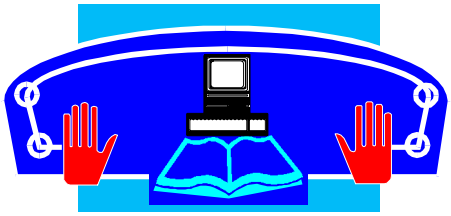

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Potential Socio-economic Impacts Of The Polaris Mine Project
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Potential Socio-Economic Impacts of the Polaris Mine Project

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Potential Socio-Economic Impacts of the Polaris Mine Project

An examination of the potential impacts on the community of Resolute Bay, the Arctic Coastal Communities, and the N.W.T. in general.

Prepared by:
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in association with
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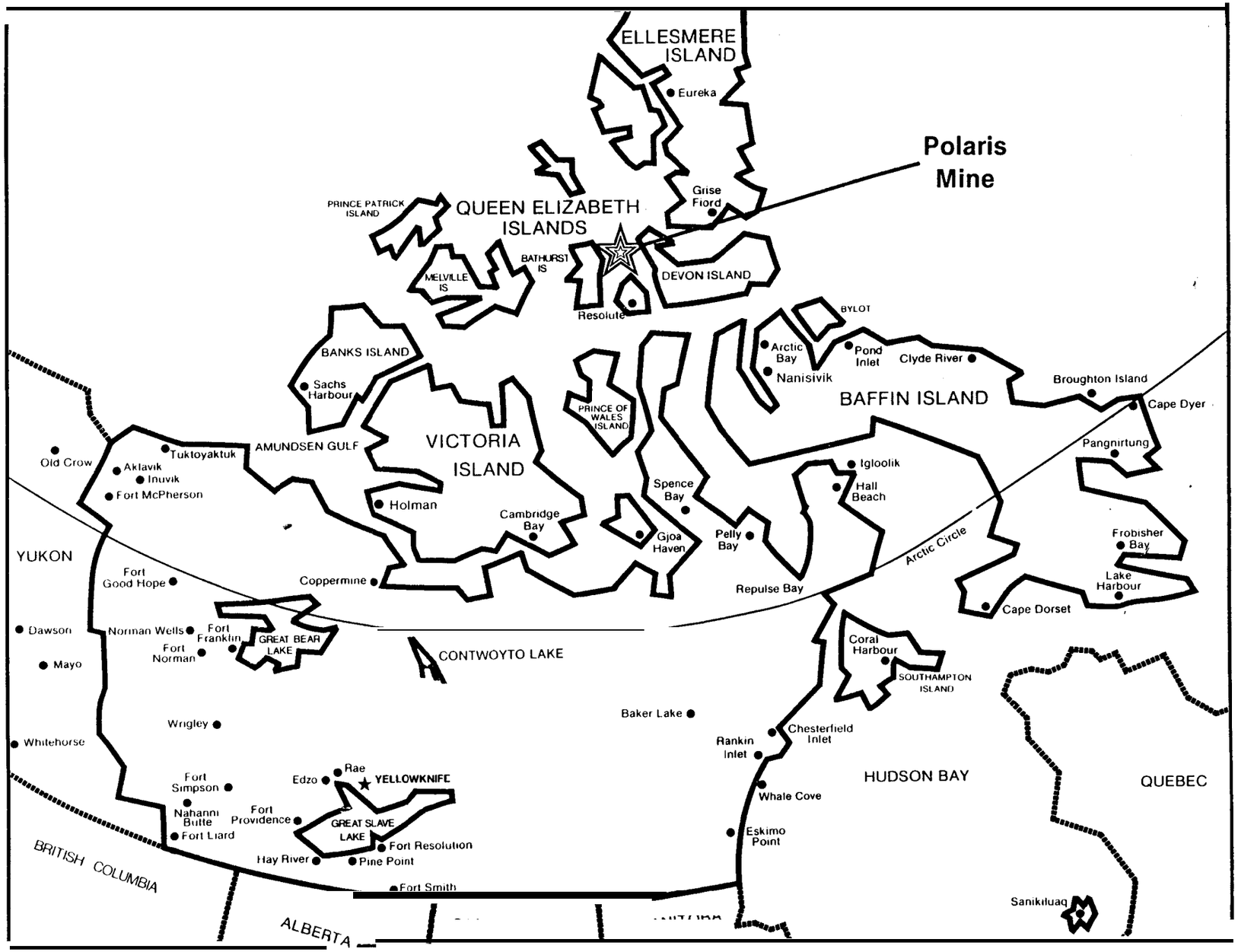
June, 1980


ELLESMERE ISLAND
Eureka
Polaris Mine
Grise Fiord
PRINCE PATRICK ISLAND
QUEEN ELIZABETH ISLANDS
BATHURST IS
MELVILLE IS
DEVON ISLAND
Resolute
BYLOT
Arctic Bay
Pond Inlet
Clyde River
Nanisivik
BANKS ISLAND
Sachs Harbour
PRINCE OF WALES ISLAND
BAFFIN ISLAND
Broughton Island
Cape Dyer
Pangnirtung
Old Crow
Tuktoyaktuk
AMUNDSEN GULF
VICTORIA ISLAND
Aklavik
Inuvik
Fort McPherson
Holman
Cambridge Bay
Spence Bay
Igloolik
Hall Beach
Gjoa Haven
Pelly Bay
Arctic Circle
Frobisher Bay
YUKON
Fort Good Hope
Coppermine
Repulse Bay
Lake Harbour
Cape Dorset
Dawson
Norman Wells
Fort Franklin
GREAT BEAR LAKE
Fort Norman
CONTWOYTO LAKE
Coral Harbour
SOUTHAMPTON ISLAND
Mayo
Baker Lake
Wrigley
Chesterfield Inlet
Rankin Inlet
Whitehorse
Rae
Edzo
YELLOWKNIFE
Fort Simpson
HUDSON BAY
QUEBEC
Whale Cove
Nahanni Butte
Fort Providence
GREAT SLAVE LAKE
Fort Liard
Eskimo Point
Fort Resolution
Hay River
Pine Point
BRITISH COLUMBIA
Fort Smith
Sanikiluaq
ALBERTA

Summary -

Introduction

The purpose of this study is to examine the socio-economic impacts of the Polaris Mine on the community of Resolute and on the Arctic coastal communities within the Polaris Mine's planned hiring area. The intention is also to provide an overview of the impacts of the mine on the N.W.T. economy.

The study was conducted during a four month period from late January to late May, 1980. The fieldwork, which involved visits to most of the communities, was completed in March and early April. Interviews were held with community councils, government officials, business ownersloperators and individual residents.

The main emphasis of the report is on the potential impacts on the community of Resolute, which is the closest community to the mine, and the community most likely to experience impacts of the Polaris Mine. Impacts on Arctic coastal communities are discussed in lesser detail and the impacts on the N.W.T. economy are presented as an overview of the potential Polaris impacts compared with a benchmark "without the mine" scenario.

Project Overview

The Polaris Mine facilities will occupy 230 acres of Little Cornwallis Island, along the Crozier Strait, 60 miles northwest of Resolute Bay. The lead zinc mine will go into operation in early 1982 and when it reaches full operation in 1984, it will process 2,050 tonnes of ore per day. Surface facilities will consist of a concentrator, storage building, accommodation facilities as well as conveyors, fuel and water tanks and fresh water and tailings pipelines.

Accommodation will be provided for 240 in 208 single rooms and 16 two-room suites. Complete kitchen, dining and recreation facilities will be included in the accommodations complex. There will be telephone, CBC television and CBC-North radio services at the site. No townsite on Little Cornwallis Island is planned.

Ore will be transported to markets during the August 15 to October 15 shipping season and at the same time 4,000 to 5,000 tons of supplies will be shipped to the mine each year. An additional 200 tons of supplies each year will be shipped by air via Resolute.

Employees will be moved via commercial carriers from hiring centres in Montreal, Edmonton, Yellowknife, Cambridge Bay and Coppermine. Air charter shuttle flights three times weekly will move staff to the mine. Airfare will be paid by Cominco to and from these hiring centres. Individuals will be responsible for paying their own air fares between home communities and the hiring centres.

- Peak construction employment will be in 1981. The total number of on site man hours is estimated at 850,000. N.W.T. residents could fill 30 to 40 percent of the Polaris Mine construction staffing requirements.

During operations, employees will follow one of two work rotation schedules. The southern rotation schedule will involve 12 weeks on the site and three weeks paid leave. The northern rotation schedule consists of six weeks on site plus four weeks leave, partially paid and prorated to southern leave. The northern rotation schedule is proposed for the Inuit to allow them to earn a good wage, yet be able to pursue their own lifestyle to some extent.

There will be 225 Polaris Mine positions . . . 205 Polaris staff plus 20 catering positions to be contracted out. For the Polaris Mine to run efficiently and meet its production targets, 163 of these 205 positions are classified as essential positions. Included in the 163 essential positions are 25 positions that will be filled by senior management personnel and administrative staff. There will also be one position in Resolute for a recruiter/expediter. The remaining 137 mine positions will be filled by rotational employees either from the North or the South. For each position filled by a southern hire a multiplier of 1.62 is used to determine the number of employees required to fill the position on a year round basis, considering "leave" time. For each position filled by a northern hire, the multiplier used is 1.84.

To provide employment for the Inuit and other N.W.T. residents, Cominco plans to recruit extensively in the North for people to fill training positions. Cominco plans to hire the majority of its northern rotational staff from the Arctic coastal communities and from Resolute.

All training programs will be particularly aimed at developing and integrating the northern employee. All supervisors will be given instruction in cross-cultural differences. Cominco has established 73 pre production training positions and will provide a total of 236 training months to employees, prior to the start of mining operations.

Once the mine is fully operational in 1985, the study team estimates that the potential number of northern employees at the site, in Resolute and in Yellowknife could range from 74 to 102. The higher number assumes that travel costs to and from all Arctic coastal communities would be paid.

All northern employees as a percentage of the total Polaris staff could range from 29 percent to 40 percent in 1985.

The study team estimates that about $2 million or 16 percent of the mine's operating supplies of $12.3 million could be purchased from northern suppliers. The small size of these northern purchases reflects the Territories lack of a manufacturing base and the project's distance from the Territories larger centres, especially Yellowknife.

Cultural Setting

The Polaris Mine will be recruiting staff from a number of isolated, semi-traditional Inuit communities in the high and coastal Arctic. The potential employees speak Inuktitut, have some acquaintance with the wage economy, and little or no experience with mining.

The apparent economy of many of these communities is dependent on hunting and trapping. In fact, because other costs are increasing more rapidly than fur prices, these communities

are increasingly dependent on cash from wage employment or government programs to finance traditional pursuits.

While educational levels are not high, the introduction of conventional schooling over the past 20 to 25 years has created some understanding and acceptance of "southern" values, and increasingly, wage employment is proposed by community residents as a solution to the problem of a growing number of educated young people who are no longer willing or capable of practicing traditional activities.

Wage employment is not easy to put into practice, as a number of government and industry experiments will testify. Further the communities, established some two to three decades ago as trading centres and government administrative areas, are not as a general rule located in prime industrial growth areas. When mines and other large wage employment projects develop they are close to communities only by chance.

Inuit make up a third of the population of the N.W.T. Contrary to some southern conceptions of Inuit lifestyles they are no longer living in a traditional manner. Inuit of 1980, particularly the younger people, are educated, exhibit tastes for North American consumer goods, are politically astute, and are willing and determined to take full responsibility for the direction of their own lives, and the protection of their culture.

The evidence is documented in a number of recent political papers including the Nunavut and COPE claims, and the debates of the N.W.T. Legislative Assembly.

Change over the past 25 to 30 years has become a way of life for the Inuit. Taken from their families in the early days for education, then settled in communities, introduced to new government structures, and finally wage employment, in a mere 25 years, the Inuit are remarkable in their capacity to adapt, and to consider carefully and seize hold of foreign concepts to further their own cultural traditions.

Communications technology, upgrading of airports, increased air traffic and regular flights, radio programming, and the introduction of North American television have reduced cultural isolation and provided ready access to hundreds of new situations and new opportunities.

Both the government, and the Inuit as a people are concerned about the problems they face with an improved level of education and a high birth rate. With more than half the population under 18, the decisions which must be made to accommodate this group of young people in the N.W.T. economy are discussed regularly.

As development projects are proposed, the merits and disadvantages are widely debated. Cultural change is both feared and welcomed, but appears to be inevitable, given the state of communication technology in the N.W.T. Slowly the debate is switching from whether or not change should come, to how change can best be managed for the benefit of residents.

Development projects inevitably lead to questions about the merits of different employment systems. Should the Inuit move from communities to jobs or should townsites be developed at project sites for the Inuit? What are the social and economic consequences of either course? These and other concerns are addressed in this study.

Impacts on the Northwest Territories Economy

The last decade and a half has been a period of dramatic change for the Northwest Territories economy. Much of the growth occurred in the period from 1967 to the mid 1970s. The population of the territories from 1967 to 1974 increased from 30,124 to 40,802, representing an average annual growth rate of 4.4 percent, while real growth in gross territorial product was well over 10 percent per year.

These figures give only a partial picture of the changes in economic structure which occurred over the period. From 1967 to 1974 the value of mineral production increased five times; investment expenditures more than tripled and totally new activities especially oil and gas exploration, were introduced to the N.W.T. economy.

Over this period a growing number of Northerners entered, and became dependent upon, the Northwest Territories wage economy.

While the data for more recent years is incomplete, it appears that the rate of economic growth has moderated and that the 1974-79 period has been one of consolidation for the Northwest Territories economy.

With a fixed capital investment of about $100 million,* the Polaris Mine will have a positive impact on the N.W.T. economy. However, the relative impact will be quite small, reflecting the high spending leakages out of the N.W.T. economy to southern Canada. These leakages are the result of the Territories lack of an industrial base.

The employment and income effects. are generally greater in the construction phase particularly in 1981, than after start up. This is typically the situation for a highly capital intensive resource project.

The Polaris Mine will have a favorable, but minor effect on the N. W.T.'s high and increasing unemployment rate. This reflects the size of the labour component of the project in relation to the Territories high unemployment at the present time, and the fairly substantial increases anticipated in the size of the N.W.T. labour force during the projected life of the mine.

In 1981, during the peak construction period, the study team estimates that about 160 construction jobs will be filled by N.W.T. residents as a result of the Polaris Mine. Personal income from these jobs is estimated to be approximately $4.2 million. This represents a percentage increase in personal income of about 1.3 percent.

When the mine is fully operational in 1986, the study team estimates that 128 N.W.T. residents will have jobs as a result of the mine. Of this number, 74 will be Polaris Mine employees. Thirty-one indirect jobs (including catering jobs) will result from Polaris purchases of supplies and services, and 23 jobs will result from the resending effects in the Northwest Territories.

Comparing these employment statistics with a projected "surprise free" future in the N.W.T. (i.e. no major projects going ahead) they represent a 5.3 percent increase in the number of Northerners employed in mining, and a 1.3 percent increase in the number employed in the residentiary sector (i.e. services industries) in 1986.

"All $ are 1979$ unless otherwise noted

In real 1979 dollars, tots! personal income to Northerners is estimated to increase by approximately $3 million in 1986 as a result of the Polaris Mine.

Close to one half the jobs, and more than one half the personal income benefits will be in Yellowknife. The location of the operating/administrative office in Yellowknife and increased respending effects resulting from Yellowknife's more developed economy, account for the higher employment and income benefits in Yellowknife.

If travel payments to and from the mine site were extended to employees from other Arctic coast communities (in addition to Coppermine and Cambridge Bay) total Polaris related employment in 1986 is estimated to increase from 128 to 162. This represents an additional 28 direct jobs and 6 jobs as a result of respending. In real 1979 dollars, the personal income from these 162 jobs would be about $3.5 million.

In summary, the economic impacts of the Polaris Mine on the total N.W.T. economy will be relatively small. Because of this, the economic dislocations caused by the mine should be negligible.

Impacts of the Polaris Mine on Resolute

Resolute, the closest community to the Polaris Mine, is 60 miles southeast of the mine. Founded in 1947, Resolute experienced gradual expansion until a boom period in the early 70s when seismic work and exploration activity in the high Arctic increased the size and economic importance of Resolute.

In the latter half of the 1970s this activity declined and by March, 1980 the total population of both the base and village areas of Resolute was less than 300. The Inuit population in March 1980 was 131, down from 169 in 1976. Of the Inuit population, 20 have full time jobs, although more Inuit in the labour force want jobs if they were available. There is a total of some 135 jobs in Resolute. Most jobs are filled by southern Canadians working in Resolute on a rotational or short term basis.

Resolute has elaborate municipal services for its size. Water and sewer services were designed to handle a much larger population. In March, 1980 there were some 20 empty houses in Resolute, approximately half reserved for residents and half for territorial government staff. There is also a number of serviced lots available.

The Inuit population of Resolute has had contact with wage employment for some 25 years. Overall, residents are pleased with their modern community, and relations with the nearby base are cordial.

Hunting and trapping activities continue in Resolute, but are no longer the sole source of income. Usually they supplement wage income, or are seasonal activities, with participants working at part time jobs when the season is over, or when jobs are available. Since the mine is in a low priority hunting area, its location is not expected to effect hunting and trapping activities. Actual employment at the mine could have some effect, but the extent will depend on whether employees use their time off to hunt and trap. Most residents felt that four weeks off was adequate time for hunting and trapping.

It is estimated that some seven to 11 residents will have permanent jobs at the Polaris Mine in 1985. Based on an estimate of the amount of money to be spent by Polaris in the community,

- a further eight jobs will-be created, with five of the eight likely to be filled by Resolute residents. In addition, resending of wages will create three more jobs for a minimum of 15 new jobs for community residents.

Part time, or seasonal work created by the mine (e.g. ship loading, unloading) will likely exceed the capacity of the Resolute labour force, until 1985. This could cause peak period staffing difficulties for local businesses, and may also cause in-migration to fill expected jobs.

Overall, an increase of approximately 40 to 50 people, or 10 to 12 families is estimated as a result of employment caused by the mine.

Comparing current community wage income and projected income from direct, indirect and induced employment, the Polaris Mine could cause a 102 percent increase in wage income in Resolute from 1980 to 1985 and a 64 percent increase in the total community income.

So that the community obtains the maximum benefit from the mine and related activity, the study team recommends that priority be given to Resolute residents who are prepared to fill available jobs.

While wage income will increase dramatically, the impact of the mine on the Resolute economy is not nearly as large, since much of the money pumped in by wage earners goes elsewhere to purchase goods for resale. There will be some strengthening of the local economy, due to greater use of existing capacity in the accommodation and airline businesses, if Cominco purchases services locally. Some new business opportunities may arise, and both the government and the Inuit Development Corporation should be prepared to assist these ventures.

If the population increases as expected, there will be a need for an additional classroom for the school, and possibly some additional housing. In the meantime, excess territorial staff housing could be made available to the community to temporarily alleviate any housing shortages.

Cominco should be prepared to hire a resident to provide ongoing liaison with the community on a number of subjects, including the provision of counseling services, the recruitment of staff for the Mine, and to monitor the effects of mine employment on the community generally.

Considering Cominco's work rotation and travel policies, families from other N.W.T. communities may decide to move to Resolute to be close to jobs. If this becomes the case and housing shortages occur, there are two interrelated solutions to be examined by Cominco and the government: discourage in-migration by advising other communities there is no housing available in Resolute; provide convenient and paid travel to and from the job site. Combined with work rotation adjustments if needed, these measures should encourage people to stay in home communities.

Extensive interviews with residents of Resolute revealed a high respect for money, softened by more traditional values relating to a satisfactory life today, and concern for the well being of the family.

Prosperity – a new truck or skidoo — is respected, in both the traditional culture (where it implies an improved ability to gather food) and in the modern lifestyle.

Elders, leaders and people with particular skills, traditional or modern, are respected in the community. Polaris employment will create new skills in the community, and may tend to reinforce a trend toward division between the "rich" and the "poor".

From the point of view of community services and job opportunities, the relatively sophisticated population of Resolute is likely to consider the mine and associated employment to be an improvement over the present situation. Residents are aware that the level of community services depends on the total population and although they do not want rapid growth, they are also concerned about the current declining population.

Wage income would likely be spent on food and better equipment for traditional hunting, trapping and fishing, as is presently the case.

Although money is held in high regard, the traditional Inuit values have not been superseded by southern values. The family and traditional activities are of great importance to residents. People still move regularly to be close to family and friends. Families still move out onto the land in hunting season.

This close knit family grouping may be affected by mine rotational employment. The residents interviewed suggested long absences of the father may create problems in the family. They also suggested that the six week work period may conflict with traditional hunting seasons, particularly in the spring.

However residents appear willing to try the planned 6 weeks on the job, 4 weeks off rotation proposed by Cominco. They suggested that modifications might be made to rotations in spring hunting season.

The study team concluded that the work rotation system should be implemented as planned, but that the effects on employees' families be monitored closely.

The company should be prepared to make changes to its rotational schedule, if negative effects on family life become evident.

Mine employment may also cause a short term impact on the leadership of the community; however, increasing numbers of women will take on both jobs and leadership roles. A related impact may be a requirement for a day care centre.

Nothing in Resolute itself, or in the reports from other projects using rotational systems of this type would lead to the conclusion that there will be a dramatic increase in alcohol consumption, or in crime as a result of mine employment. The company should be prepared to work with the community agencies to resolve any incidents or problems that may occur.

The company has indicated its intention of providing orientation programs for southern staff. These programs should extend beyond the work environment, to ensure southern workers are sensitive to the Inuit community environment. In discussions with residents, a number of suggestions were made as to how this might be accomplished. These types of suggestions should be considered in planning the overall working atmosphere, and where possible encouraged.

Job satisfaction is defined by Resolute residents as having a job you like, earning good money, and having variety and opportunity to learn. There appears to be some preference for the

"better than menial" jobs, although some people are not happy with a management role when decisions inevitably affect family and close friends.

To meet these job aspirations, upgrading and training will be required. If Cominco conducts a strong and sustained campaign to upgrade Inuit employees so that they can obtain "better than menial" jobs, the study team concludes that the other indicators of job satisfaction will be met by Polaris positions.

Although concerned about the separation of families during work periods at the mine, Resolute residents are not convinced a townsite at the mine is the answer. Although it was considered as an immediate solution to the problem, Resolute residents also recognized that a townsite would likely cause a further decline in the size and services in Resolute, and could have an effect on hunting and trapping harvests in their area.

Impacts of the Polaris Mine on Arctic Coastal Communities

Residents from Arctic coastal communities (Cambridge Bay, Coppermine, Holman Island, Gjoa Haven, Spence Bay and Pelly Bay) could hold from 38 to 66 Polaris Mine positions in 1985. The high estimate would apply only if travel was paid for residents in communities other than Cambridge Bay and Coppermine. This would represent a maximum of 12 percent of the total labour force in these six communities.

Polaris employment will have a moderating effect on the current and projected high unemployment rates, but at no time will the number of jobs exceed the labour supply in the Arctic coastal communities.

In total, it is estimated that from 47 to 81 jobs could be created for residents of these communities including jobs created as a result of resending effects of Polaris Mine employees.

Income from these jobs in 1985, in real 1979 dollars, could be as high as $1.5 million. In Cambridge Bay the addition of job opportunities will have a positive effect, since the community depends on wage employment.

Pelly Bay would feel the greatest impact of mine employment with a potential 16 percent of the labour force working at the mine in 1985, depending on transportation policies. Because Pelly Bay has so few jobs now, and so few job prospects, the mine opportunities are considered a positive impact. Similar positive impacts will also result in the other communities, since unemployment is high in all communities surveyed, but particularly in Gjoa Haven, Spence Bay and Pelly Bay.

Although mine wages will be higher than those for community jobs, residents are not concerned that key community workers will be lured by mine employment. Community contacts indicated that lower paying jobs in the community would be more attractive because of the traditional Inuit regard for the family. This leads to the conclusion that Polaris jobs will attract young people who do not have full time jobs and are generally not full time trappers.

There could be a reduction in the amount of income generated by hunting and trapping; however, the impact is expected to be relatively minor. The study team concluded that if all

potential mine employees were trappers, this would only represent about 15 percent of the Arctic coastal community trappers. Residents generally feel that the rotation allows sufficient time for trapping during the period of 4 weeks at home.

There is concern in the communities that a sufficient number of Polaris Mine jobs be made available for residents, which indicates a high interest in mine employment.

As in Resolute, the major social impact of mine employment is expected to be the separation of families. There is concern in the communities about handling family problems when the man is away from home. For the best chance of success in hiring local residents and maintaining a stable labour force, the study team recommends that the company hire a part time recruiter/counsellor to facilitate hiring and the flow of accurate information in each community where Polaris employment is seriously considered.

Major movements of people from a more remote community to a hiring centre such as Cambridge Bay can be avoided by the application of appropriate hiring and transportation policies. Aside from a modest increase in the use of existing airline and accommodation capacity, no major effects are foreseen in the economy of the area apart from employment effects. A need is seen for a northbound connection between Cambridge Bay and Resolute to expedite the transfer of mine-bound employees.

The possibility of a mine townsite was discussed in each community. While people felt a townsite at the mine would lessen the strain on families, they appeared reluctant to move to the site for long periods, preferring their home areas.

A positive impact on educational and job aspirations in coastal communities is foreseen as a result of mine employment. Educational levels are presently quite low in these communities. To obtain training and better job opportunities, residents must leave the community for a larger centre. The mine will provide training opportunities while preserving the home community base.

Cambridge Bay has a severe alcohol problem and a high incidence of crime. Of all the communities reviewed, Cambridge Bay may suffer the greatest increase in these problems as a result of the separation of stable family units, and the movement of transients through the community. The study team recommends strongly that the community and the government agencies work together to examine the causes of the problems in Cambridge Bay. The company should be prepared to assist these efforts where possible, and make adjustments to hiring and travel plans if it appears current plans are likely to increase these problems.

Project Options and Alternative Cases

In order to effectively assess the data collected, a number of options or alternative cases were considered by the study team. Some were considered at commencement of the study, others were conducted to test conclusions reached.

1. Baffin and Keewatin were considered as additional sources of manpower. If travel costs were paid between the mine site and all Baffin and Keewatin communities, the number of Northerners employed successfully by Polaris could increase by 35 percent. Costs of employment may also rise.

2. A shorter rotation schedule was considered for Resolute. This could be expected to increase Resolute hires by 4 to 6 people.

3. If a shorter rotation was applied to other communities, there would likely be a substantial gain in numbers of northern employees and in income for the N.W.T.

4. Paid transportation from all N.W.T. communities increases the number and likelihood of success of northern employees, since it is unlikely that potential employees would want to spend much of their earnings getting to and from one of three N.W.T. hiring centres.

5. A townsite at the mine was considered. While the townsite might lessen the impact on families, the cost, the social problems involved in establishing a new Arctic community, and the anticipated desertion of established communities, particularly Resolute, indicate a townsite should not be considered at this time.

6. If other major projects (Arctic Pilot, Polar Gas Project) were to go ahead at the same time, there may well be a scramble for the available labour force and particularly those with skills. This would be disruptive to community life, and in the long run unprofitable for the projects. It is strongly recommended that prospective employers work together to establish a systematic and co-operative approach to hiring and training northern employees.

Summary Conclusions

The Economy

On the broad scale of the N.W.T. economy, the Polaris Mine will have a small but positive impact. This will be the case for most resource development projects until the N.W.T. develops a broader industrial base.

