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NORTHERN MINERAL POLICY A FRAMEWORK
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The Northern Mineral Sector: A Framework for Discussion

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THE NORTHERN MINERAL SECTOR:
A FRAMEWORK FOR DISCUSSION

INDIAN AND NORTHERN
AFFAIRS CANADA

A MESSAGE FROM THE HONORABLE DAVID CROMBIE

Mining has always made an important contribution to Canada's economic well-being. Nowhere is this more true than north of 60, where the main engine of social and economic growth has been the mineral industry. Entire communities, including the transportation systems that link them and the energy that powers them, have been founded upon the resourcefulness and initiative of this sector.

In recent years, difficult market conditions have hampered industry's performance. Yet despite this uncertain operational environment, many mines continue to perform well, largely through increased productivity and reduced costs. The challenge is to enhance mining's competitive position over the long-term. Government can help industry meet this objective by providing a clear and consistent policy and program framework.

Such a framework cannot be developed in isolation in Ottawa. Great changes are in store for Yukon and Northwest Territories, changes which will fundamentally alter the relationship between the territories and the rest of Canada. Intergovernmental issues such as the shared responsibility for natural resources will have a direct impact on the future health and viability of the northern mineral industry. Therefore, we must ensure that the process of change is sensitive to both the traditional and potential roles of this sector.

All Canadians have a stake in ensuring that these issues are addressed. That is why I am issuing this paper as the first step in a consultative process which will lead eventually to the development of a northern mineral policy. Such a policy will help shepherd the industry safely through the period of change which lies ahead.

I invite you - industry, labour, government, concerned Canadians - to contribute to the decision-making process. Please send your written suggestions and comments to me at the address listed below by April 30, 1985.



David Crombie
Minister
INDIAN AFFAIRS AND
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The Northern Mineral Sector:
A Framework for Discussion

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I. INTRODUCTION

1. A New Direction for Canada

On November 8, 1984, the Minister of Finance presented an Economic and Fiscal Statement which drew the attention of Canadians to the new realities and new challenges that must be met to reclaim the future of Canada. One of the key concerns identified was the need to revitalize the private sector, especially the resource sector, to secure sustainable growth and create jobs.

Government has a role to play to encourage risk taking and entrepreneurship and to promote greater flexibility and adjustment in the economy. **In the past**, government may have been seen as becoming too big and too intrusive, distorting the entrepreneurial process through the measures it took in some areas, or through lack of vital support in other areas. The appropriate role for government must be developed in an atmosphere of co-operation and consultation with all Canadians.

A framework to focus the consultation process has been outlined in the paper A New Direction for Canada: An Agenda for Economic Renewal. Two major concerns are addressed: promoting growth in the private sector and restoring fiscal flexibility. There are a number of approaches to foster private sector growth and overcome obstacles through appropriate changes in a broad spectrum of policy areas. Major areas for promoting private sector growth include R & D, innovation and technology diffusion, export markets and financing, private sector investment, and labour markets and human resources. Economic strength and adjustment at the national, regional and individual levels should be looked at in terms of adapting to economic and technological change and sharing and drawing upon the inherent strengths of all regions in Canada. The appropriate role for government in economic regulation and intervention requires close scrutiny. Energy policy is a separate issue of particular importance. Further issues may be identified in the course of discussion.

This paper examines how these concerns apply in particular to the mineral sector in the Northwest Territories (NWT) and Yukon.

2. A New Direction for the North

The mineral industry is a key sector of the Canadian economy. This is especially true in the two territories where the mineral industry is the leading producer of new wealth. Before the recent downturn in the industry in Yukon, it **accounted** for more than 80 per cent of the total value added by all goods-producing industries in both Territories. Northern Canada, with less than 1 per cent of Canada's population, contributes 8 per cent to the national metallic mineral production. Even this is well below the north's potential considering that it comprises 40 per cent of the Canadian land mass. Figure 1 illustrates changes in the value of production by territory over the period 1973-1984.

In southern Canada, the direct responsibility for regulating the mineral industry rests with the respective provincial governments. In the northern territories, the Crown owns the resource and the federal government has placed the mandate for its management with the Minister of Indian and Northern Affairs Canada who at present exercises many duties similar to those of a provincial government. Some responsibilities (e.g. roads) are performed jointly by the federal and territorial governments, others (e.g. education and training, and, in the NWT, mining safety) by the latter alone.

At the national level, as distinct from the specifically local or regional level, the federal Department of Energy, Mines and Resources plays a lead federal role related to mining.

Northern political directions are changing as territorial governments and native people seek a greater influence over the course of northern development by acquiring new powers and increased governmental responsibilities. Northerners want to assume their place within the mainstream of Canadian political life. But with the acquisition of provincial-type powers will come the need to strengthen the North's economic base.

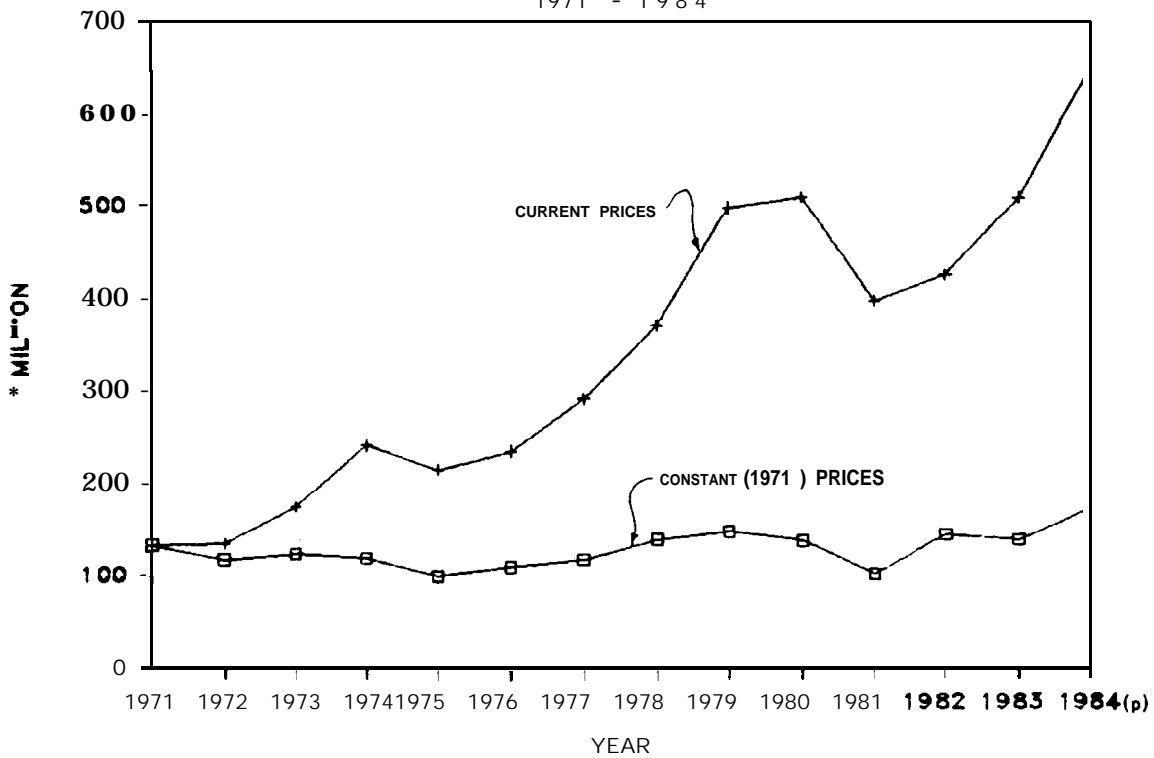
In the remainder of the 1980s, the economic environment for the northern mineral industry will be constrained by increased international competition in mineral production and modest growth in world demand for most mineral commodities. The efficient mines will survive, just as they did during the recent recession.

The mineral sector offers one of the few options for an increase in the financial viability of government in the North. Without non-renewable resource development, the economic base needed to support the rising aspirations and increasing political autonomy of the territorial governments is unlikely to be attained, and resource revenues which could be shared with the territorial governments will simply not materialize.

