cyprus Anvil's business. The alternative to closure would be a large government subsidy.

Should the railway be closed, trucks will be used as an alternative means of freighting goods and services into Yukon with Edmonton emerging as a key terminal for goods going north to Yukon as well as to the Northwest Territories. While no alternative cost or employment estimates have been carried out, it is clear that all 203 direct railway employees would require alternative employment; 102 of these are resident in Yukon.

Further, due to the fixed cost nature of the railway business, the removal of Cyprus Anvil's business would make rail rates higher than those for trucking. Yet, under the present circumstances, the preference shown by most shippers to use rail suggests that it is now cheaper than trucks. Should Cyprus Anvil close, the costs of freight to the rest of Yukon would then rise by the difference between truck and existing rail service.

The level of competition among truckers outlined in Report of the Inquiry into the White Pass and Yukon Railway and Other Surface Transportation Services into and out of Yukon indicates that such increases would be small, yet the report fails to come to grips with the increased costs of highway repair that would ensue.

THE NCPC

The NCPC currently generates electricity from both hydro and diesel fuels. As noted earlier, Cyprus Anvil and Faro consume 36.4 per cent of all electricity generated by the NCPC. In 1980-81, the latest year for which data are available, only 43,728 thousand kWh of sales were diesel generated out of total sales in the Whitehorse-Faro system of 292,461 thousand kWh. Thus, it is

obvious that without Cyprus Anvil minimal use of diesel would occur in the Whitehorse-Faro area for such things as emergency back-up (NCPC p 21).

In 1981/82, the NCPC's fuel costs were \$3.5 million. Given that 17 members of NCPC staff are attributable to Cyprus Anvil cost savings of \$4.0 million would be available to NCPC or \$2.4 million less than the revenues it received from Cyprus Anvil and Faro. The NCPC would still be liable for the costs of its equipment unless it could gain some resale value. Further, the entire hydro system would need to be maintained. In short, based upon the 1981/82 setting it is not obvious that rates could have fallen significantly had Cyprus Anvil ceased to exist.

Rising energy costs combined with increased demands could, however, change these results over time. As Yukon moves to greater reliance on diesel, the potential savings on fuel by eliminating any key user rises relative to total costs. While intuitively clear, such a shift can be more than offset by rising rates. Within the Whitehorse-Faro system of NCPC, based on 1981/82 load factors, energy costs for 1982-83 are projected to be \$13,843,345 of which \$10,207,400 are to be spent for lubricants and fuel. Using the Mayo hydro system as a benchmark, no more than \$200,000 would be required for non-diesel lubricants. Thus, \$10 million of energy costs on the Whitehorse-Faro system in 1982-83 is slated for diesel. If load factors were to remain constant, Cyprus Anvil would be asked to pay energy costs of \$8,043,712. If the total costs of fuels and lubricants are allocated to Cyprus Anvil, the additional costs above revenues would be \$2,163,988. NCPC is

anticipating at least one change in rates that would allow revenues from Cyprus Anvil to exceed costs by \$912 thousand so that, the savings to the system of not operating the mine and therefore requiring no diesel would amount to \$1.25 million. NCPC would, however, still be left with the commitment to pay Cyprus Anvil interest and depreciation charges on facilities that NCPC is purchasing of \$1.48 million. Thus, there would be no reduction in rates elsewhere in Yukon if Cyprus Anvil were to close down.

With the operation of the new mill, electrical consumption by Cyprus Anvil will rise so that diesel fuel requirements by NCPC may reach \$19.5 million in 1982/83, barring the loss of any other major user. Because the marginal price of diesel generated electricity is set at 11.88¢ per kWh, most of the increased diesel under NCPC recommendations will be passed on to the incremental user. The effects of the rising price of diesel are to be passed to all consumers through a .061¢ kWh for every 1.0¢ change in the price of fuel for the generation site for diesel generated power and by the same factor, multiplied by the ratio of the anticipated diesel generation level over the hydro generated one. Because hydro users then share the higher costs of diesel, it is not possible to determine whether or not the closure of Cyprus Anvil would affect rates in the rest of Yukon, given the higher levels of consumption resulting from the expansion, the impact on rates of a closure would not be large.

It is also worth noting that the impact of the cutback on White Pass and Yukon's fuel operation using 1981 figures would not be \$1.2 million but \$3.5 million on their fuel operations. Thus,

Cyprus Anvil directly and indirectly would be deemed to account for 27.5 per cent of that company's sales in Yukon in 1981. Given the anticipated higher generation of electricity from diesel in 1982, the level will be about one third of White Pass and Yukon's fuel business.

More Tenuous Advantages

While several more tenuous relationships to Cyprus Anvil exist, specific estimates of their magnitude have not been incorporated into the analysis. No account has been taken of the role of the mill as a demonstration project indicating that mining and milling operations are feasible in remote parts of Yukon. Yet many of those interviewed recognized that the success of the mine had not only lead to further explanatory work by Cyprus Anvil, but also encouraged others to step up their exploration. Table 3.1 indicates that exploratory activity by Cyprus Anvil expanded markedly from 1978 to 1979, while that by others has grown over the last decade. Total expenditures on exploration have grown from \$3.0 million to \$50 million over the decade from 1971 to 1981.

Table 3.1

Year	Exploration Activities (million current \$)	
	Cyprus Anvil	Total
1975	1.3	15.5
1976	1.6	13.4
1977	1.7	17.8
1978	1.3	17.7
1979	4.2	27.3
1980	4.1	40.0
1981	4.3	50.0

Sources: Cyprus Anvil and Yukon Chamber of Mines

The upswing in exploratory activity in the last half of the 1970's was tied not only to operating example of Cyprus Anvil but also to the relatively prosperous times for many firms concerned with mining. The degree to which Cyprus Anvil's success encouraged prosperity in Yukon simply cannot be quantified and has therefore been omitted from the empirical analysis.