Resolute will benefit most from the mine, to the extent that now marginal businesses could return to a profitable position and some new business opportunities could arise. The major benefit for Resolute is increased employment income.

Arctic coastal communities will also receive employment benefits. The extent of these benefits will depend on whether transportation costs to and from the mine are paid for potential employees from all Arctic coastal communities.

The mine is not likely to have a significant impact on the hunting/trapping/fishing sector of community economies, since the residents indicate employment income will be used to some extent for improved equipment and the proposed work rotation system allows sufficient time for hunting and trapping.

Peak employment during construction of the mine will cause a relatively minor bump in the total number of jobs the project offers over the life span of the mine. This is a positive effect since the transition from construction to operation will not cause major dislocations in the N.W.T. work force.

Some increase in the number of houses constructed in Resolute may be caused by the mine. This would represent a possible re-allocation of government funds from one community to another, rather than an increase in costs to the government, since housing will have to be constructed somewhere for a growing population.

Social Impacts

Since cash income has become important to N.W.T. residents, measures to increase wage employment are of benefit to the N.W.T. The Polaris Mine "transitional" rotation schedules for Inuit workers will have a positive effect socially in that it permits employees to practice both the traditional and wage earning lifestyles. A further benefit offered by the mine is the opportunity for Inuit to acquire portable skills.

On the negative side, rotational employment will cause separation of families for extended periods of time.

In addition the rotation system itself can be considered in a negative light. Simply put, the existing economic and social situation demands that the Inuit work force at Polaris accept an employment system most southern Canadians would not find desirable on a long term basis. Although southern Canadians do work away from home in resource based industries, they also have the option of employment in other industries and job areas in or near home communities. In the Northwest Territories employment opportunities are limited, and often the Inuit have no job choices other than resource industry, and must be prepared to work away from home if they want a job. A larger N.W.T. population may make the development of more communities possible in the future, but at the present time, development of communities at resource sites is not economically or socially acceptable.

The study team concludes that with regard to rotation, Cominco is attempting to create the most positive result possible under the circumstances. It is hoped that continuing efforts will be made by the company and by other employers to fine tune the system for the benefit of future N.W.T. rotational employees.

overall, the extent to which the Polaris Mine will have a positive effect on the N.W.T. will relate to whether Cominco can and does successfully implement its plans as presently outlined.

Summary of Major Study Recommendations

A townsite should *not* be established at the Polaris Mine at this time.

Although a townsite would alleviate some of the negative effects of family separation, it would not lessen the effects of separation from the extended family. At the same time, a townsite could cause new negative effects, particularly related to the hunting and trapping activities of both new residents and the Resolute people who have traditionally used this area. Rather than a townsite, the study team recommends that work rotation scheules be altered if the impacts of family separation are having negative effects on the hiring and retention of Inuit people. Development of Resolute as a Polaris Mine dormitory community could be " another alternative to a townsite, but this option should be considered only if adjustments to rotational schedules do not mitigate negative impacts of family separation.

Work rotation schedules for Inuit should be monitored and adjusted where necessary.

Realizing that work rotation schedules have been established to allow' proper training time for Inuit employees, to ensure an efficient mine operation, and to meet operating budgets, we

recommend that the 6-4 work rotation be tried, with careful monitoring of the program through the first two years of operation. If it proves unsatisfactory, then Cominco should be prepared to adjust the work rotation schedule to more closely meet the identified needs of Inuit employees.

Transportation costs between home communities and the mine site should be paid for all N.W.T. employees.

It is unlikely that many people outside the hiring centres of Coppermine, Cambridge Bay and Yellowknife will work at the Polaris Mine if they have to pay their way to these hiring centres, since this extra cost would negate much of the positive effects of mine employment. Since payment of travel costs to all N.W.T. employees could add to the total operating costs of the mine, we suggest that an arrangement be worked out between Cominco and the government, based on the net additional costs to Cominco and the related economic gains to the N.W.T. in general and to specific communities.

The Polaris administrative/operating office should be located in Yellowknife.

Much of the economic benefit to the North will result from the location of the administrative/operating office in Yellowknife. For this reason we recommend that the office be located in Yellowknife, to maximize benefits resulting not only from direct employment, but also from employment resulting from the purchases of supplies and services and resending effects.

Cominco should implement a northern purchase policy for the Polaris Mine.

In this policy "northern preference" should be defined, and the policy should be designed in such a way, that northern businesses can be more competitive with southern businesses, and have the opportunity to submit tenders for jobs they are equipped to handle.

Government's small business development programs should take into account the requirements of proposed major resource development projects.

Many of the supplies and services the Polaris Mine will require are simply not available in the N. W. T., although many could be developed in the territories as the market for these services expands. Small business development programs should be in tune with the needs of major resource development projects, so northern businesses can benefit from these projects.

Cominco should give recruitment and training of northern employees high priority to ensure employment benefits of the mine remain in the N.W.T.

Cominco should establish goals for employment of Northerners and should employ a coordinator for native recruitment/training. There should also be a full time recruiter/-counsellor in Resolute and part time recruiters/counsellors in other communities showing high interest in Polaris employment.

Where possible, Cominco should work with government to set up pre-employment training programs in home communities, or home regions. This could encourage participation. Having to attend courses at the Adult Vocational Training Centre in Fort Smith, often discourages potential trainees from taking the required courses.

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-1. Introduction

The purpose of this study is to examine the socio-economic impacts of the Polaris Mine on the community of Resolute, and on the Arctic coast communities within the proposed Polaris hiring area. The intention is also to provide an overview of the impacts of the mine on the N.W.T. economy.

This report examines both the construction and operations stages, with emphasis on the operations stage.

OBJECTIVES OF THE STUDY

1. To review information on the Polaris Mine with communities in order to assess interest and obtain feedback.
2. To obtain baseline data on communities that might be affected by the Polaris Mine.
3. To analyze the potential socio-economic impacts of the mine on Resolute, the Arctic coast communities and the economic impacts on the N.W.T. in general.
4. To recommend methods of implementing the project so N.W.T. residents benefit as much as possible.

TERMS OF Reference

The terms of reference proposed by the study team and agreed to by Cominco and the study team[1] were that the study team would examine three areas:

- Resolute – a detailed analysis of potential impacts
- Other Arctic coast communities – a less detailed analysis of potential impacts, concentrating on the hiring centres of Coppermine and Cambridge Bay
- Northwest Territories – an overview of economic impacts

For the Resolute section of the study we agreed to address a number of specific topics related to the mine including:

- employment and income effects
- effects on community services and infrastructure
- effects on transportation and communication
- effects on the local economy
- effects on hunting and trapping
- effects on population growth
- effects on community satisfaction, social organization and community stability
- effects on job and education aspirations and job satisfaction

See Appendix 7 for more detailed terms of reference.

[1] An introduction to the study team is included in Appendix 7,

This was accomplished mainly through personal interviews and the results are presented in Chapter 4. In other communities the potential effects of the mine were examined in lesser detail, with results presented in Chapter 5.

CONDUCT OF THE STUDY

The study was conducted during a four month period from late January to late May, 1980. The field work was completed in March and early April.

Two members of the study team visited Resolute. and one member visited the communities of Cambridge Bay, Gjoa Haven, Spence Bay and Pelly Bay. Introductory visits were also made to Coppermine and Holman Island.

During a total of 14 man days in Resolute, the study team visited many businesses and government operations. At the invitation of the Resolute Settlement Council, we met with them to hear their comments and concerns about the Polaris Mine.

Using a prepared questionnaire we interviewed people from 17 of the 25 Inuit households in Resolute. A local interpreter was used for these interviews. Those interviewed included the head of the Resolute Hunters and Trappers Association. the secretary of the local alcohol committee and the secretary manager of the Resolute Housing Association. A complete list of individuals interviewed is contained in Appendix 1.

A total of 14 days was spent in Arctic coast communities. Meetings were held with councils, with municipal employees, with business people and with territorial and federal government officials.

In addition to the field work we also examined available data on other mining and drilling operations in the N.W.T. which hire local people. This included a review of a number of work rotation systems. A complete list of material reviewed is contained in Appendix 2.

Statistical information on N.W.T. population, crime, transfer payments, education levels, skill levels, etc. was collected from government departments responsible for these services. In addition, interviews were conducted with a number of government officials to discuss the project.

To analyze the employment and income effects of the Polaris Mine on the N.W.T. economy we used the economic model of the N.W.T. government, which according to the purpose outlined in the Users' Manual, is "to assist policy makers by providing 'forecasts' of economic variables as well as providing an analytical tool for evaluating the economic impacts of different policies and projects."

STUDY LIMITATIONS

Changes to Polaris Mine Plans – Information presented in the internal Cominco document *Polaris Mine Project Summary Report, July 1979* is used as the base case in this study. In the past 10 months changes have been made to this base CaSe data. Rev ised information or variations in base case data are noted when used in this study.

Some changes which were made after the study was well underway, are not considered in this report. These changes, either discussed orally with Cominco, or presented in the *May,* 1980 *Polaris Report,* include the addition of Frobisher Bay as a hiring centre, the formation of several community committees to work with Cominco on planning aspects of mine employment policies and the decision to re-consider the establishment of a Polaris administrative/operating office in Yellowknife. Although these decisions do not affect the base case analyses in the study, they limit the study in that it does not totally reflect the most current Polaris plans released in May, 1980.

Data Availability – In addition to the data provided in the *Polaris Mine Project Summary Report, July 1979,* additional Polaris data was needed to complete our analysis. Due to ongoing planning and revisions to the Polaris Mine plans, we experienced some difficulty in obtaining all the required data, particularly data related to staffing, staff rotations and expenditures within the Northwest Territories. For this reason some figures used in the report (e.g. employment multipliers, distribution of potential purchases in the N.W.T.) are a result of our analysis and reflect our understanding of the staffing and purchasing policies of the Polaris Mine, and are not based on finalized Polaris plans or the summary report.

Timing – Since the study team felt there might be a conflict if our community consultation work was carried out at the same time as Cominco was conducting its awareness program in Resolute and Arctic coast communities, it was decided to delay our visits by several weeks. This, combined with the untimely bankruptcy of the only airline serving Arctic coast communities caused delays in the field work and ultimately meant that planned follow up visits to Coppermine and Holman Island had to be cancelled. This limited the amount of data collected from these communities (re skills, interest and attitude towards the project,) which could reflect on the interest factors used for these communities. However, the study team was able to use other data sources and does not feel that the lack of this additional data affects the validity of the report.

N.W.T. Economic Model – There were some limitations with the N.W.T. economic model used to develop the N.W.T. economic projections. One particular concern is that these economic projections incorporate increases in real wages and productivity that reflect trends in the N.W.T. economy which occurred from 1967 to 1974. These increases are much higher than the growth in real wages and productivity that is likely to occur in the early 1980s. As a consequence, the model provides reliable estimates of the relative impact of the mine on the N.W.T. economy, but the absolute values generated by the model should be viewed with some caution. These and other limitations are discussed further in Chapter 3, pages 51 and 52.

ORGANIZATION OF THE REPORT

The report is divided into six main sections. The Project Overview section outlines the project's facilities, policies, expected expenditures and employee requirements. Using this base case data, the section also summarizes expected northern employment.

The economic impact of the Polaris Mine on the Northwest Territories economy is determined in another section. Low, medium and high simulations of possible impacts are compared with a benchmark (without the mine) scenario.

The main section of the report deals with the socio-economic impacts of the Polaris Mine on the community of Resolute Bay, which is the closest community to the mine site, and the only community likely to be affected both as a hiring centre and a staging area for men and supplies. In this section we determine the potential employment and income in Resolute as a result of the project, and we use this data as well as baseline data and interview data to determine the potential impacts of the Polaris Mine on the community.

The socio-economic impacts on the six Arctic coastal communities of Coppermine, Cambridge Bay, Spence Bay, Pelly Bay, Gjoa Haven and Holman Island are presented in lesser detail in the next section.

In the final section the study team recommends methods of implementing the Polaris Mine project to the benefit of the Northwest Territories, the community of Resolute and the Arctic coastal communities within the proposed Polaris Mine Arctic coast hiring area.

'2$_0$ Project Overview

2.1 General Description

The Polaris lead-zinc ore body is located on the southwest corner of Little Cornwallis Island, about 60 miles from Resolute Bay, N.W.T. Approximately 80 percent of the surface facilities are located in an area of 230 acres along Crozier Strait.

When full production is achieved, Polaris will process 2,050 tonnes of ore per day to produce 38,000 tonnes of lead concentrate and 170,000 tonnes of zinc concentrate annually. Estimated lifetime of the mine based on presently known resources is 21-25 years. Further mineral exploration could add to these resources.

2.1.1 MINING

The mine design is based on initially mining in the upper, higher grade section of the ore body (the Panhandle). It is anticipated that mining of the Keel Zone ore will start in about production year four.

Preproduction development is scheduled to start in November, 1980 and will be finished in late 1981. The mine will be highly mechanized. Drill equipment will be electrically powered to minimize fumes and heat. Development drilling will be dry, eliminating the need for an underground water supply system.

2.1.2 SURFACE FACILITIES

These include a barge housing the concentrator and service facilities, a concentrate storage building with a 12-month production capacity, accommodation facilities, a reclaim system of conveyors, dock facilities including shiploader, fuel oil storage and two pipeline systems, one for fresh water and one for tailings.

The process barge will be built, and the equipment installed on it, in eastern Canada. The barge will be towed to Little Cornwallis Island during the 1981 shipping season. During the 1980-81 construction period a berth will be prepared for the permanent location of the barge. This process barge is 100 feet (30.5 m) wide, 400 feet (122.0 m) long and four stories high (60 feet -18 m). The concentrator, powerhouse and heat regenerative equipment, shops, warehouses, laboratories, offices, soiless garden, and change house are located within the building on the barge; fuel oil storage tanks are located in the hull.

The concentrate storage building, 688 feet (210 m) x 175 feet (55 m), will be located south of the concentrator. Enclosed conveyors will carry the concentrates from the processor to the storage area.

The lead storage capacity will be 38,000 tonnes and the zinc storage capacity will be 175,000 tonnes. A shiploading conveyor system will move concentrates to ships. The shiploading will be carried out once a year during a period of six to nine weeks. Except for this period, the concentrate storage area will be unmanned.

Water Supply – Freshwater supply for the Polaris Mine will be obtained solely from Frustration Lake, which is approximately 3 miles (5 km.) from the plant site. An 8 inch water supply line will run to the 200,000 U.S. gal. freshwater tank. This water tank will serve domestic and process uses.

Tailings Disposal – Two 5 inch tailings lines (one a standby) will carry tailings to Garrow Lake. The pipes will be extended below the 26 m depth of the lake. The tailings line will be approximately 4 miles.

Sewage Disposal – Sanitary sewage from the accommodation complex and process plant, will be collected in two tanks, macerated and discharged, at depth, into Crozier Strait.

Airstrip – The existing airstrip will be extended to 3500 feet to permit use of DC-3 or equivalent aircraft, as well as STOL craft such as the Twin Otter or Dash 7. The airstrip will have navigation aids and lighting in compliance with M.O.T. regulations. The accommodation complex will be located near the airport so that part of it can be used as a terminal. A jet port was investigated, but dropped since the benefits were not great enough for the capital required to build it.

Dock – The dock will be located in Crozier Strait and is designed to accommodate carriers up to 40,000 WMT capacity. It will be located approximately 300 feet off shore.

Accommodation – This will be provided for 240 in 208 single rooms and 16 two-room suites, grouped around common lounge, laundry and sitting areas. The dining area can accommodate 150 people at one sitting and kitchen facilities cover all areas of food preparation (baking, butchering, etc.). Recreation facilities include an indoor pool with sauna and exercise room, a gymnasium, billiard area, reading room and music rooms. The complex will also house an infirmary, an office area and a storage area. No townsite on Little Cornwallis Island is planned.

2.1.3 COMMUNICATIONS

The Bell Telephone Company and the Telesat Corporation through the Anik satellite will provide general telephone/telex service. Employees may have private telephones by applying to Bell Canada and by paying standard installation and monthly rental rates. A receiver will be installed for reception of CBC-North service and an AM radio antenna will be erected to receive the CBC radio signal, and re-transmit this around the site via a low power transmitter. This will depend on acquisition of the necessary licences and the reception of satisfactory signal.[1]

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[1] Information from Cominco's May 1980 Polaris Mine Report.

2.1.4 TRANSPORTATION

Ore – The concentrates will be shipped from the site during the shipping season which extends from late August until mid November depending on the type of ship used.

Given shipping season limitations, the ore can be moved in eight to nine shipments by five to six ships of Type A or B, plus the M.V. Arctic, the Canadian built Class 2 ice-breaking bulk carrier.

Scheduling will be:	Shipment	1	August 15- August 26
	Shipments	2-7	August 25- September 15
	Shipment	8	October 15

The first and last shipments will be with the M.V. Arctic.

Supplies – General cargo amounting to 4,000-5,000 tons annually, will be delivered in late August or early September by one or two ships presently engaged in Arctic re-supply. One tanker will deliver the annual fuel requirements in late August to early September. In addition, approximately 200 tons of supplies will be moved by commercial air carriers to Resolute and then air charter to Little Cornwallis Island annually.

Personnel – Employees will be moved via commercial carriers from hiring centres in Montreal, Edmonton, Yellowknife, Coppermine and Cambridge Bay to Resolute Bay. Air charter shuttle flights three times weekly will move personnel from Resolute to the site on Little Cornwallis Island.

Airfare will be paid by Cominco to and from the hiring centres. Individuals will be responsible for paying their airfares between their home communities and the hiring centres.

From Montreal there are two flights weekly to Resolute Bay. These flights are operated by Nordair. Both flights stop only at Frobisher Bay en route to Resolute.

From Edmonton and Yellowknife there are two flights weekly to Resolute Bay. These flights do not stop at Cambridge Bay en route to Resolute, but do stop at Cambridge Bay on the southbound leg of the flight.

To travel from Cambridge Bay to Resolute at present, a passenger must fly to Yellowknife, overnight there, then board a plane for Resolute. The same scheduling is required to get from Coppermine to Resolute. Possibly PWA would stop at Cambridge Bay en route to Resolute if there was sufficient traffic.

For Coppermine people the connecting flight to either Cambridge Bay (once a week) or Yellowknife (four times a week) is operated by Northwest Territorial Airways. From Cambridge Bay there is connecting service three times a week to Gjoa Haven and Spence Bay, twice a week to Pelly Bay, once a week to Coppermine and once a week to Holman Island, with a one day stopover at Coppermine.

2.1.5 PRODUCT MARKETING

Astudyby Cominco's Corporate Business Services indicates adequate markets for the proposed Polaris production. Western Europe and the United States will be the main markets for concentrate from the Polaris Mine.

According to the *Polaris Mine Project Summary Report, July 1979,* the expected growth in western world zinc consumption is sufficient to permit the start up of 1⅓ mines of Polaris' zinc output each year, and the expected growth in western world primary lead consumption is sufficient to permit the start up of one mine of Polaris' lead output every year.

-2.2 Construction

2.2.1 CONSTRUCTION SCHEDULE

The Polaris Mine schedule calls for start-up of the concentrator operation in early 1982 with first movement of concentrates to Europe in the 1982 shipping season (August - October).

The critical item, as is the case in any High Arctic endeavour is the shipping season. Within the confines of the shipping season and the target start-up date the schedule is as follows:

Engineering Start, September 1979 – A contract was awarded to Canadian Bechtel for engineering, procurement, construction management and cost control for all phases of work for lead/zinc concentrating and support facilities for the Polaris Mine.

Field Work Start, March 1980 – This field work started with preparing the existing camp and upgrading the airstrip. Site preparation work such as water lines, fuel tank installation, roads, foundations, barge beaching site, etc. will be continued through 1980 and 1981. (For complete breakdown see Appendix 3).

Major Shipment of On-Site Material, August 1980 – Included in this shipment will be the materials for the permanent accommodation complex and the concentrate storage building. The first modules of the permanent accommodation will be ready for occupancy in January, 1981. This installation will be completed by the summer of 1981.

Mine Development Start, November 1980 – The existing underground workings will be opened and underground development will start at this time.

Shipment of Process Barge to Site, August 1981 – Barge construction in Eastern Canada will be completed by the summer of 1980, allowing installation of the process and power facilities during 1980-81 winter season, to be ready for moving to the site in the summer of 1981.

Fall, 1981 – Mine development work will be completed by the fall of 1981, including installation of the underground crusher and conveyor system. Mine training programs and initial production will start as development is phased out, and broken ore will be moved to the stockpile at the plant site, to be available to start-up in early 1982.

2.2.2 CONSTRUCTION EMPLOYMENT

The total number of on-site construction positions will vary from 30 during the first month of construction to 260 (for five months) during peak activity in 1981. This includes both direct employees of the contractor, Bechtel, and employees of sub contractors working on the site. On-site personnel working directly for Bechtel will be unionized, but Inuit workers will be exempt from union membership unless they choose to join.

TABLE 1

On Site Manpower Requirements by Month during Construction[1]

As at 1st of month	1980 Manpower Requirements	1981 Manpower Requirements
January	0	160
February	0	250
March	0	260
April	30	260
May	56	260
June	60	260
July	60	260
August	60	250
September	72	220
October	160	180
November	160	120
December	155	65

[1] Bechtel Canada, *Progress Report 4*, March, 1980.

TABLE 2

Man-Hour Requirements by Skills during Construction'

Teamsters 60,000 man hours	Iron Workers/Rebar 4,000 man hours	Painters 14,000 man hours
Labourers 200,000 man hours	Pipefitters 45,000 man hours	Sheet Metal Workers 24,000 man hours
Boiler Makers 10,000 man hours	Millwrights 23,000 man hours	Surveyors 17,000 man hours
Carpenters 40,000 man hours	Electricians 100,000 man hours	Diamond Drillers 3,500 man hours
Cement Masons 2,500 man hours	Operators 220,000 man hours	Insulators 7,000 man hours
Iron Workers/Structural 80,000 man hours		

'Information supplied by Cominco Ltd., April 1980.

The total number of on-site man hours is estimated at 850,000. The total hours of labourers and heavy equipment operators account for nearly 50 percent of the total hour requirements. These positions are the ones most likely to be filled by Northerners, although some teamster, carpenter and painter positions and maybe a small number in a few other categories could be filled by Northerners. Considering the skill levels of Northerners, the Bechtel northern recruitment policy for direct hires, the attractive wages offered on the site, and the travel payment factor, the study team estimates that Northerners will fill 30 - 40 percent of the construction staffing requirements.

2.2.3 CONSTRUCTION EXPENDITURES AND INCOME

Total expenditures for labour, materials, equipment and sub contracts will be close to $1 OO,OOO,OOO.[1] Nearly 20 percent of this amount will be for on-site labour, including labour costs of both Bechtel and sub contractors working on the site. (see Tables 3 and 4).

Northern hires will often be in the lowest paying jobs since they do not, in most cases, have the skills required for the higher paying trades jobs. Although we estimate that 30-40 percent of the on-site construction workers potentially could be Northerners, it is unlikely that Northerners' income would be 30-40 percent of the total on-site wage estimate.

In direct income from labour expenditures, the study team projects that Northern employees will earn approximately $5.7 million dollars during the 1980 and 1981 Polaris Mine construction phase.

Additional income will accrue to northern businesses through the purchase of supplies and services. In most cases, these will be labour intensive services, with labour costs included in the wage income listed above. Other Northern Value Added will be reflected in salaries paid to northern contractors and profits earned from Polaris Mine contracts.

To make it possible for northern companies to bid on some Polaris Mine construction contracts, large jobs are being broken down into component parts, so they can be handled by smaller northern companies. It is estimated that a total of $8,000,000 in sub contract work *could go* to northern companies, based on supplies and services available in the Northwest Territories. A list of jobs which could be handled by northern companies appeared in N.W.T. newspaper advertisements and is included in Appendix 4

[1] All $ 1979 dollars unless otherwise indicated. Information supplied by Cominco Ltd.. 1980

TABLE 3

Capital Expenditures: Construction

(Constant 1979 $'000)

	Bechtel Scope[1]	Mine Development	Owner's costs	Development	Total
1979	2,500	250	510		3,260
1980	32,931	2,787	1,000		36,718
1981	37,502	5,310	4,370		47,182
1982	7,835	711	449	—	8,995
1983					
1984		—		1,643	—
Total	80,?68	9,058	6,329	1,643	97,798[2]

Source: Outcrop estimates derived from Cominco July 1979 report and additional data supplied by Cominco.

[1] i.e. concentrator and surface facilities.

[2] The study team was given some updated figures for capital costs, prepared in March 1980. They showed that overall Polaris costs have increased by 13 percent to about $111 million (1980$). However, most of this increase is accounted for by the use of 1980$ rather than 1979$. The remainder is accounted for by purchases of material and equipment, all of which will probably be made in the South. It appears that real labour costs have remained essentially unchanged.

TABLE 4

Capital Expenditures: Construction

By Expenditure Category
(Constant 1979 $'000)

	Labour		Material	Equipment	Other[2]	Total
	Onsite	Offsite[1]				
1979	575	324	851	469	1,041	3,260
1980	7,427	4,243	11,111	5,920	8,017	36,718
1981	9,088	4,825	13,232	7,375	12,662	47,182
1982	1,784	1,011	2,676	1,396	2,128	8,995
1983		—		—	—	
1984	—		—		1,643	1,643
Total	18,874	10,403	27,870	15,160	25,491	97,7983

Source: Outcrop estimates derived from July 1979 report and additional data supplied by Cominco.

[1] Excludes offsite labour of Bechtel sub contractors. This is included in other.

[2] Includes owner's costs and deferred 1984 development.

[3] The study team was given some updated figures for capital costs, prepared in March 1980. They showed that overall Polaris costs have increased by 13 percent to about $111 million (1980$). However, most of this increase is accounted for by the use of 1980$ rather than 1979$. The remainder is accounted for by purchases of material and equipment, all of which will probably be made in the South. It appears that real labour costs have remained essentially unchanged.

2.3 Operations

2.3.1 OPERATIONS SCHEDULE

Mine production will beat the rate of 2050 metric tonnes per calendar day or 750,000 tonnes per year. Mill throughput is expected to be 68 percent of capacity during the first year primarily to allow for normal start-up problems throughout the operations and to compensate for the higher grade ore from the Panhandle zone.

Estimated Total Tonnage Per Year

First year	– 510,000
Second year	– 610,000
Third year	– 720,000
Fourth year and thereafter at average mine grade	– 750,000

The current schedule calls for start-up of operations in early 1982.

2.3.2 WORK ROTATION SCHEDULES

There will be two types of work rotation schedules for employees at the Polaris Mine. One involves 12 weeks on site and three weeks paid leave "off site" and is referred to as the *sou them TO tation schedule.* [1] Hiring centres for this group of employees will be Yellowknife, Edmonton and Montreal.

The second schedule, the *northern rotation schedule,* consists of six weeks on-site and four weeks "off site" leave, partially paid and pro rated to southern leave. This northern rotation schedule is proposed for the Inuit to allow them to earn a good wage and yet be able to pursue their own lifestyle to some extent. Inuit are not restricted to the *northern* rotation schedule, but may work the *southern* work rotation schedule (12 and 3) if they so wish. Hiring centres for the northern rotation schedule employees are Resolute Bay, Cambridge Bay and Coppermine.

For the purposes of this study we have assumed that *all* Inuit employees will work a northern work rotation schedule (6-4) although there is the possibility that some Inuit will select the southern work rotation schedule (12-3).