Figure 1

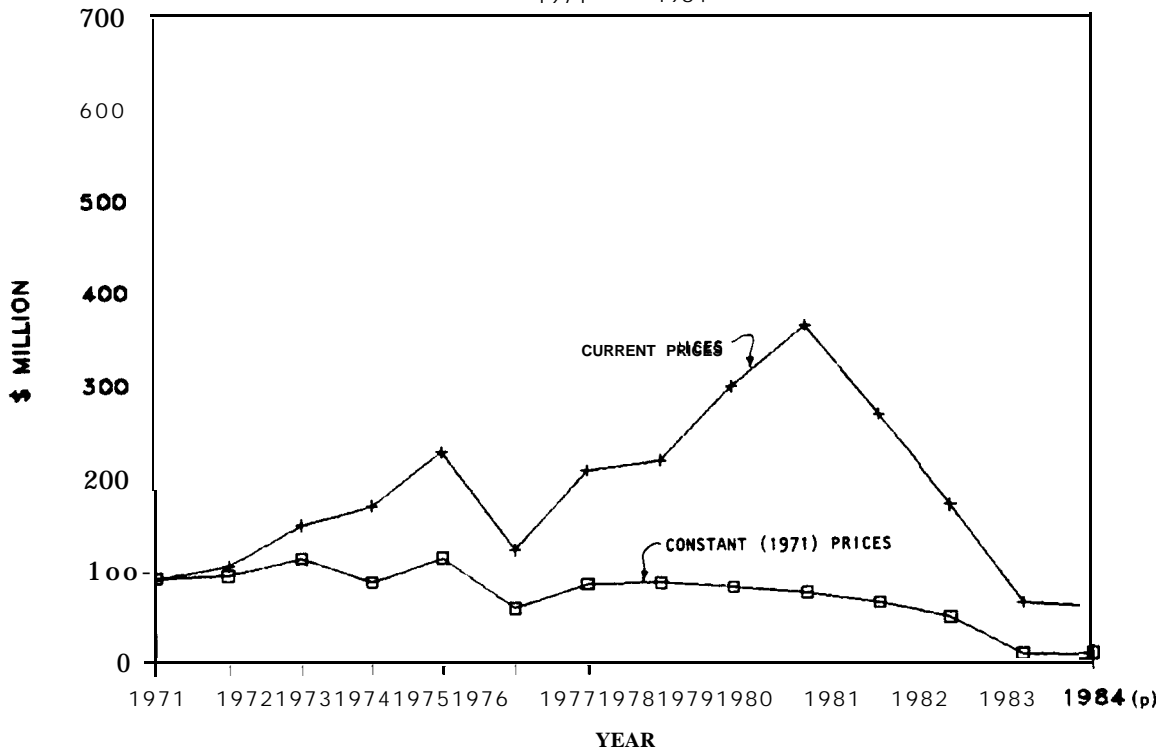
VALUE OF MINERAL PRODUCTION – NWT

1971 - 1984



VALUE OF MINERAL PRODUCTION – YUKON

1971 - 1984



On the other hand, it is doubtful if direct revenues from minerals could of themselves significantly affect the financial viability of the territorial governments. A review of current statistics bearing on federal-territorial financial relations clearly highlights the problem. The economic reality is that people who live in southern **Canada** comprise the majority of the de facto northern tax base. The nation as a whole bears a very much larger proportion of the costs of public services and administration in the territories than in any other part of Canada. Deficit grants from the federal government to both territorial governments in the 1983-84 fiscal year were \$450 million, or about \$6,400 for each of the 70,000 territorial residents. These transfers comprised 73 per cent of the budget of the Government of the Northwest Territories (**GNWT**) and 59 per cent of the budget of the Government of Yukon. These ratios have not improved since, nor would any improvement appear likely in the foreseeable future. With increasing pressures for **devolution** not only to the territories but within the territories, this fiscal dependency on the south is likely to increase significantly during the next decade unless major indigenous sources of revenues are found. Even if a very optimistic view of such revenues is taken, large subsidies are likely to be required by the territories until well into the next century. Given the enormous demands that structural and **demographic** changes throughout Canada will place on federal resources **during** coming" decades, anything that can be achieved to decrease the costs and increase the **viability** of Canada's most marginal regions, such as the territories, will be a positive step.

A major **challenge** in the North therefore will be to keep the northern mineral industry competitive in world markets by increasing productivity and reducing costs. In order to achieve this, a broad spectrum of issues concerning government/industry interrelationships must be addressed to ensure that government uses its limited resources to play an appropriate and effective role in northern mineral development. This means freeing up the system without adding new costs. Not surprisingly, the issues facing northern mining can be readily identified with those set out in the strategy for economic renewal. They are discussed in more detail in subsequent sections of this paper.

None of the major social and economic problems that confronts the industry can be resolved unless government, industry and northern interest groups work together. **The** task facing all-those concerned is no longer to argue how to divide an automatically expanding pie but to ensure that the pie continues to expand and that in an increasingly competitive world a viable industry is maintained. This can only be achieved by reducing costs, including those imposed by government, and by promoting simplicity, equity, savings and investment. The debate and discussion this paper will initiate is part of the process of facilitating needed adjustment to the new economic realities and arriving at a consensus on new directions.

II. OVERVIEW

1. Northern Mineral Resource Base

Yukon and the Northwest Territories comprise 40 per cent of Canada's land area. This vast region contains a wide variety of geological environments with mineral potential similar to the geological provinces of southern Canada.

In 1983, the 16 hard rock mines and numerous placer mines in the Yukon and Northwest Territories produced 7.3 per cent of Canada's metallic mineral production with a value of \$590 million. Two of these mines, both small silver producers, operated only in 1983. Figure 2 shows the mines operating in 1984.

The northern mineral industry is in an early stage of development and much of the mineral potential remains to be identified by exploration. Our knowledge to date points to the conclusion that the northern mineral resource base will not be a main limiting factor in realizing more fully the potential of the mining industry to create more jobs and to contribute in **many other ways to the northern economy**. However, under current metal market conditions only a few of the identified mineral deposits in the north have the potential to be brought into production over the next few years (Figure 3). For the longer term, there is a substantial inventory of major deposits of lead, zinc, silver, gold, tungsten, uranium and other mineral commodities which could be developed for production under favorable economic conditions (Figure 4).

a) Zinc and Lead

The North contains four of the seven largest zinc-lead-silver mines in Canada, although one of the largest zinc-lead mines, Cyprus Anvil Mining Corporation's mine in Fare, is currently closed. The three operating mines produced 23 per cent of the zinc and 27 per cent of the lead produced in Canada in 1983.