Cyprus Anvil has played a leading and innovative role through the employment of 115 women; 66 of them wives of other staff members. It has experienced success in its policy of hiring native peoples. In 1981, 30 new employees who are native people were hired and of the these, by mid February, 28 remained on staff.

These employees participate with others in the \$1.8 million annual training program for which governments have only recently begun to provide 10 per cent of the financing. These activities usually have about a 50 per cent retention rate with a nearly 100% success rate at examination time. Through these

mechanisms the company enhances the productivity of its own labour force but that of other Yukon employers who may hire some former staff.

The numerical analysis of linked employment and incomes has taken no account of these more tenuous ties to Yukon's economy. That is not to argue that they should be discounted completely but to admit the difficulties in quantifying them. Because the role played by the tenuous linkages is ignored empirically, the numerical results still have elements of downward bias.

Implied Multipliers

These revisions to the employment and wage and salary linkages lead to slightly higher multipliers than those of Chapter II. The closure of the White Pass and Yukon Railway would lead to a larger decrease in indirect employment. The pursuant effect on the demand for services by Yukoners would then result from the greater decrease in indirect employment. The upshot would be a decrease in employment of 2.9 times the direct employment by Cyprus Anvil in contrast to the 2.7 in the previous chapter. Similarly wages and salaries would decline by 2.2 times Cyprus Anvil wages and salaries compared to the lower estimate of 2.1 in the previous chapter.

The employment as well as the wage and salary impacts are summarized in Charts 3.1 and 3.2 respectively. In order to facilitate comparisons, these are laid out in a parallel manner to Charts 2.1 and 2.2.