Although all on-site employees will be on either northern or southern work rotation schedules, these schedules will be set up in such a way that there will not be major schedule changes days when a large number of people come into or leave the site. Rather the rotation will be staged so there is continuous movement of small numbers of people into and out of the mine site.

NOTE:

In this report, Polaris Mine employees are broken down into two general categories; northern employees and southern employees. Within the northern category, further breakdowns were required to conduct the analysis. Following are the definitions applied to northern and southern employees in this report.

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[1] The 12-3 rotation is a change from the 13-3 schedule presented in the July 1979 *Summary Report,*

NORTHERN EMPLOYEES

Northern employees are considered to be all Polaris employees whose place of residence is the Northwest Territories. This includes employees working at the mine site, the administrative/operating office in Yellowknife, or in Resolute. Northern employees include the following two categories:

Northern Rotational Employees – This includes only northern employees who work at the mine site on a six weeks on the job, four weeks off, work rotation. These employees are mainly Inuit and reside in the Northwest Territories outside of Yellowknife. In this report, when referring to northern rotational employees, they may also be called northern on-site employees, or northern hires.

Senior Staff Employees – This group of 10 people will hold the senior mine positions and will rotate between the mine site and the office in Yellowknife.

Northern employees may also work on southern rotation schedules or may not work on rotation.

SOUTHERN EMPLOYEES

Southern employees are employees who are *not* residents of the Northwest Territories. These employees will travel from other parts of Canada to work at the mine for 12 weeks, then will return to their home area for three weeks.

2.3.3 OPERATIONS EMPLOYMENT

2.3.3.1 Number of Positions

Exhibit A-1 shows the positions that need to be filled on a full time basis for the, Polaris Mine to run efficiently and meet its production targets. There is a total of 163 positions. While it is possible that the mine could operate for short periods with some of these positions vacant (for example, during periods of sick leave), it is undesirable for the mine to operate for extended periods with any of these positions vacant. In other words, the mine will be staffed in such a way that all these 163 positions will be filled almost all the time.

It should be noted that 163 is not the total number of positions. According to Cominco's July, 1979, *Polaris Mine Project Summary Report,* there are 205 (non-catering) positions. Included in this total, however, are 42 positions (= 205 – 163) that can be considered "non-essential" in the sense that they can remain unfilled for extended periods without significantly reducing the efficiency of the operation. The analysis contained in the remainder of this report is based on the 163 "essential" positions.

Included in the 163 essential positions are 25 positions that will be filled by administrative and senior staff employees located in the project office in Yellowknife[1] and one position for the Resolute expediter. These positions will be filled by full time employees. The remaining 137 positions will be filled by rotational employees, either Southerners who will work a 12 weeks on — 3 weeks off schedule o-r Northerners who will work a 6 weeks on – 4 weeks off schedule.

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[1] Ten of these people will work both at the mine site and at the Yellow knife office

Multiplier for Northern Rotational Employees

A certain number of the 137 rotational positions will be filled by Northerners. Clearly, the number of northern rotational employees will be greater than the number of rotational positions filled by Northerners since each Northerner will work only 31 weeks (= 52/10 x 6) out of the 52 weeks in the year, and someone (presumably another Northerner) will have to fill his/her job for the remaining 21 weeks. In this section, we determine a multiplier that will answer the question: If Northerners hold x rotational positions, then what number should we multiply x by to determine how many northern rotational employees there are?

Since each northern rotational employee will work only 31 weeks, the minimum number of Northerners required to fill each rotational position is 1.68 (= 52/31). It is unlikely, however, that the multiplier will be as low as 1.68.

A multiplier this low could only be obtained under very ideal conditions: a large number of rotational positions held by Northerners, each Northerner possessing the skills necessary to fill several positions (so that Northerners can be easily shifted from position to position), rotation schedule for all northern employees designed in such a way that there is not a single day of overlap (two employees on-site to fill a particular position when only one is required). On the other hand, it is clear that the multiplier is less than 2, since the rotational positions held by Northerners could be covered by two shifts of northern employees with the number of people in each shift equal to the number of positions and with the second shift reporting to the site at the beginning of week five of the first shift's work period. It appears reasonable to use 1.84, the average of 1.68 and 2, as the multiplier for northern jobs, i.e., the number of nort hem rotational employees will be 1.84 times the number of rotational positions held by Northerners.

Multiplier for Southern Rotational Employees

Since each southern rotational employee will work only 42 weeks (= 52/15 x 12) out of the 52 weeks in the year, the minimum numbers of southern rotational employees required to fill each rotational position is 1.24 (= 52/42). As with Northerners, it is unlikely that the actual multiplier is this low. The multiplier is clearly lower than 2, however, since two shifts, each equal to the number of positions, could clearly cover these positions. We will use 1,62, the average of 1.24 and 2, as the multiplier for southern rotational employees.

The total number of rotational employees will vary according to the percentage of rotational positions that are held by Northerners. For example, if 40 percent of these positions are held by Northerners, then there would be 55 rotational positions held by Northerners and 82 rotational positions held by Southerners; this would mean there would be 101 (= 55 x 1.84) northern rotational employees and 133 (= 82 x 1.62) southern rotational employees, for a total of 234 rotational employees. On the other hand, if 60 percent of the rotational positions were held by Northerners, a similar computation would show there would be a total of 240 rotational employees.

At first glance, it might seem as though these multipliers imply there will be a lot of rotational employees "standing around" during periods when the rotation shifts overlap. For example, if the northern multiplier is 1.84, there will be a total of 8

weeks per year (= [1.84 - 1.68] x 52) during which each two northern rotational employees holding-the same position overlap. Similarly, a southern multiplier of 1.62 would imply a total of 20 weeks per year (= [1.62 - 1.24] x 52) during which each two southern rotational employees overlap. It should be kept in mind, however, that there are 42 rotational positions in addition to the 137 essential rotational positions, so there is little doubt that useful work can be found for rotational employees during periods of overlap. (For example, if Northerners hold 40 percent of the 137 positions, it can be shown that a maximum of only 33 of the 42 non-essential positions can be filled by northern and southern rotational employees during periods of overlap.)

It could still be argued that the southern multiplier seems intuitively too high. A lower multiplier for southern rotational employees would not significantly affect the analysis contained in the rest of this report. For example, if the southern multiplier were only 1.43, the average of the lowest theoretically possible multiplier of 1.24 and the multiplier of 1.62 we have used, the total number of rotational employees would change by less than 10 percent.

EXHIBIT A-1

Essential Polaris Mine positions (full operation)

MINESITE

MINE

Mine foreman	– 1
Shift foreman	– 2
Relief/training foreman	– 1
Drillers	– 4
Diamond drillers	– 2
Development miner	– 8
Blaster	– 4
Scaler/Rockbolter	– 4
Crusherman	– 4
Muck machine operator	– 4
Mine maintenance foreman	– 1
Heavy duty mechanic	– 4
Millwright/repairmen	– 2
Surveyor	– 1
Tool crib attendant	– 1
Surveyor's helper	– 1
Mine clerk	– 1
Mine secretary	– 1
Mechanic apprentice	– 3
Tireman/labourer	– 1
Sampler	– 1
Underground labourer trainee	– 3
	54

MAINTENANCE

Mine shops foreman	– 1
Assistant shops foreman	– 1
Heavy duty mechanic	– 4
Machinist	– 1
Welder	– 1
Millwright	– 1
Plumber	– 1
Carpenter	– 1
Mechanic's apprentice	– 3
Machinist's apprentice	– 1
Welder's apprentice	– 1
Millwright's apprentice	– 1
Tireman/labourer	– 1
Carpenter's apprentice	– 1
Electrical foreman	– 1
Powerhouse operator	– 2
Electronics mechanic	– 1
Electricians	– 6
Electrician's apprentice	– 3
Labourer clean up	– 1
Surface foreman	– 1
Equipment operator	– 2
Truck driver	– 2
Labourer	– 2
	40

MILL

Mill foreman	– 1
Shift foreman	– 2
Relief/Iraining foreman	– 1
Grind operators	– 2
Flotation opertors	– 2
Relief operators	– 2
Filter operators	– 2
Reagent operator	– 1
Relief/trainee	– 1
Mill maintenance foreman	– 1
Millwright	– 1
Pipefitter	– 1
Welder	– 1
Welder's apprentice	– 1
Greaser, clean up	– 1
Development technician	– 1
Chief chemist	– 1
Shift assayer	– 1
Relief assayer	– 1
Bucker	– 1
	25

YELLOWKNIFE OFFICE

● Manager — Polaris Mine
Manager's Secretary
*General Superintendent
*Chief Geologist
*Mine Superintendent
● Maintenance Superintendent
● Mill superintendent
● Getdogist
Geological Technician
● Mine Engineer
Planning Engineer
Mining Technician
*Maintenance Engineer
Maintenance Planner
Maintenance Clerk
● Mill Engineer
Accountant
Assistant Accountant
Accounting Clerk
Payroll Clerk
Personnel Assistant
Purchasing Agent
Buyer
Secretarial/Clerical(2)

25

ADMINISTRATION

Safety officer	– 1
Nurse	– 1
First aid man	– 1
Personnel supervisor	– 1
Training officer	– 1
Accommodations supervisor	– 1
Assistant training officer	– 1
Storekeeper	– 1
Manager's secretary	– 1
Assistant storekeeper	– 1
Warehouse clerk	– 4
Accounting clerk	– 1
Payroll clerk	– 1
Timekeeper	– 1
Personnel assistant	– 1
	18

Total Positions ● t Mine Site 137

Total Yellowknife Office 25

RESOLUTE

Expediter/Liaison 1

Total Polaris Positions **163**

*indicates positions where people will work part of their time in the Yellowknife office and part at the Polaris Mine site.

Information provided by Cominco, April, 1980.

EXHIBIT A-2

Polaris Mine Positions – Phasing-in and Full Operation

On-Site Staff by
Work Area Positions

	Phasing-in Years 1 and 2		Full Operation	
MINE	**Spvr.**	Non **Spvr.**	**Spvr.**	Non **Spvr.**
Operations	4	25	4	33
Maintenance	1	9	1	16
	5	34	5	49
MAINTENANCE				
Shops	2	14	2	17
Electrical	1	10	1	13
Surface	1	6	1	6
	4	30	4	36
MILL				
Operations	4	10	4	10
Maintenance	1	5	1	5
Labs	2	3	2	3
	7	18	7	18
ADMINISTRATION				
Accounting		3		3
Safety	2	1	2	1
Personnel	3	2	3	2
Warehouse	1	5	1	5
Manager's Secretary	—	1	—	1
	22	94	22	115

Total Mine Site	116	137
Resolute Office	1	1
Yellowknife Office	25	25
Total Positions	142	**163**

2.3.3.2 Positions and **Qualifications**

The on-site staff is defined in terms of positions to be filled. The number of positions in each work area during the phasing in period and full operations is shown in Exhibit A-2.

The on-site jobs will require different skills, education levels and experience as follows:

A Category - Professional - University or 5 years or more mining/supervisory experience (i.e. chemist, foreman, etc.)
B Category – Highly Skilled -3 years formal training or technical background (i.e. tradesmen, drillers, surveyors)
C Category - Skilled - minimum 1 '/z years previous experience (i.e. operators in mill, assayer, equipment operators)
D Category – Semi-Skilled -6 months - 1½ years previous experience or minimum education required (i.e. muck machine operators, crushermen)
E Category – No previous experience - basic induction, orientation (i.e. new apprentices, labourers)

TABLE 5

Summary of On-Site Positions by Job Category

Full Operation	A	B	c	D	E	Total
Mine	5	25	4	12	8	54
Maintenance	3	19	2	2	14	40
Mill	7	3	8	3	4	25
Administration	6	4	4	4	–	18
Totals	21	51	18	21	26	137

Exhibit B describes the positions in each category by work area and Exhibit C relates possible Northern hires to these positions.

Wages

A representative annual salary for an on-site rotational worker in a non supervisory capacity (categories B, C,D,E) in 1979 dollars would be $20,000 for a Northern hire (working approximately 31 work weeks) and $30,000 for a Southern hire (working approximately 42 work weeks). The average salary for on-site supervisory staff (A category), administration staff and senior management rotational staff would be considerably higher.[1]

[1] Information provided by Cominco. April, 1980.

EXHIBIT B

On-Site Positions by Skill Category
(during full operation)

	A	B	C	D	E
MINE					
Operations	Mine foreman - 1 Shift foreman - 2 Relief/training foreman – 1	Driller - 4 Diamond driller – 2 Development miner – 8 Blaster - 4	Scaler/rock. bolter - 4	Crusherman - 4 Muck machine operator - 4	Underground labourer/ trainee – 3
Maintenance	Mine maintenance foreman - 1	Heavy duty mechanic - 4 Millwright repairman – 2 surveyor - 1		Tool crib attendant – 1 Surveyor's helper – 1 Mine clerk – 1 Mine secretary – 1	Mechanic apprentice - 3 Tireman labourer - 1 Sampler - 1
		25	4	12	8
MAINTENANCE					
Shopa	Mine shops foreman - 1 Asst. shops foreman- 1	Heavy duty mechanic - 4 Machinist – 1 Welder - 1 Millwright – 1 Plumber – 1 Carpenter - 1			Mechanic's apprentice - 3 Machinist's apprentice – 1 Welder's apprentice - 1 Millwright's apprentice - 1 Tireman/labourer – 1 Carpenters apprentice – 1
Electrical	Electrical foreman - 1	Powerhouse op. – 2 Electronics mech. – 1 Electrician - 6			Electricians apprentice – 3 Labourer/ Clean-up – 1
Surface		Surface foreman – 1	Equipment op. – 2	Truck driver - :	Labourer – ?
		19	2		14
MILL					
Operation	Mill foreman –) Shift foreman – ? Relief/training foreman – 1		Grind operator – 2 Flotation operator – 2 Relief operator – 2	Filter op. – ? Reagent operator - 1	Relief/trainee – 1
Maintenance	Mill maintenance foreman – 1	Millwright – 1 Pipefitter – 1 Welder - 1			Welder's apprentice – 1 Greaser Cleanup – 1
Labs	Dev.technician – 1 Chief chemist – 1		Shift assayer – 1 Relief assayer – 1		Bucker – 1
		3	8	:	4
ADMINISTRATION					
Accounting			Accounting clerk – 1 Payroll clerk – 1 Timekeeper – 1		
Safety	Safety officer – Nurse –	First aid man – 1			
Personnel	Personnel spvr. – Training officer – Accommodations spvr.	Asst. training officer – 1 Personnel assistant – 1			
Warehouse	Storekeeper	Manager - Secretary – 1	\.. I sto rekee pe r 1	Warehouse clerk –	

EXHIBIT C

Assessment Re Possible Northern Rotational Employees
by Job Category Skill Requirements

Category	Total # of positions	# which could be filled by Northerners 1982	# which could be filled by Northerners 1985
A	21	—	—
B	51	3	12
c	18	5	12
D	21	21	21
E	26	26	26
	137	55	71
		40%	52%

— Based on assessment of skills currently available in hiring area, unemployment rates
— Considering recruitment/training policies specified
— Assuming Cominco is a "preferred" employer in the area

— Assuming that some of the people who are hired initially continue in jobs and that via these jobs, 50 percent of those in apprenticeship positions go on to journeyman jobs in Category B
— Considering increasing number of young people entering the work force in N.W.T.
— Assuming limited number of new major employers in the N.W.T.

Study team estimates.

2.3.3.3 Recruitment/Training

Cominco personnel plans specify that they will provide employment for the Inuit and other N.W.T. residents. To achieve this, they plan to recruit extensively in the North for people to fill training positions. In 1980 the recruitment program will concentrate on an education effort to acquaint communities with mining in general and to increase awareness of the range of job opportunities available. During 1980, specific commitments will be given to individuals who complete upgrading or pre employment courses.

In 1981 specific recruitment will take place for the remaining training positions.

Cominco plans to hire the majority of its northern rotational staff from the Central Arctic coast communities and from Resolute, with the main recruitment effort in these communities.

Training Programs*

All training programs will be particularly aimed at developing and integrating the northern employee. All supervisors will be given instruction in cross-cultural differences. Where possible Inuit lead hands and supervisors will be trained and will be used.

Certain training positions will be available for persons with minimum education requirements. These positions will include a variety of apprenticeship positions such as heavy duty mechanics, millwrights, welders, industrial warehousemen, etc. Selected candidates for apprenticeships will be guaranteed employment upon completion of academic upgrading or formal schooling.

Target date for hiring apprentices who have completed the pre employment course at the Adult Vocational Training Centre in Fort Smith is June 1981. These apprentices will work at Cominco's Con Operations or Pine Point Mine until the Polaris Mine starts operations. The target date for hiring apprentices who have not completed the pre employment course is December, 1981.

There will also be training openings for two surveyors and two assayers, to be hired in spring, 1981. Work leader trainees to be hired June, 1981 will be given exposure to mining work experience and leadership training at Cominco's Con Mine in Yellowknife and Pine Point Mine.

A course in basic mining skills, lasting 20 to 30 days will be mandatory for miner training. Target date for these trainees is November, 1981. There will be no minimum education requirements.

A program of formal on-the-job training will start for people at the concentrator in October of 1981, and in December of 1981, up to 40 persons will be given basic mine induction training to enable them to take general labour jobs. Equipment operators positions will likely go to Northerners with previous training, but if training is required, it will be through AVTC'S Heavy Equipment Operator course.

Training positions will be widely advertised in the North using ANIK info ads and notices sent to settlement/hamlet councils. Also, N.W.T. government area service

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Cominco Ltd.. *Operation Katak.*

people and adult educators in the communities as well as Canada Manpower Outreach offices will be advised of available positions.

Employment and Training Committee

An Employment and Training Committee will be formed to ensure there is a good communications link between employees and management. Representatives from the work force and management will meet regularly to discuss problems, correct problems, improve training and examine any other concerns that employees may have.

TABLE 6

Pre Production Training Positions

Position	# of trainees	Training Months Per Trainee	Total Training Months
1) Interpreter	1	—	
2) Recruiter	1	12	12
3) Surveyor	2	9	18
4) Spvr./work leaders	4	6	24
5) Pre employment grads	4	6	24
6) Assayer trainees	2	6	12
7) Warehouse	4	6	24
8) Mine Trainee	8	3	24
9) Concentrator trainee	4	3	12
10) Apprentices	11	2	22
11) Office clerical	2	2	4
12) General hire	30	2	60
	73		236

Information supplied by Cominco, April, 1980.

2.3.3.4 Potential Northern Staff

In this section we summarize the total number of potential northern employees expected to work at Polaris and determine the most likely situations regarding percentage of mine positions which will be filled by Northerners in the years 1985, 1990, 1995 and 2000.

For northern rotational jobs at the site we considered potential employees only from Resolute and the Arctic coastal communities. To estimate the percentage of *all* Polaris positions which will be held by northern employees, we included the staff in Yellowknife and the expediter in Resolute,

In our breakdown of potential employees, Coppermine and Cambridge Bay have been considered separately since they are classified as hiring centres, with round trip transportation paid from these two communities. The other Arctic coastal communities are within the specified hiring area, but people from these communities would have to pay their own travel costs to Cambridge or Coppermine if they wanted Polaris Mine employment.

In addition to the base case outlined above, (travel costs paid only from Cambridge Bay and Coppermine) we also considered an alternative case which gives numbers of potential northern employees if travel costs were also paid to and from the site for residents from the Arctic coastal communities of Spence Bay, Gjoa Haven, Pelly Bay and Holman Island.

The methodologies for estimating the number of northern employees from each location are explained in Chapter 4.2 Resolute Employment and Chapter 5.2 Arctic Coastal Communities Employment.

In the following tables, full time northern rotational employees are employees who are expected to work at the mine one year or longer. Partial year rotational employees are the people who will work at the mine for less than one year, for varying lengths of time. The partial year rotational figures are expressed in man year equivalents, since the period of employment could range from one month to just less than one year.

TABLE 7

Potential Number of Northern Employees

BASE CASE

	1985	1990	1995	2000
Resolute				
Full time rotational	7	9	11	11
Partial year rotational	3	4	5	5
Cambridge and Coppermine				
Full time rotational	17	20	22	25
Partial year rotational	14	16	18	20
Other Arctic Coast Communities				
Full time rotational	4	5	5	6
Partial year rotational	3	4	4	5
Total	48	58	65	72
On Site Northern Hires				
Expressed as % of on-site positions	19%	23%	26°10	28%
Expressed as % of on-site jobs	21%	25%	28%	31%
Yellowknife office	25	25	25	25
Resolute Expediter	1	1	1	1
Total – All Northern Employees	74	84	91	98
All Northern employees as % of Total Polaris Staff	29%	33%	360/o	38 0/0

TABLE 8

Potential Number of Northern Employees

ALTERNATIVE CASE

(assuming paid travel costs to and from other Arctic Coast Communities)

	1985	1990	1995	2000
Resolute				
Full time rotational	7	9	11	11
Partial year rotational	3	4	5	5
Cambridge and **Coppermine**				
Full time rotational	17	20	22	25
Partial year rotational	14	16	18	20
Other Arctic Coast Communities				
Full time rotational	19	24	27	30
Partial year rotational	16	18	23	25
Total	76	91	106	116
On Site Northern Hires				
Expressed as **%** of on-site positions	**31%**	370/0	**42%**	**47%**
Expressed as **%** of on-site jobs	33 Q/o	**41%**	**45%**	**49%**
Yellowknife office	25	25	25	25
Resolute Expediter	1	1	1	1
Total – **All** Northern Employees	**102**	117	132	142
All Northern employees as **%** of Total Polaris Staff	**40%**	**46%**	**52%**	**55%**

2.3.4 OPERATION'S EXPENDITURES

An analysis was conducted on an item by item basis of the operating purchases of the mine in relation to the supply capability of Resolute, Yellowknife and the total N.W.T. economy. Broad estimates were also developed of the Northern Value Added (largely wages and salaries, proprietor's income and profit) that would be generated by those purchases from northern suppliers. The analysis, which is presented in the following table suggests that about two million dollars – or 16 percent of the mine's operating supplies of $12.3 million could be purchased from northern suppliers. The small size of these northern purchases reflects the Territories lack of a manufacturing base and the project's distance from the Territories larger centres, especially Yellowknife.

The study team's estimated breakdown of these purchases by community is presented in Table 10.

TABLE 9

Annual **Polaris** Purchases of Goods & Services During Operations

Total annual supplies excluding **labour** equals $12,262,000

($'000)

	Total Purchases	Value of Purchases From Northern Suppliers	Northern Value Added*
Fuel	2830	—	—
Mill Operating Costs	1752	—	—
Mine Operating Costs	2474	—	
Maintenance Costs	425	—	—
Corporate Charges	384	—	
Catering	1168	1168	4671
Rotational Expenses	888	220[4]	176
Safety Program	30	30	24[2]
Communications	204	—	—
Personnel Overhead	160	160	**128**[2]
Personnel Travel Expenses	35	10	8[2]
Misc. Personnel Expenses	60	—	
Operating Office Costs	135	75	75
Annual Freight	1305	120[3]	962
Hiring Costs	202	120	96[2]
Training Costs	45	45	36[2]
Emergency Air Evacuations	40	20	16[2]
Stores, Average Loss & Damage	125		—
	12,262	1968	1122

e: estimated

[1] 40 Q/o of purchase is assumed to be northern value added

[2] **80%** of purchase is assumed to be northern value added

[3] includes air related expediting plus expediting services at Resolute plus ship loading and off-loading at Polaris site, 18 man crew for three months a year, incoming freight and concentrates.

[4] includes air related purchases plus hotel expenses for lay-over of personnel (1 day per person each way per rotation)

* Includes wages and salaries, proprietor's income and profit to northern residents

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Note: These estimates of value added are based in part on the document "Evaluation of the Costs and Benefits Related to the Development of the Polaris Project of Arvik Mines, Ltd." by Marcel St. Pierre, Northern Program Planning Branch, Dept. of Indian .4 ffairs and Northern Development, February, 1978.

TABLE 10

Community Distribution of Purchases During Operations

The following northern purchases would likely be made in Resolute:

	Value of Purchase ($ '000)	Northern Value Added 4$'000)
Annual freight[1]	120	96
Rotation expenses[2]	220	176
Emergency Air Evacuations	20	16
	360	288

[1] Annual freight includes the labour costs of unloading and loading ships at Polaris during shipping season.

[2] Rotational expenses includes charter air costs between Resolute and the mine site, and meals and accommodation costs for people holding over in Resolute en route to and from the mine site.

The remainder, related to administration, catering and hiring will probably be made in Yellowknife, although it is possible that the hiring and catering services could be purchased in another N.W.T. community.[1]

	Value of Purchase ($'000)	Northern Value Added ($'000)
Catering	1168	467
Hiring costs	120	96
Safety program	30	24
Personnel Overhead	160	128
Personnel Travel Expenses	10	8
Training costs	45	36
Operating Office costs	75	75
	1608	834

[1] Based on study team analyses.

Some of the purchases allocated to Resolute could occur in Coppermine and Cambridge Bay (i.e. rotational expenses, some of the labour costs re ship loading since Resolute cannot likely supply all the manpower requirements for this short term operation).

3. Economic Impact of the Polaris Mine on the Northwest Territories Economy

Before evaluating the economic impacts of the Polaris Mine with respect to different N.W.T. communities: Resolute, Coppermine, Cambridge Bay, and so on, it is first necessary to determine the employment and income impacts on the total Northwest Territories economy. These N.W.T. impacts include direct employment and income effects, the indirect or supplier related effects resulting from the employment and income gains realized by N.W.T. suppliers to the mine, and the induced or resending effects which largely result from the consumer expenditures of Polaris employees and the employees of the mine's suppliers. It is necessary to determine the impacts for both the construction (1980-82) and operations (1982 on) phases of the Polaris Mine. Once the total N.W.T. impacts are identified, these income and employment effects and resulting multipliers are then used to determine the economic impact of the Polaris Mine on different communities. Essentially, the main analysis involves the application of various assumptions regarding community multipliers and labour availability in order to distribute the total N.W.T. impacts among the various communities.

This chapter therefore describes the methodology used to analyze the employment and income effects of the Polaris Mine on the N.W.T. economy and to summarize the results from applying this methodology.

3.1 Methodology

For this analysis, the study team decided to use the economic model of the Northwest Territories, N.W.T. MODO, developed and run by the Department of Economic Development and Tourism of the N.W.T. governmental The N.W.T. MODO is a computerized simulation model of the existing Northwest Territories economy. As outlined in the Users' Manual, the purpose of the model is to assist policy makers by providing forecasts of economic variables as well as providing an analytical tool for evaluating the economic impacts of different policies and projects. In this manner, the model provides a consistent framework within which the performance of the economy can be identified, and policy and project impacts can be evaluated. The model is a demand driven non-linear specification built around the sector accounts of the Northwest Territories Economic Accounts. Given the parameter values, values for the exogenous variables, and initial values for the predetermined variables, the model generates values for all endogenous variables for as many years as the user requires.[2] The model is essentially run by the export sectors of the N.W.T. economy: mining, mineral exploration, the fish and fur sector, tourism, and the government sector. These "export" industries are the model's exogenous sectors and their levels of activity largely determine the economy's overall performance.

The simulation runs for this analysis were conducted by Dan Westman, Research Officer with the Planning and Resource Development Division of the Department.

Users' Manual for N.W.T. MO DO. May, 1978, page 1.