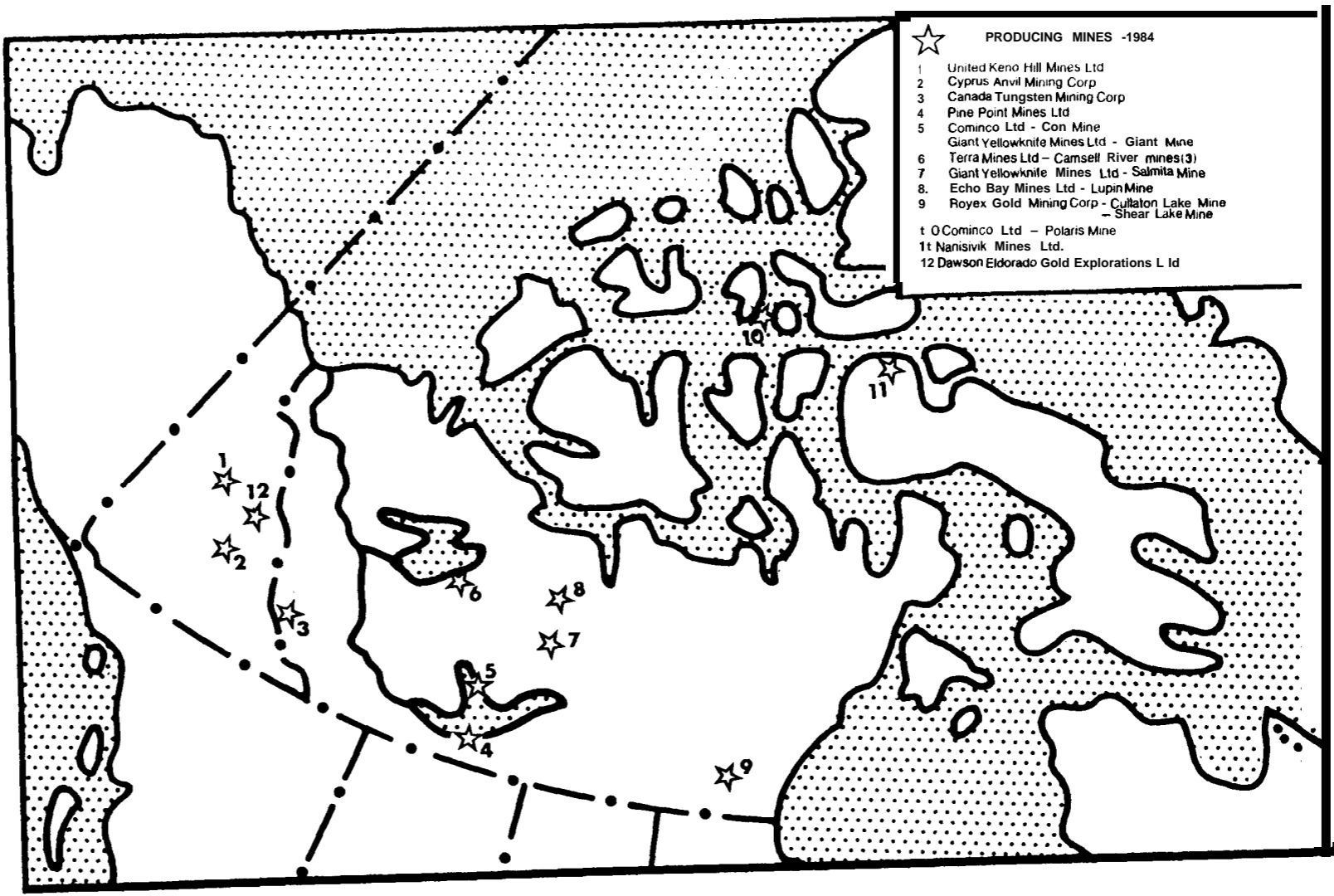


Figure 2

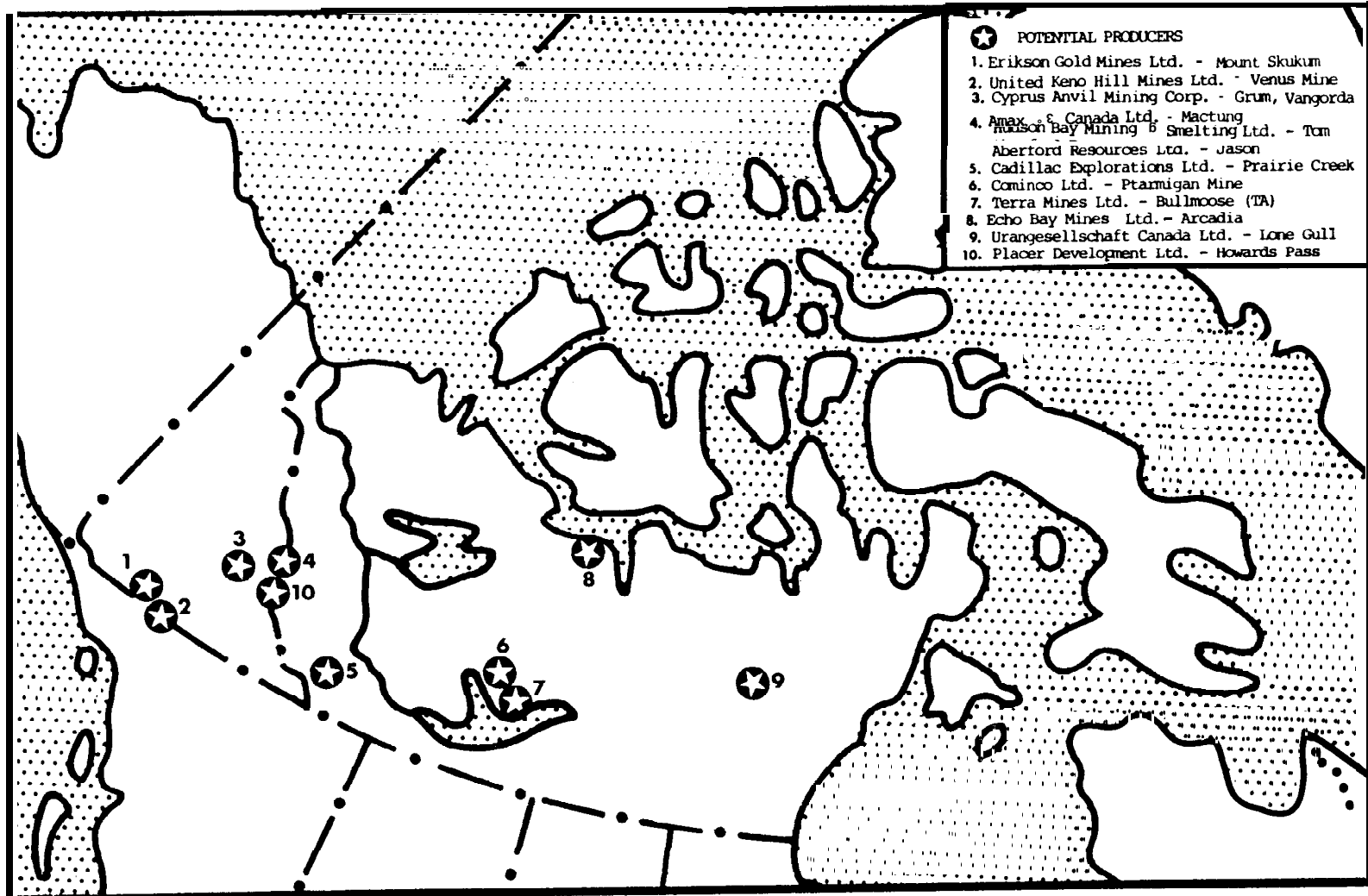


Figure 3

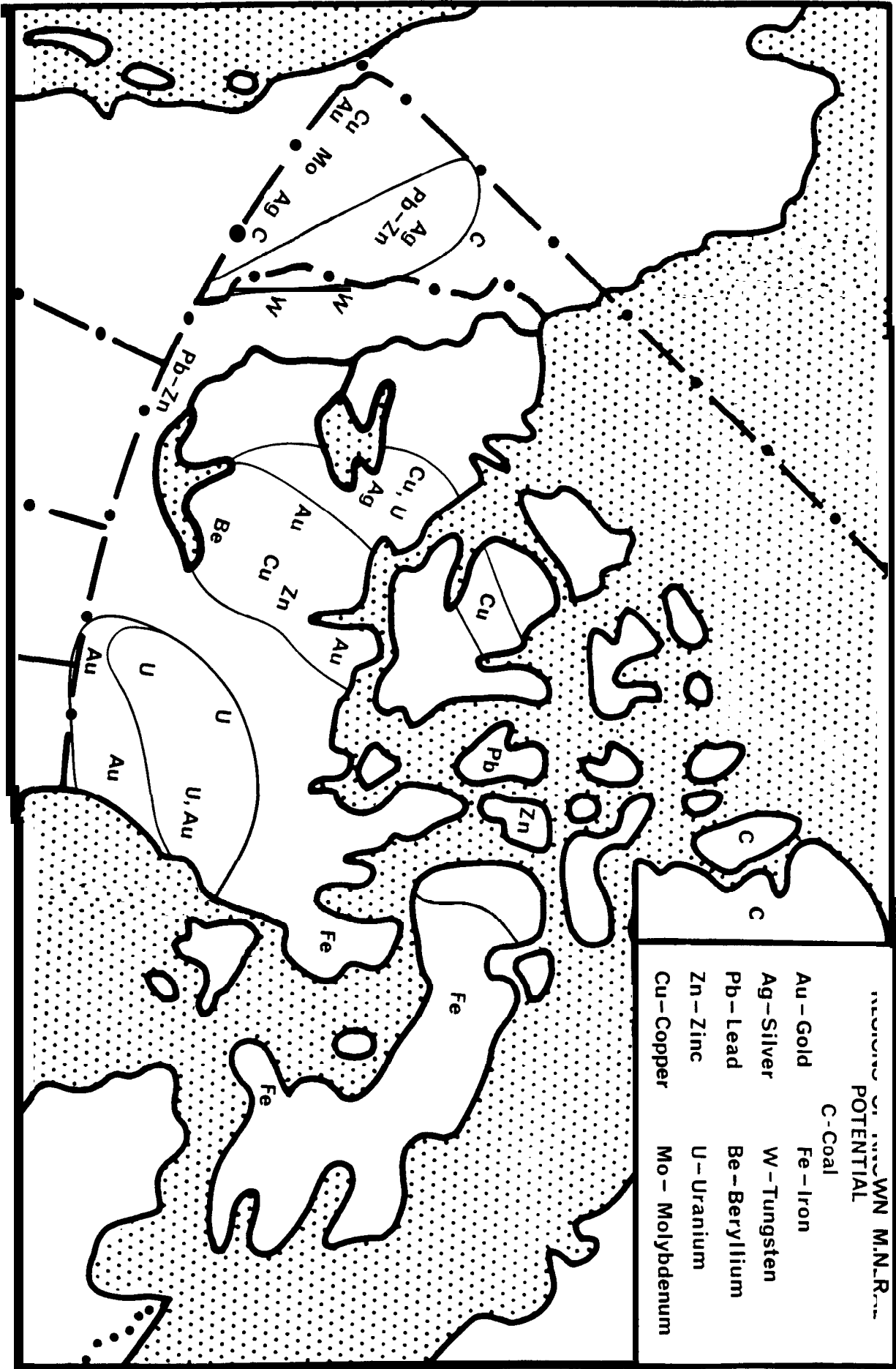


Figure 4

b) Gold

The five gold mines in the Northwest Territories and over 200 placer mining operations in Yukon produced, in **total**, 17.2 per cent of the 1983 Canadian gold production. This sector was the most active in exploration and development in 1984.

c) Silver

The five silver mines along with the by-product silver production from zinc-lead and gold mines in Yukon and the Northwest Territories produced 6.2 per cent of the 1983 silver production in Canada.

d) Tungsten

Canada Tungsten Mining Corporation, once Canada's only tungsten mine and until recently North America's largest producer, produced 96.9 per cent of Canada's tungsten in 1983. The world's second largest tungsten deposit at MacMillan Pass on the Yukon-NWT border is expected to be brought into production in the late 1980s.

e) Coal and Other Minerals

Coal is not currently mined in the North, but coal resources are large.

Numerous deposits of various minerals containing **barite**, beryllium, molybdenum and uranium have been defined. They could be developed under favorable economic scenarios.

2. The Economic Impacts of Northern Mining

Since the turn of the century, exploration and mining have played a major role in the political and economic development of both territories. These activities have contributed significantly to the development of the transportation and power generating infrastructure and led to the development of several communities.

Because of the relatively simple structure of the territorial economies and the restricted range of other economic opportunities, mining plays a more important role there than in other areas of Canada. For example, if the two territories are considered together, it is estimated that mining's direct contribution to Gross Domestic Product (GDP) in 1982 was 18 per cent. This is three times greater

than mining's contribution in Newfoundland (six per cent) and about 15 times greater than most other mining provinces in Canada. Similarly, mining's contribution to regional employment in the two territories averaged almost 16 per cent over the period 1976-1981 or about nine times the Canadian average. Clearly, the future health of the mining industry will have a major impact on the growth of the territorial economies.

However, significant differences in the role of mining can be observed when the territories are examined individually. In Yukon, it is estimated that mining's total direct, indirect and induced contribution to the Gross Domestic Product over the period 1971-1975 averaged 46 per cent, declining to about 33 per cent in 1977-1978. (Statistics Canada is currently preparing estimates to 1982). This share has declined significantly with the permanent closure of Whitehorse Copper Mines and the indefinite suspension of production at Cyprus Anvil's Faro mine, resulting in adverse impacts throughout the Yukon economy, including reduced employment opportunities and the shut-down of the White Pass and Yukon Railway (Figure 5).