MAN YEARS OF EMPLOYMENT

Faro

Yukon Outside of Faro

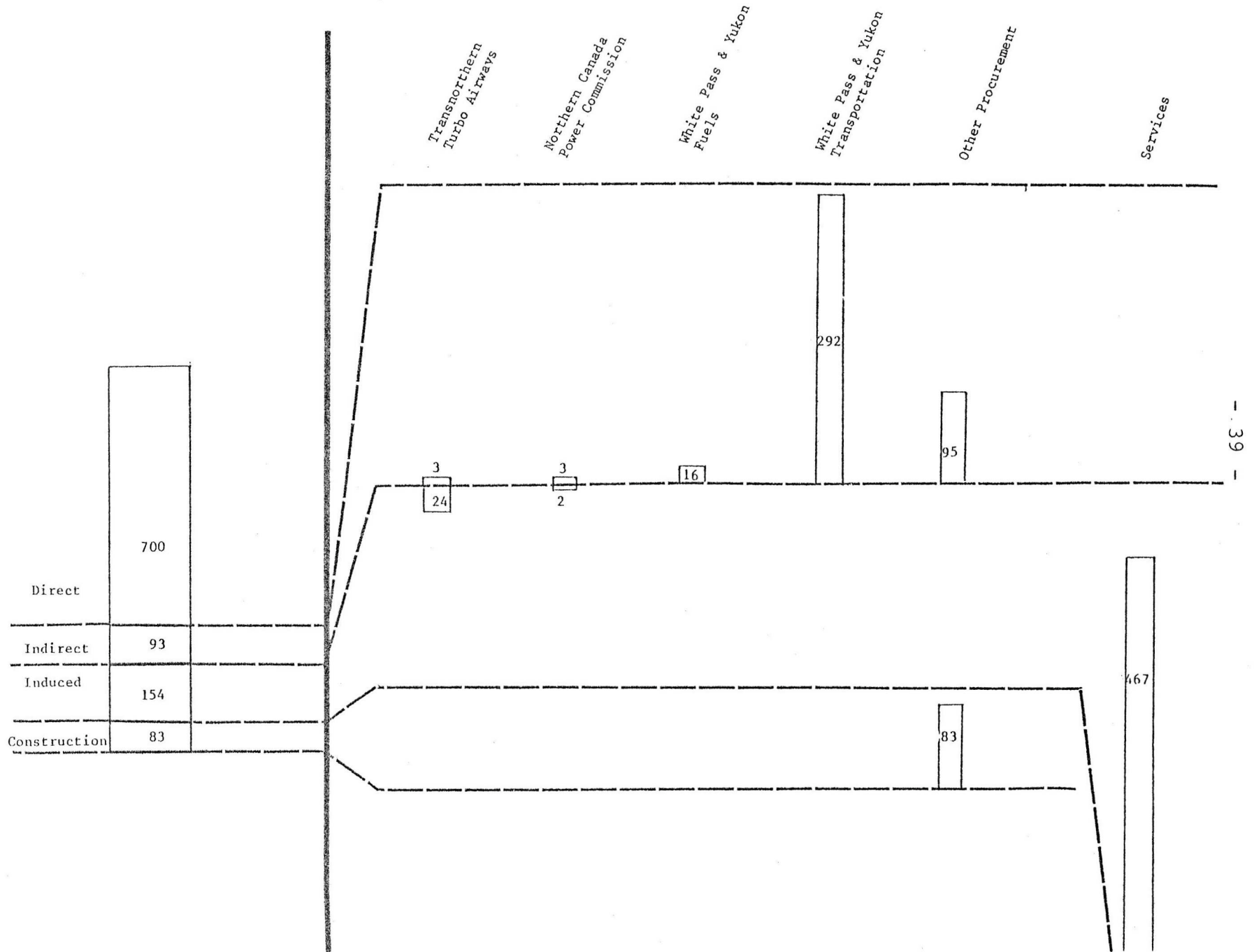
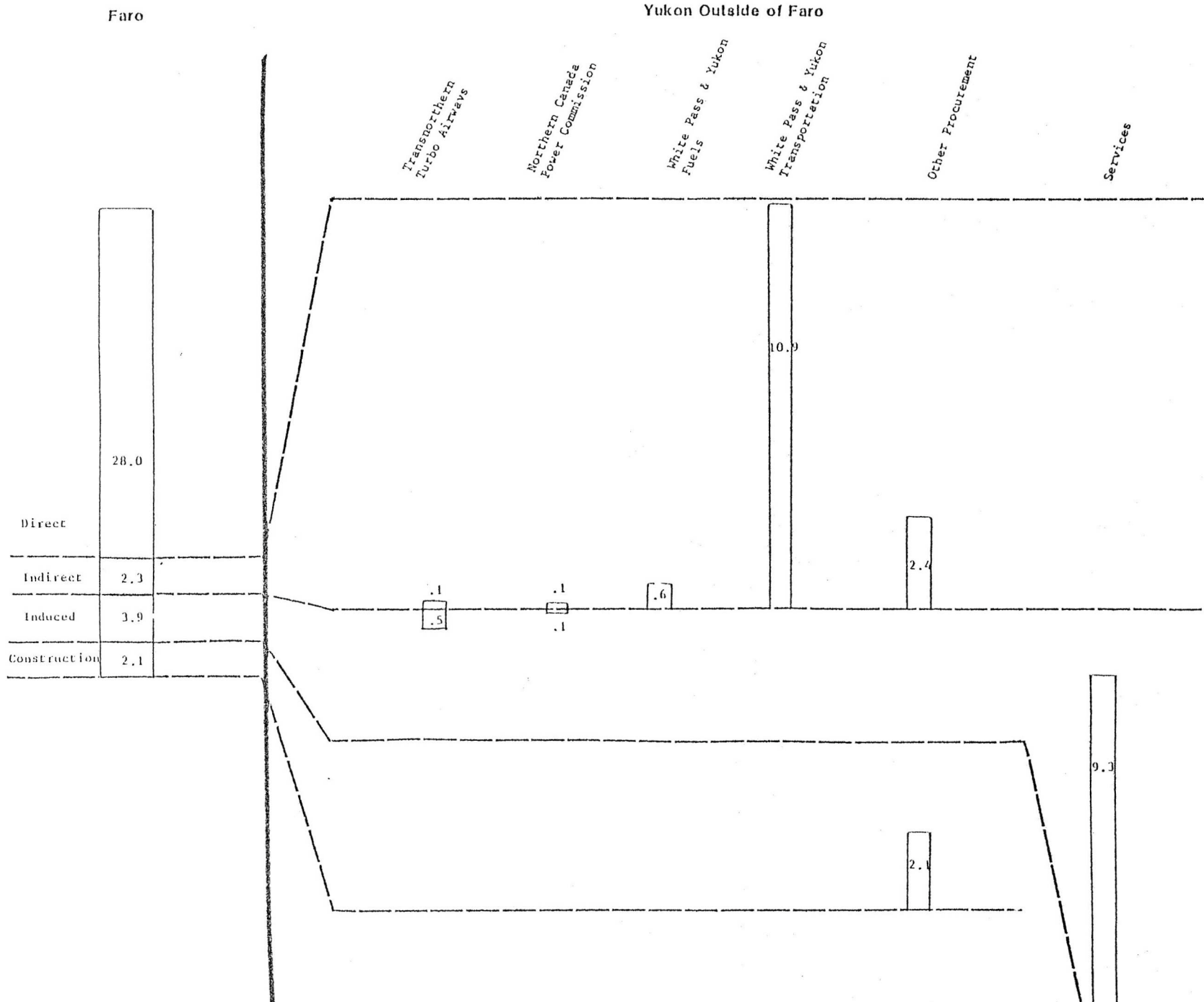


Chart 3.2
 WAGES AND SALARIES (millions of dollars)



Chapter IV

Cyprus Anvil and the Government Sector

Personal income taxes paid by employees who are tied to Cyprus Anvil operations through direct, indirect and induced mechanisms in the economy, constitute a key element in Yukon's revenues. The reliance of the government sector for revenues on Cyprus Anvil, however, goes beyond revenues from personal income taxes. Taxes are paid by Cyprus Anvil directly as well as indirectly on some key materials and supplies. The taxes paid by corporations with which Cyprus Anvil is associated have been included where data are available.

The Yukon Territorial Government budget for 1980/81 contained revenues of \$132.8 million of which \$57.2 million came from the federal government so that \$75.5 million was raised from its own sources (Yukon pg 30-31). The largest single item is simply "revenue" at \$19.3 million of which \$13.3 million stemmed from liquor sales. Income taxes amounted to \$15.4 million (Yukon pg. 30). Cyprus Anvil in 1980, paid royalties of \$281,360 and income tax of \$473,181 of which \$146,000 went to Yukon. A further \$1.2 million was paid indirectly through the product delivered by White Pass and Yukon to Cyprus Anvil. Thus, on these items alone Cyprus Anvil was responsible for \$1.6 million of Yukon's "revenues".

In 1981 Cyprus Anvil employees paid taxes of \$8.3 million of which \$2.5 million went to Yukon. With the expansion of both

the labour force and real incomes at Cyprus Anvil, these payments have been growing over time as shown in Table 4.1.