In the study team's view, N.W.T. MODO represents a particularly appropriate tool for evaluating project impacts. Because of the lack of up-to-date time series data-information that is generally required to estimate model equations using econometric techniques – N.W.T. MODO has some limitations as a forecasting tool. However, these limitations become less important in impact analysis which involves comparing the performance of the N.W.T. economy under a "with the mine" scenario, with a "without the mine" benchmark scenario. In this type of analysis, the *differences* between the with and without the mine scenarios are much more important than the actual levels of those economic indicators. Comparisons between the two scenarios can provide useful and meaningful results even when the absolute values of these indicators happen to be either over or under-estimated. In sub-section 3.4 of this Chapter, most of the emphasis will be given to these differences with particular attention given to the following indicators: gross territorial product, personal income, total employment, unemployment, and the income and employment multipliers.

In order to conduct the simulations, it was decided to construct a "dummy" export sector for the Polaris Mine. This was made necessary by the fact that this mine has very different economic characteristics from other mines in the Northwest Territories. In particular its location in the high Arctic probably means a sharp reduction in the opportunities available to local N.W.T. firms in the more developed centres in the Territories to supply materials and services to the mine. As well, because of the mine's location and the lack of a townsite, the proportion of the work force who are residents of southern Canada could be higher compared with mines in the southern part of the Territories. In order to construct this dummy sector, it was necessary to establish values for the following parameters:

i) the mine's capital investment, both before and after start-up
ii) the value of the mine's exports from the N. W.T., net of freight charges
iii) the share of construction and operating employment that will go to residents of the N.W.T.
iv) the share of capital requirements and operating materials and supplies that will be met by N.W.T. firms
v) based on iii and iv, the estimation of N.W.T. value added – mainly wages, salaries and profits — and the development of parameter values for the 'marginal propensity to import capital goods and the marginal propensity to import inputs into the mine. (See point 2 of Technical Note to this Chapter)

Cominco has been able to estimate values for the first two fairly precisely but the last three parameters are subject to a great deal of uncertainty. The objective of Cominco is to maximize northern and in particular Inuit employment during both the construction and production phases of the Polaris Mine. However, the extent to which this objective is achieved will depend on a variety of factors, including the success of Cominco's recruitment and training programs, the firm's policies on travel costs and the attitudes and interests of the N. W.T.'s Inuit population.

The opportunities for N.W.T. firms to supply to the mine are limited by the mine's location and the N. W.T.'s lack of an industrial sector. Within these constraints, the objective of Cominco is to maximize the supply opportunities open to N.W.T. firms. Most of these opportunities will arise during the operations phase, and would include:

- catering at the mine site (discussions have been held with the **Inuit** Development Corporation regarding their interest in supplying this service)
  laundering the-miners' **workclothes**
- the provision of air charter services, expediting services, ship loading and off-loading, plus meal and accommodation expenditures for the stop-over of personnel at Resolute, and expected purchases by **Cominco** at stores in Resolute[3]
  smaller-scale opportunities, often of a non-recurring nature, available to business service firms in Yellowknife, e.g., management consulting, consulting engineers, computer firms, lawyers.

These opportunities were further described in sub section 2.3.4. Current estimates of the size of these contracts, the share of these contracts that will go to northern firms, and the **N.W.T.** value added that will result from them, are very preliminary and are subject to change.

Because of the uncertainties surrounding these parameter values, the study team decided to test three scenarios which incorporate varying degrees of economic impacts for the **N.W.T.** economy. The three scenarios were chosen in order to display a wide range of potential impacts from the mine. In developing them, particular weight was placed on the availability of **labour** in the **N.W.T.** in relation to the personnel requirements of the mine. The low scenario was selected to portray the lowest level of impact that could be anticipated. The high scenario may not be realistic at this time but could be approached over time as northern skills improve and firms in the Territories increase their supply capability. Therefore, the low and high scenarios should be viewed as the two outer bounds within which the actual impacts can be expected to fall. More specifically, the three scenarios incorporate the following key comparisons:

Low Impact Scenario

i) northern value added – largely wages and salaries plus profits – comprises five percent of the cost of construction; this implies that about one-quarter of on-site **labour** during construction is resident in the N. W.T.; (this assumption also incorporates a small amount of supply by **N.W.T.** firms).

ii) during operation, **N.W.T.** residents hold about a quarter of the total jobs. Since all management and administrative staff (**totalling** 26) are based in Yellowknife (except for the employee in Resolute) and are automatically classified as northern employees this assumption implies that about a sixth of the on-site staff are residents of the **N.W.T.**

iii) by 1986 when the mine achieves its **long-term** production and revenues levels, northern value added from the supply of materials and services to the mine's operations will be $1 million per annum, which implies supplier generated employment of about 30 positions per annum.

Medium Impact Scenario

i) northern value added makes up 13.5 percent of the cost of construction, implying that about two-thirds of on-site construction labour are N.W.T. residents.

ii) during operations, N.W.T. residents account for about a third of the on-site work force.

[3] preliminary estimates of these expenditures are provided in the document: "Evaluation of the Costs and Benefits Related to the Development of the Polaris Project of Arvik Mines. Ltd.. " by Marcel St. Pierre, Northern Program Planning Branch, Dept. of Indian Affairs and Northern Development, February, 1978.

iii) by 1986, northern value added from the supply of materials and services to the mine's operations will be $1.5 million; this implies supplier generated employment of perhaps about 40 positions per annum.

High Impact Scenario

i) northern value added makes up 22 percent of the cost of construction, implying that all of the on-site construction labour are resident in the N.W.T. (this also includes about $2 million of value added associated with the supply of materials and services for construction.)

ii) during operations, N.W.T. residents comprise about one half of the on-site work force.

iii) by 1968, northern value added from the supply of materials and services to the project will be $2 million, implying supplier generated employment of about 55 positions per annum.

These assumptions, and their major implications, are fully detailed in Table 11. All values are in constant 1979 dollars, and therefore differ from the values in the Polaris Summary Report which include escalation factors. (This re-adjustment was required in order to operate the model.) Particular attention should be given to the two marginal propensities, which are much higher than the corresponding marginal propensities contained in the regular equations in the model. The marginal propensity to import capital goods in the model comes to .7 compared with a range of .78 to .95 estimated for our scenarios. In the model, the marginal propensity to import inputs into the mining industry is .71, while the range for our scenarios is from .89 to .95. This points out the unique characteristics of the Polaris Mine relative to other mines in the Northwest Territories. An assumption implicit to all three scenarios is that northern workers have the same productivity record as workers residing in southern Canada.

In comparing these scenarios with the analysis contained in other scenarios of this report, it would appear that the "most likely" outcomes for most of these variables lie between the low and medium scenarios. As noted earlier, the high scenario should be viewed as an upper bound for N.W.T. impacts and is mainly included for purposes of sensitivity testing.

'3.2 Analysis of the Three Impact Scenarios

In analyzing the results of the simulation runs, it was found that, in general, the model was providing realistic and consistent results. Some manual adjustments had to be made to model output, but the analyst was aware of this problem prior to the simulations. One other important adjustment was made to the model results. The model only provided results up to 1985. The 1986 figures for the benchmark simulation (the N.W.T. economy without the Polaris Mine) were acquired through extrapolating 1979 to 1985 trends. The 1986 impacts for the three scenarios were calculated through making minor adjustments to the 1985 impacts (generally through using the ratio of 1986 northern value added to 1985 northern value added as described in Table 11).

Before assessing the three impact scenarios, it is first useful to take a brief look at the benchmark, (without the mine) simulation. The benchmark involves a "surprise free" future for the N.W.T. economy and thus assumes that no major projects such as Petro-Canada's Arctic Pilot Project or the Polar Gas Pipeline. are launched during the projection period. Under the benchmark, gross territorial product is projected to rise at an annual average rate of 7.9 percent from 1979 to 1986 (based on constant dollars) while the annual growth rates for population and total employment are 2.3 and 1.7 per cent respectively. Reflecting the slow growth in employment, the unemployment rate under the benchmark is projected to rise from 16.1 percent in 1979 to 21.7 percent in 1986.

Table 13 at the back of this chapter provides all of the results from the three simulation runs. For each variable and year, the result with the Polaris Mine is compared with the benchmark (without the mine) simulation. This difference, which is provided in the "absolute change" column, provides the incremental impact of the Polaris Mine for that variable in that year. For example, under the low impact scenario, the total N.W.T. population is higher by 150 people in 1986 (and in each succeeding year) relative to the without the mine simulation. By contrast, under the high scenario, the N.W.T. population is higher by 315 people in 1986 (and beyond) compared with the situation in which Polaris does not proceed.

Table 12 summarizes the impacts for the major indicators for the years 1981 – when construction activity reaches its peak — and 1986 (and beyond) when production and sales achieve their long term levels. The following general comments can be made regarding the results of the simulation runs.

1. Under the low and medium impact simulations, the Polaris Mine has a positive impact on the N.W.T. economy but the relative impact is quite small, reflecting the high spending leakages out of the N.W.T. economy to southern Canada. These leakages are the result of the Territories lack of an industrial base. (The relative impact of the mine is further discussed in the Technical Notes to Chapter 3).

2. The benefits to the N.W.T. economy increase substantially as we move from the low to the high scenario. For example, from 1986 on, the employment and personal income benefits more than double. As discussed previously, the high scenario is not

realistic at this time, but it does serve to point out the important benefits which could accrue to the N.W.T. economy from successful efforts to train and employ Northerners at the mine, and from the utilization of northern suppliers. Viewed in this light, the high impact scenario could be viewed as a possible long-term goal.

3. The employment and income effects are generally greater in the construction phase, particularly in 1981, than after start-up. This is typically the situation for large, highly capital intensive resource projects.

4. Footnote four to Table 13 (page 49 of this Chapter) suggests that the Polaris Mine will have a favorable but minor effect on the N. W.T.'s high and increasing unemployment rate. This reflects the relatively small size of the project in relation to the Territories high unemployment at the present time, and the fairly substantial increases anticipated for the N. W.T.'s labour force over the projection period.

TABLE 11

Polaris Mine: **N.W.T** Parameters Used in Model Simulations

	Autonomous Investment ($'000)	Northern Value Added from Investment* ($ '000)	Marginal Propensity to **Import Capital** Goods	Value of **Exports**[3] ($'000)	Northern Value Added From Exports			Marginal Propensity to Import Inputs to the Mining Industry
					Direct Wages Salaries ($'000)	From Materials and Supplies ($'000)	Total **($'000)**	
I. Low Impact								
1980	39,978[1]	1,999	.950	—	—	—	—	—
1981	47,182	2,359	.950	—	—	—	—	—
1982	8,995	450	.950	29,700	1,103	501	1,604	**.946**
1983	500	25	.950	51,700	1,920	872	2,792	.946
1984	2,643	132	.950	55,900	2,076	943	3,019	.946
1985	1,000	50	.950	60,400	2,243	1,019	3,262	.946
1986 on	1,000	50	.950	59,800	2,200	1,000	3,200	.946
II. Medium Impact								
1980	**39,978**[1]	5,397	.865	—	—	—	—	—
1981	**47,182**	6,370	.865	—	—	—	—	—
1982	**8,995**	1,214	.865	29,700	1,665	741	**2,406**	**.919**
1983	**500**	68	.865	51,700	2,898	1,290	4,188	.919
1984	**2,643**	357	.865	55,900	3,133	1,395	4,528	.919
1985	**1,000**	135	.865	60,400	3,385	1,507	4,892	.919
1986 on	**1,000**	135	.865	59,800	3,370	1,500	4,870	.919
III. High Impact								
1980	39,978[1]	8,795	.780	—	—	—	—	—
1981	47,182	10,380	.780	—	—	—	—	—
1982	8,995	1,979	.780	29,700	2,247	**990**	**3,237**	.891
1983	500	110	.780	51,700	3,912	1,723	5,635	.891
1984	2,643	581	.780	55,900	4,230	1,863	6,093	.891
1985	1,000	220	.780	60,400	4,571	2,013	6,584	.891
1986 on	1,000	220	.780	59,800	4,540	2,000	6,540	.891

[1] Includes 1979 Investment

" 10% of Northern Value Added from Investment is accounted for by materials and supplies

[3] Net of freight charges

In general, the simulation runs suggest that, when placed in the context of the total N.W.T. economy, the impacts of the Polaris Mine are relatively small. At the same time, it can be argued from these criteria that the economic effects of the mine are quite manageable and that the economic dislocations caused by the Polaris Mine should be negligible.

The information contained in Table 12 can be used to develop income and employment multipliers relevant to the Polaris Mine. The personal income multiplier is defined as the total increment in personal income resulting from the mine divided by the increments resulting from the direct and supplier related effects combined. This multiplier is computed to be 1.18 from 1986 on. This means that, in addition to the income resulting from direct employment and from the purchases of supplies, the mine will generate another 18 percent in income as a result of the resending of these direct and supply-related incomes. The equivalent employment multiplier is 1.22. These multipliers are applied in the next two sections of this chapter,

TABLE 12

Impacts[1] of the Polaris Mine on Major N.W.T. Economic Indicators

	Low Simulation	Medium Simulation	High Simulation
Population: 1981	127	301	475
1986 on	150	.233	315
Employment: 1981			
Direct Impact	106	287	467
Supplier related impact[2]	9	24	39
Resending effect[3]	25	67	104
Total	140	378	610
Employment: 1986 on			
Direct Impact	66	101	136
Supplier related impact	27	41	55
Resending effect	20	30	40
Total	113	172	*231*
Personal Income: ($ '000) 1981			
Direct Impact	2123	5733	*9342*
Supplier related impact[2]	236	637	*934*
Resending effect[3]	464	1250	*2030*
Total	**2823**	*7620*	12306
Personal Income: ($ '000) 1986 on			
Direct Impact	2245	*3491*	4738
Supplier related impact	1005	*1514*	2022
Resending effect	569	*913*	1254
Total	3819	5918	8014
Gross Territorial Product: ($'000)			
1981	3060	8263	13321
1986 on	4020	6210	8399
Federal Government Revenue:[4] ($ '000)			
1981	510	1376	2222
1986 on	690	1068	1447
Territorial Government Revenue:[4] ($ '000)			
1981	1565	4046	6665
1986 on	1539	2389	3239

[1] A project impact is defined as the absolute difference for a given variable in a given year between the with-the-mine simulation and the benchmark (without-the-mine) simulation. For example, under the low impacts scenario, the total N.W.T. population is higher by 150 in 1986 (and in each succeeding year) relative to the without-the-mine simulation.

[2] That is, the employment or personal income (wage and salary) increases associated with the sales of supplies to the Polaris Mine by northern firms.

Otherwise known as the induced or consumption effect, that is, the increased employment and incomes generated by the spending of the mine's employees, and the employees of the mine's suppliers, on consumer goods and services.

[3] These figures reflect [he impacts of a "typical" mine in the N.W.T. and [here (ore should be viewed as "order of magnitude" estimates only.

3.3 Analysis of the Most Likely Impacts of the Polaris Mine

Construction and Operations

The simulation runs present approximations of the absolute and relative impacts of the Polaris Mine on the Northwest Territories economy. The data and assumptions which provide the bases for these simulations are developed from the July 1979 Summary Report of Cominco. The figures used in the simulations — such as for wages and salaries per employee — are averages. In reality, the actual figures will tend to vary depending on the year being analyzed, the occupational categories filled by Northerners, and the communities from which workers are drawn. These will depend in turn on the training programs, rotational schedules, travel payment policies, etc. instituted by Cominco. Further analysis conducted recently by Cominco and the study team allows us to "fine-tune" the simulation results in order to provide estimates of the "most likely" impacts of the Polaris Mine on the Northwest Territories economy. This section describes the most likely effects on the total N.W.T. economy, while the final sub-section describes the community distribution of these impacts. The key assumptions employed in this analysis are discussed with the presentation of the results.

It is estimated in section 2.2 of this report that between 30 and 40 percent of the construction work force at the site will be Northerners. Using the mid-point between those percentages, an average wage rate of $10.00 an hour[1] and 2000 hours worked per person-year, this implies that construction employment and direct wages and salaries for Northerners will be approximately as follows:

	Construction Employment	Direct Wages & Salaries ($'000)
1980	126	2,520
1981	159	3,180
1982	28	560
1984	8	160

Once supplier and resending effects are taken into account, this level of northern construction suggests that in 1981 the Polaris Mine will result in an increase of about $4.2 million in the N. W.T.'s total personal income relative to the "without the mine" case. This represents a percentage increase of about 1.3 percent relative to the benchmark's value for personal income.[2] While not large in a comparative sense, it should be noted that this Polaris impact will raise the growth rate in personal income for that year from 8.4 percent (without the mine) to 9.7 percent.

In section 2.3, the study team has analyzed the availability of workers in communities within "commuting" distance of the Polaris site, as well as the share of the mine's operating purchases that realistically, could be expected to go to northern suppliers during the early years of the mine's operations.

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[1] This wage rate is based on the assumption that the average northern worker is paid $8.20 per hour plus time and a half for overtime and that about 44 percent of the total time worked is overtime.

[2] See Table 13

This analysis allows us to make a fairly precise estimate of the most likely impact of the operations phase of the Polaris Mine. It is estimated that in 1986 the Polaris Mine will result in direct employment of about 74 Northerners, with an average annual wage per employee of $36,840.[3] This total N.W.T. figure is a "weighted" average of the figures for the four community groupings discussed in the next sub-section. The average 1986 wage for each is estimated to be:

	Average Wage Per Employee in 1986
Yellowknife	$51,350
Resolute	30,160
Coppermine and Cambridge Bay	29,230
Other Arctic Coast Communities	29,230

These community figures are developed from an analysis of the occupational categories likely to be filled by residents of each grouping. As well, we estimated that purchases valued at about $2.0 million – generating personal incomes of $1.1 million — will be directed towards northern firms.

Based on these figures and the multipliers generated by the model, the total employment and personal income impacts would be as follows:

Base Case Impacts: 1986	Employment	Personal Income (6'000)
Direct Impact	74	2726
Supplier related impact	31	1122
Resending effect	23	693
Total Impact	128	4541

This employment impact will provide an increase of 1.0 percent to the total N.W.T. employment relative to the benchmark simulation while total personal income will be raised by 1.0 percent as well.

In addition to this base case, we have also investigated the increased employment to Northerners that could result from extending travel payments to workers from other Arctic coastal communities (that is, in addition to Resolute, Cambridge Bay and Coppermine). It is estimated that this policy would increase employment of Northerners in the mine from 74 to 102 in 1986. The total impact of this alternative is computed to be:

"Alternative" Case: 1986	Employment	Personal Income ($'000)
Direct Impact	102	3544
Supplier related impact	31	1122
Resending effect	29	840
Total Impact	162	5506

This policy change would result in the generation of an additional one million dollars in personal incomes in the N.W.T. economy in 1986. The increase in 1986 employment, relative to the benchmark, would be 1.3 percent and the relative increase in N.W.T. personal incomes, caused by the Polaris Mine would be 1.2 percent.

This refers to employment as generally defined in statistical surveys. This number is higher than the number of positions in the project. and is lower than the number of people who WIII appear in the Polaris payroll during the course of the year,

Relative to the 1979 constant dollar figure used in other sections of this report, this 1986 figure incorporates the effects of skill upgrading for Northerners in the early years of the mine's operation, plus — and more important — *the growth in real wage rates from* 7979 *to* 7986 as projected by the N.W.T. MODO model. The latter adjustment. which involves a growth factor of 1.58 from 1979 to 1986. was necessary in order to allow comparisons between the Polaris impacts and the benchmark values from the model. This consideration is further explained in notes 1 and 2 of the Technical Notes to this Chapter on pages 51 and 52.

3.4 Distribution of Impacts among Communities

Finally, the analysis of **labour** force availability by community contained in Section 2.3, allows us to estimate the community distribution of the N.W.T. employment and personal income impacts of the Polaris Mine in 1986. In computing the resending effects, by community, it was necessary to make adjustments to the total **N.W.T.** multipliers in order to reflect the differences among communities in terms of their economic structure. In particular, our analysis suggests that the resending effects in Resolute would be lower — reflecting the number of Southerners who work in the community for a limited period of time, i.e. less than a year, normally on a rotational plan of some sort, and that the resending effects in **Yellowknife** would be somewhat higher, the result of that community's more highly developed economy. In this analysis, the following multipliers are employed: ,

	Employment	Personal Income
Total **N.W.T.**	1.22	1.18
Resolute	1.16	1.13
Coppermine, Cambridge Bay and other High Arctic	1.22	1.18
Yellowknife	1.26	1.20

On this basis, we are assuming that the resending effects in Resolute will be about 30 percent below the Territorial average, and that the resending effects in **Yellowknife** will be about 20 percent above. The **N.W.T.** averages have been applied to the remaining communities. (It should be noted that these community multipliers are fairly specific to the Polaris Mine, and may not be appropriate to other projects proposed for the Northwest Territories. See point 4 of the Technical Notes to this Chapter.)

The distribution of employment and income impacts generated by supplier related effects is based on the analysis of the likely location of mine purchases within the **N.W.T.**

Exhibits D and E display the community distribution of employment and income impacts for the base case and the alternative case as described in the previous section. A four part community breakdown is used:

- Resolute
- Coppermine and Cambridge Bay
- Other Arctic coast communities
- Yellowknife (and remainder of N. W. T.)

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Community Distribution of Polaris Impacts in 1986

BASE CASE

TOTAL N.W.T. IMPACTS

Employment		**Personal Income**	**($'000)**
Direct:	74	Direct:	2726
Supplier related:	31	Supplier related:	1122
Respending:	23	Respending:	693
Total:	128	Total:	4541

RESOLUTE IMPACTS

Employment	
Direct:	1
Supplier related:	8
Respending:	3
Total:	22

Personal Income	**($'000)**
Direct:	332
Supplier related:	288
Respending:	81
Total:	701

COPPERMINE & CAMBRIDGE BAY

Employment	
Direct:	31
Supplier related:	—
Respending:	7
Total:	38

Personal Income	**($'000)**
Direct:	906
Supplier related:	—
Respending:	163
Total:	1069

OTHER COASTAL ARCTIC

Employment	
Direct:	7
Supplier related:	—
Respending:	1
Total:	8

Personal Income	**($'000)**
Direct:	205
Supplier related:	—
Respending:	37
Total:	242

YELLOWKNIFE, ETC.

Employment	
Direct:	25
Supplier related:	23
Respending:	12
Total:	60

Personal Income	**($'000)**
Direct:	1284
Supplier related:	834
Respending:	424
Total:	2542

N.B. Some totals may not add due to rounding.

EXHIBIT E

Community Distribution of Polaris Impacts in 1986

ALTERNATIVE CASE

TOTAL N.W.T. IMPACTS

Employment		Personal Income	($'000)
Direct:	102	Direct:	3544
Supplier related:	31	Supplier related:	1122
Resending:	29	Resending:	840
Total:	162	Total:	5506

RESOLUTE IMPACTS		COPPERMINE & CAMBRIDGE BAY		OTHER COASTAL ARCTIC		YELLOWKNIFE, ETC.	
Employment		Employment		Employment		Employment	
Direct:	11	Direct:	31	Direct:	35	Direct:	25
Supplier related:	8	Supplier related:	—	Supplier related:	—	Supplier related:	23
Resending:	3	Resending:	7	Resending:	8	Resending:	12
Total:	22	Total:	38	Total:	43	Total:	60
Personal Income	($'000)	Personal Income	($'000)	Personal Income	[$'000)	Personal Income	($'000)
Direct:	332	Direct:	906	Direct:	1023	Direct:	1284
Supplier related:	288	Supplier related:	—	Supplier related:	—	Supplier related:	834
Resending:	81	Resending:	163	Resending:	184	Resending:	424
Total:	701	Total:	1069	Total:	1207	Total:	2542

N. Il. Some totals may not add due to rounding.

TABLE 13

The Impacts of the Polaris Mine on the N.W.T. Economy

(all dollar values are in constant 1979$ in '000)

	BENCHMARK (W/O MINE)	LOW SIMULATION			MEDIUM SIMULATION			HIGH SIMULATION		
	Value	Value	Absolute Change	% Change	Value	Absolute Change	% Change	Value	Absolute Change	% Change
Total N.W.T. Population										
1979	43,830	43,830	—	—	43,830	—	—	43,830	—	—
1980	44,715	44,884	169	0.4	45,172	457		45,423	708	—
1981	45,696	45,823	127	0.3	45,997	301	0.7	46,171	475	1.0
1982	46,724	46,851	127	0.3	46,935	211		47,021	297	
1983	47,799	47,949	150	0.3	48,030	231		47,113	314	
1984	48,924	49,081	157	0.3	49,165	241		49,252	328	
1985	50,102	50,255	153	0.3	50,336	234		50,418	316	
1986 on	51,304	51,454	150	0.3	51,537	233	0.5	51,619	315	0.6
Employment: Mining'										
1979	1,184	1,184	—	—	1,184	—		1,184	—	
1980	1,208	1,208	—	—	1,208	—		1,184	—	
1981	1,232	1,232	—	—	1,232	—		1,232	—	
1982	1,256	1,314	58	4.4	1,345	89		1,376	120	
1983	1,281	1,339	58	4.3	1,370	89		1,401	120	
1984	1,307	1,369	62	4.5	1,402	95		1,435	128	
1985	1,333	1,399	66	4.7	1,434	101		1,469	136	
1986 on	1,360	1,426	66	4.6	1,461	101		1,496	136	

N.B. The absolute change equals the simulation value minus the benchmark value. The % change equals the simulation value minus the benchmark value as a percentage of the benchmark value. In the simulations construction begins in 1980 and operations begin in 1982.

'The increase in mining employment under the three simulations reflects only the jobs at Polaris going to N.W.T. residents.

continued

TABLE 13 continued

The Impacts of the Polaris Mine on the N.W.T. Economy

(all dollar values are in constant 1979$ in '000)

	BENCHMARK (W/O MINE)	LOW SIMULATION			MEDIUM SIMULATION			HIGH SIMULATION		
	Value	Value	Absolute Change	% Change	Value	Absolute Change	% Change	Value	Absolute Change	% Change
Employment: **Residentiary** Sector*										
1979	4,370	4,370			4,370	—		4,370	—	
1980	4,342	4,350	‘8		4,364	22		4,377	35	
1981	4,316	4,350	34	0.8	4,407	91	2.1	4,459	143	3.3
1982	4,293	4,329	36	0.3	4,360	67		4,398	105	
1983	4,273	4,319	46		4,345	72		4,373	100	
1984	4,257	4,306	49		4,330	73		4,356	99	
1985	4,243	4,292	49		4,317	74		4,342	99	
1986 on	4,230	4,277	47	1.1	4,301	71	1.7	4,325	95	2.2
Employment: Total[3]										
1979	11,542	11,542	–		11,542	—		11,542	–	
1980	11,695	11,793	98		11,960	265		12,127	432	
1981	11,863	12,003	140	1.2	12,241	378	3.2	12,474	611	5.1
1982	12,048	12,162	114		12,259	211		12,362	314	
1983	12,250	12,355	105		12,414	164		12,472	222	
1984	12,471	12,588	117		12,656	185		12,725	254	
1985	12,711	12,829	118		12,892	181		12,957	246	
1986 on	12,956	13,069	113	0.9	13,134	178	1.4	13,198	242	1.9

continued

[3] The service industries (including government and construction) plus manufacturing. Therefore this includes both the supplier related and resending effects.