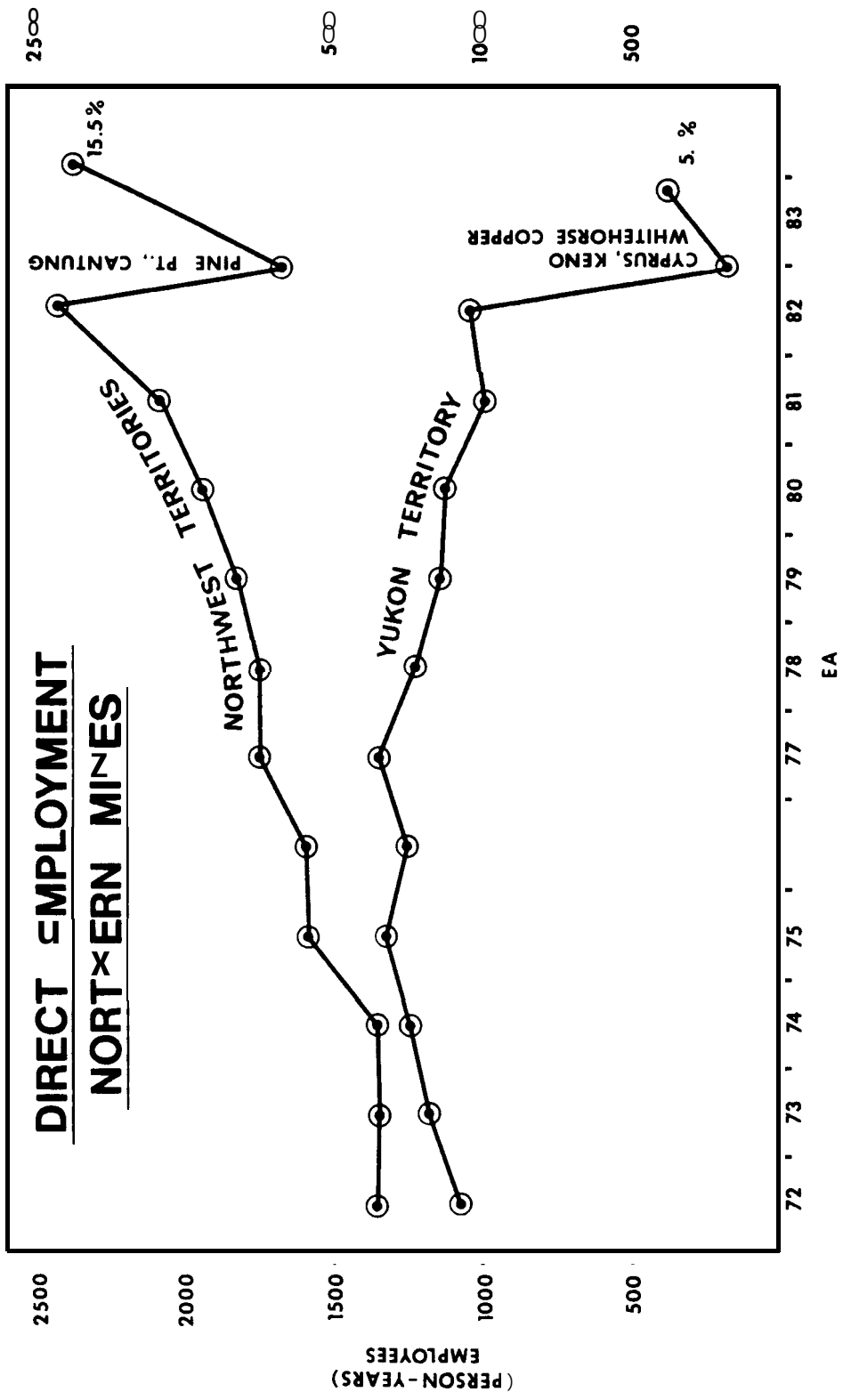
In contrast, the mining industry in the Northwest Territories is healthier, consisting of 13 operating mines in 1984. Mining's total share of GDP was estimated at about 40 per cent over 1971-1975 and about 44 per cent in 1978. In spite of the health of the industry and the opening of new mines, mining's share may decrease as oil and gas projects come into production and contribute a greater share to the GDP.

The impacts of mining vary considerably with the type and location of projects and the structure of the regional economies. Large interior base metal mines, such as Cyprus Anvil and Pine Point, generate most northern benefits through the development of new communities and their requirements for major transportation and power infrastructure. Remote developments, such as remote interior gold mines or base metal mines located on tidewater, have fewer local impacts but do provide significant benefits to southern Canada through their demands for goods and services. It is estimated that over the period 1978-1982 the Northwest Territories' mining industry spent on average about 28 per cent of its annual expenditures (wages, salaries and taxes) in the Territories while the balance was spent 58 per cent in the rest of Canada and 14 per cent outside Canada. Northern mines also contribute significantly to the Canadian balance of payments since much of northern mineral production is exported.

3. Competitiveness of Northern Mining

World cost-rankings in the early 1980s showed Canadian mines on average as the lowest cost producers of zinc in the world and our northern mines - excluding Cyprus Anvil - among the lowest-cost

Figure 5



producers in Canada. Analysis of cash flows from six northern mines indicates a range of internal rates of return similar to other regions in Canada. Producers of the metals mined in the region (zinc, lead, gold, silver, tungsten) face international competition and currently depressed prices as do mines in southern Canada. Because of the mix of metals produced in the North, the industry does not face the problems experienced by copper and nickel producers where much of the competition is state-owned and less profit-oriented. **In fact**, in the NWT, the value of production has set record highs for the last three straight years.

Because of the vast distances and harsh climatic conditions, high development and operating costs for **labour**, power and transportation place northern mines at a distinct disadvantage to mines in southern Canada. Thus to be successful they have required larger, richer orebodies with favorable mining and concentration characteristics, or other advantages such as proximity to **tidewater**. Not surprisingly the only zinc/lead orebodies developed in Canada during the last decade are close to tidewater in the Arctic.

Precious metal exploration has not been so restricted by the vastness of the northern region and limited infrastructure. **Mining** in the North started with **precious** metals, during the **Klondike** gold rush. Precious metals still account for the majority of the mines, and are by-products in most of the others. While not having the lowest mining costs in Canada, these mines are able to compete because of a favorable combination of factors such as size and ore grade, (for example, the **Lupin** mine) or because they are old established operations such as the Giant-Yellowknife mine.

At the present time it is probably an understatement to say that the international mining industry generally is in a state of depression with surplus capacity and low product prices in terms of U.S.A. and Canadian currency. There is little Canada can do in regard to international production and metal prices. Although there are negative impacts on other parts of the Canadian economy, weakness of the Canadian dollar in relation to the U.S. dollar generally helps the Canadian mining industry. Thus, while existing northern mines may be glad that they are not involved in copper and nickel, the outlook is definitely not optimistic for a return to buoyant cash flows and activity in the immediate future, particularly with recent trends in the prices of silver and gold. **While** potential for development undoubtedly exists, the present economic environment is not conducive to bold decisions on development with long lead times, and large capital outlays.

In the past, northern mining has been successful. For it to remain competitive in the future, both government and industry must take steps to ensure that the right blend of resources, capital and human skills is available to develop the mineral potential of the North.

III. KEY ISSUES

Many issues and problems are common to the mineral industry across Canada. However, ongoing consultation on northern mining operations has identified a number of key issues which are of particular importance to - in some cases unique to - the northern mineral industry.

In order to help focus the discussion these issues are addressed in the following sections in broad groupings which relate generally to the items identified in A New Direction for Canada: An Agenda for Economic Renewal. Obviously, any decision on the devolution of resources to the territorial governments could have major implications for many of these issues.

1. Roles of Private and Public Sectors

a) Government Framework

The northern mining industry has expressed the concern that the federal government does not assign to mineral development in the Northwest Territories and Yukon a priority appropriate to its role in the economic development of the North and Canada. This concern was spelled out clearly in the report of the Northern Mineral Advisory Committee on northern mineral policy and implementation strategies, presented to the Minister of Indian and Northern Affairs Canada in August 1979. The Committee recommended as a first policy principle that the federal government foster, promote and encourage prospecting, exploration and mining in Yukon and Northwest Territories in recognition of the fundamental role of non-renewable resources in the economic and social development of the North.

GIVEN THE MINERAL INDUSTRY'S PAST ACCOMPLISHMENTS AND THE NORTH'S MINERAL POTENTIAL, HOW CAN GOVERNMENT ENCOURAGE NORTHERN EXPLORATION AND MINING DURING THE CURRENT PERIOD OF INTENSE INTERNATIONAL COMPETITION AND GOVERNMENT'S FISCAL CONSTRAINT?

b) Infrastructure for Transportation and Power

The mining industry has sought clarification regarding the government's role in the provision of infrastructure to encourage mineral development. Primary concerns of the mining industry

have been the lack of adequate infrastructure and the uncertainty associated with cost-sharing. The industry maintained that it was unfair to ask potential developers to share costs when the industry already pays corporate taxes, royalties, fuel taxes and licensing fees. Cost-sharing is seen as a factor retarding development rather than promoting it.

In most cases, the cost of infrastructure is the most significant in the total cost of mining projects. In the case of Pine Point, for example, infrastructure accounted for about 78 per cent of the **total** project cost (\$112.9 million), whereas at Cyprus Anvil and **Nanisivik** the amounts were in the order of 23 per cent (\$117.5 million) and 26 per cent (\$93.8 million) respectively.

Government's role in the provision of infrastructure in support of mining has varied with changing government objectives and priorities. A flexible approach has been taken with all mining developments being considered on a case-by-case basis. Its contribution has ranged from not providing any assistance (Polaris and **Lupin** Mines), to cost-sharing (access roads), to cost recovery (Great Slave Lake Railway, **Nanisivik** dock), to providing infrastructure without cost recovery (construction of or upgrading of the territorial road network), to taking equity in the mining venture in return for the provision of infrastructure (**Nanisivik**). In recent years, the trend has been towards a greater degree of cost-sharing **and/or** cost recovery.

WHAT METHODS AND CONDITIONS OF COST-SHARING OR COST-RECOVERY ARE PREFERRED FOR THE PROVISION OF INFRASTRUCTURE?

The costs of construction and reconstruction of roads in the North are high, but the distances are great and difficult environmental conditions pose problems. It is not unusual for a development road to cost between \$150,000 and \$500,000 per **kilometre** across difficult terrain. In the North, federal funds have been expended in the expectation that the North as well as Canada will benefit. The railway to Hay River and Pine Point and the extension of the road network to Faro provided essential transport linkages for communities and regional development, including tourism. Provinces, often with help from the federal Government, have contributed to or funded roads and/or railways leading to resource developments.

At present, the total capital budget for the Northern Roads Program funded by the federal government amounts to \$19.2 million per year. This covers all new roads and the reconstruction of

all inter-territorial roads, bridges and ferries in an area that covers 40 per cent of Canada. Not all of this funding contributes directly to mining developments. It also covers main highways, some of which promote the hydro-carbon industry, tourism and community access.