From Table 4.2, it is obvious that the indirect and induced employment are expected to generate considerable revenue for both orders of government. Expected personal income taxes payable in 1982 both federally and to Yukon have been estimated. There are approximations in that, except for Cyprus Anvil where deductions were available, they are based on average earnings figures for employees in each group specified in Chapter 2. During 1982, at the lower rates and with income in kind aside, Cyprus Anvil employees are expected to pay \$7.7 million in personal income taxes. Taxes paid by all direct, indirect and induced employment will reach \$13.8 million; of this \$4.15 million will go to Yukon. Should the effects of the previous chapter be considered, a further \$894 thousand in taxes would be paid in total.

Assuming that Cyprus Anvil employees and related workers drank the average amount they would also have paid \$2.2 million of general revenue. Their share of sales tax relative to wages earned would be \$929 thousand. Health care premiums cost the company \$144 thousand. On a similar payment standard, related workers would contribute \$226 thousand. Thus, Cyprus Anvil employees and related personnel were responsible for \$3.5 million in Yukon "revenue". Taken as a whole then, Cyprus Anvil and related employees paid about \$9.4 million out of Yukon's total non-federal revenues of \$75.5 million.

Cyprus Anvil also paid taxes to the Town of Faro worth \$1,085,985 in 1980 (see Table 4.3). These funds constituted the main revenue base for the town.

Table 4.1

Taxes Paid by Cyprus Anvil Employees

<u>YEAR</u>	<u>GROSS EARNINGS</u>	<u>TAX</u>
1978 union members	11,367.42	2,843,924
1979 union members	12,032,987	3,158,528
1980 union members	15,131,451	4,062,662
1981 union members	22,069,926	6,448,447
staff	4,609,569	1,371,111
other	1,569,511	<u>458,584</u>
1981 Total		8,278,142

Source: Cyprus Anvil

Table 4.2

Estimated Income Taxes Paid by Cyprus Anvil
and Related Employees 1982
(thousands)

	Federal	Provincial	Total
Cyprus Anvil	5375	2311	7686
Other in Faro	1130	486	1616
NCPC	77	33	110
White Pass & Yukon			
- freight	1332	573	1906
- fuel	83	36	229
NCPA	77	33	110
Other Outside of Faro	<u>1534</u>	<u>660</u>	<u>2194</u>
	9609	4132	13741

Source: Informetrica Limited

Table 4.3

Taxes Paid by Cyprus Anvil to the Town of Faro

1978	608,000.00
1979	637,000.00
1980	823,000.00
1981	1,085,985.00

Source: Cyprus Anvil

In 1980 Cyprus Anvil's corporate taxes to the federal government were \$353 thousand. Due to poor prices they are expected to be zero for 1981. The income taxes paid by employees and related workers were worth another \$9.6 million to the federal government.

The impact of these revenues on Yukon is significant. Should Cyprus Anvil cease production, 12.5 per cent of Yukon Territorial Government revenues from its own sources would cease. Under these conditions, either cutbacks in Yukon government services would be required or more federal subsidies would be necessary. Proportional cutbacks in Yukon government employment by taxes attributable to Cyprus Anvil's existence would imply a reduction of 265 employees or a further \$4.8 million in wages and salaries, thereby indicating that Yukon wages and salaries without Cyprus Anvil would be expected to dwindle to 22.3 per cent of current levels.

Cessation of Cyprus Anvil's activities could also save the government money for its support of Faro and some servicing of its employees. Given that only 46 territorial civil servants are employed in Faro with a similar number employed in teaching the offspring of those employed through indirect or induced mechanisms, their wage and salary bill would be \$1.2 million. How seriously a closure would affect road crews and other civil servants is not clear. It is, however, unlikely that the Yukon Territorial Government would be able to cutback enough to offset the decline in revenues outlined above.

Chapter V

The Proposed Changes In Personal Income Taxes

"The Department of National Revenue should be requested to refrain from taxing any of the currently existing common and essential benefits and subsidies conferred upon both employees and their families living in the Yukon and Northwest Territories" (Report of the Northern Mineral Advisory Committee pg. 10).

Taxes on Full Income

The November 12, 1981 budget made clear the government's intent to tax "northern benefits" beginning in 1983. While the plea to continue to moratorium could be repeated, it is not likely to be considered seriously by government. Within the policy directions laid down in the budget, two options may be followed. The efficiency principles upon which the budget itself claims to be based would dictate that the full rental value sufficient to cover investor costs or any other benefits be included as income. The second option would entail following the principles set out in a 1975 memorandum prepared by Treasury Board and accepted by Revenue Canada.

Under this memorandum Treasury Board accepts CMHC's evaluation of the monthly rental value of buildings. In communities where markets operate, that value is set at the low end of the market. In more remote posts where there is no market, rent is estimated from the values in a nearby market with the

appropriate downward adjustments for the lack of amenities in the more remote site. Since these criteria do not involve the cost differentials of putting housing in place in the more remote areas, they are inconsistent with the efficiency criteria of the budget. At this juncture in the evaluation of policy it is not clear which avenue will be followed by the federal government.

The government does appear to be determined to stop transferring what it sees as benefits through the tax system. Early work is underway at the Department of Indian and Northern Affairs and Treasury Board to establish a system of grants either to firms or individuals. Subsequent sections of this chapter assume that no grants are made to either Cyprus Anvil or related employees. They further, without prejudicing labour negotiations, delineate the costs to Cyprus Anvil and related employers should the entire impact of changes in perquisite be passed on to the employers.