[4] Total employment includes northern construction employment (i.e. employment to N.W.T. residents) of the following:

	Low	Medium	High
1980	90	243	396
1981	106	287	467
1982	20	55	89
1983	1	3	5
1984	6	16	26
1985	2	6	10
1986	2	6	10

In the model, it is assumed that all of these employees are currently residents of the N.W.T. and therefore the employment does not generate any permanent in-migration from the south.

continued

TABLE 13 continued

The Impacts of the Polaris Mine on the **N.W.T.** Economy

(all dollar values are in constant 1979$ in '000)

	BENCHMARK (W/O **MINE**)	LOW SIMULATION			MEDIUM SIMULATION			HIGH SIMULATION		
	Value	Value	Absolute Change	% Change	Value	Absolute Change	% Change	Value	Absolute Change	% Change
Value Added From **Mining** Industry ($ '000]										
1979	49,925	—	—		—			—		
1980	52,972	—	—		—			—		
1981	56,205	—	—		—			—		
1982	59,637	60,740	1,103		61,302	1,665		**61,884**	2,247	
1983	63,279	65,199	1,920		66,177	2,898		67,191	3,912	
1984	67,144	69,220	2,076		70,177	3,133		71,374	4,230	
1985	71,246	73,489	2,243		74,631	3,385		75,817	4,571	
1986 on	75,592	77,792	2,200		78,962	3,370		80,132	4,540	
Total Value Added in **Export** Activities ($ '000)										
1979	147,840	147,840	—	—	147,840	—		148,840	—	
1980	155,348	157,347	1,999	1.3	160,745	5,397	3.5	163,513	8,165	5.3
1981	163,264	165,624	2,360		169,638	6,374		173,650	10,296	
1982	171,611	173,667	2,056		175,236	3,625		176,836	5,225	
1983	180,413	183,232	2,819		184,673	4,260		186,184	5,771	
1984	189,698	192,851	3,153		194,587	4,889		196,377	6,679	
1985	**199,492**	202,808	3,316		204,525	5,033		206,305	6,813	
1986 on	209,793	213,043	3,250	1.5	214,804	5,010	2.4	216,562	6,769	3.2

continued

TABLE 13 continued

The Impacts of the Polaris Mine on the **N.W.T.** Economy

(all dollar values are in constant 1979$ in '000)

	BENCHMARK (W/O **MINE**)	LOW SIMULATION			MEDIUM SIMULATION			HIGH SIMULATION		
	Value	Value	Absolute Change	% Change	Value	Absolute Change	% Change	Value	Absolute Change	% Change
Unemployment[4]					—			—		
1979	2,219	2,219	—	—	2,219			2,219	—	
1980	2,401	2,325	76		2,195	206		2,057	344	
1981	2,593	2,527	66		2,413	180		2,294	299	
1982	2,779	2,721	58		2,689	90		2,650	129	
1983	2,971	2,929	42		2,908	63		2,888	83	
1984	3,172	3,126	46		3,097	75		3,067	105	
1985	3,381	3,337	44		3,312	69		3,287	94	
1986 on	3,601	3,561	40		3,534	67		3,510	91	
Labour Force										
1979	13,761	13,761	—		13,761	—		13,761	—	
1980	14,096	14,118	22		14,155	59		14,184	88	
1981	14,457	14,530	73	0.5	14,654	197	1.4	14,768	311	2.2
1982	14,826	14,883	57		14,948	122		15,012	186	
1983	15,221	15,284	63		15,322	101		15,360	139	
1984	15,643	15,714	71		15,753	110		15,792	149	
1985	16,093	16,166	73		16,204	111		16,244	151	
1986 on	16,557	16,630	73	0.4	16,668	111	0.7	16,708	151	0.9

continued

[4]The unemployment and participation rates (o/o) for the four simulations are as follows:

Unemployment Rate

	Benchmark	Low	Medium	High
1979	16.1	16.1	16.1	16.1
1980	17.0	16.5	15.5	14.5
1981	17.9	17.4	16.5	15.5
1982	18.7	18.3	18.0	17.7
1983	19.5	19.2	19.0	18.8
1984	20.3	19.9	19.7	19.4
1985	21.0	20.6	20.4	20.2
1986	21.7	21.4	21.2	21.0

Participation Rate

	Benchmark	Low	Medium	High
1979	43.4	43.4	43.4	43.4
1980	43.3	43.4	43.5	43.6
1981	43.3	43.3	43.3	43.3
1982	43.2	43.2	43.2	43.2
1983	43.2	43.2	43.2	43.2
1984	43.1	43.1	43.2	43.2
1985	43.1	43.1	43.1	43.1
1986	43.0	43.0	43.0	43.0

continued

TABLE 13 continued

The Impacts of the Polaris Mine on the **N.W.T.** Economy

(all dollar values are in constant 1979$ in **'000)**

	BENCHMARK (W/O MINE)	LOW SIMULATION			MEDIUM SIMULATION			HIGH SIMULATION		
	Value	Value	Absolute Change	% Change	Value	Absolute Change	% Change	Value	Absolute Change	% Change
Gross Territorial Product **($'000)**										
1979	409,393	409,383	—		409,393	—		409,393	—	
1980	440,781	442,780	1,999		446,178	5,397		448,946	8,165	
1981	474,962	478,022	3,060	0.6	483,225	8,263	1.7	488,283	13,321	2.8
1982	512,291	514,821	2,530		517,102	4,811		519,408	7,117	
1983	552,925	556,322	3,397		558,150	5,225		560,036	7,111	
1984	497,384	601,250	8,866		603,372	5,988		605,562	8,178	
1985	646,004	650,001	4,097		652,241	6,237		6..,458	8,454	
1986 on	698,581	702,601	4,020	0.6	704,791	6,210	0.9	707,250	8,399	1.2
Personal Income **($ '000)**										
1979	268,104	268,104	—		268,104	—		268,104	—	
1980	290,503	290,452	1,949		295,763	5,260		298,461	7,958	
1981	314,871	317,694	2,823	0.9	322,491	7,620	2.4	327,177	12,306	3.9
1982	341,506	343,955	2,449		346,100	4,594		348,265	6,759	
1983	370,649	378,873	3,222		375,629	4,980		377,438	6,789	
1984	402,554	406,220	3,666		408,256	5,702		410,354	7,800	
1985	437,545	441,437	3,892		443,489	4,944		445,611	8,066	
1986 on	475,577	479,396	3,819	0.8	481,495	5,918	1.2	483,591	8,014	1.7
Earned Income ($ '000)										
1979	244,546	244,546	—		244,546	—		244,546	—	
1980	265,354	267,270	1,916		270,527	4,993		273,180	7,826	
1981	287,987	290,779	2,792	1.0	295,524	7,537	2.6'	300,156	12,169	4.2
1982	312,691	315,104	2,413		317,212	4,521		319,341	6,650	
1983	339,717	342,900	3,183		344,634	4,917		346,419	6,702	
1984	369,306	372,929	3,623		374,942	5,636		377,016	7,710	
1985	401,756	405,605	3,849		407,635	5,879		409,734	7,978	
1986 on	437,057	440,834	3,777	0.9	442,910	5,853	1.4	444,983	7,926	1.8

Technical Notes to Chapter Three

Four technical points were raised in this chapter which require further elaboration.

1. It was found in analyzing the output from the model that personal income per employee and similar indicators (e.g. gross territorial product and earned income per employee) were rising at a fairly steady rate through the projection period. For the benchmark simulation the projection for personal income per employee was as follows:

Year	Personal Income Per Employee ($)	Annual Increase % *
1979	23,229	
1980	24,840	6.9
1981	26,542	6.9
1982	28,345	6.8
1983	30,257	6.7
1984	32,279	6.7
1985	34,423	6.6
1986	36,707	6.6

% Increase 1979-86 58.0%

Av. Annual Increase 1979-86 6.7%

*The basis for these annual increases are outlined below.

Since the model's projections are in constant dollars, this increase cannot be the result of inflation. Rather, it likely reflects a combination of factors, including:

- the growth in real wages in the N. W.T.'s export sectors (e.g. mining) as a result, in part, of rising world prices for metals, energy and other resource commodities
- productivity improvements as a result of shifts in the N.W.T. labour force from lower productivity to higher productivity economic activities
- increases in real dollar terms in the value of government transfer payments (unemployment insurance, social assistance, etc.) to N.W.T residents.

In order to properly compare the Polaris Mine's impacts with the model's benchmark projections for 1986, it was necessary to apply the growth factor of 1.58 to wages and salaries generated directly and indirectly by the Polaris Mine, (This is based on the assumption that real wages generated by the Mine would keep pace with the growth in real wages in the total N.W.T. economy. This would be necessary in order for the mine to attract and retain a skilled work force.) However, in the view of the study team this increase of 58 percent (i.e. a growth factor of 1.58) exaggerates the growth in personal income per employee that can be expected in the Territories over the next six years (note 2, next page). If data based on 1979 wage rates were used, we would be seriously *underestimating* the relative impact of the mine on the N.W.T. economy in the year 1986.

On the other hand, if the reader wishes to convert the personal income figure contained in sub-sections 3.3 and 3.4 of Chapter 3, back to the original data based on 1979 real wages, this can be done by dividing all of the dollar figures in the two sub-sections (especially Exhibits D and E) by the factor of 1.58.

2. This second note relates specifically to the high growth rates for personal income, employee and other values generated by the model. The model was largely developed from 1967-74 data. This was a period of explosive growth and major structural change for the N.W.T. economy. For example, population over this period increased from 30,124 to 40,802, representing an average rate of increase of 4.4 percent while the growth in gross territorial product was well over 10 percent per annum. While the data for more recent years is incomplete, it appears that the pace of expansion since then has been much slower and that the 1974-79 period has been one of consolidation for the Northwest Territories economy. To the extent that the benchmark projection reflects the 1967-74 rate of expansion and this rate is not achieved in the 1979-86 period, the benchmark projections for the N.W.T. economy would be lower in the latter period compared with those presented in Table 13. If this is true, the relative impact of the mine – as described in Table 13 and discussed on page 34 of the text — would be somewhat higher when measured in percentage terms. ,

3. In deriving projections of economic activity in the N.W.T., the model places important weight on a number of "marginal propensities to import". Two of these marginal propensities related to capital goods and inputs to the mining industry were particularly important to the evaluation of the impacts of the Polaris Mine (See Table 11). The marginal propensity to import capital goods is defined as imports of capital goods as a proportion of gross investment expenditures. In general terms, the difference between imports of capital goods and gross investment expenditures is the value added (wages and salaries, proprietors income and profit) which is retained within the N.W.T. economy as a consequence of investment activity. The marginal propensity to import inputs into the mining industry is defined as imports into mining as a proportion of the value of mining exports (net of freight charges). Again, the difference between these two variables represents the value added which is retained in the N.W.T economy as the result of mining activity. As noted in the text, the study team developed values for these two marginal propensities that are specific to the Polaris Mine (since Polaris' characteristics are very different from other investment and mining projects in the N.W.T. These differences reflect the location of Polaris in the high Arctic, far removed from the N. W.T.'s larger centres.

4. Page 41 includes the statement that the community multipliers used in this analysis are fairly specific to the Polaris Mine and therefore may not be appropriate to other projects proposed for the Northwest Territories. This statement reflects the points noted in 3 above plus adjustments made to the Resolute multiplier based on our knowledge of the type of employees likely to be employed by Resolute suppliers to the mine. This statement is included as a warning to other analysts who may wish to apply these multipliers to other projects. Before doing this, they should have a firm understanding of the assumptions made and the projections developed for this analysis.

4. Potential Socio-Economic Impacts on Resolute

4.1 Overview of Socio-Economic Conditions

4.1.1 HISTORY OF RESOLUTE

When heavy ice conditions prevented the establishment of a meteorological station on Melville Island, Resolute was selected as an alternate site. In 1947 construction began on the station and airstrip and these facilities were improved and expanded over the next six years.

In 1953 the federal government implemented a program to relocate Inuit families from Port Harrison, Quebec and Pond Inlet, N.W.T. to Resolute. The reason for relocating these people appears to have been economic need due to an increasing population and decline in game in their home area. Improved hunting and some opportunities for wage employment would be available to the Port Harrison people at Resolute. Three families (totalling 18 people) were moved from Port Harrison in 1953. They were accompanied by one family from Pond Inlet (5 people) selected to assist the Port Harrison people adapt to the High Arctic conditions. Although this was a new and somewhat artificial Inuit community, the history of Inuit movements through the area spans several thousand years.

During 1955 and 1956 more families arrived from Port Harrison and Pond Inlet and in the next 10 years more Inuit arrived from Arctic Bay, Spence Bay and Grise Fiord as well as Pond Inlet and Port Harrison. By 1967 the Inuit population of Resolute was 154. As Resolute's transportation and communications role expanded the need for an Inuit work force at the base increased.

One description of the initial move of Resolute Inuit into the wage economy is as follows:

> "The actual employment of Inuit began in 1956, three years after the relocation. Hiring was initiated by C.M.U. Construction which was contracted to extend and improve the runway and airport facilities. Men were hired for the summer season as labourers on the runway construction, and from 1955 to 1963 most employment was seasonal although several men were hired by the Royal Canadian Mounted Police as janitors on a full time basis.'"[1]

[1] W. B. Kemp et al. *The Communities of Resolute and Kuvinaluk: A Social and Economic Baseline Study* (Resolute Community Council, Kuvinaluk Community and Polar Gas Project, 1977) p. 177,

The Royal Canadian Air Force which provided services to Resolute, withdrew in 1963, and a number of private companies took over. In addition, a number of government agencies moved into the area and with the service companies provided more year round employment opportunities for Inuit.

Over the years there has been a shift from casual/seasonal employment to full time employment. Although hunting and trapping are still important, people are increasingly dependent on wage employment for cash income.

The boom period for Resolute was during the early to mid 1970's. Oil and gas exploration, along with seismic work and mineral exploration, provided many employment opportunities, both in the settlement and away from the community.

In 1976 the Resolute Inuit population was 169, with 36 Inuit in the work force (defined as currently employed or would like employment if jobs were available). In early 1980 the Inuit population was 131, with 20 Inuit holding full time jobs.

Resolute is divided into two distinct areas: the M.O.T. base and the village, located approximately 4 miles from the base. Half way between the two is South Camp. which houses several service functions.

4.1.2 THE BASE (INCLUDING SOUTH CAMP)

Resolute is the main transportation/communications facility in the High Arctic. Base facilities include the airport itself, staff accommodations, M.O.T. telecommunications, Environment Canada, other government services such as the RCMP and Post Office, Northern Canada Power Commission and auxiliary services such as general contracting companies (Narwhal, Arctic Resources) service companies (The Bay, Imperial Oil) and air charter companies.

South Camp is near the unloading area for summer sealift. In addition to Arctic Resources, it houses the Resolute fuel tank farm and some federal government operations.

Total population at the base (including South Camp) is approximately 130 people, mainly male.

Most people who live at the base are on some form of rotational contract and few consider it their permanent home although some have worked in Resolute for many years. Those who are not on rotational contracts are on some form of limited time span, which usually does not exceed two years. The base population originates from across Canada and generally lists "money" as the main reason for being in Resolute.

Base residents spend little time in the village, and the main interaction with Inuit residents of Resolute is via social activity, since the base is the social centre in Resolute. Inuit people join with base residents for curling bonspiels, dart tournaments, movies and socializing in the Arctic Circle Club.

Contributions to the local economy by the base are limited to a small amount of employment and some purchases of supplies and services at local businesses. The base is self-sufficient, with its own service and maintenance personnel and base supplies are flown in regularly from southern Canada.

4.1.3 THE VILLAGE

The development of a new Resolute townsite was started in the early 70's as a major project to integrate base and village residents. It was originally designed to house federal government families as well as local people. It was also developed to accommodate future growth in the area and to establish Resolute as a government area services centre. It was intended to reduce costs of operating two sites, by combining the base and former village into one. The plan was gradually scaled back, influenced by declining activity in the area and the decision of **M.O.T.** not to move employees to Resolute on a permanent basis. The village was relocated to its new site less than five years ago.

Today the community has approximately 150 residents. The population has shown a gradual decline over the past five years as follows:

1977 - 181
1978 - 167
1979-1980 - 150 (estimated - including whites)

A cutback in **N.W.T.** government operations and out-migration of **Inuit** reduced the population. Movement into and out of the community seems to continue. Some families have returned or plan to return to their home communities of Port Harrison or Pond Inlet, while others move back to Resolute to be near family, jobs, to change their life style or to marry someone from Resolute. It appears that approximately 10-20 percent of the community is in the migratory pattern, with the current trend towards out-migration.

Resolute **Inuit** Population by Age and Sex, March, 1980*

	Male	Female	Total
o - 4	7	9	16
5 - 9	9	9	18
10-14	11	11	22
15-19	11	11	22
20-24	5	7	12
25-29	5	9	14
30-34	4	2	6
35-39	2	2	4
40-44	2	2	4
45-49	2	2	4
50-54	1	1	2
55-59	2	2	4
60-64	1	1	2
65 +		1	1
	62	69	131

*taken from a listing of people in town March, 1980, verified through interviews.

4.1.3.1 Village Facilities

Businesses – There are only two businesses operating in the village: the co-op and an outfitting company. The co-op, established in 1962, is the only grocery supply outlet in the community. It also deals in skidoos, skidoo parts and to a limited degree hardware, dry goods and arts and crafts. Main customers of the co-op are Inuit since most of the white population order their supplies directly from the south. The co-op (in addition to the Bay) purchases furs and handicrafts from the local people for shipment to fur markets or for local sales. Also, the co-op has a government contract for fuel delivery within the village.

The local outfitting company, owned and operated by a non-Inuit, does not currently hire any Inuit people on a full time basis. As part of the operation, there is a limited accommodation unit in the community.

Housing – The Resolute Housing Association is responsible for all social housing units in the community, with the exception of the N.W.T. government staff housing units. It is responsible for rent collections, repairs, maintenance and for house assignments.

Rents are assessed on a specified scale, based on the size of the house, residual income, zone living allowances, etc. Minimum rent is $28.00 per month and maximum rent for a social housing unit is $335 per month. Rent includes fuel, utilities and repairs. There are 32 social housing units in Resolute at present and 21 are occupied. Of the 11 vacant houses, most are the older, less attractive Northern territorial rental units. The N.W.T. government has an additional 18 units for staff – 10 row houses and 8 detached, and less than half are occupied. (Data obtained in March, 1980).

Recreation – Recreation facilities in the community are limited to activities at the community hall (bingos, dances, movies) and the drop-in centre which is equipped with pool tables, television-videotape and games. There is an active interest in curling, which is done at the small (1 sheet) rink at the base. Other recreation centres around more traditional activities such as hunting and fishing, especially in the spring and summer. Residents feel that additional recreational facilities are required and most suggest that the community needs a skating/hockey/curling rink.

Territorial Government Services – The territorial government is responsible for services such as water and sewage, maintenance of government facilities, social assistance programs, wildlife regulations, education, and other government programs from issuing driver's licences, to assisting with sealift. The three classroom school has one principal, two teachers and an Inuit teaching assistant for 43 students. Of the total territorial government staff of 13, six are Inuit.

Nursing Station – The federal Department of Health and Welfare nursing station is located in the village, although it also serves the base. It is staffed by two nurses who conduct regular clinics, are involved in educational programs in the community and tend to the ongoing medical needs of the residents. There are also two Inuit on staff. From April 1978 to March 1979, 11 patients were admitted to the station for a total of 25 days of care.[2]

[2] Statistics provided by Canada Dept. of Health and Welfare, March 1980.

Municipal Government – Resolute Bay is classified as a settlement, and is governed by a settlement council, made up of eight members, one of whom is appointed chairman. The administrative duties of the community are handled by a secretary manager.

Infrastructure – Resolute has the most fully developed infrastructure of the communities covered by this study. It has an official community plan with developed serviced lots — some of which are not yet in use.

Water for the community is supplied from nearby Char Lake. It is pumped to a water treatment plant and then distributed by underground mains to all houses/buildings.

Sewage disposal is via underground mains to an emulsifier then dumping into the ocean. The sewage treatment plant is partially completed, but was discontinued when the community developers realized the planned expansion for Resolute would not take place. The water/sewage system could accommodate 10 times the current population.

The community fire protection system includes one fire truck and related fire fighting equipment, which is housed in a community fire hall. Also, Resolute is probably the only northern community with fire hydrants placed throughout the settlement.

4.1.3.2 Community Attitudes

The residents of Resolute generally enjoy their community because they are close to family and friends. It is the community where many grew up and they are familiar with the area. For quite a few, it provides job opportunities.

They"feel the services provided are adequate but would like improvements in medical services, with a requirement for a dentist high on the list.

Negative comments about the community relate mainly to the weather, the high cost of living and shortages of certain food and supplies, and the distance from game, particularly caribou.

Most parents would like their children to live in Resolute, but feel that is a decision the children must make.

Community Growth

The residents of Resolute are not concerned about increased population in the community, and many would welcome more people, since the housing and services are available; however, they would like gradual growth rather than a sudden large "in-migration". There is some apprehension about people moving in from "other" communities but this is not widespread.

Wages/Income

Most people interviewed did not feel they were earning enough money to buy the things they wanted for themselves and their families. One man commented that you "need to be a millionaire to buy things in Resolute". With more money people said they would spend it mainly on groceries, clothing and skidoos, although some said

they would save it and some would use it to travel. Average household wage income was $10,026 in 1976[3] and is estimated to be $13,800 in 1980 prior to the start of work at the Polaris site.

Alcoholism/Crime

According to statistics, there is no problem with alcohol in Resolute. However, some people interviewed felt that alcohol was a problem in Resolute, and was having an effect on the lives of the people. Alcohol is available at a social club at the base, or can be flown in from Yellowknife or Frobisher Bay. Crime is not a problem in Resolute, with most offences of a minor nature.

Hunting/Trapping

Hunting and trapping are an important part of the lifestyle of the Resolute people, but are more weekend or seasonal activities than full time activities. Men who do continue to hunt and trap mentioned getting part time jobs when the season ended.

Contact with Wage Employment

The people of Resolute have been involved with wage employment for 25 years. Because the new community of Resolute was established near the base, the people moved into the wage economy, depending on hunting and trapping income between jobs, or using it to supplement their income. Many people in the community have had some work experience at the base, and all individuals have had contact with wage employment. Currently, there are more full time jobs for Inuit in the village than at the base. The total number of full time jobs held by Resolute Inuit was 20, prior to the start of work at the Polaris site. In the village, jobs are with the territorial government, the Co-op, the Resolute Housing Association and the nursing station. Base jobs are at M. O. T., (Tower Arctic) Narwhal, Arctic Resources, NCPC and the Bay.

There are also part time positions which include cleaning duties, equipment operation, freight handling, supervising the Drop-in Centre, part time support staff for community groups and representatives of various organizations, associations in the community. The small number of Inuit working full time at the base, in relation to the number of jobs available there reflects both the attitudes of a number of employers at the base, and the lack of skills or qualifications of the Inuit.

Many of the jobs at the base require qualified tradesmen, special educational levels or a certain amount of experience. Most employers at the base have hired Inuit at least part time in certain positions, but generally are frustrated by the Inuit view of wage employment which centres more around immediate need for money than long term career objectives, and often places time off for hunting ahead of job responsibilities.

Resolute's Inuit residents are aware they are dependent to a certain degree on wage employment and few expressed an interest in returning completely to a traditional hunting, trapping lifestyle, mainly because they couldn't earn enough money.

4.1.4 TRANSFER PAYMENTS

Social assistance payments in Resolute over the past three years have been rising although the population has been decreasing. Even with this increase, payments are quite low compared with those in some Inuit communities. The category showing the

[3] Kemp et al. p. 195.

greatest increase is economic need which includes the unemployed, or unemployable. This tends to verify comments that it is now more difficult to get jobs in Resolute. Following is a breakdown in social assistance and unemployment insurance payments in Resolute over the past few years:

SOCIAL ASSISTANCE **PAYMENTS**[1]

	1977-78		1978-79		1979-80 (9 mths. only)	
Reason	# of cases	Total amount paid	# of cases	Total amount paid	# of cases	Total amount paid
Health	10	$ 984.	5	$4,599.	2	$2,306.
Dependant children	6	12,277.	8	12,099.	4	5,651.
Economic (unemployed, unemployable	4	3,889.	7	4,552.	9	10,330.
Economic (other)	1	179.	3	799.	2	971.
Supplementary	-		1	232.		
Unidentified	1	98.				
	22	$17,437.	24	$22,281.	17	$19,258.

Average payment per case – 1977-78 = $ 793.
Average payment per case – 1978-79 = $ 928.
Average payment per case – 1979-80 = $1,133.

[1]Statistics provided by N.W.T. Government, Dept. of Social Services, March 1980

UNEMPLOYMENT INSURANCE **BENEFITS**[1] -by age and sex

	Jan. 1978-Jan. 1979	Jan. 1979-Jan. 1980
Males	9	7
Females	4	6
	13	13
15-19	1	1
20-24	4	4
25-34	4	4
35-44	1	2
45-54	3	2
55-65	0	0
	13	13

[1]Statistics provided by Canada Employment and Immigration, Yellowknife, March 1980

CONCLUSIONS

Resolute is made up of two distinct communities – the base and the village. Most jobs are at the base and are mainly held by rotational staff from other parts of Canada. Little of the income earned in Resolute is retained in the community.

The base population is made up mainly of southern Canadians, while the village population is mainly Inuit. There is some social contact between these two groups, particularly at gatherings such as dart tournaments, dances or curling bonspiels. In most cases this social activity occurs at the base.

It is unlikely the Polaris Mine will alter the duality of the community, but it could adjust the economic importance of the village as a hiring/job centre.

RECOMMENDATIONS

If space can be found in the village and if the settlement council agrees, a Cominco office should be opened in the village to give local residents access to ongoing information about the project. This office could also serve as the local recruiting office, the Cominco community information centre, the co-ordinating office for local business tenders, the financial counseling and orientation office for employees and families, and the secretariat for the suggested Cominco advisory committees which both include Resolute.

This office should be staffed by a local resident who is familiar with the community, the Inuktitut language, the village residents and the business community. This Resolute employee would be the liaison person between the company and the community. He/she would have to be sensitive to any tensions or potential problems within the community, particularly non verbal ones. Having a person accessible to discuss problems might help to avoid or mitigate against situations which could lead to serious problems. Generally, this person would assist in the community's adjustment to the Polaris Mine and to mine employment by Resolute residents.

Cominco should be prepared to provide the necessary training for this employee and should have such a person on staff at least six months before the operation phase of the project starts. The service which could be provided to the community via this office, and the rapport which Cominco could build with the community, should more than justify the expense of the operation.

4.2 Potential Employment Impacts

To assess the employment impacts on Resolute, it was necessary to chart *all* available jobs to be filled by community residents during the operational lifetime of the Polaris Mine. As representative years we selected 1985, 1990, 1995 and 2000.

Since mine jobs would form part of this total number, it was necessary to determine the number of Resolute residents who might have full time jobs at the mine. To do this we developed a specific methodology explained later in this section.

In addition to estimating the likely number of full time mine employees, we had to estimate the number of jobs created as a result of indirect income from the mine (purchases of supplies and services in Resolute) and the number of jobs created through induced income, or the resending effect of new dollars in the community. We also had to consider the ongoing number of local jobs which would be available to residents during this time period.