In addition, the territorial governments are allotted \$100,000 per year through their capital grants for resource exploration access. The GNWT has discontinued this program and utilized the resources for other priorities. The Government of Yukon has budgeted \$30,000 of the \$100,000 for resource exploration access in 1984-85.

Although the federal government has taken the role of leader in the provision of infrastructure, this has required the direct and indirect involvement of many others such as the territorial and municipal governments, local interest groups, communities and business. The number of players involved, all usually with their own - often conflicting - objectives, complicates decision-making (Figure 6). Other perceived constraints to the speedy provision of roads and airstrips have been: limited funding, lengthy and costly environmental processes, claims by native groups and, in some cases, opposition to development by groups seeking environmental preservation.

The provision of infrastructure for the generation and transmission of electricity for mining is another matter of concern. Some companies in remote areas generate their own electricity, but most companies buy it from the Northern Canada Power Commission (NCPC) at rates that reflect the cost of generation and transmission. Some long-term considerations include the cost of electricity for industrial consumers and the provision of adequate generation facilities to meet the future electrical demand.

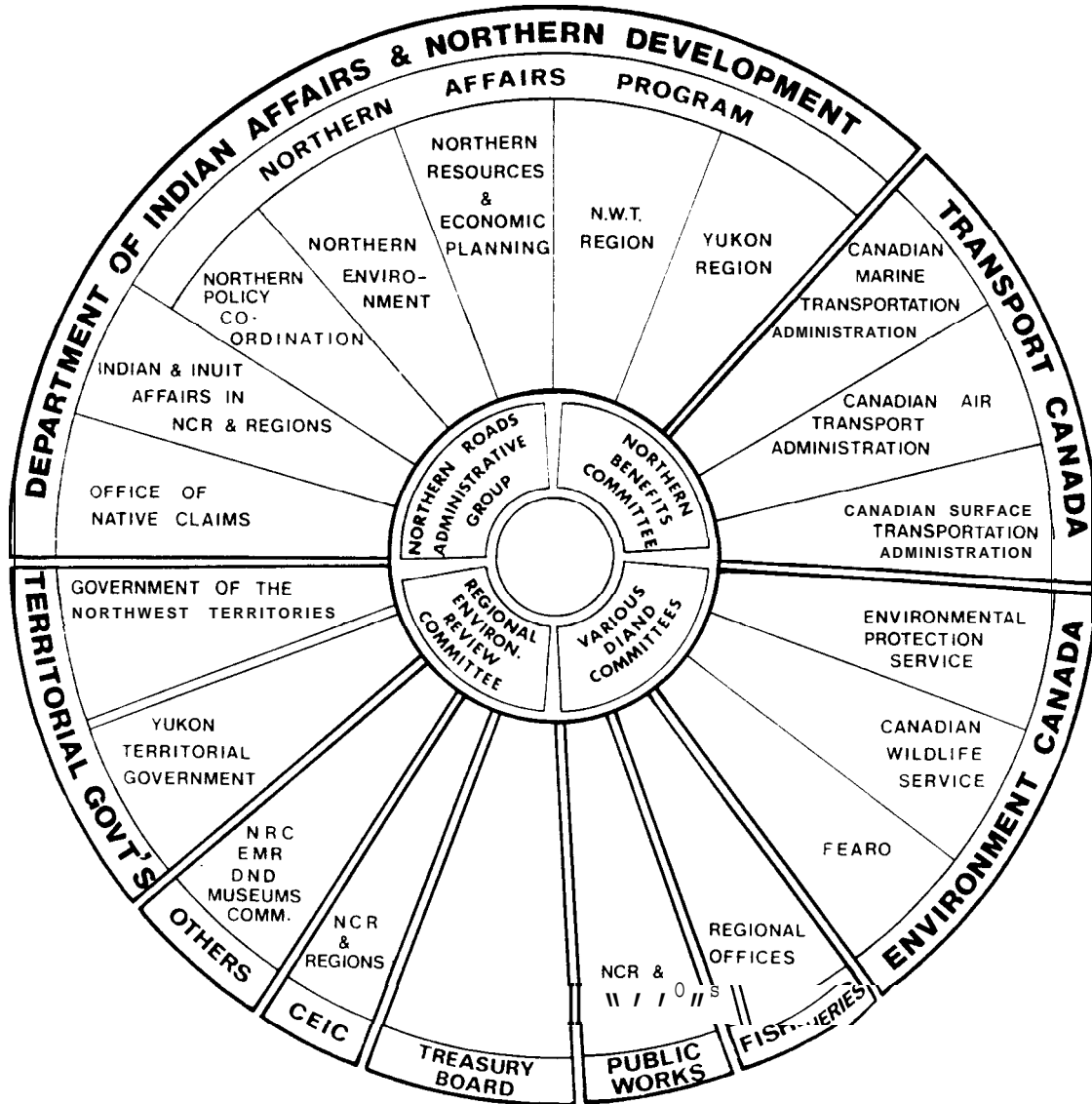
WHAT IS THE MOST EFFECTIVE WAY OF SPEEDING UP AND IMPROVING DECISIONS REGARDING THE PROVISION OF INFRASTRUCTURE, GIVEN THE INVOLVEMENT OF SO MANY PLAYERS? HOW CAN INDUSTRY HELP?

c) Taxation and Royalty Structures

The northern mining royalty or taxation regimes have not been changed significantly in recent years. In Yukon, the placer mining tax on gold is 37.5 cents an ounce, payable only upon export of the gold from the territory. Other metal mining royalty levies in Yukon are contained in the Yukon Quartz Mining Act which was enacted in 1924. This tax is based upon profit of

Figure 6

GOVERNMENT PARTICIPATION IN PROVISION
OF TRANSPORTATION INFRASTRUCTURE



the mine as determined by section 95 of the Act. It provides for mining taxes generally lower than in the provinces, but may be in some way inequitable because it does not authorize deductions for some costs which today are generally considered necessary expenses directly related to the cost of mining, for example, those relating to subsidized housing and recreation facilities in isolated communities. Exploration and development costs may be deducted only in the year they are made. The burden of mining royalty or taxation in the Northwest Territories has been lower than in Yukon largely because of a three-year tax-free period and a maximum rate. Recent interpretations of the meaning of certain sections of the Yukon legislation may significantly reduce future royalties. The Northwest Territories royalties are set out in section 65 of the Canada Mining Regulations.

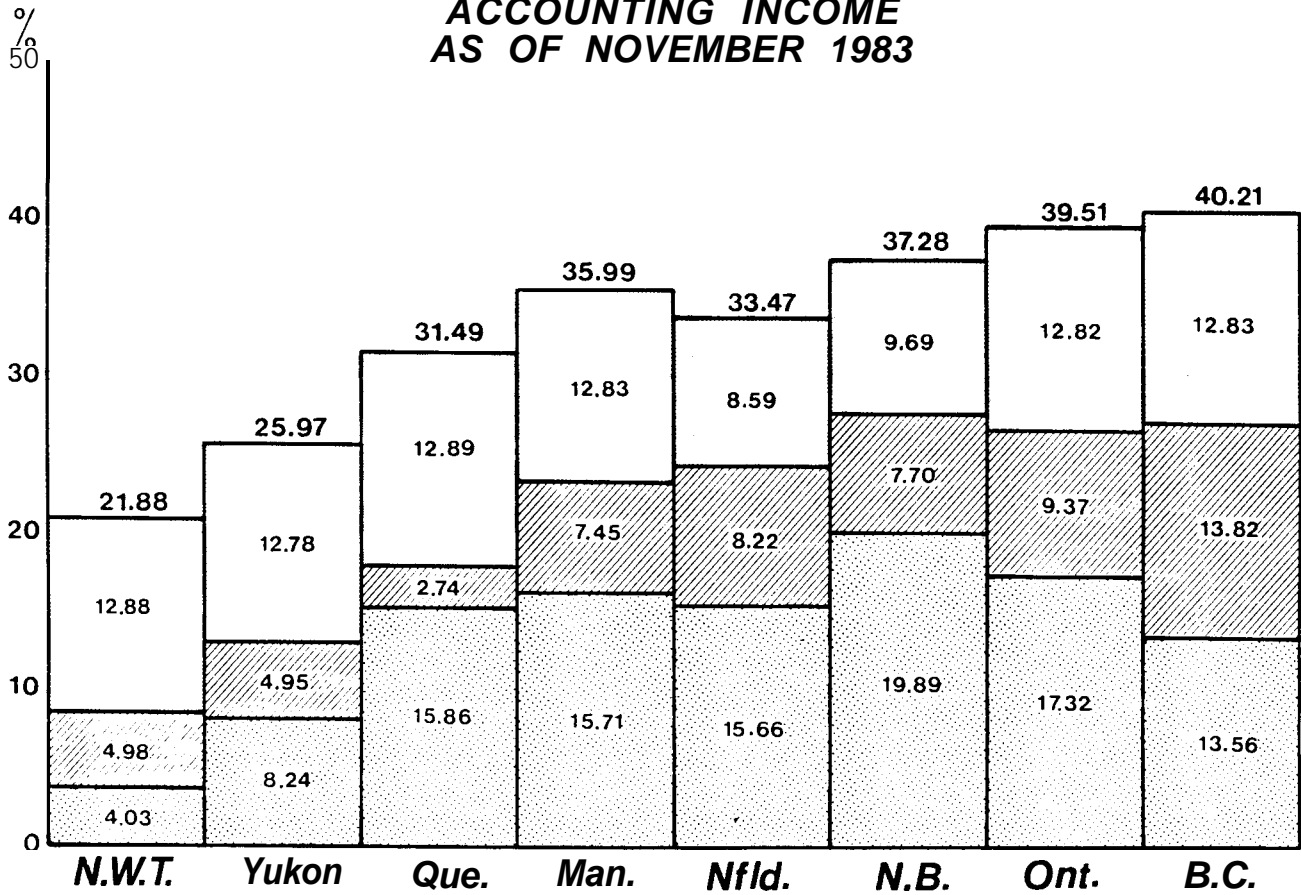
Although in the north there are no special provincial tax incentives for exploration such as exist in Quebec, the tax burden on profitable mines is generally lower than in the provinces. Based on legislation in effect September 1, 1983 and using as a model **a \$100 million mining project with a 10-year life and annual net revenue of \$25 to \$45 million**, a Price Waterhouse study indicated that total income-based taxes in B.C. and Ontario amounted to about 40 per cent, in Quebec 31 per cent, while taxes in NWT and Yukon were 22 per cent and 26 per cent respectively (Figure 7).