Full Costs

Given the state of flux in policy for determining the value of housing, it is prudent to be aware of the highest possible estimate. Based on efficiency criteria, rental values would have to be determined in line with full costs of construction, upkeep, and interest based on the opportunity costs of money. Within a town which has mining as its sole purpose, the economic lifespan of housing is determined by the expected life of the mine. Thus, the full capital costs of housing can be determined by estimating the annual costs of a mortgage required to pay-off the housing

completely by the time the mine closes. With no alternative use at closure the anticipated value at that time is zero.

Assuming mine closure in the year 2005, annual mortgage payments on the capital stock of 489 units in Faro owned by Cyprus Anvil under various interest rates appear in Table 5.1. These abodes house 555 employees including 66 wives of employees who work for the company. Since these buildings now yield rents of \$253,056 the amount that would be considered as additional income for employees would be \$3.1 million.

As noted in a memorandum from D. Rouleau and T.S. Andrew other items would also become taxable. This analysis differs in that the above housing estimates would not conform to their figures and income was set at \$40,000 which is commensurate with 1981 earnings. Their numbers failed to take account of the number of husband and wife teams. Thus, rather than having 255 individuals utilizing room and board there are 189 families. The amount of room and board that would be paid by employees in 1982 is \$95,200 rather than \$128,444 out of a budget of \$3,326,000 so that \$3,140,800 becomes taxable. The values for items falling within income in kind appear in Table 5.2.

Revenue Canada Precedent

The second alternative does not follow equity principles but is consistent with the precedent set between Treasury Board and Revenue Canada in estimating rents on federal housing in the North. Adherence to this precedent would correspond, at least in the

Table 5.1

Cyprus Anvil Housing Costs

- Assumptions:
- o all terms to 2005
 - o first payment at beginning of 'next' year; last payment at beginning of 2005, therefore no. of years = 2005-1969 etc.,
 - o interest rate is the lower of bank business prime or conventional mortgage.
 - o discrete payment formula

$$A = \frac{PVi}{[1-(1+i)^{-n}]}$$

	<u>Years</u>	<u>Chtd. Bk Bus. Loan (Jan)</u>	<u>Conv. Mortgage Rate (Jan.)</u>	<u>PV</u>
1969	36	<u>7.00</u>	9.45	4864
1971	34	<u>7.00</u>	9.94	2880
1974	31	<u>9.50</u>	10.02	2160
1976	29	<u>9.75</u>	11.84	2925
1979	26	<u>12.00</u>	11.28	4000
1980	25	<u>15.00</u>	<u>13.26</u>	4720
1981	24	18.25	<u>15.17</u>	7024

Mortgage Schedule

								<u>Total Mortgage Payments</u>
1969								373.143
1970	373.143							373.143
1971								597.197
1972		224.054						597.197
1973								597.197
1974								815.495
1975			218.298					815.495
1976								1121.273
1977				305.778				1121.273
1978								1121.273
1979								1602.352
1980					481.079			2257.353
1981						655.001		
1982							1102.722	3360.075
2005	373.143	224.054	218.298	305.778	481.079	655.001	1102.722	3360.075

Source: Informetrica Limited

Table 5.2

Taxable Amounts of Income In Kind (1982)

\$

Treasury Board/Revenue Canada

	Full Cost	Precedent
Housing	3,107,019	2,634,360
Room and Board	3,140,800	3,140,800
Vacation Transport	1,232,640	1,232,640
Yukon Health	198,204	198,204
Bus Transport	492,528	492,528
Dental	250,622	250,622
Heat and Power	<u>991,386</u>	<u>991,386</u>
Total	9,413,199	8,940,540
Costs per employee	12,652	12,016
(Total/744)		

Source: Informetrica Limited

northern context, to a second principle of equity that was also contained in the budget in that the methods for evaluating housing for both private and public personnel would be the same. It would not meet equity criteria with those living in the south.

Within this framework, where local markets are either too small or non-existent for the determination of market rents, the market in closest proximity is used with a downward adjustment for any amenities which a remote site may lack. A conversation with David Kingsley at CMHC in Whitehorse has confirmed that Whitehorse is used as the proxy for estimating the rental value of federal housing in Faro.

Although a direct comparison was not available with similar types of housing in both locales, the adjustment for lack of access to amenities appears to be nil.

A problem with this approach is that fluctuations in the Whitehorse market, which may be completely independent of Cyprus Anvil can alter the estimated rental values of houses in Faro. For example, housing will become very expensive in Whitehorse should the Alaska Highway Natural Gas Pipeline proceed and could cause a short-term overvaluation of estimated rents in Faro. Some long-term inflator that is more independent of Whitehorse per se should be sought.

In 1981, CMHC evaluated the rents on four buildings in Faro. A 1050 sq. ft. duplex mobile home was set at \$235 per month, standard mobile home with three bedrooms at \$295 and a deluxe mobile home at \$310 with three bedrooms. All are expected to increase by 15 per cent. The increase in the rental value of a

house rather than a mobile unit is 50% of the rental value of the mobile unit. Thus, the anticipated CMHC evaluation in 1982 of a two bedroom duplex in Faro is \$419; on a standard mobile home \$340 and on a deluxe mobile home \$357. These figures compare with those in the memo of \$425, \$375 and \$400 respectively. The rentals of \$700 per month on the single homes compare with CMHC estimates of \$430 and \$730 in Whitehorse for two story four bedroom frame houses with 1290 and 1880 square feet respectively. These houses were built immediately after the war. Given the relative age of the housing stock, the memo's estimate for Faro is a reasonable guess that may be a little low given that several basements have been finished. For these reasons no adjustments were made to the P. Rouleau-Andrew memo except the adjustment to room and board and wages and salaries. That memo has also been adjusted to reflect the full range of deductions.