The resulting overview of the Resolute job scene was then compared with the projected Resolute labour force, to assess the employment and related impacts on the community. In developing all our employment figures we assumed that except for small fluctuations and short term work, the number of jobs available to residents (apart from Polaris jobs) would be approximately the same as present. This was based on the following assumptions:

- no major developments which could draw on the Resolute labour force (i.e. Arctic Pilot Project, Polar Gas) will be going ahead in the next five years[1]
- that there will be no changes in the current hiring practices of Tower Arctic or other base operators. (Presently only 7 full time positions at the base are filled by Inuit)
- that native people will only take over a limited number of other jobs (i.e. nurses, teachers, RCMP, territorial government staff) that are presently held by southerners.

4.2.1 DIRECT POLARIS EMPLOYMENT

To compute the potential employment impacts of the Polaris Mine on Resolute, we first had to develop a methodology to estimate the likely numbers of residents who would work on the site. Only Inuit were considered as residents since most of the other people in Resolute are on rotational systems. This methodology involved the following four steps:

1. Determining the Resolute Inuit population *of lab our force age* in the years 1985, 1990, 1995 and 2000.
2. From the total number of labour force age, establishing the number likely to be *in the labour force* during these years.
3. From the number "in" the labour force estimating the number of likely candidates for Polaris Mine jobs (i.e. the number of people who would likely try employment at Polaris).
4. From the number of likely candidates estimating the number of potentially successful candidates (candidates who would continue employment at the mine for one year or longer).

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[1] If the Arctic Pilot Project goes ahead. Resolute is listed as one community from which workers will be recruited. In the *Arctic Pilot Project Socio-Economic Statement North of 60 Latitude, 1978,* the report says the seasonal number of jobs available to Inuit during construction will be 175.

Determining **Inuit** Population of Labour Force Age

For purposes of this study, **labour** force age was considered to be 18-50 inclusive. (Although some people over 50 will be in the **labour** force, we have used the 18-50 age span to provide a more conservative estimate of people in the **labour** force.) The number of people of **labour** force age in Resolute was determined by using an actual list of current residents and aging them over the next 20 years. For the people not yet born (1998, 1999, 2000) we assumed that the birth rate will remain constant (i.e. birth rate of 1979 = 1980 = 1981 = 1982). We also assumed that there were no deaths in the 18-50 age category, and we did not consider in-migration or **out**-migration. From this step we determined that the **Inuit** of *labour force age* in Resolute would be:

	1980	1985	1990	1995	2000
Males	27	33	44	52	52
Females	31	42	46	51	62
Total	58	75	90	103	114

*Complete data in Appendix 5a

Number of Resolute **Inuit** actually "in" the **labour** force

"In" the **labour** force was defined as either currently employed, or would like to be employed. A 1980 figure was determined through interviews with Resolute people. For subsequent years the number of people in the labour force was adjusted by simply subtracting those people in the 1980 **labour** force who reach 51 and adding all males and some females who turn 18. The number of females added to the **labour** force was the actual number who turn 18, adjusted to allow for mothers not in the **labour** force. Again deaths, in-migration and out-migration were not considered. The number of Resolute **Inuit** "in" the **labour** force are estimated as follows:

	1980	1985	1990	1995	2000
Males	26	33	44	52	51
Females	16	21	22	24	34
Total	42	54	66	76	85

*Complete data in Appendix 5b

Likely Candidates for Jobs at Polaris

The number of likely candidates was determined by multiplying the number of people in the labour force by the "percentage interested". The percentage interested is defined as the percentage of people in the **labour** force who would *try* jobs at Polaris Mine if there were jobs available. In Resolute the percentage interested was determined by personal interviews and an assessment of the current job situation, contact with wage employment, interest in the project and current lifestyles. Separate percentage interested factors were developed for men and women. The following equation was used to develop these factors:

$$\frac{\textit{People now working at Polaris} + \textit{People who would work at Polaris if jobs available}}{\textit{Total \# of men/women in labour force}} = \textit{Percentage interested (Interest factor)}$$

Using numbers obtained in previous steps, the current interest factors for men and women are:

Males $\frac{5 + 7}{26}$ = 46% interest factor

Females $\frac{0 + 2}{16}$ = 12.5°10 interest factor

It should be emphasized that, although these interest factors have been developed through comprehensive interviews with Resolute residents, they should still be regarded as very preliminary and somewhat speculative. As more information becomes available regarding the actual interest of Resolute residents in working at the Polaris Mine, these preliminary interest factors can be refined. Obviously it is the residents of Resolute themselves who will ultimately determine the extent of their interest. Nevertheless, it is felt that the interest factors presented above are sufficiently realistic for the purposes of the impact assessment and preliminary project planning.

We have assumed these interest factors remain constant over the years, although in fact
- they may increase if jobs at Polaris turn out to be especially attractive (because of good living conditions, well designed training program)
- they may decrease if additional jobs become available in Resolute (because of purchases by Polaris in Resolute, because of other projects going ahead)

Using these interest factors, the numbers of people from Resolute who would likely go to work at the Polaris Mine are:

Year	# in labour force	X	Interest factor	=	Candidates by male/female breakdown	Total candidates for Polaris jobs
1985	M 33 F 21	X	.46 .125	=	M 15 F 3	18
1990	M 44 F 22	X	.46 ,125	=	M 20 F 3	23
1995	M 52 F 24	X	.46 .125	=	M 24 F 3	27
2000	M 51 F 34	X	.46 .125	=	M 23 F 4	27

Potentially Successful Candidates

The above numbers indicate only those who will *try* employment at Polaris. They do not indicate the ones who will be successful. The number of potentially *successful* candidates (the number who remain at Polaris for one year or longer) was determined by applying two more factors to the number of candidates.

The first factor is the success rate. This success *factor* was determined from the Nanisivik experience with rotational employment, specifically the experience of the people of Arctic Bay. This factor is an estimate of the percentage of job candidates

from Resolute who would remain at Polaris if the conditions at Polaris were the same as the conditions at Nanisivik during the years 1975-1979. The success rate for Arctic Bay residents working at Nanisivik Mine through these years was 34 percent? This success rate is for employees from a community which is close to the actual mine (approximately 12 miles away), where separation from families is not a problem. It also reflects a five year work period, when many employees were first moving into the wage economy.

Considering this figure in relation to the Resolute situation, two differences could alter the success rate. First, the Resolute community is not as close to the mine site, although employees from Resolute would have some advantages of proximity (i.e. frequent and direct air transportation to home community, little travel time on shift rotation, less cost for long distance calls home). Secondly, the Resolute people have had more experience with wage employment than the Arctic Bay people and have an increased awareness of the mining industry as an employer. Assuming that the longer distance from home slightly outweighs the experience with wage employment, we have adjusted the Arctic Bay success rate downward to 30 percent when applying it to the Resolute situation.

The second consideration in determining the number of potentially successful candidates was an estimated *improvement factor* for the Polaris Mine relative to success rates at the Nanisivik mine. The improvement factor was developed from a number of considerations including:

- the Polaris work rotation allows for more time at home for Inuit workers;
- the availability of data regarding experiences at Nanisivik and elsewhere which will enable Polaris to take advantage of "lessons learned":
  high number of training programs and training positions developed at Polaris for potential Inuit workers;[3]

For these reasons we have assumed an improvement factor of 35 percent for the Polaris Mine.

To obtain the number of potentially successful candidates our equation is:

# of likely candidates	*Adjusted success rate of Arctic Bay workers at Nanisivik Mine*	x	*Improvement factor*	=	*Potentially successful candidates*
1985 – 18 X	.3	x	1.35	=	7
1990 - 23 X	.3	x	1.35	=	9
1995 – 27 X	.3	x	1.35	=	11
2000 – 27 X	.3	x	1.35	=	11

Expressed as percentages of the total number of people in the Resolute labour force:

Year	Total labour force	Potentially successful candidates	Potentially successful candidates as % of labour force
1985	54	7	13%
1990	66	9	14%
1995	76	11	14%
2000	85	11	13%

[2] Baffin Region Inuit Association (B. R. I. A.) *Socio-economic impacts of the Nanisivik Mine on North Baffin Region communities* (Nanisivik Mines Ltd., Government of the Northwest Territories, Government of Canada, November, 1979), p. 95.

[3] Cominco Ltd.. *Operation Katak, May 1980.*

In addition to potentially successful Resolute employees at Polaris, there will be a number of Resolute people who will work there, but will not complete one year.

Year	Candidates	Potentially successful candidates (full time rotational)	People working less than 1 year (partial year rotational)
1985	18	7	11
1990	23	9	14
1995	27	11	16
2000	27	11	16

Using the duration of employment of Inuit Nanisivik Mine employees 1975-1979[4], with modifications to the five year averages to reflect the Resolute situation, Resolute duration rates are assumed to be:

	O-6 weeks	7 weeks to 4 months	5 months to 1 year	over 1 year
% of total candidates	26%	18%	15%	41%
# of total candidates	5	3	3	7

$$\frac{1 \text{ month} \times 5}{5 \text{ months}} + \frac{3 \text{ months} \times 3}{9 \text{ months}} + \frac{8 \text{ months} \times 3}{24 \text{ months}} = 38 \text{ months}$$

In tots months this represents the equivalent of 3 man years. Although the number of people involved is higher, for purposes of assessing direct employment we have used the man year equivalents.

The following chart summarizes the Polaris direct employment of Resolute residents up to the year 2000:

	1985	1990	1995	2000
Full time employee stationed in Resolute[5]	1	1	1	1
Full time rotational	7	9	11	11
Partial year rotational	3	4	5	5
	11	14	17	17

[4] B. R.I.A. *Nanisivik*, p. 96.

Polaris Mine Project Summary Report, July 1979,

[5] Measured in man year equivalents.

4.2.2 INDIRECT EMPLOYMENT

Indirect employment resulting from the Polaris Mine is derived from the Northern Value Added portion of purchases made in Resolute by the Mine. The study team has assessed that the following purchases would likely be made in Resolute:

	Value of Purchase	Northern Value Added[a]
Annual freight[b]	$120,000	$96,000
Rotation expenses[c]	220,000	176,000
Emergency air evacuations	20,000	16,000
	$360,000	$288,000

[a] Includes profit as well as wages and salaries.

[b] Annual freight includes the labour costs of unloading and loading ships at Polaris during shipping season. Once the labour force of Resolute increases, it is likely a large portion of this amount would go to Resolute, since local people could handle this seasonal work. Also, this includes freight expediting from commercial carriers to small planes, for transport to the mine site.

[c] Rotation expenses include air charter costs between Resolute and the mine site, and meals and accommodation costs for people holding over in Resolute en route to and from the mine site.

According to data provided in chapter 3, for every $36,200 Northern Value Added spent in the Northwest Territories one new job is created. (This could also represent a number of part time jobs with total wages equivalent to one full time job as would likely be the case in Resolute).

Therefore the indirect employment in Resolute resulting from the new purchases will be

$$\frac{\textit{Northern Value Added } \$288{,}000}{\$36.200} = 8 \textit{ jobs}$$

About half of these jobs (in man-year equivalents) will be related to loading and unloading ships. The rest will likely be in the accommodation, expediting and airline areas. Since it is unlikely that all eight jobs will go to residents (i.e. air charter companies could add extra pilots for the summer; a hotel could hire an extra southern chef) we estimate that the actual number of indirect jobs which could be filled by the resident Resolute labour force will be 60% of the total, or 5 jobs.

'4.2.3 INDUCED EMPLOYMENT

Induced employment is derived from the respending effects of direct and indirect Polaris income in Resolute. To determine the number of jobs created in Resolute due to respending (i.e. more purchases at the Bay or Co-op, new businesses opening, more use of air charter service by residents) we applied a multiplier of .16 to the total direct and indirect jobs.[7]

Direct Polaris jobs to Res. residents	+	*Indirect jobs to Res. residents through purchase of supplies, services*	x	*Induced employment factor*	=	*Employment resulting from resending*

11 direct jobs + 8 indirect jobs[8] x .16 = 3 jobs

4.2.4 RESOLUTE EMPLOYMENT SUMMARY

Summary of all Employment in Resolute due to Polaris Mine:

	1985	1990	1995	2000
Direct employment	11	14	17	17
Indirect employment	5	5	5	5
Induced employment	3	4	4	4
	19	23	26	26

Polaris Mine and Related Potential
Employment as Percentage of Labour Force in Resolute

Year	Total labour force	Polaris related employment	Percentage of labour force
1985	54	19	35%
1990	66	23	35%
1995	76	26	34%
2000	85	26	31%

Community Employment

In addition to potential direct, indirect and induced jobs resulting from the Polaris Mine, other community jobs will continue to be available to the Resolute labour force. Currently the Inuit of Resolute hold 20 full-time jobs in the community and at the base. To reflect the fact that some Inuit will likely move into jobs held by southerners who decide to leave Resolute, we have increased the current jobs available to residents by 20% for every five year period. Over the years, improved education, skill levels and job experience will likely account for this movement of the Inuit into new job areas.

"The explanation for use of this multiplier is in Chapter 3

[8] We have not used the adjusted indirect employment figure since all employees in Resolute would contribute to the resending effects. However, since southern based employees are likely to spend less. we have adjusted our induced employment multiplier downward, to reflect this additional leakage.

'To reflect employment which will likely go to Inuit residents, we have used the adjusted indirect employment figure. We have also assumed constant expenditures for supplies and services in Resolute, resulting in constant indirect employment figures.

Projected total jobs held by Inuit residents in Resolute will be:

	1985	1990	1995	2000
Polaris related	19	23	26	26
Other community	24	29	35	42
	43	52	61	68

Considering the total number of people in the **labour** force, the actual situation in Resolute will be:

	1985	1990	1995	2000
In **labour** force	54	66	76	85
- Jobs available	-43	-52	-61	-68
= Surplus **labour** force	11	14	15	17

Note: In **labour** force represents only those people 18-50 years old who actually have a job or would like a job if one were available. Assessment of the numbers in the **labour** force was projected from the current (1980) situation, and could be changed by a number of factors.

4.2.5 ANALYSIS OF THE EMPLOYMENT IMPACTS IN RESOLUTE

From our assessment of the employment opportunities in Resolute, it appears that the projected **labour** force can fill the jobs likely to be taken at Polaris, leaving limited unemployment in the community. However, there are a number of other factors to be considered before drawing any conclusions.

Part time rotational employees – In our calculation of total number of Polaris Mine employees, we converted the total months worked on a partial year basis to man year equivalents. In actual fact there are eleven people covering these three man year equivalents.

Since we have assumed that five will drop out after one month, and another three after three months, we can only assume that the distribution of these partial year Polaris employees would be such that there is no significant change in the number of jobs held at any one time.

Ship loading/unloading – We have allocated four man year equivalents to this **task,**[10] when in actual fact, during the short shipping season, approximately 16 men will be needed. In this area, there appears to be a shortfall of people to fill the jobs. Since our **labour** force figures do not include people over 50 or under 18, there is the possibility that these people would in fact be in the **labour** force to fill some of this shortfall. Initially, part of the **labour** force for these jobs will likely be drawn from other communities.

Part time work available in Resolute – In the assessment of positions available in the community we did not include part time jobs. Although some of these could develop into full time jobs and be reflected in indirect or induced employment numbers, others are seasonal work such as snow ploughing, sealift unloading, road work. Again, the over 50 group might pick Up some of the shortages in this area.

[10] See section 4.2.2.

Male/Female ratio – We have not considered the male/female ratio in relation to the jobs available, and this could have some effect on filling available jobs.

Catering service – Due to limited manpower in Resolute, we have assumed that few Resolute residents will be involved in catering jobs.

CONCLUSIONS

During the first five years of mine operation the Resolute labour force is likely to be almost fully employed. Initially there will not likely be enough people in Resolute to fill all job requirements. A limited amount of in-migration will probably occur to fill available jobs. After 1985, considering this in-migration and the number of young people entering the labour force in Resolute there will be a sufficient labour supply to handle community jobs, mine and mine related jobs, and part time seasonal work.

This increased demand for labour in Resolute could result in the following:

1. Jobs will become available to other N.W.T. residents who are prepared to move to Resolute. Initially we expect this will involve former residents returning to the community and relatives of residents moving to the, community.

2. Local employers will experience some difficulty in obtaining part time seasonal workers. This could mean bringing in crews from the south or other N.W.T. communities for some jobs.

3. More women could move into the work force, in some cases assuming jobs traditionally held by men.

4. There could be more opportunities for students from Resolute and other N.W.T. communities to obtain seasonal, summer jobs.

5. Since some people currently holding community jobs could move to Polaris jobs, the community could experience some short term shortages of skilled people to carry out necessary jobs (e.g. housing maintenance).

By 1985 and beyond, the Resolute labour force should be able to fill all available jobs. Through direct, indirect and induced employment approximately 35% of the Resolute labour force could have jobs which are related either directly or indirectly to the Polaris Mine.

RECOMMENDATIONS

1. Since Resolute will be most affected by the mine, priority in hiring and training programs should be given to the Inuit in Resolute, if they are interested and prepared to take full time jobs at the mine. For seasonal work such as unloading supply ships and loading ore ships, the Resolute Inuit should also be given priority in hiring programs, Local companies providing extensive services to the mine should be encouraged to draw part of their staff requirements from the local labour force if possible.

2. The employment situation in Resolute should be carefully monitored by the resident Cominco employee to ensure that hiring of Resolute residents for Polaris

jobs is not creating negative effects on the provision of local services. This could be done by adjusting starting dates to allow the community to train other individuals-for jobs to be vacated by people who want to work at Polaris.

3. Within the community, required skills needed to provide community services should be identified, and a labour pool with these skills should be developed. Possibly this could be done by territorial or municipal government, using some existing government employment/development programs.

4. If another project starts and is also planning to use the Resolute labour force, discussions should be held with the settlement council, Cominco and the *new* project, to determine the degree of recruitment/hiring to be done in Resolute.

4.3 Potential Income in Resolute from the Polaris Mine

In March, 1980,20 Inuit in Resolute had full time jobs. Estimating an average wage of $16,000,[1] the 1980 wage income from these jobs will be $320,000. Assuming that another $25,000 will be earned through part time employment, the projected 1980 wage income in Resolute will be $345,000. This does not include income from hunting and trapping and handicraft production, nor does it include income from Polaris employment.

To assess the increase in wage income in Resolute for the year 1985 as a result of the Polaris Mine we used the employment figures developed in Section 4.2 of this chapter and assigned dollar values in 1979 dollars and based on 1979 real wage rates. (see point 3 in the Technical Note to Chapter 3).

Polaris Related Income

Direct Employment Income:	1 expediter/liaison	$25,000	
	7 full time rotational x $20,000[2]	140,000	
	3 partial year rotational (equivalent of 3 man years) X $18,000[3]	54,000	
		$219,000[4]	$219,000

Indirect Employment Income
The indirect employment is estimated at 8 jobs (section 4.2.2) but to present a more realistic view of indirect employment income, we are using the adjusted indirect employment figure, which represents only jobs or job equivalents which we feel will go to Inuit residents. We are also making a conservative salary estimate of $17,000 per annum in 1979 dollars.

5 indirect jobs x $17,000	$ 85,000

Induced Employment Income
The induced employment (or employment resulting from resending) is estimated to be 3 jobs (section 4.2.3)

3 jobs x an average salary of $16,000	$48,000
Total Polaris Related Income	$352,000

[1] This was based partially on a survey of incomes for different level jobs in Resolute and partially from actual salary information provided.

[2] The annual average salary for 1985, expressed in 1979 dollars was estimated to be $20,000. (See section 2.3.3)

[3] A lower wage of $18.000 was used to reflect the likely low-category jobs to be held by employees who work less than 1 year.

[4] This figure does not correspond with the figure shown in Chapter 3. Exhibit D since it does not consider the economic model parameter which includes annual real wage increases. The figure in Chapter 3 was used for comparative reasons only.

If all jobs currently filled by **Inuit** residents continued to be filled by them, the Polaris Mine **could** represent a 102 percent increase in the wage income of the Resolute **Inuit.**

$$\frac{\$352{,}000 \text{ Polaris related earnings}}{\$345{,}000 \text{ Current community earnings}} \times 100 = \mathbf{102\%}$$

However, we know that at present there are other types of earned and unearned income in Resolute.

Wage Income	$345,000
Trapping Income	50,0005
Other	30,0006
Total Income	$425,000

Using a very conservative scenario which estimates *no* income from hunting and trapping, and *no* other income once the Polaris Mine is operational, the TOTAL 1985 income in Resolute in 1979$ would be:

$$\underset{\$345{,}000}{\text{existing earned income}} + \underset{\$352{,}000}{\text{Polaris related income}} = \$_{697}000$$

This represents an increase in total income of $272,000 or a 64 percent actual increase in the total income of the **Inuit** residents of Resolute.

In the above figures we have not considered the dollar value of resources harvested for domestic use. Since we were unable to obtain up-to-date figures of Resolute domestic harvests, we cannot provide domestic harvest income figures; however, we can conclude that any reduction in domestic harvests would reduce the percentage of increased income due to the Polaris Mine.

CONCLUSIONS

By the year 1985, the Polaris Mine could double the current wage income in Resolute. Since the number of people in the **labour** force will be higher, this will result in a substantial increase in the average household income.

Since it is unlikely that all hunting and trapping and handicraft activities will cease due to the Polaris Mine, (as described in our scenario) it is expected that total earned income in Resolute will be higher than the $697,000 estimated.

Resources harvested for domestic use are considered as earned income. It is unlikely that there will be a substantial decrease in the amounts harvested, although the distribution per hunter may vary. In the Nanisivik experience there was little change in the total harvests of seal and caribou in communities which had some people working at the mine on a rotational **basis.**[7]

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[5] For the current year. this figure is estimated based on the total value of fur exports for the previous year (N.W.T. Wildlife Service. 1980)

[6] Transfer payments — estimate only. based on 1976 figure of $26.000 (Kemp et al. *Resolute*) and 9-month figures for 1979.

[7] B. R. I. A.. *Nanisivik*, p. 316.

4.4 Potential Effects on Population Growth

In our discussion of population growth, we have ruled out the possibility of a decline in population since a townsite at the Polaris mine is not in the current plans. Historically, the availability of new jobs to a community has caused at least marginal growth and since Resolute will be a prime hiring centre, we can conclude that population growth will occur.

The most likely scenario for population growth in Resolute is

1) limited amount of in-migration during the first years of mine construction and operation (possibly former residents returning). Some of this group will not likely stay in Resolute permanently.

2) additional in-migration, but not extensive while the indirect income and **respending** effects produce more community jobs. Possible in-migration by some Polaris employees from other communities who want to locate their families in Resolute so they are closer to the work **site.**[1]

3) Population stability as young people from Resolute enter the **labour** force and assume jobs in **the community** and-at the mine.

Excluding the base, Resolute is a very small community with a limited **labour** force. There are currently 42 **Inuit** people between 18 and 50 who are *in* the **labour** force. Half the population is below the **labour** force age and will be entering the labour force in the next 18 years.

In the past few years, there has been a net out-migration of people from Resolute.. in some cases, individuals moving to other communities.. and in other cases, entire families relocating to other communities.

As in many Arctic communities, there is a certain portion of the population that appears to be in a 'migratory pattern', that is, moving out of a community one year, then moving back later, or simply packing up and moving on to the next community. Resolute is no exception, and has a number of families who do move in and out of the community, either to live with relatives elsewhere, or to live at outpost camps. For the purposes of this study this migrant group was counted only if resident in Resolute in March 1980, but was considered to be the potential in-migrant group once mine jobs are available.

The main factor which will influence population growth in Resolute is the availability of jobs.

In 1985, there will be a total of 75 Inuit of labour force age in Resolute. Of this number, we estimate that 54 will actually be in the labour force, 33 men and 21 women. This figure may be optimistic since all Resolute males over 18 were included and we did not consider any out migration. With 54 people in the labour force and 43 employed, (see section 4.2.4) it appears the employment rate will be 80 percent.

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[1] This in-migration would likely be from Baffin region communities. since Arctic coast community residents have shown little interest in relocating to Resolute. Community Interviews, March 1980.

However considering the fact that there will be a number of people who will try mine employment for-short periods of time (we only count full man year equivalents in our Polaris Mine calculations) and there will be seasonal jobs, actual utilization of the labour force could be even higher than the statistics suggest since part time community jobs and ship loading and unloading jobs at the mine site also will be available.

Although some people outside the labour force age of 18-50 will likely fill some jobs, the labour requirements could surpass the manpower availability. From this information, we can conclude that during the early years of the project the labour force will be well utilized and the availability of year round and part time jobs will likely attract former residents back to Resolute or will attract some new residents to the community.

In actual numbers, we estimate the population of Resolute will increase by 40 to 50 people (10-12 families) between the years 1980 and 1985. After that Resolute will experience only natural growth with a decreasing amount of movement.

Another factor could affect the population growth of Resolute. If travel is not paid from home communities to the hiring centres, a small number of people who are anxious to have full time jobs might relocate their families to Resolute to get the jobs at less personal expense. We feel that the number who would do this would be quite low. They could come from Arctic coast communities, the Keewatin and the Baffin. Baffin region people appear more likely to move since they have the closest ties with Resolute people, speak the same dialect, and in the case of Pond Inlet, Grise Fiord and Arctic Bay, are more familiar with high Arctic conditions.

In the past few years the population of Resolute has been declining. In 1976, the government estimated the 1981 resident population at 280 and the 1986 population at 325. Considering Resolute in isolation from all other projects except Polaris, it is unlikely that the population will reach this level by 1986. A more realistic population forecast for Resolute for 1986, barring other developments, and including *all* residents of the village, and year round base residents might be:

Inuit	225
Other	50
	275

Although the expected in-migration could have some negative impact related to the integration of peoples from different regions and other problems related to the stress of a move to a new location, these could be offset by positive impacts such as improved community services, more goods available for sale, and a chance for improved frequency of medical and dental services.

Impacts of increased population growth on community infrastructure and services are discussed in a later section.

CONCLUSIONS

The mine will cause some population growth in Resolute. It is expected that those who would move to Resolute would be former residents and friends and relatives of

those already resident, since the community is not considered particularly attractive to outsiders nor does it offer good hunting nearby.

Population growth of about 10-12 additional families can be anticipated. The community as a whole is not concerned about a gradual population increase, since the population would be growing back to its former level, but it is concerned about a sudden influx of people, particularly strangers.

RECOMMENDATIONS

If for some reason in-migration to Resolute becomes very popular, and the community is becoming crowded, the government should discourage people from moving to Resolute. This could be done by advising communities showing high numbers of in-migrants that there is no housing available in Resolute.

Also in the Cominco hiring program, there should be emphasis placed on the people continuing to live in their home communities, while working on rotation at the mine site. This could be a more attractive alternative to moving to Resolute if the employees had assurance of prompt, paid transport home, once they have finished their work shift.

4.5 Potential Effects on the Local Economy

The economy of Resolute is tied very closely to government operations. Resolute was developed as a weather station and air base, and these functions continue to provide the reason for Resolute's existence. The main employer, Tower Arctic, operates the airport on contract to the Ministry of Transport. Other federal and territorial government departments also have employees and services in Resolute.

Several years ago, oil and gas exploration work in the high Arctic contributed substantially to the Resolute economy, but this activity has declined, although there is some work done for the oil/gas and related industries.

The business community in Resolute is quite small and depends directly or indirectly on government and to some degree exploration and scientific crews, for its livelihood. Most businesses in Resolute are marginal at best, and if business doesn't improve, or if they lose any contracts, some admit they will have to close down. Some businesses have already reduced operations or moved out of Resolute in the past few years.