The level of taxation and mineral royalty in the territories may appear low by provincial standards, although the open-ended incremental Yukon rate structure would sharply increase the royalties payable with inflation and on large profitable projects. The structure of the present royalty provisions has been criticised because they do not fully allow for depreciation, **pre-production** costs, processing allowances, the value of capital and allowable expenses such as taxes and townsite costs. While room appears to exist for additional taxation, it may be argued that northern development is heavily dependent on mining for year-round employment and that a differential in relation to the provinces may be appropriate, particularly in view of the higher risks in northern mining. The effect of the level of mineral taxation on the level of economic mining activity could be an important factor in the consideration of any change.

SHOULD THE TAXATION AND ROYALTY STRUCTURES IN THE TERRITORIES BE MODIFIED TO TAKE ACCOUNT OF THE RISKS INHERENT IN THE OPERATION OF BOTH ESTABLISHED AND NEW MINES?

Figure 7

**SUMMARY OF EFFECTIVE TOTAL INCOME
AND MINING TAX RATE ON HYPOTHETICAL
NEW MINE AS A PERCENTAGE OF
ACCOUNTING INCOME
AS OF NOVEMBER 1983**



Federal Income Tax . 1 Provincial Income Tax  Provincial Mining Tax 

d) Mechanisms for Government Consultation

Ongoing consultation between the federal government and the northern mineral industry on issues and concerns of common interest is essential. Since 1978, the Northern Mineral Advisory Committee (NMAC) has been the formal channel of communication with the Minister of Indian and Northern Affairs Canada. The Committee is made up of representatives from the Northwest Territories Chamber of Mines, the Alberta Chamber of Mines, the B.C. and Yukon Chamber of Mines, the Mining Association of Canada and representatives of the federal and territorial governments. The Yukon Chamber of Mines withdrew from the Committee in November 1984, citing dissatisfaction with its effectiveness. From the formation of the NMAC until September 1984, there was in the Minister's office a senior mining advisor who also acted as Executive Secretary of the Committee. In addition to this formal mechanism, there is ongoing consultation at the ministerial and officials level with industry organizations, companies and individuals on specific issues.

SHOULD THE NORTHERN MINERAL ADVISORY COMMITTEE BE
RESTRUCTURED OR REPLACED?

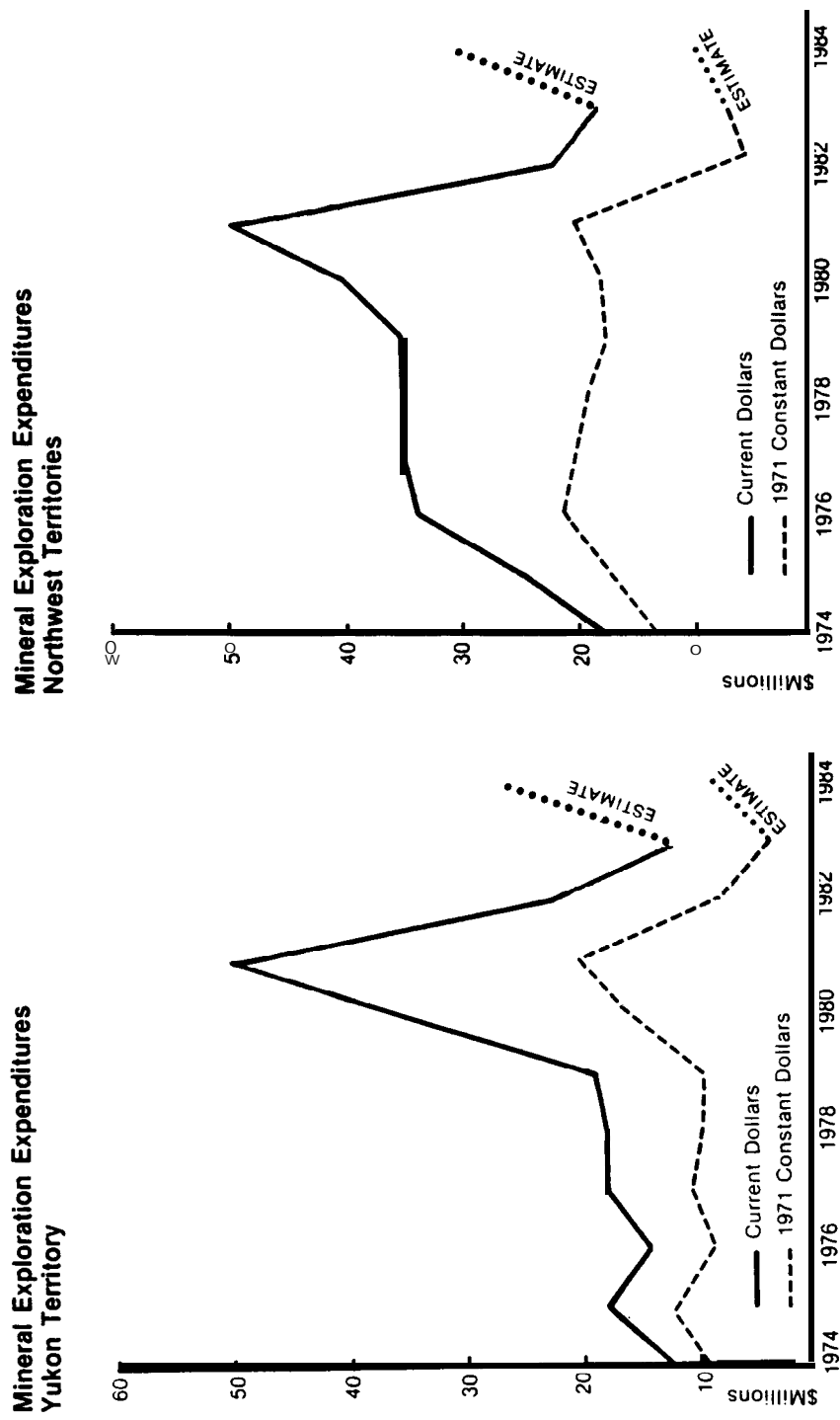
e) Support for Exploration

Over the long term, Yukon and the Northwest Territories offer considerable potential for growth in the industry if private investment in mineral exploration is maintained at an adequate level. Trends in exploration expenditures are shown in Figure 8.

Historically, government has supported mineral exploration by provision of basic geological and survey maps, which have increased in detail over time. More recently, reports of exploration activities have been required as a condition under which **stakers** may acquire the rights to Crown minerals. This information is added to the data base and is available for later **research**. Resident geologists are employed to provide expert local knowledge for the assistance of those planning exploration **activities**.

Since the 1950s, Canadian provincial geological surveys have assumed a larger role in the provision of geological services to support private-sector mineral exploration. Complementary to this, the Geological Survey of Canada (GSC) has directed its activities increasingly towards a diversified **geoscientific** role to provide both broader and in-depth knowledge of Canada's geology and mineral/hydrocarbon resources rather than a provincial-type survey role in direct support of mineral exploration activities. INAC and GSC officials meet annually to co-ordinate their respective field activities. In terms of the

Figure 8



Level of geological services and outputs, the geological services provided by INAC in Yukon and the Northwest Territories have lagged behind those of the provinces, perhaps reflecting the frontier nature of exploration in the North. Indeed the budgeted resources in each Territory are lower in terms of dollar expenditures and person years than any of the provincial geological surveys of Canada, including those of Newfoundland, Nova Scotia and New Brunswick, based upon published 1982-83 comparisons. However, in 1983 the Northwest Territories ranked fifth in the total value of metallic minerals produced. The results of a comparative analysis are shown in Table 1. Table 2 shows federal expenditures. Furthermore, unlike some provinces, the federal government does not offer direct assistance for exploration. During 1985-1989, the resources allocated for INAC'S geological services in Yukon will be increased by a planned \$1.1 million under the Canada-Yukon Subsidiary Agreement on Mineral Resources. There are no similar plans to augment INAC'S geological services in the NWT.

WHAT SHOULD INAC'S ROLE BE IN SUPPORT OF MINERAL EXPLORATION AND DELINEATION?

COULD THE GOVERNMENT FUNDS AVAILABLE FOR SUPPORT FOR EXPLORATION BE ALLOCATED IN A MORE EFFECTIVE MANNER?

2. Human Resources

a) Human Resource Development

Many northerners are adjusting to significant changes in their lifestyle. They are making efforts to increase their understanding of the resource developments that are likely to offer them new opportunities. A recent example of their initiative was a seminar on mining, given by INAC (December 1984) at the request of the Council for Yukon Indians.

Meanwhile the federal government has been seeking methods of helping native northerners to develop the skills required for an increasingly sophisticated technological society. It appears that until the training of northerners in appropriate skills is accomplished there will be a need to bring southerners to fill the highly-skilled and senior managerial positions.

IS THE CURRENT RESPONSE BY INDUSTRY AND GOVERNMENT TO THE NEED FOR SKILLED PERSONNEL ADEQUATE?