Under either of the above taxation approaches the implications for Cyprus Anvil are significant. Using CMHC's lower estimates of housing costs in Faro and Cyprus Anvil's cost estimates for other taxable perquisites, taxes for Cyprus Anvil employees would rise by \$9,138 per employee if supplemental income were given by Cyprus Anvil to workers to neutralize the effects of the taxation policy change. A similar figure calculated with Cyprus Anvil's higher estimate of housing costs results in an increase of \$9,858 per employee. While the issue of who is to cover the tax on perquisites will be subject to negotiations, the magnitudes are substantial.

They would also affect Cyprus Anvil indirectly in that suppliers also face upward adjustments. As a proxy for benefits received by suppliers, travel allowances of \$2,000 have been assumed for each person indirectly employed as well as Yukon Health care of \$22.00 per month. By making these benefits taxable, personal income tax for Cyprus Anvil and related employees would be \$8.3 million. In the high impact case, they would rise to \$8.8 million. These results are summarized in Table 5.3.

Approaches

Given the determination of the federal cabinet to proceed with the elimination of perquisites, it would be preferable to follow existing precedents. Evaluation under them could be lowered if the costs of a return trip from Faro into Whitehorse per month were considered as part of the costs of living in a remote area that should be deducted from the estimated rents of Faro relative to Yukon. Valued at \$100 per round trip by car per employee, this would lower rental estimates by \$892,000. Air fares would be worth \$164 return at present rates and therefore correspondingly more.

Table 5.3

Additional Taxes Payable for Income in Kind*

	\$	
	Per Employee	Total
Cyprus Anvil	9,138	6,798,672
Other in Faro	1,142	376,860
White Pass and Yukon Freight	1,637	338,859
White Pass and Yukon Fuel	1,637	21,281
NCPC	1,159	19,703
TNTA	1,119	30,210
Construction	1,142	94,786
Cyprus Anvil Procurement	1,142	108,490
Service	1,094	<u>472,608</u>
Total additional taxes		8,261,469

Source: Informetrica Limited

* figures include taxes on supplemental salary required by employee's to maintain previous disposable income level.

Current policy directions appear to be towards upholding the Treasury Board-Revenue Canada memorandum but there is no firm policy on the issue and as this chapter has indicated the higher estimate could be adopted under efficiency criteria as well as on equity terms with the rest of the country. If it were adopted it would also have to apply to housing owned by the federal government in the North. A situation in which the lower rule was applied for federal housing and the higher one for private sector would be inequitable and make hiring and retaining staff more difficult. That would constitute the worst of all possibilities.

In short, Revenue Canada has three basic approaches ordered as follows: (1) use the local market to judge rents; (2) where there is no local market, use a closely adjacent one and adjust for the lack of amenities; and (3) where there are inadequate grounds for these adjustments, use a proper return on investment that would be associated with full costs.

Given the lack of a local market and this analysis, (2) is the preferred approach by the company with the caveat that CMHC should be persuaded to deduct the monthly travel costs needed to obtain equivalent amenities. Further some indexing mechanism to hedge against extraordinary pressures on rents in Whitehorse during construction of the AHNGP should be established.

Given the magnitudes under consideration both the company and unions have vested interests in persuading the federal government to introduce its policies gradually or alternative to give an extra year's notice of how it will evaluate the "fair market" rental value of the housing stock. A cost based approach

should be avoided unless interest rates are set very low. Further, given the magnitudes involved there is an argument in favour of their gradual introduction over time. Gradualism would allow such additional tax burdens to occur during a period when prices are anticipated to improve.

Chapter VI

Future Directions of Key Players Other Than Cyprus Anvil

The relationships between Cyprus Anvil and its suppliers reflect mutual reliance upon each other's presence and business. This reliance is so great that bargaining is not carried out in a purely competitive situation. This chapter addresses two of those relationships; first with NCPC and then with White Pass and Yukon.

NCPC

The NCPC notes in its foreword to Proposed Revisions to Existing Utility Rate Structures Yukon Territory Rate Zone that

"The rate applied in each community within the Yukon rate zone need not, however, reflect the actual costs of providing utility services in each community, provided total revenue within the zone is sufficient to meet the expenses associated with all operations within the zone". (NCPC p. 1)

This ruling implies the NCPC has the power to cross-subsidize within its rate zones. There is no reference to the legal foundations, if any, for this ruling by the NCPC even though its implications for Cyprus Anvil are significant.

The alternative of the NCPC proposals, if adopted, would result in Cyprus Anvil paying revenues that exceed costs for electricity by 6.98 per cent given 1981/82 load factors. If costs and revenues for the Cyprus Anvil operations were equated it would save the company \$922,667 in electricity bills (NCPC sec 5 pg. 9) in direct expenditures.

This same document indicates that, should the proposed rate schedule be adopted for residential, commercial and street lighting purposes within Faro, costs will exceed revenue by \$109,835. Thus, for Faro and Cyprus Anvil together revenues of NCPC would be expected to exceed costs by \$812,832. Yet within Whitehorse, costs would exceed revenues by \$327,021. There is little or no reason to argue that Cyprus Anvil should indirectly subsidize electrical users in Whitehorse. The only plausible explanation would be that expansion of Cyprus Anvil was leading to more diesel generation but such an hypothesis fails to recognize that Whitehorse's own expansion also necessitates increased diesel usage. Further, provisions in the proposed rate for Cyprus Anvil would pass on the costs of diesel usage to it.