Although activity picks up in the summertime for most businesses, the winter season is generally slow, necessitating staff cutbacks and in some cases cutbacks in services. Businesses in Resolute are services-oriented, mainly construction, maintenance, airlines, accommodation, fuel supply. Although the business sector is small in Resolute (about a dozen businesses) it is considerably larger than the business sectors in other N.W.T. communities of comparable size.

Very few businesses in Resolute are locally owned. Most are branch operations of companies with headquarters outside the Northwest Territories. And most have staff who are resident in another part of Canada, working in Resolute on a rotational basis.

Inuit hold about 15 percent of the full time jobs available in Resolute.[1] Some Inuit, by their own choice, have part time jobs only, while others have part time jobs because they are unable to get a full time job.

Given this situation, there are two interesting points to note about the current Resolute economy:

1. Very little direct or indirect income into Resolute is retained in the community. All supplies/inventory /lubricants, etc. needed to operate businesses must be purchased in the South. In most cases, any profit made from Resolute businesses may go to a head office and may or may not be reinvested in Resolute.

2. Both the business and government sector's contributions to Resolute are mainly in wages . . . full time and part time, although the rotational staff at the base spend very little in Resolute.

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[1] Total Resolute jobs including base estimated at 135.

This is not unlike the situation in other parts of the Northwest Territories. Lack of a manufacturing sector necessitates many imports into the N.W.T. But in Resolute it is more pronounced because of the high number of rotational people who do not live in the community year-round. Also current lack of a skilled labour force makes it difficult to fill many positions in Resolute by resident Northerners at this time (i.e. pilots, aircraft mechanics, air radio operators).

The direct or indirect income dollars from the Polaris Mine will *not* have a dramatic effect on the local businesses, but for some businesses, the purchase of supplies and services will provide the extra income needed to move the business from marginal to profitable. This in turn could provide the needed capital for three things:

1) diversification or possibly expansion of some existing businesses

2) flexibility in hiring and training. Training a person for a job costs money, since the person does not function at full capacity until he/she has learned the job. If businesses were more profitable, they could afford to do more training.

3) opportunities for new small businesses to get started in Resolute could arise.

All of these things would have an effect on strengthening the economy of Resolute. To examine the effects of the Polaris Mine on the Resolute economy we have looked at existing businesses and possible effects on them, potential new businesses and the cost of living.

4.5.1 EXISTING BUSINESSES

Purchases of supplies and services, as we said earlier, could move existing businesses from break even or marginal operations to profitable operations. This in turn could mean more local hiring, and a chance to expand into additional areas which could provide required supplies/services to the Polaris Mine.

From interviews with local businesses, we have concluded that the local economy is not healthy. Apart from Tower Arctic which operates the M.O.T. facilities on a contract basis for the federal government, most other businesses are breaking even, or are only marginally successful. Some have indicated they may have to leave Resolute if the situation does not improve. Most appear to be operating far below capacity and could readily accommodate increased business. There are only two businesses which currently operate within the village section of Resolute, a co-op and a tourism/outfitting business.

Tourism/Outfitting Business – Although the tourism/outfitting operator was not interviewed? it is understood that he plans to open an accommodation unit which could possibly benefit from Polaris Mine pass through traffic. Since the accommodation unit is located in the village, away from the airport, it is not likely it would get a large portion of the business, although it could get some, if facilities are adequate and if an effort is made by Cominco to spread the “over night” stops to all accommodation facilities in Resolute. (See Section 4.5 re use of Resolute accommodation.)

? Owner operator was out of town during period study team was in Resolute.

Resolute Co-op – The co-op has been a marginal business since it started in Resolute 18 years ago. It is the only grocery outlet in Resolute and also carries some dry goods and hardware as well as skidoos and skidoo parts. There are plans to upgrade the store and put in new display and freezer units. The co-op has the contract for fuel delivery in the community. The co-op had a total dollar volume of about a quarter of a million in 1979 and is planning some retail space expansion.

More money in the community from wages paid to Inuit workers would increase the volume of business at the co-op. This could lead to an additional part time or full time job. Although there might be some purchases by Polaris at the co-op, these are not likely to be high. The co-op currently orders its fresh fruit and vegetables from the south and could possibly be the supplier/expediter of fresh fruit and vegetables to the mine. Operating such a service could also improve the quantity, quality and variety, and possibly the price for local residents, if supplies were ordered in larger quantities. The co-op is interested in providing services to the mine, and would be particularly interested in some type of local project which would involve the women, possibly operating the laundry service for Polaris.

Arctic Resources – This company, an associate of Tower Arctic, has a million dollars plus investment in Resolute. This includes an accommodation unit, a large garage and servicing facilities and a wide range of heavy equipment. It is involved in general contracting, road building and maintenance, water lines installation, maintenance, mechanical repairs, etc. The company has only two full time staff in Resolute, a manager and a heavy equipment operator. For some contract work it also hires casuals. Considering the investment and the related volume of work, this appears to be only a marginal operation at this time.

There is the possibility of a number of contracts at the mine site through construction. (This company has already been awarded one contract valued at over one million dollars)[3]. These contracts are labour intensive and will likely mean moving people in from Frobisher Bay or from the south. Also, the company could hire casuals from Resolute if the required people can be found. During both the construction and operations stage, the company could benefit from accommodation rental, and in the operations stage, it could handle the freight transfer/expediting work for the mine. Also, it might receive small contracts for repair and maintenance work which cannot be handled by on-site staff.

Narwhal – In addition to an accommodation complex which can house up to 69 people, this company has a large service garage and is also involved in construction, maintenance, expediting, equipment rental and related jobs. Owner/manager Tom Wallace estimates his capital investment at “probably a couple of million dollars”. It was deduced from conversation with the owner that this business is only marginally profitable, particularly since the cutback in activity out of Resolute.

This operation could provide accommodation facilities for Polaris employees and expediting services during both the construction and operations phases. Also, during construction it would be possible for Narwhal to handle some construction contracts. At present it is handling expediting for the site, and its accommodation facility is being used by Bechtel staff.

[3] Interview, Polaris project manager, March 1980.

Kenn Borek Air – Resolute Manager Tom Frook said that this company's business fell off in 1974 after seismic work ended, and never picked up. Although he didn't have the figures, he guessed that the Resolute operation was only breaking even. He said they are currently running at only one third capacity, although business picks up in the summer and extra crews are brought in. The company has two DC-3's and one twin otter (a second expected for the summer) on site. This company runs the Class 3 scheduled service between Resolute, Nanisivik/Arctic Bay, Pond Inlet and Grise Fiord.

Using the base case for Polaris, the mine will have a positive effect if Kenn Borek Air obtained a contract for scheduled services into the mine or if it received a share of the mine's charter work. Also, if travel policies or hiring points change, there could be an increase in passenger traffic on the current scheduled runs, plus an opportunity for charter work into other communities. Frook does not think the Cominco work would justify an additional plane on site.

Bradley Air – Bradley has five planes stationed in Resolute (some currently out on contracts) and 13 employees although they scale down to 4-6 from mid-November to mid-February. In addition to an air charter service, it also has an accommodation complex, which a spokesman said they won't be opening this summer, since they lost money on it last summer and there is not enough activity in Resolute at present to support another accommodation facility.

If the Polaris contract is mainly for moving personnel and fresh produce on jet flight days, Bradley would not require any additional planes or personnel, but could handle this with its existing capacity. As in the case of Ken Borek Air, the Polaris Mine could have more effect on Bradley if air charters were used to transport people from Arctic coast or Baffin communities to Resolute, but this is not being considered by Cominco at this time.

Hudson Bay Company – At present the Bay in Resolute is only marginally profitable. Although it does not sell groceries, it does carry a range of general merchandise from clothing to hardware to stereos, skidoos and souvenirs. With about 1500 square feet, the Bay manager feels he could double his sales without increasing the size of the store.

More wage income into the community would likely increase sales at the Bay, and could lead to some store expansion and another full time employee. Also, Bechtel has purchased some supplies at the Bay (and to a lesser degree at the co-op) and a continuation of this local purchasing could lead to the increase in volume required for additional staff. Wages at the Bay are quite low,[4] and could mean that they will have trouble finding and retaining staff once higher paying jobs are available to Resolute people.

Imperial Oil – The company has storage capacity for approximately 15 million gallons of fuel and is currently handling about 7 million gallons per year of jet fuel, diesel, gas, etc.

The main effect of Polaris would be increased air traffic into and out of Resolute. This could increase the volume of fuel brought in each year, but not enough to warrant expansion since they would probably need to sell 2 million gallons more to expand staff requirements.

[4] Interview, Bay Manager, March 1980.

Canadian Imperial Bank of Commerce – The bank operates a small branch office in Resolute, with a satellite office in Nanisivik. The main effect the Polaris Mine would have on the bank would be an increase in local usage to cash cheques, handle accounts. At most this might involve 20 new accounts and would not require any additional staff.

4.5.2 NEW BUSINESSES

In a previous section (4.2) we identified the number of direct and indirect jobs which could go to Resolute residents as a result of the Polaris Mine. A large percentage of the earnings from these residents will likely be spent on goods and services within the community. This increase in income and its resending in Resolute, could mean expansion for some existing business, or the starting of some new businesses. Although no in-depth study has been done of potential new businesses in Resolute which could open as a result of mine related activities, or increased disposable income, there are a number of possibilities including:

Commissary - Mine Site – Although this would be a small volume business, there could be an opportunity for a Resolute resident to be given a concession for operating a small confectionery/toiletries shop at the mine site. This could be handled as a new business, or possibly could be operated by the co-op which is already ordering goods from southern suppliers. If the floor space was provided free of charge by the mine, and if goods could be flown into the site on the Cominco charter aircraft, there is a possibility of a viable business and an opportunity for a local resident to learn more about retailing.

Taxi Service - Resolute – This was tried before in Resolute and found to be unsuccessful, partly due to a decline in activity in Resolute and partly due to difficulties in obtaining vehicle parts for needed repairs. Possibly this service could be re-established, if there was an increase in income in Resolute, and an increase in the number of people coming to Resolute and traveling between the base and the village.

Travel Agency – There could be a possibility for a travel agency operating part time, likely run in conjunction with some existing business. This could only exist if all Polaris employees' bookings for travel to and from the mine site were made through this agency. Also, the increased income in the community could mean more travel by residents who could book through this agency. If such an agency were also able to do bookings for other local firms and government for rotational employment and vacation leave, part of the travel dollars spent by Resolute residents could stay in the N.W.T. At this time we have not investigated the conditions to be met to be licensed as a travel agent, but only put this forward as a possibility.

Recreation/Entertainment Related – There is a shortage of recreation/entertainment facilities in Resolute in general and the village in particular. If a plan could be devised, without requiring excessive capital, something possibly could be developed in this area. In addition to the interest in curling shown by all residents, possibly a small bowling operation, with say two lanes, could be successful . . . particularly if it could be installed in excess warehouse space in Resolute.

Crafts Production – Although more people will be entering the labour force, there will still be a number of people who will hunt or trap, maybe carve, and others, par-

titularly women who could produce handicrafts. With a new flow of southern people through the community, including everyone from southern mine workers to government people, to Cominco executives, there could be an expanded and captive market for locally produced handicrafts. Possibly a small store could be opened at the airport for sales before and after flights, and at other specified times . . . to attract not only Polaris and Polaris related people, but also other visitors to the North. This maybe in competition with the Bay or co-op to some degree, but it might be something either one of these stores might consider as an adjunct to their existing business.

Manpower Overload Business – As a result of Polaris Mine shipping operations and seasonal jobs which must be done at other times of the year, there could be some requirement for organization of the work force in Resolute. Possibly one person could act as the co-ordinator of local manpower, and could arrange to move manpower to jobs, as required. For this service, based on being able to search the labour pool, put together the crew or obtain the individual, and have the required manpower on site, the organizer would receive a fee based on a percentage of wages, or on the number of individuals recruited. Although this type of work is done extensively in the south, it has generally been a government role in the North. Possibly a small business venture such as this could be taken on by an existing community group or organization.

4.5.3 COST OF LIVING

The cost of living in Resolute is close to double that of Yellowknife. Food items are very expensive and rent for a house, without subsidy, would be $1000 or higher, per month in the community. There are only two privately owned homes in Resolute.

Large items which must be transported to Resolute i.e., skidoos, outboard motors, are considerably higher priced than Yellowknife, to account not only for transportation but higher overheads and operating expenses in Resolute.

Utility and fuel costs are high in Resolute and consumption of these items is estimated to be higher than the N.W.T. average because of long, cold winters with periods of total darkness.

Most of the Inuit in Resolute live in social housing provided by the N.W.T. Housing Corporation through the local Housing Association. Rents are assessed on retained earnings, house size, zone, cost of living, etc. The minimum rent is $28 monthly and the maximum is $335. Employment at Polaris could have an impact on the cost of living through increased rents for people whose former incomes were lower. However this cost should be offset by a net increase in disposable income. For the unemployed person who goes to work at Polaris, rent could go up $100 to $200 per month.

Another effect on cost of living could be the need to purchase additional food. Currently part of the regular food supply is caribou, fish and seal. Generally hunting and stocking this meat is a weekend or vacation activity. Although it would be possible for a Polaris employee to obtain a stock of meat while on his four weeks at home, the timing may not coincide with the char run, or the availability of caribou. In this situation, there could be some shortages of meat which would be made up by additional store-bought foods. Since we have no current data on domestic use of game meat and fish we cannot determine what, if any, impact this would have on living costs, but we mention it as a possibility.

Some concern was expressed in the community about possible increases in food prices in relation to increased income into the community. Excluding regular food price increases which are common across Canada, the prices should not rise excessively for two reasons:

First, the only food supplier in town is the co-op which has the expressed objective of servicing its members who are a large proportion of the families in Resolute. Since the co-op manager is responsible to a local co-op board, control of pricing policies would seem to lie with the community. Although they may wish to increase prices to realize expansionary plans, it is unlikely that rapid or uncontrolled price escalations would take place.

Second, if the income into Resolute increases, and co-op sales increase, it is likely that better economies of scale would apply, allowing larger purchases of some items at reduced rates. Also, with more money available there could be faster movement of some items, decreasing shelf time, storage time and other factors which add to the end cost of the product.

It is unlikely that the Bay would dramatically increase its prices. If it were to do so, people would likely seek an alternate place to make a purchase (i.e. a skidoo) and the Bay could lose the sale. Although the two retailers in town deal in different lines of merchandise, to some degree, they would act as a form of control on one another if each wanted a portion of the expected increased spendings.

CONCLUSIONS

The effects on the local economy are expected to be positive. Study responses indicate that businesses in Resolute now have excess capacity caused by a decline in activity in the High Arctic. The Polaris Mine can be expected to take up some of this excess capacity and could make the difference between marginal and profitable operation of some Resolute businesses.

The increase in money supply caused by increased activity will offer at least three advantages to the community. Increased profitability can be expected to open training opportunities and provide more job opportunities to residents. At the same time businesses will have an opportunity to consider expansion. Finally, there may be opportunities for new businesses.

Higher income caused by mine and mine related employment may cause some increase in demand for goods, and a consequent short term small increase in the cost of living. Rents may be increased in line with higher income, and more food may have to be purchased at the co-op to replace food from the land. Since the co-op controls the food outlet, any increases in the cost of food would be directly controlled by the people of Resolute, and additional profits could be made to work for the expansion of activities of the co-op.

Since the rotation system planned for the mine will not cause a large number of people to pass through the community at one time, the pass throughs can be expected to have a beneficial effect on the accommodation industry which currently has excess capacity. Some 2,200 pass throughs per annum are expected. (This is discussed in more detail in the next section.)

RECOMMENDATIONS

Local businesses should be given priority in the awarding of contracts for mine related services they can provide. These businesses should have ongoing communication with Cominco, be kept up to date on their plans, and be given ample time to prepare tenders for jobs.

Government or Inuit Development Corporation personnel responsible for small business development should consult with both Cominco and the Resolute people, to see what services required could be provided locally, and what services local people are interested in providing. Business advice, training and assistance should be provided by government or IDC to the Inuit people to give local residents a chance to enter the Resolute business community, either within an existing business, or as part of a new enterprise.

4.6 Potential Effects of "Pass-Through" Traffic on Resolute

The people of Resolute, both at the base and in the village are accustomed to many people passing through the area, and view the Polaris traffic as just another group passing through town.

4.6.1 EXTENT OF POLARIS "PASS-THROUGH" TRAFFIC

To determine the number of people who will pass through Resolute as a result of the Polaris Mine we examined:

1. Number of potentially successful (full time) Northern hires (not including Resolute)
2. Number of partial year Northern hires
3. Number of full time Southern hires
4. Number of partial year Southern hires
5. Senior staff employees
6. Catering staff
7. Miscellaneous traffic

The methodology for assessing the number of potentially successful Northern hires from Coppermine, Cambridge Bay and other Arctic coast communities is outlined in section 5.2 of this report. For the "pass-through" impact analysis. we used the alternative case which assumes that travel costs from the communities of Holman, Gjoa Haven, Spence Bay and Pelly Bay, to hiring centres, would be paid. The number of "successful employees" from these communities is estimated at 36.

In addition to successful candidates (complete one year or more) there will also be a number of candidates who will work less than one full year. Converted to man year equivalents (see section 5.2) this will represent an additional 30 people passing through Resolute.

It is impossible to calculate an exact percentage of Northern hires on the Polaris Mine payroll at any one time, in light of the ones who will not stay a full year; therefore, we have assumed that southern hires will hold 60 percent of the mine positions. Converted to number of employees this is 133 people.

Again, since we did not do an analysis of the success rate of Southern employees, we simply estimated that the equivalent to 10 man years would not last a full year on the job.

Senior staff employees will also be on a rotational system, of six weeks at the mine site, four weeks at the Yellowknife office or vacation. Ten people will make up this group.

It is estimated that 20 positions "will be filled for catering and housekeeping duties at the mine. For purposes of this "pass-through" analysis, we will assume that half are from the North and half are from the South. We also assume they work the standard Northern and Southern work rotations. This would represent 18 Northern hires and 16 Southern hires to fill all 20 positions (see section 2.3.3.1).

In addition to direct mine employees there will also be another group of people passing through Resolute en route to the mine. These people will be senior Cominco staff, skilled tradesmen needed for one-time jobs, visiting dignitaries, government people. We have estimated that the number of "miscellaneous" people passing through Resolute will total 150 visits to the mine per year.

Using the preceding numbers, and considering that:
a) a Northern hire will work 5 cycles in a year and a Southern hire 3 cycles and
b) that each person will pass through Resolute twice...once on the way to the mine and once returning from the mine, we assess the total pass-through traffic as:

Category	No. of People		Work Rotations Per year	
Full time Northern hires[1]	- 36	x	5 rotations	x 2 = 3 6 0
Partial year Northern hires[2]	- 30	x	5 rotations	x 2 = 3 0 0
Full time Southern hires	- 133	x	3 rotations	x 2 = 7 9 8
Partial year Southern hires	- 10	x	3 rotations	x 2 = 6 0
Sr. staff employees	- 10	x	5 rotations	X2=1OO
Northern catering[3]	- 18	x	5 rotations	x 2 = 1 8 0
Southern catering staff	- 16	x	3 rotations	x 2 = 9 6
Miscellaneous	150			x 2 = 3 0 0
Total Resolute Pass Through Traffic				2194

Ideally, a large number of these people would simply get off a commercial carrier, and board a charter plane to the mine site . . . and people at the mine site, would simply arrive in Resolute by charter and board a southbound plane. However, given the current plan of three charters into the site per week, and the fact that employees must be moved in before other employees can leave, and considering the current commercial airline schedules, it becomes quite obvious that at least half this number will have to overnight in Resolute. In addition, bad weather and a range of other considerations, could delay people in Resolute for more than one night. To take into account all eventualities, we are making a high estimate on the number of Resolute "pass throughs" and assume that each person on average, will spend one night in Resolute en route to the mine, and one night on the way home. Therefore, there could be 2194 pass throughs, rounded off to 2200 in one year.

The distribution of these people over one year relates directly to the Polaris rotation system. There will be no large rotation changes at the mine; rather all rotations will be staggered, with small numbers of people coming and going at all times . . . in direct relationship to the commercial air services into and out of Resolute. This means that large numbers of people will not be in Resolute at any one time, although bad weather or other delays could mean that several small groups could be there at one time.

This does not include full time hires from Resolute.

' This is measured in man year equivalents and does not include Resolute.

This assumes that no catering staff will come from Resolute.

The number of pass throughs in Resolute for any one rotation change would be from 5 - 11 people. Since the Polaris Mine will use staggered rotation, and expects to have people coming and going on each plane, we arrive at this figure by simply cutting the pass through traffic in half (to represent the number coming in or going out) and divide this by the number of commercial flights annually (4 x 52) into Resolute.

$$\frac{\textit{one way traffic}}{\textit{4 flights per week x 52 weeks}} \cdot \textit{number per shift change} \quad \frac{1100}{208} = 5.3$$

Since it is unlikely the scheduling will be that precise, we expect that the actual number of pass throughs per rotation change is more likely to be double this, or 11.

4.6.2 IMPACT OF PASS THROUGH TRAFFIC ON RESOLUTE FACILITIES

The main service to be used by this pass through traffic will be accommodation facilities. Currently Resolute can supply about 35,000 bed nights annually. This does not include some facilities which are currently closed. In 1979 accommodation facilities were running at less than 50 percent capacity annually, although usage increases in the summer.

The Polaris related pass through traffic will take up less than 10 percent of the total Resolute annual accommodation capacity. This traffic can be accommodated, although there could be some need for additional beds in the summer. If other accommodation units in Resolute reopen for the summer season, possible seasonal problems would be eliminated.

Apart from accommodation, (including dining facilities) pass through traffic will make little use of other Resolute services. Only social/recreational facilities such as the Arctic Circle Club and the movie theatre are likely to be used by this pass through group. It is also assumed that this group will purchase few goods locally, with the exception of possible purchases of Northern arts and handicrafts and souvenirs.

CONCLUSIONS

Impacts of pass through traffic on the community and its residents will likely be minimal, since not many people are expected to stay in the village or spend much time in the village. Generally any contact between this group and residents would have to be initiated by residents. Areas where this pass through group could have an effect are outlined in later sections on community stability and community satisfaction. We would also conclude that there will be no negative effects on local facilities caused by pass through traffic, since they would make limited use of these facilities. Some positive effects will be felt by the local economy, particularly by businesses operating accommodations facilities.

4.7 Potential Effects on Transportation and Communications

With the building of an airport in the mid fifties, Resolute was established as the transportation and communications centre for the high Arctic. Initially it was used mainly as a resupply base for federal government operations, but as the search for oil and minerals moved to the high Arctic, Resolute became a staging area for a number of operations.

In 1974 and 1975 when there was a great deal of activity in the high Arctic, the total aircraft movements (take offs and landings) for Resolute was over 14,000 annually. Recently activity has declined and in 1979 there were just under 7,000 aircraft movements.

4.7.1 IMPACTS ON REGIONAL AIR CARRIERS SERVING RESOLUTE

Approximately 2200 people, representing 1100 in both northerly and southerly directions will be using regional air carriers. Also the Polaris Mine will be moving approximately 200 tons of freight into Resolute per year for transfer to the mine site.

Resolute is currently serviced by two regional air carriers, Pacific Western Airlines and Nordair. Each airline provides two flights weekly into Resolute, Nordair on Tuesdays and Friday, PWA on Wednesdays and Saturdays. The planes used on these flights have passenger/cargo configurations. The exact configuration depends on the freight or passengers to be moved. For both airlines, Resolute passengers get priority bookings, of a certain number of seats, with the residual seats going to stopping points en route to Edmonton or Montreal.

The PWA flight connects Edmonton and Yellowknife with Resolute. It will be used by Southern hires from the west (estimated to be low in light of the current Alberta economic situation), Yellowknife senior staff and Arctic coastal hires.

Current annual capacity into Resolute is 1,820 tons (35,000 lbs per flight x two flights weekly x 52 weeks). If 40 percent of passenger traffic to the mine, and half the air freight were carried by PWA, total Polaris usage of this airline would be equivalent to 8 percent of its current operating capacity into Resolute.

The Nordair flight connects Montreal, Frobisher Bay and Resolute. Since more Southern hires are expected to come from the east, this flight could get higher usage than the PWA flight. Current annual capacity into Resolute is 1,456 tons annually (28,000 lbs per flight x two flights weekly x 52). If 60 percent of the passengers travelled via this airline, and half the cargo were moved by Nordair, the Polaris Mine would use 12 percent of the total capacity of the Nordair service into Resolute in one year. At present, both PWA and Nordair have this extra capacity[1]

4.7.2 IMPACTS ON LOCAL AIR SERVICES

There are two local air charter companies with bases in Resolute . . . Kenn Borek Air Ltd. and Bradley Air Services. Kenn Borek's Air Class 3 service[2] represents about 30

[1] Telephone interviews with Frank Kirkman, Nordair and Ken Walmsley, PWA, March 1980.

[2] Class 3 Service: "Specific point commercial air service, being a service that is operated wholly within Canada and that offers public transportation of persons. goods or mail by aircraft, serving points consistent with traffic requirements and operating conditions at a full per unit of traffic, " Ministry of Transport definition, March 1980.

hours per month flying time, and is a small part of the current capacity of the company. If the travel payment policy to communities serviced by Kenn Borek Air (Arctic Bay/Nanisivik, Pond Inlet, Grise Fiord) changed, this service could receive increased usage which could create some difficulties for Resolute residents wanting to travel to these communities.

Both companies do charter work for exploration companies, scientific groups, government and some private individuals. The number of aircraft stationed in Resolute (pre construction) was adequate for current needs, and in summer, when demands are higher, both companies can and do move in additional aircraft and crews.

Under the current plan, the Polaris Mine will run three charters weekly into the mine site from Resolute. Since the mine site is only 60 miles away this represents about three hours per week flying time and some holding time. The planned arrangement with the air charter companies allows for schedule adjustments if the required aircraft is not available at the precise time required. Both companies report spare capacity, particularly in the winter season.

4.7.3 IMPACTS ON ANNUAL SEALIFT

In 1979 the supply requirements of Resolute, both base and community were filled by one ship in addition to a tanker supplying fuel. It is not anticipated that there will be any disruptions in resupply for eastern or high Arctic communities during either construction or operation of the mine. Federal and territorial government officials involved in sealift operations to communities did not feel there were any shortages in filling current needs, and the federal government official felt the shipping companies would make the necessary adjustments to accommodate both the communities and the mine.[3]

4.7.4 IMPACTS ON COMMUNICATION SYSTEMS

The mine site will have its own communications system (see Chapter 2) so there will be no direct impact on Resolute services. Although Resolute air communications services could receive a little more usage, it is not likely that this would necessitate hiring any more staff. There could be some increase in long distance calls by local residents (calling spouses at the mine site) but this would not be significant enough to affect the community.

Also, there should be no disruptive effects on any air or sea navigational communications, since the traffic will be limited.

4.7.5 IMPACTS ON AIRCRAFT FUEL SUPPLY

Imperial Oil established a fuel resupply business that now has a 15 million gallon capacity. Last year sales volume was in the 7 million gallon range including all fuels. Although Imperial Oil brings in its fuel to meet pre ordered commitments, it usually brings in an additional 10 percent to ensure all needs are met. Therefore, fuel could be stored and supplied to aircraft as required, if users are able to determine their requirements prior to resupply ordering.