COMPARISON OF PERSONNEL RESOURCE ALLOCATION BY
NATIONAL PROVINCIAL AND TERRITORIAL GEOLOGICAL SURVEYS

SURVEY AND REGION	PREDOMINANT OBJECTIVE	MINERAL PRODUCTION VALUE PER PERSON YEAR (\$ MILLIONS/PY)	AREA PER PERSON YEAR (KM ² /PY)
GSC: NORTH OF60	GEOSCIENTIFIC RESEARCH	2.5	15,900
GSC: CANADA TOTAL		11.8	11,900
DIAND: N.W.T.	GEOLOGY IN SUPPORT OF MINERAL DEVELOPMENT	35.5	270,500
DIAND: YUKON		21.1	59,800
QUEBEC	GEOLOGY IN SUPPORT OF MINERAL DEVELOPMENT	7.8	6,200
ONTARIO		10.0	3,600
BRITISH COLUMBIA		17.0	12,700
MANITOBA		9.3	13,900
SASKATCHEWAN		23.0	13,600
ALBERTA		2.9	3,200
NEW BRUNSWICK		16.2	2,700
NOVA SCOTIA		0.9	692
NEWFOUNDLAND		6.1	3,600

Table 2

INAC REGIONAL GEOLOGICAL SERVICES
BUDGET ALLOCATION 1984-85

ACTIVITY	YUKON	N. W. T.
ADMINISTRATION	214, 000	180, 000
CORE LIBRARY	10, 000	30, 000
FIELD WORK		
BEDROCK MAPPING	273, 000	563, 000
SURFICIAL MAPPING	86, 000	4, 500
OFFICE GEOLOGY		
MINERAL INVENTORY AND ANALYSIS	96,000	170, 000
PUBLICATIONS	19, 000	230, 000
EDUCATION	5, 000	6, 000
TOTAL	703, 000	1, 184, 000

The Geological Survey of Canada has budgeted approximately \$35 million for direct scientific activities of which over one third is allocated to projects related to the Territories. The Territories make up about 40 per cent of Canada's land mass.

Both territorial and federal governments have responsibilities for vocational training. In Yukon, industrial training is the responsibility of the Department of Education while the Canadian Employment and Immigration Commission (CEIC) takes care of other types of training. In the NWT, all training sponsored by government is funded by CEIC though the GNWT administers some programs. Training for mining is normally undertaken by the mining companies in co-operation with the territorial governments and CEIC, which is investigating a new approach to the organization of training.

Modular training systems, career counseling services and co-operative in-service training courses sponsored by a group of companies with mines in close proximity are some methods that have been attempted. Courses are offered at vocational schools and in universities in larger centres and in southern Canada, but the small isolated mines in the North cannot always take advantage of this institutionalized training.

HOW CAN MORE NORTHERNERS BE ENCOURAGED TO DEVELOP SKILLS FOR A CAREER IN MINING?

b) Labour-Management Relations

Labour-management relations in the North are similar to those in southern mines. However, few of the newer northern mines are unionized. It is too early to determine whether there is a long-term shift towards **non-unionization; such a development could bring a major change in labour-management** relations.

Workers, whether union members or not, are affected both directly and indirectly by the successes and failures of the businesses for which they work. In mining the risks are great.

The principle of labour and management working together to achieve increased productivity has been advanced both in Canada and abroad. This was apparent in the northern mining industry over the past two years when new approaches were developed by labour and management in order to keep some mines in operation in spite of severely depressed metal markets. For example, at Cyprus Anvil's Faro mine, a unionized mine, labour and management co-operated to facilitate productivity improvements in implementing the stripping program which began in June 1983. It is believed these improvements were the major factor in a 30 per cent reduction in unit mining costs. However, at the end of 1984, contract negotiations broke down, the company imposed a lock-out and the mine remains shut down. High productivity has also been achieved in non-unionized operations, e.g. at the Nanisivik mine in the high Arctic.

Few native people have chosen to become union members and consequently most natives do not enjoy the same privileges with regard to job opportunities as union members. Furthermore, some unions have resisted the idea of government awarding negotiated contracts, but it is by these that government can provide native entrepreneurs with opportunities to gain experience and enhance skills.

c) Mining Community Development

Mining communities have a special characteristic in that they are frequently temporary settlements. Like other resource communities, they are normally dominated not only by a single industry but also by a single enterprise. The dominance of a company in the social life as well as in the work life of workers, though not necessarily undesirable, can result in an imbalance both economically and socially.

The temporary nature of single-industry settlements may lead to a feeling of insecurity among workers and their families. It is due to not only insecurity of employment, but also the associated difficulties in provision of continuity of education and health care for families. **Whether** companies own the houses or individuals buy them, there is a perception that in some mining towns conditions do not match those of more established communities. **In** northern Canada most of them reap the benefits of isolation from other communities, but also suffer the disadvantages.

In order to reduce costs, increase employee well-being and to reduce turnover rates, companies are giving serious consideration to the **fly-in/fly-out** concept. **In** this respect, the Government of the Northwest Territories has announced a policy that would discourage construction of single resource towns with an anticipated life span of fewer than twenty years. The Government of Yukon would also encourage fly-in/fly-out operations provided that the origin of the flights is within Yukon.

Conditions vary so much that it is questionable if a formula could be used to determine whether to establish fly in/fly out operations, to construct new towns, to promote growth centres or to expand existing settlements.

WHAT SHOULD GOVERNMENT DO TO CUSHION THE IMPACT OF MINE CLOSURES ON SINGLE-INDUSTRY COMMUNITIES?

SHOULD GOVERNMENT RESPOND TO PRESSURES FOR MORE OR LESS GOVERNMENT INVOLVEMENT TO SMOOTH THE BOOM AND BUST CYCLES?

3. The Regional Dimension

a) Placer Mining

The Yukon placer gold mining industry involves the working of large quantities of silt, sand or gravel in, or adjacent to, streams and rivers to separate out the valuable heavy gold particles. In 1984 the industry consisted of about 200 operations which employed several hundred persons seasonally. Most of the operations are small or family concerns with only a few employees", who are following the tradition of those independent entrepreneurs who made this industry symbolic of Yukon's culture, its way of life and its roots. They feel mining is their right and see themselves as upholding a last frontier of freedom for those wishing to retreat from an over-regulated world.

The fundamental factors influencing the placer industry, as in all mining, include the price of gold and the cost of mining. The first cannot be controlled by government unless trade restrictions and price controls are introduced. The cost of mining can be influenced by the operational standards imposed on the industry in response to pressures from the tourist industry and conservation organizations seeking to limit the adverse environmental effects of placer mining.

Sections 31 and 33 of the Fisheries Act contain provisions protecting fish habitat and prohibiting the deposit of waste in waters containing fish. **The placer miners are uneasy because the administration of these provisions often calls for discretionary decisions by local fisheries officials.**

Attempts by the federal government and the Yukon Territorial Water Board since 1973 to develop a regime to improve environmental management of the industry have created fears among placer miners for the future of the industry. In January 1984, a Public Review Committee held hearings in Yukon into proposed guidelines for placer mining operations. The committee concluded that the guidelines were generally appropriate but should not be invoked for 12 years, unless new research demonstrates the economic viability of the placer mining operations under such requirements. The federal and Yukon governments are funding research directed towards these ends. Meanwhile, interim measures were taken to allow water licences to be issued by the Yukon Territorial Water Board until 1987. The issue falls

within the respective mandates of Indian and Northern Affairs Canada, the Department of Fisheries and Oceans and the Department of the Environment.

WHAT STEPS SHOULD BE TAKEN TO PROVIDE A SUPERIOR MANAGEMENT RÉGIME WHICH WOULD ENSURE LONG-TERM ENVIRONMENTAL STANDARDS AND ADEQUATE LEGAL CERTAINTY FOR PLACER MINERS?.

b) Spin-Offs from Mining

In the past, when a company applied for a **licence to** export ore **and/or** for financial assistance, the project was reviewed in terms of government's northern and national objectives to identify potential spin-off benefits such as employment, small business opportunities, purchasing of goods and services and further processing. In consultation with the developer, an agreement was negotiated which **set out** how these spin-off benefits could be realized. To ensure compliance with the terms and conditions of these agreements, a monitoring process was put in place. All projects were considered on a case-by-case basis. However, there is no specific legislation setting out the assessment process, formulation of agreements, etc.

Some feel that caution must be used in imposing requirements on industry so as to avoid creating onerous situations where industry would no longer wish to develop in the North. Others feel that maximum benefits should be assured before mining is allowed to proceed, since few other downstream benefits accrue to the Territories.

IS GOVERNMENT INTERVENTION JUSTIFIED TO ACHIEVE "SPIN-OFF" BENEFITS FROM MINING IN THE NORTH?

c) Taxation of Benefits

The mineral industry is an important beneficiary of remission orders governing the taxation of housing, travel and other benefits received by northern employees. Benefits initiated prior to November 13, 1981 are not taxed, while housing and travel benefits initiated after this date are taxed up to certain limits. The remission orders are in place until the end of 1985. In the interim, the government will consult with interested parties toward establishing in law a more permanent regime. It was estimated that revenues forgone by all levels of government from the non-taxation of benefits in 1981 amounted to \$39 million. A study undertaken in 1983 revealed that taxing the benefits paid by all northern employers would have a substantial financial impact on the mineral industry.

The taxation of benefits is a controversial topic. There is no question that current remission orders introduce inequities into the taxation system. Employees who fall under the old (prior to November 13, 1981) remission order are treated differently from those falling under the new one. All benefits recipients are treated more favorably than the many northerners who must meet their own equally high housing and travel costs. Because many northerners, especially native people, do not earn enough income to pay taxes, the issues arising from the taxation of benefits are of particular concern to more affluent northerners.

HOW CAN PRESENT INEQUITIES IN THE NORTHERN TAXATION SYSTEM BE OVERCOME WITHOUT A SIGNIFICANT NEGATIVE EFFECT ON NORTHERN INDUSTRIAL COSTS?

IS THE TAXATION SYSTEM AN APPROPRIATE VEHICLE FOR PROMOTING NORTHERN DEVELOPMENT? WHAT ALTERNATIVES EXIST?

4. Land Use Constraints

a) Availability of and Access to Land

Although the northern mineral industry generally supports the principle of maintaining ecological integrity, it is concerned that tenure of mining lands and access to mining properties in the North could be eliminated or reduced by withdrawals of land for single or limited use purposes.