The NCPC indicates that under new rates on the Whitehorse-Faro and the MAYO, systems will be used to subsidize users in Dawson and Johnson's Crossing by \$503,788 and \$61,057. Except for the \$13,344 for street lights in Dawson City, all electricity consumed in Dawson and at Johnson's Crossings is slated to be by government or "commercial government". In essence this aspect of the proposed rate structure constitutes an indirect tax levied by a federal crown corporation, the NCPC, on the private sector in order to subsidize other government operations and government owned commercial enterprises in Dawson and Johnson's Crossings. Yet taxation powers are vested in parliament and legislatures, not the NCPC. Further, on efficiency grounds such a stance is wrong. People will substitute alternative fuels at efficient levels when the price mechanisms are correct and based on the marginal costs of generation.

If Dawson is to be viewed as a national heritage site, in commemoration of gold rush days for the benefit of tourists from Canada and abroad, then it is the nation, not the private sector firms operating in Yukon, that should be paying for its preservation. The allocation of funds to support Dawson is most appropriately made by Cabinet with access to national support not by the NCPC. By exempting itself from realizing the full costs of supporting a heritage site, as would be the case in the proposed rates, the government is hiding the true costs of supporting such a venture.

There are then grounds for opposing the suggested new rates with a strong thrust towards the establishment of cost recovery systems for each system within the Yukon rate zone. A withdrawal of cross-subsidization could save the company a net of over \$800,000 in the year 1982/83 even after offsetting the current NCPC cross-subsidy to Faro.

The Mining Industry

While increased demands by Cyprus Anvil, due to the completion of the plant expansion as well as overall population growth in Yukon are expected to call forth increasing proportions of diesel-generated electricity in 1982, demand pressures would fall the following year as both Whitehorse Copper and United Keno wind down. Hildebrandt, Young and Associates Ltd. have noted that the closure of these two sites would more than offset increased electricity demands from Cyprus Anvil's expanded mill (HY & A p. 24).

Given the recently announced delays at Mactung and AMAX, it is hard to be optimistic about an expansion of mining until at least the mid 1980s in Yukon. The fate of the Alaska Highway's Natural Gas pipeline remains uncertain due to the failure, thus far, to consolidate the financial package. Should it go ahead, electricity will be needed. Further, there is a potentially large demand to fuel electrically driven pumping equipment by the late 1980's.

Table 6.1 presents other alternative mining sites with anticipated electricity demands. This is taken from Hildebrandt, Young and Associates and reflects their view of the future except for the closure of United Keno which has been advanced following a conversation with David Waugh of the Yukon Chamber of Mines. Further, Cyprus Anvil with the Grum and Vangorda properties intends to continue to operate into the next century.

Given 6-7 years lead time to build a hydro facility, if the more optimistic scenario is accepted then demands dictate that the process be started.

Hildebrandt, Young and Associates (HY and A) estimate the costs of new hydro output at 185 mills per kWh. While capital costs would vary from site to site and with the scale of such a project, (HY and A pg. 13), such a price would be cheaper than diesel once the price of diesel fuel rises above \$2.75-\$2.80 per gallon or nearly twice the 1981/82 level in Yukon. New sources will not be cheap!

Given anticipated increases in the price of diesel, two major thrusts are in order. Seek out alternative hydro sites that

Table 6.1

Low And High Assumptions Of Economic Growth
For The Yukon Economy

LOW CASE

HIGH CASE

Year	Electrical Consumption	Cause Of Change	Population
1980/'81	-- 351,721 kWh	--	24,130
1981/'82	+ 26,854 378,575 kWh	. expansion, Cyprus Anvil	24,130
1982/'83	+ 27,500 406,075 kWh	. expansion, Cyprus Anvil	24,130
1983/'84	- 35,500 370,575 kWh	. closure, Whitehorse Copper	23,500
1984/'85	-- 370,575 kWh	--	23,500
1985/'86	-- 370,575 kWh	--	23,500
1986/'87	-- 370,575 kWh	--	23,500
1987/'88	-- 370,575 kWh	--	23,500
1988/'89	-- 370,575 kWh	--	23,500
1989/'90	-- 370,575 kWh	--	23,500
1990/'91	- 170,000 200,575 kWh	. closure, Cyprus Anvil @ Faro	21,348
	- 30,400 162,175 kWh	. closure, United Keno Hill Mines @ Elsa & Carcross	20,148

Electrical Consumption	Cause Of Change	Population	Year
-- 351,721 kWh	--	24,130	1980/'81
+ 26,854 378,575 kWh	. expansion, Cyprus Anvil	24,488	1981/'82
+ 27,500 406,075 kWh	. expansion, Cyprus Anvil	25,053	1982/'83
+ 8,400 414,475 kWh	. Harbaco Resources		
- 35,500 378,975 kWh	. closure, Whitehorse Copper	25,386	1983/'84
+ 8,000 386,975 kWh	. Prism Resources Kathleen Lakes deposit on stream	26,495	1984/'85
+ 58,700 445,675 kWh	. Anax Northwest Mining Mactung Deposit comes on stream (MacMillan Pass)	27,350	1985/'86
-- 445,675 kWh	--	27,747	1986/'87
+ 95,000 540,675 kWh	. HBM&S Tom Deposit comes on stream (MacMillan Pass)	29,409	1987/'88
-- 540,675 kWh	--	29,835	1988/'89
-- 540,675 kWh	--	30,268	1989/'90
+ 82,000 622,675 kWh	. Placer Development Ltd./ U.S. Steel Corp. - Summit Lake Deposit comes on stream (Howards Pass)		1990/'91
- 38,400 584,275 kWh	. closure, UKIM Ltd. @ Elsa & Carcross	30,706	1990/'91