Under the National Parks Act mineral development is prohibited in national parks. INAC in cooperation with Energy, Mines and Resources (EMR) has an assessment process in place to evaluate the mineral potential of lands before they are withdrawn and dedicated for exclusive use such as for national parks. To achieve a balance by limiting the amount of land dedicated to non-mining, conservation purposes, the national parks planning system limits to 5 per cent of the northern lands the total area proposed for national parks. Other areas in which mining activity is restricted or prohibited include wildlife and migratory bird sanctuaries, which at present are estimated to involve an additional 2.5 per cent. Approximately the same amount again (7.5 per cent) is under consideration for International Biological Program (IBP) sites.

Industry fears that if substantial areas of land are dedicated to uses which are incompatible with mining, the total resource base of mining will be proportionally reduced and long-term regional exploration programs could be curtailed before an economic discovery is made but after substantial investment

cost has been incurred. The creation of large, private, freehold estates, for which access to or across must be negotiated, may affect mining, exploration and development costs. Industry is concerned that the development of identified economic mineral deposits may be prevented if transportation or electrical transmission corridors or access to tidewater are pre-empted.

The basic difficulty is that mineral resource inventories are by their very nature undefined until the time of discovery. The recent discovery of the Hemlo gold deposits in Ontario is a reminder that economic mineral deposits can be found in areas previously considered to be of low potential.

Historically, Canadian jurisdictions have opted to balance the competing rights to the use of the surface by mineral rights owners and others by legislation defining the rights, obligations and privileges of the several owners. These pieces of legislation, commonly called Surface Rights Acts or Entry Arbitration Acts, provide for entry to the surface by miners and procedures for the settlement of damages. Access to and across lands is generally provided by establishing public roads or road allowances on a one-mile grid.

Alternatively, issues of rights and access can be resolved through common law or through negotiation with binding arbitration where necessary.

WHAT ARE THE MOST APPROPRIATE METHODS FOR AVOIDING OR RESOLVING APPARENT OR REAL LAND USE CONFLICTS?

b) A Land Claims Perspective

The settlement of northern land claims is important both to the native beneficiaries seeking greater control of their own lives, and to developers hoping for clearer rules for development.

The settlement of claims will provide certainty with respect to ownership of northern lands. It will also have an impact on third parties such as mining companies and individuals who hold legal title to Crown lands.

The existence of the comprehensive claims process, which embraces the four major groups of northern native people, has created a desire for and expectation of greater participation in decision-making on activities with environmental impact; this would involve sharing in a more direct way and to a greater extent in the immediate benefits from those activities.

The Agreement-in-Principle with the Council for Yukon Indians and, to an even greater extent, the Committee of Original Peoples Entitlement (COPE) Final Agreement provide natives with a significant role in reviewing development proposals and formulating recommendations to the Minister of INAC on whether or not activities should proceed and, if so, on what basis. So far, both **Tungavik Federation of Nunavut (TFN)** in the Eastern Northwest Territories and the **Dene/Métis** in general discussion indicate a similar desire on their part to exercise a controlling voice in management structures and to impose considerably more stringent tests of environmental and social acceptability of development proposals.

Based on the example of the COPE settlement and the Council for Yukon Indians negotiations there may be extensive private ownership of former **Crown** lands in the North. **Many** of these privately-held lands **might** include freehold mines and minerals.

On these lands, it is possible that claimants will seek higher surface land rents and royalties for exploitation of subsurface resources, and possibly more stringent conditions related to environmental **impact** mitigation and physical site restoration. In addition, claimants may seek related financial benefits in the form of employment, equity participation and entrepreneurial concessions. Such features are in large measure beyond the control of government since they are attached to the nature of private ownership of land and, where applicable, sub-surface resources as well.

It can be assumed that the conditions of use or access over these lands could vary from one claimant to the other.

HOW BEST CAN NATIVE PEOPLES AND INDUSTRY WORK TOGETHER TO MAXIMIZE THE VALUE OF THE HUMAN, FINANCIAL AND LAND RESOURCES NEWLY AVAILABLE AS A RESULT OF LAND CLAIMS SETTLEMENTS?

c) Legislative Base

Indian and Northern Affairs Canada administers six legislative items which deal with the disposition and administration of mineral rights (excluding oil and gas) in the North to ensure the orderly development of mining and related operations. Over time, the political, economic and social environment for legislation changes, as does the technology of exploration and development. This should be taken into account when considering northern mining legislation.

In Yukon, the legislative base is old: for example, the Yukon Placer Mining Act dates from 1906 and all details are locked into statutes. This inhibits timely responses to changing circumstances.

In the Northwest Territories, extensive regulations such as the Canada Mining Regulations have been made under the enabling power of the Territorial Lands Act and the Public Lands Grants Act.

The outdated wording of the taxation (royalty) sections of the Yukon Quartz Mining Act pertaining to lode mining does not fit modern mining and accounting practices, so that varying interpretations continually change the taxation differential between the territories and the provinces. The problems inherent in the outdated Yukon legislation could be **solved** either by the introduction of one Yukon Minerals Act which could administer all mineral rights in the territory, or alternatively by modern individual acts. Although a long list of inadequacies in the outdated Yukon legislation can be compiled, industry has in the past generally resisted change, fearing that if the statutes were amended to provide administrative or technical improvements, governments could not resist imposing new and more extensive regulatory constraints on the industry. A further issue is the regulatory system for the placer mining industry in the Yukon, which has evolved overlapping and contradictory regulatory jurisdictions. For instance agencies concerned with the use of water by placer miners include the Yukon Territorial Water Board, the Department of Fisheries and Oceans, the Department of the Environment, several branches within Indian and Northern Affairs Canada and the Government of Yukon.

By contrast, the mining instruments applicable to the Northwest Territories are contained in regulations, and thus can be amended relatively quickly. **Over** a longer term, a new Northwest Territories Mines Act could be established with administrative details provided by regulation. Such a statute could dispel uncertainties respecting possible frequent change to elements such as tenure, Canadian ownership requirements and taxation levels.

DO THE INADEQUACIES OF EXISTING MINING LEGISLATION
SIGNIFICANTLY IMPEDE MINERAL DEVELOPMENT?

d) Regulatory and Approval Processes

Over the **past** two decades, a national consciousness awakened to environmental issues has led to the establishment of new relationships between developers and regulators. The regulatory and approval processes applied to the mining industry in the North are perceived by industry to be more complex than those of the provinces, and thus to add to already high costs of exploration, development and production. The application of federal environmental measures enacted in the early 1970's, particularly under the Northern Inland Waters Act and Regulations, the Fisheries Act and the Territorial Land Use Regulations, has in some instances been criticized. Industry perceives stringent application of some regulations as adding unnecessary costs to mining projects and placing environmental protection ahead of the economic benefits of mining. (At INAC'S request, industry has provided three case studies in support of this contention, and these are currently being assessed to determine whether or not industry is in fact being subjected to unnecessary costs or delays). Mining operations are subject to screening and approval under the Environmental Assessment and Review Process (EARP). While no northern mining project has yet been referred to the federal Environmental Assessment and Review Office (FEARO) for a full public review, nor been turned down as a result of screening, many in the mining industry feel that the outcome of EARP is not predictable, the process is slow and the costs involved in preparing environmental impact statements or evaluations are onerous and time-consuming. However, such regulations are intended to serve the needs of all northerners.

DO FEDERAL ENVIRONMENTAL MEASURES IMPOSE A FAIR AND REASONABLE COST BURDEN ON INDUSTRY?

Regulatory processes appear to many in industry to be contradictory, unclear or duplicative. The use of water and the regulation of waste discharge in mining operations fall under the authority of the Northern Inland Waters Act (NIWA) and the Fisheries Act. Licensing under the provisions of NIWA has sometimes involved protracted hearings and controversial conditions owing to the absence of clear guidelines or standards, legal uncertainty, and weak data on renewable resource values. In the Northwest Territories, mining exploration activities are subject to the Territorial Land Use Regulations which may involve community consultations on environmental and socio-economic impacts, and impose conditions or restrictions during and after the life of the project.

In addition, the GNWT is becoming increasingly involved in the regulation and approval of mining activities.

The existing process which requires companies to submit complete project proposals for review and criticism as the initial step may lead to confrontation, whereas alternatives which would allow negotiation before the company develops detailed proposals might encourage co-operation and reduction of costs.

One idea which has been considered is for INAC to assign a senior official at an early stage in a new mining project to act as a pathfinder or guide during the proponent's interaction with government agencies. He could make the company aware of all requirements and processes and intercede, where necessary, to help bridge the gap between different federal departments, agencies and levels of government. An important element in this approach would be to have sound administrative backing to provide support and continuity to the pathfinder role.

HOW CAN NORTHERN ASSESSMENT AND REGULATORY FUNCTIONS BE CHANGED TO REDUCE DELAYS AND UNCERTAINTIES IN ORDER TO HELP INDUSTRY GENERATE ECONOMIC GROWTH CONSISTENT WITH BROADER OBJECTIVES? SHOULD THE PATHFINDER CONCEPT BE IMPLEMENTED FOR NORTHERN MINING PROJECTS?

Iv. WHAT NEXT?

The northern mineral industry has urgently requested that the federal government establish a clear, strong **policy** and legislative framework in support of northern mineral development over the next decade. It is particularly important now, in the face of increased international competition, that the mining industry clearly know the rules of the game. In this paper, we have documented how closely mineral development is associated with social development in the North. Therefore, others who are concerned with, or affected by, mining must also have an opportunity to express their views.

This discussion paper is the first step towards this end. It has presented some facts - the results of several years' research and data collection by INAC - and posed some questions. However, this is only the beginning of the consultative process. The questions asked here are by no means definitive or all-inclusive: they are put forward as a starting-point for public discussion on the future of northern mining. It is hoped that the responses to this document will determine which are the issues of most concern to the interested sectors of Canadian society, and that they will form an important element in the development of a Northern Mineral Policy.