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Source: Hildebrandt-Young & Associates Ltd., Projected Yukon Energy Requirements 1980 - 1991, October, 1981.

are as economical as possible. In the case of Cyprus Anvil it may be necessary to request permission to construct facilities to meet incremental needs and then sell it to NCPC at a later date. Alternatively, strenuous conservation efforts, including the use of modern wood-burning furnaces for home heating, constitute real options in the quest to lower the need to use diesel for generation. If this effort is to be effective it would imply that the rate structures should uniformly reflect the costs of using diesel at the margin. With the price of diesel fuel at \$1.65 this would be 11¢ kWh (HY and A pg. 56) on systems that use diesel. Campaigns to encourage greater insulation would also reduce winter peaking that requires diesel generated electricity.

Hildebrandt, Young and Associates also suggest the potential use of gas for home and hot water heaters. The use in hot water heaters above would offset the estimated increased demands by Cyprus Anvil for electricity over the next fiscal year. They are, however, so vague about the costs of establishing the needed delivery systems among small concentrations of population that one is hesitant to push such a view.

In order to obtain a lower price of electricity, diesel generation needs to be minimized through:

- 1) encouraging better home and factory insulation,
- 2) the use of wood-burning furnaces,
- 3) marginal cost pricing at 11¢ per kWh plus adjustments for diesel cost increases for all users,
- 4) discontinuation of the cross-subsidies within the Yukon rate zone,

- 5) in keeping with the above, charge its own employees for electricity consumption in order to encourage greater conservation by them, and
- 6) seek alternative hydro sites as long as one assumes that the price of diesel fuel will more than double or if one can find a source that will generate fuel at rates less than 185 mill kWh.

White Pass and Yukon

The major supplier to Cyprus Anvil is White Pass and Yukon. Ways and means whereby it could lower costs are less obvious than those of the NCPC. The Report of the Inquiry... referred to earlier came to the fundamental conclusion that "There is no evidence to suggest that there are any improper financial relationships that exist between rail operations and any other operations within the groups of companies."

There were several recommendations with respect to railway operations which include:

- a) proper maintenance of road beds, bridges and rails as well as the updating of some equipment,
- b) movement of head office to Whitehorse,
- c) improved management,
- d) tougher bargaining with unions,
- e) more aggressive marketing, and
- f) revised pricing of rail services with a view to covering total costs.

In 1979, 78 per cent of White Pass and Yukon's southbound tonnage was in concentrates that were dominated by Cyprus Anvil (Thompson p. 23-25). With the demise of Clinton Creek since then and the pending closure of two other key mines, the railway's

reliance on Cyprus Anvil has been augmented and will be heightened even further by operations of the expanded mill in 1982. The only obvious route whereby competition could be developed, to encourage the railroad from raising tariffs, would be the completion of the Carcross-Skagway Highway to specifications for heavy, ore-carrying trucks. Such a process would be contrary to existing territorial government policy.

The Report of the Inquiry... is, however, pessimistic about this solution on ground of costs. The only direction would then appear to be in ensuring the railway enough traffic in expansion of Cyprus Anvil to keep the per unit price down, given the high fixed costs of operating a railway.

While the railway will garner additional business during the construction of the AHNGP, additional ore hauls will be required to keep rates per ton mile down either after the AHNGP has been built or in lieu of it. With the hesitancy of investors to proceed with new mining sites in Yukon, Cyprus Anvil's own expansion plans become crucial.

Tonnage output is expected to increase by nearly 50% next year with a resulting increase in freight payments to tidewater of the same proportions. Table 6.2 contains anticipated output figures in tons as well as anticipated costs of movements to tidewater. The production figures are inclusive of the present site as well as output from the expansion of Grum and Vangorda.

Table 6.2

Anticipated Output and Transportation Costs

	Production Concentrates		Total	Transport Costs '000 of 1982\$
	Lead (tons)	Zinc		
1982	121,273	237,684	358,957	23,268
1983	118,074	233,205	351,279	22,417
1984	123,671	234,286	357,957	22,541
1985	147,788	270,535	418,323	22,529
1986	182,488	293,050	475,538	28,659
1987	187,661	320,310	504,971	30,438
1988	187,825	328,025	515,849	31,095
1989	147,577	286,235	433,812	26,156
1990	212,815	280,656	493,471	29,725
1991	181,500	305,107	486,607	29,329
1992	135,065	246,563	381,628	23,007
1993	135,065	241,632	376,696	22,708
1994	128,530	231,769	360,299	21,720
1995	83,041	151,050	243,091	14,112

Source: Cyprus Anvil

During periods where traffic is increasing, such as from 1984-86 arguments should be made by Cyprus Anvil in support of lower rates on the grounds that fixed costs of the railway can be spread over more business. The converse would be true after 1990 but, hopefully by then more operations will be underway over which the railway's fixed costs can be spread.

If the AHNGP should progress as scheduled, then the demands by Cyprus Anvil on the railway should help smooth demands in that they pick up just as the AHNGP would be dropping off.

Even though transportation costs are high, the use of up-to-date technology to handle bulk commodities suggests that little room exists for cost savings except through the careful management of White Pass and Yukon with aggressive marketing techniques with respect to other cargo. In particular more northbound traffic would lead to a better balance. Some of this traffic faces competition from trucks so that the railway may only be able to recover variable cost rather than full costs on it. Nevertheless to the extent that such revenues offset more than variable costs, some of the fixed costs would be defrayed by something other than the ore haul.

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