[3] Telephone Interview, M. O. T., Ottawa, March 1980.

CONCLUSIONS .

The effects of the Polaris Mine on transportation, and communications at Resolute are expected to be beneficial or negligible.

The airlines, both local and regional, have capacity available for increased traffic. Polaris related traffic is expected to consume 12 percent of Nordair northbound capacity, and only 8 percent of Pacific Western Airlines northbound capacity currently existing at Resolute. There could be some overload at times when local residents and mine employees need seats.

Local charter companies have excess capacity out of Resolute. There will be little effect on the availability of aircraft and the mine is not expected to interfere with the Class III service to Nanisivik and points east. This service is used to move employees to Nanisivik, and is used by local people to commute between communities.

No effect is expected on the availability of ships for sealift. Shipping companies appear to have the flexibility to meet the changing needs of Northern communities with or without the mine.

The mine will have its own communications facility, and with the exception of increased calls to and from Resolute, no impact on the communications network is anticipated.

RECOMMENDATIONS

1) To ensure that Resolute residents, other than those on rotational employment, are able to get flights out of Resolute when required, some consideration should be given to assigning a certain number of seats on Nordair and PWA for resident's use, to be released 10 hours before flight time if not required. Although it is not likely there will be a shortage of passenger seats at most times, it could happen during busy summer months, when bad weather delays or cancels flights, or when large meetings are held in Resolute.

2) A similar procedure could apply to Kenn Borek service to north Baffin communities, if the company did not expand its once weekly service, and if travel costs are paid for potential employees from those communities.

4.8 Potential Effects on Community Services/Infrastructure

The community of Resolute is unlike any other community above the treeline. For a small populaton, it has the most developed infrastructure. It offers almost all services available in other, larger communities. In addition it has a sophisticated air transportation system and ongoing contact with southern-style living, although it is one of the most northerly communities in Canada.

There are three considerations in an examination of the impacts on services and infrastructure:

1) The mine itself – will the operation and needs of the mine have any effect on Resolute services or infrastructure?

2) Pass through population — will the number of people passing through Resolute have any effect on the infrastructure or services?

3) The availability of mine and related employment – will more people move to Resolute?

In the case of the first two items above, it is unlikely they will have any effect on Resolute's services and infrastructure. The mine will be self contained in that it will provide its own services and infrastructure. Although there will be a nurse at the mine site, a possible use of local services by the mine might be assistance by the local nurse in Resolute in the case of transfers of medical evacuations or other emergencies. This would be in isolated situations and would not have an effect on local services. The only other area where there could be a minor strain on local services is the Post Office, if mail to and from the mine is funnelled through the Resolute Post Office; however, at most this could only cause slight delays in sorting local mail.

Since the "pass through" people will be in limited numbers at any one time, it is unlikely they will have any effect on local services. They will likely use only the accommodation facilities, social/recreational facilities, and occasionally make some purchases at the local retailers.

The availability of jobs, and the related possibility of in-migration into the area requires a more lengthy discussion. Following is an examination of Resolute infrastructure and services, anticipated uses, and effects if any.

4.8.1 EFFECTS ON INFRASTRUCTURE

The new Resolute community was originally designed to accommodate a much larger population. Since the move to the new town site, and the recent decrease in economic activity in Resolute, the actual population of Resolute has declined. Out-migration of Inuit people, and staff cutbacks by the territorial government account for part of the decline. Today Resolute's infrastructure is under utilized. The sewage and water system could easily accommodate a large increase in population. The availability of serviced lots is no problem, since there are a number which have services extended to

them, but are as yet unused. If it were necessary to add new buildings to the community, Resolute has a municipal plan and could provide the necessary lots. In brief, Resolute was built for a much larger population, and could accommodate increases with only small adjustments to the existing infrastructure.

4.8.2 EFFECTS ON SERVICES

Resolute provides the usual range of services to its residents. In some cases the services are for both residents of the village and the base. Effects of in-migration on services would be:

RCMP – The Resolute detachment is manned by two officers stationed at the base. They cover the village and the base and make periodic trips to scattered high Arctic operations. Since no major increase in crime in Resolute is anticipated and since the mine will be handling its own security it is unlikely that in-migration of the magnitude anticipated would have any effect on police services. (See Section 4.11)

Health Services – The nursing station, located in the village serves both the base and the village. Two nurses provide services to a population estimated at less than 300 people. There are other nursing stations in the Northwest Territories, where two nurses serve populations of nearly 500 people (Spence Bay, Gjoa Haven). Since we do not expect a major increase in alcoholism or crime and therefore related injuries, no effect on the Resolute health services is anticipated. One positive effect might be that doctors visiting the mine site, if this were to happen, might be able to spend a day in Resolute to assist with any local problems requiring a doctor.

Education Services – In the past the existing school has had up to 66 students.[1] Fifty-nine were registered for the 1979/80 year with about 43 students in March. The actual building is able to serve the existing needs, plus probably a small increase. In our estimate of in-migration we conclude that not more than a dozen families will move into Resolute. With the addition of 20 children of elementary school age, it is likely that new facilities or at least an additional classroom and another teacher would be required to meet the needs of the community. A new school with a gymnasium would likely be preferable. Existing recreation facilities for children are limited, and the addition of 20-30 children to a community with limited recreation facilities could cause some community problems such as vandalism. This could be offset with the provision of additional recreational facilities for children.

Housing – In March, 1980, Resolute had 11 vacant public housing units and the territorial government had another 10 vacant staff houses. When the expected in-migration to Resolute occurs, there should be enough accommodation available if:

a) the older houses are upgraded to acceptable standards,
b) if territorial staff houses which have been vacant, but heated for some time, are temporarily leased to the Housing Association to alleviate shortages during the transitional period.

The pattern in Resolute is for people to move in, leave for awhile, then maybe return. It is expected that a number will return, and relatives of existing residents will move in, particularly through the mine construction phase, when high paying jobs, with only brief periods of time off (2 weeks) are available. Not all these people are likely to

[1] N.W.T. Department of Education Statistics, March 1980.

stay in Resolute permanently. Once the mine begins operations, and the period of time at home is four weeks, we anticipate that some people will again leave the settlement. Also, some people moving in for construction jobs, may leave if the job does not live up to their expectations.

Since it is impossible to estimate the number of families coming into Resolute through this construction (or even early operations stage) it is difficult to assess exact housing requirements. For this reason, a possible method of dealing with this situation, and not overbuilding the residential section, is to use some of the territorial staff houses on a temporary basis. At the same time, units which require upgrading could be renovated, to be ready for families who do plan to stay in Resolute long term. Also, people in other communities should be advised of any housing shortages in Resolute, and encouraged not to move their families to Resolute until housing is available, and until they are assured of a job locally.

With upgrading of existing public units, and use of government staff housing through uncertain transition periods, it would appear that any prolonged housing problems could be averted, although new housing may be required if more than the anticipated 10-12 families move into the community after the mine is in production. Also, new housing will be needed as more people leave home, marry and start their own families.

Additional use of local housing could necessitate the addition of maintenance staff to the local housing association, probably on a part time basis only.

Municipal Services – The population increase in Resolute would be too small to cause any strain on municipal services such as garbage collection or fuel oil delivery. Also, there would be no effect on snow removal services.

Fire Fighting Services – The existing fire truck, equipment and fire hall would adequately handle any increase in population. Likely some retraining of volunteer firemen/women would be required if a number of the men in the community are working at Polaris either full time or part time.

Recreation – There are few recreational facilities in the community at present. The community hall which serves as the main social centre in the community would not be affected by an increase in population, but the increase in people could accentuate the need for some type of recreational facility in the town. At present we are not aware of any small communities in the N.W.T. which have services such as hockey arenas or curling rinks. These are generally only in larger centres where the population is at least 800 or more.

4.8.3 NEW SERVICES NEEDED

Comparing the services in Resolute with those provided in other N.W.T. communities, it is unlikely that many new services would be required, apart from the addition of a room to the school or a new school, and possibly some new housing units.

The only other required service might be a day care centre. Traditionally, if women had jobs they left their children with other family members. However, if there is an increase in female participation in the labour force, this could reduce the number of

women left to do "baby-sitting" duties, and there might be some need for a centre to look after children while women are working.

CONCLUSIONS

Resolute has established services and infrastructure to handle an increase in population. One area where short term problems could occur is housing. In March, 1980 there were 11 vacant public housing units in Resolute, and almost as many territorial government staff housing units. People moving in temporarily to obtain work at the mine and have their families closeby, could put a strain on housing, although it is expected that others could well leave the community, or these new residents could decide not to stay in Resolute. Another community service which will likely be affected by the mine is the school. It is likely that another classroom and another teacher will be required to accommodate an increase in the number of students.

RECOMMENDATIONS

To accommodate any influx of people during the construction phase, territorial government staff housing should be made available, on temporary loan to the local housing association. At the same time, once all public housing units are occupied, the government should advise people in other communities against moving their families to Resolute until housing becomes available.

Housing should be carefully monitored by the local housing association. The association and the N.W.T. Housing Corporation should be developing contingency plans in the event that more housing is required once the mine is in the operational stage. Close contact should be maintained between Cominco and housing officials.

The Department of Education should be advised of the possibility of expanded classroom requirements, so it can incorporate this potential need into future planning.

4.9 Potential Effects on Hunting and Trapping

Although hunting, trapping and fishing are an important part of the lifestyle of the Inuit of Resolute Bay, these activities no longer form the sole source of income for any family in Resolute. Usually hunting and trapping activities supplement wage income or are seasonal activities, with participants working at other part-time jobs when the trapping season is over, or when part-time jobs become available.

From interview data, some comments to note about hunting and trapping in the Resolute area were:

- the main hunting that can be done close to the community is seal hunting with some polar bear and white fox nearby
- the prime area for fishing and hunting is Somerset Island with this mentioned as the place where people go in the spring and summer. Fishing around Resolute was not considered good since the fish are too small.
- for most people hunting/trapping is a weekend, part time or vacation activity

For detailed comments see Appendix 6

Hunting, trapping or fishing for Resolute people often involves traveling a certain distance from the community. Seals and other marine mammals are available close to the community. Foxes and polar bears can be trapped or hunted on Cornwallis Island, but other species, particularly caribou, are not readily available closeby. Areas north of Resolute were seldom mentioned as hunting areas, although one person did mention that the northern areas, including Little Cornwallis Island were used for shorter hunting trips.

To determine if the project will have an effect on hunting and trapping income, and the availability of food, we examined two questions:

1) Will the location of the mine have any effect on hunting and trapping?

2) Will employment at the mine affect the quantities currently hunted and trapped?

4.9.1 MINE LOCATION AND EFFECTS ON HUNTING AND TRAPPING

Although the increased degree of involvement with a wage economy may have reduced the amount of hunting and trapping done, it does not seem to have changed the extent of land actually used in these activities. Land used by the Resolute Inuit today is approximately the same as that used in 1960-19741 as confirmed by interviews with local residents.

To answer the question "Will the location of the mine on Little Cornwallis Island have any effect on hunting/trapping?" it is necessary to first examine the prime hunting areas of the Resolute Inuit.

Milton Freeman Research Limited. *Inuit Land Use and Occupancy Project* (Department of Indian and Northern Affairs, 1976) 1, p.p. 173-178.

White Fox – When the fox cycle is high, white fox are available along the coast of Cornwallis Island. According to the *Inuit Land Use and Occupancy Project,* in the pre 1960 period the men trapped primarily along the coastline of Somerset Island and along the shore of Stanwell Fletcher Lake. The report continues:

> "During period III (1960-1974) the main trapping areas have been extended from the southeast coast of Cornwallis Island to the south coast of Bathurst Island, including the shorelines of the Griffith, Somerville and Brown islands and along the coast of Somerset Island."*

Caribou – Interview data indicated that there is no caribou hunting near Resolute and hunters must travel to other areas for caribou. Somerset Island was listed as a main hunting area, with northern regions listed for shorter duration trips. The *Inuit Land Use and Occupancy Project* provides this data on caribou hunting areas:

> "The Inuit recognize two major groups of Peary's caribou within the region. Northern populations inhabit Bathurst, Little Cornwallis and Cornwallis Islands; southern populations occupy Prince of Wales, and Somerset Islands and the islands in the Peel Sound. Caribou on the southern islands are typically larger, in superior condition and darker than those on the northern islands . . . .
>
> "Other than seals, caribou is by far the most important resource available to the Resolute Inuit. During Period II (pre 1960) caribou were hunted primarily on Somerset, Prince of Wales, Prescott and Russell Islands. During Period 111 (1960-74) the major hunting area for caribou has been southeastern Bathurst Island. Little Cornwallis Island and the southwestern part of Cornwallis Island have been hunted less intensively owing to the poorer stock of caribou. In early spring, commencing in March, caribou on the western part of Somerset Island and on Russell Island are heavily hunted, in many cases while the men are in search of polar bears. To a lesser degree, the east coast of Prince of Wales Island is also hunted for caribou in the spring."3

In another report by B.C. Research. additional information was provided on the caribou on Little Cornwallis Island.

> "Important terrestrial mammal species which are found in the Polaris area are caribou, muskox, arctic fox and lemmings...
>
> "Compared to Bathurst, Devon and Somerset Islands, Little Cornwallis Island supports small numbers of caribou and muskox. The caribou population on Little Cornwallis Island was 11 animals in 1974. These animals appear to prefer the Lichen-moss-algae vegetation communities which are probably the major vegetation type of Little Cornwallis Island. Portions of these communities were heavily used by caribou while other areas with similar vegetation experienced little use. The area of the ore body and concentrator facilities does not represent important caribou habitat because of the lack of the Lichen-moss-algae community where these facilities are located."[4]

To determine caribou populations in the vicinity, a study is planned by the Canadian Wildlife Service.[5]

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* *Ibid.*, p. 176."

3 *Ibid.*, p. 174,

4 B.C. Research. *Polaris Mine: Summary of Environmental Information,* (Dec. 1979).

5 Personal conversation, Pierre Jo li, N.W.T. Government Wildlife officer, Resolute, March 1980.

Polar Bears – The following excerpt from the *Inuit Land Use and Occupancy Project* outlines the polar bear situation, which is confirmed by current interview data.

> "Polar bears are common in the Resolute region because their chief prey, ringed seals are abundant . . .. The **Inuit** report that the main bear breeding and denning areas are situated along the entire coast of Prince of Wales Island and that there are smaller, isolated denning areas on the southeast tip of Somerset. Resolute **Inuit** begin to hunt bears in October along the south coast of **Bathurst** and **Cornwallis** Islands and in McDougall Sound. Most bears are killed between February and May, when traveling conditions are ideal and the men then extend their hunting range to the area between the southwestern corner of Bathurst Island and the northwest corner of Prince of Wales Island and from the northeast corner of Somerset Island to southeastern Devon Island, including all of Barrow Strait. To a lesser extent the northwest corner of Somerset Island and Peel Sound are also hunted at this **time."**[6]

From the data presented, other data in the ***Inuit*** *Land Use and Occupancy Report,* and from interviews, we conclude that the mine location will have little impact on the hunting/trapping harvests of the Resolute **Inuit** since Little **Cornwallis** Island is a low priority hunting area. Bathurst Island, particularly the southwestern corner, appears to be the only area in the general vicinity of the mine that is a higher priority hunting area.

4.9.2 EMPLOYMENT AT THE MINE AND EFFECTS ON HUNTING/TRAPPING

The second question we examined was the ability to hunt and trap to meet food needs and lifestyle expectations if employed at the mine on a full time basis.

Income statistics for Resolute **trappers**[7] (including several residents at **Creswell** Bay) for 1977-78 and 1978-79 indicate that earnings from fur sales would mainly be sup **plemental** earnings, or part time earnings.

Earnings from Fur Sales	1978-79	1977-78
Total # of trappers	36	29
# of **trappers earning** over $600.	**31**	**5**
Total **Fur** Dollars	**$50,678.00**	**$10,127.00**
$ 600-$1000 income range	6	4
$1000-$2000 income range	21	1
$2000-$3000 income range	3	—
$3000-$4000 income range	—	—
$4000-$5000 income range	1	—
$5000-$6000 income range	—	—
$6000-$7000 income range	—	—
$7000-$8000 income range	—	—
$8000 & over income range	—	—

These figures exclude marine mammals.

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[6] Freeman, *Inuit Land* Use, p. 176.

[7] N.W.T. Wildlife Service, Trappers Incentive Program, 1980

Resolute Harvests by Species[8]

Species	1978-79	1977-78	1976-77
Polar Bears	30	41	27
Black fox	—	1	
Red fox	1		
Blue fox	2	1	—
White fox	328	520	524
wolf	3	2	1
Seals	n/a	54	247

Resolute Kill Statistics

The most recent kill statistics available from the N.W.T. government are 1975-76. They are derived from General Hunting Licence holders, 1975-76

Caribou	–	151
Polar Bear	–	31
Ptarmigan	–	243
Grouse	–	34
Duck	–	150

Marine Mammal Harvests[g]

Type	1979	1978	1977
Beluga Whale	6	1	17
Narwhal	2	14	2
Walrus	3		2
Harp Seal		11	1
Ringed Seal		—	53

Hunting and trapping income can be one of two types: dollar income from the sale of furs and food equivalent income from animals hunted for domestic use. Dollar income from hunting and trapping is quite low and will not likely change much. Food equivalent income from hunting/trapping could be affected (see section 4.3). This would mean that disposable income could be reduced — since store bought food could replace game meat.

At present, apart from trips to Somerset Island, and spring polar bear hunts there are few Inuit hunters, who spend long periods away from home hunting. Most people with jobs indicated that hunting was a weekend activity or a seasonal/vacation activity.

People generally felt that the 6 weeks on the job, 4 weeks at home work rotation schedule allowed enough time for hunting, but many suggested that the time off should be longer in the spring and summer. Some comments supporting this were:

– "Around May and June men would rather hunt than work."

– "Give more time off in summer"

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[3] *Ibid.*

[‘] Environment Canada, 1980.

In discussions about what would be bad about having people from Resolute work at the mine site, only one person mentioned its effect on hunting. She said that "you can't get caribou and food unless the man is hunting."

From the amount of hunting and trapping activity currently carried out, it would appear that some Resolute people working at the mine could have a net gain in the amount of time for hunting (approximately 20 weeks per year as opposed to weekends and holidays). It also appears that the one time of year used to obtain a supply of caribou meat and char is spring and possibly, people might need more time off during spring. One person suggested that the people might work longer rotations at the mine during the dark season so they could get more time off in spring.

In a study of the effects of mine employment at Nanisivik on hunting activities in communities providing workers, the general conclusion was that few if any shortages of wild food were experienced within the communities, although there were some periodic shortages of caribou in Arctic Bay and Pond Inlet because of the distance from hunting grounds.[10] Similar shortages related to the distances from hunting grounds already occur for the Resolute Inuit.

Trapping data related to communities providing workers to Nanisivik Mine indicate that there has been no significant reduction in the total harvest in any of these communities. It also stated that the low proportion of trappers who worked at Nanisivik trapped less fur during the winters they had mine employment.[11] Although this is a possibility at Polaris, the fact that they will have four weeks at home, compared with two weeks for Nanisivik workers, could provide more time for trapping.

A shortage of time for "spring camping" activities appears to be the main negative impact on hunting/trapping activities, related to Nanisivik mine employment,[12] although 90 percent of those interviewed said they were able to continue their spring camping activities.

With better equipment purchased with mine earnings,[13] it is possible that the actual harvests could improve in Resolute.

Since men would not be able to go out hunting every weekend and obtain supplementary food as needed, there could be some negative impact on the family, but generally people feel four weeks allows enough time for stocking required food supplies.

CONCLUSIONS

The study team feels the influence of the mine on hunting and trapping income depends to a large degree on residents themselves. Income from hunting and trapping in Resolute is not high in relation to that in other communities. Some trappers are older residents not considered to be of work force age by this study, or are not considering jobs at the mine. Others are younger men, who hunt/trap part time while holding jobs.

Income from hunting and trapping could decline if these younger hunters work at the mine and do not use some of the extended time off for hunting.

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[10] B. R.IA., *Nanisivik*, p.p. 310-311

[11] *Ibid.*, p. 320

[12] *Ibid.*, p. 323,

[13] *Ibid.*, p. 136. Large sums of Nanisivik earnings were spent on resource harvesting equipment particularly skidoos and boats.

Residents feel that the mine rotation schedule will allow adequate time to hunt and trap. Residents anticipate that there may be some conflict if a six week shift coincides with a prime hunting or trapping season.

The location of Polaris is not expected to have an effect on the total harvest of Resolute residents since Little Cornwallis Island is not a prime hunting area of these residents.

RECOMMENDATIONS

1. Cominco should try the present system to see how it works for Resolute residents who are also hunters and trappers. Cominco should also be prepared to consider flexibility during prime hunting season if required. Four weeks for spring camping could be adequate, and should be tried. If it proves to be too short a period of time to travel to Somerset Island etc. then flexibility in the work rotation schedule should be considered.

2. Since the caribou population appears to be quite small around Resolute, and there is a possibility of in-migration to the community and more hunters, the caribou populations should be closely monitored by the Wildlife Service to ensure that over harvesting does not occur.

4.10 Potential Effects on Community Satisfaction

To determine the current level of community satisfaction we interviewed Resolute residents using a prepared questionnaire. Part of this questionnaire asked people to rate a number of items according to a level of importance. From this questionnaire we determined that people are generally satisfied with life in Resolute, but would like to see some changes. One item of community dissatisfaction related to moving the people back to their home communities. One person explained how the government relocated them to Resolute, and now will not pay for them to return to their home community in Northern Quebec. This complaint, no matter what the actual policy is, has some bearing on the level of community satisfaction. Some people seem to have accepted Resolute since it appears there is nowhere else to go. Others plan to return "home" someday.

The following, in rank order, are the items which are important to the people of Resolute. (See Appendix 6 for complete breakdown.)

1. Having good community services (i.e. health, schools, etc.)
2. Having family nearby
3. Hunting, trapping and fishing
4. Having a job you like
   Having things available to buy at the stores
5. Spending time with family
   Having a high paying job
   Good airline service
6. Having friends nearby
7. Having telephone service
   Living a traditional lifestyle
8. Having TV and radio
9. Living in a small uncrowded community

Resolute residents don't mind living in their particular community but only some are enthusiastic about the place. Seven of the 17 interviewed said they liked living there, eight were indifferent about the place and two said they didn't like living in Resolute.

In response to the question, what was good about living in Resolute, or what did they like, most alluded to the fact that they had lived there most of their lives, it was their home town now and they had family and friends there. Other reasons centred on hunting, jobs and the size of the community.

The weather was cited as the main aspect of Resolute the residents disliked, followed by the shortage of game animals closeby. The high cost of living, discrimination and the fact that there is little hiring done from the village were also mentioned as things the people didn't like.

Most said they would like their children to live in Resolute, but qualified this by saying that the final decision would be the child's once he/she has grown up. Most of the residents say they are now able to spend enough time with their family and friends.

In response to the question what can't you buy in Resolute, the main item mentioned was snowmobile parts. This was followed by fresh fruit and vegetables and other groceries, then clothing and hardware. Most people said they had to order needed items of clothing, hardware and furniture from the south.

Radio was always rated higher in importance than television, probably because of native language programming on radio.

Several people were quite concerned with the high prices of goods in Resolute and almost all responded that they were not earning enough money to have the things they wanted for their families and themselves. If they earned more they would spend it mainly on food, clothing and skidoos.

The people interviewed felt that full time jobs were not readily available in Resolute, although part time ones opened up from time to time.

Following are brief discussions of impacts the Polaris Mine could have on the things which are important to the people of Resolute:

1. Good community services — *small positive impact*
   The people are fairly well satisfied with their community services although they would like more dental treatment available and more recreational facilities in the community. The Polaris Mine could have a small positive impact on community services. With the anticipated population increase and mine nearby, doctor's or dentist's visits could become more frequent.

2. Having family nearby – *negative impact*
   Historically the family unit has been very important in Inuit culture. For most people interviewed, having family nearby was a top priority. It ranked lower only in the case of single people. The movement of Inuit people from Resolute to other communities (often the home community of husband or wife) is evidence of the importance of having family nearby. Some of the people interviewed were concerned about the separation of the father from his family if he were to work at the mine. This separation of families is considered a negative impact of mine employment.

3. Hunting, trapping, fishing — *possible small negative impact*
   These activities are an important part of the Inuit lifestyle, and all interviewed said they were involved in these activities. For most it was a seasonal or weekend activity, or was considered one type of job, supplemented by part time work. The main hunting time mentioned by most people was spring, interpreted as May and June. If ability to hunt is restricted by six week periods at the mine, there will be a small negative impact, offset by people having four weeks to hunt. Extended time off in spring could neutralize any impact.

4. Having a Job you like – *positive impact*
   This is considered a positive impact for the following reasons:
   1. The mine will offer positions in areas that people consider to be "good" jobs to have.[1]

[1] See interview comments, Appendix 6.

2. Most people are interested in training programs and the mine will be offering a number of training programs and training positions.
3. The mine can provide portable skills which can be used in other areas in jobs they like, if they decide to leave the mine after completing a training program.
4. The mine offers opportunities for higher level jobs for those who have the necessary skills, or are prepared to take the required training.

5. Having things available to buy at the local stores — *small positive impact*
All people interviewed pointed out items they needed which were not available locally, or not available in the quantity or quality desired or at the price desired. Increases in income and resulting resending at the local stores, could allow expansion of inventory at these stores, providing a wider selection for the local people.

6. Spending time with family – negative *impact*
In response to the question "What would be bad about having people at the community working at the mine site," the most frequent answer related to absences from home. We can only conclude then, that there would be some negative impact on community satisfaction related to spending time with the family, if residents worked at the mine.

7. Having a high paying job – *positive impact*
Money emerged as a fairly important item to the people of Resolute. The mine provides opportunities to earn money. At the average northern hire salary of $20,000 per annum (1979$) a Resolute resident would not only be earning more than the current average, but would have 20 weeks a year to pursue other activities which are important, especially hunting. With training programs available, the individuals also have the opportunity of increasing their wages to higher levels.

CONCLUSIONS

Community residents felt that there were not as many job opportunities as there used to be in Resolute. They also complained of perceived discrimination in employment and social activities. On balance, however, they consider their community and its services are satisfactory. Of high importance to those interviewed are jobs, money and the possibility of additional goods at community stores. These are all likely outcomes of mine employment.

However, separation from the family while working at the mine, and restrictions on hunting activity while working indicate a negative impact. There is a possibility that there will be less country food available to community members if hunters are employed at the mine, and don't take advantage of time off to hunt.

From the summary of all responses and related impacts it would appear that the good things about mine employment outweigh the bad things according to the following indicators:

- more people mentioned positive effects of mine employment than negative effects
- more people mentioned the jobs and money part of employment at the mine than mentioned family separation

— most agreed with the work rotation system, with some adjustments (particularly for spring hunting)

We would conclude that overall, the people would be more satisfied with the mine than without it, although family separation would cause some concern.

RECOMMENDATIONS

1) The existing work rotation schedule should be one option for Resolute residents and if family separation is a major problem, shortened schedules should also be offered for Resolute residents. Some time allocation (i.e. two or three years) should be attached as a Resolute residency requirement, to dissuade people from other communities from moving en masse to Resolute, simply to take advantage of the shortened work rotation schedule.

2) Cominco should consider rotation schedule modifications – to meet the need for time off for spring hunting. Although four weeks may be adequate in most cases, there could be some employees who require additional time, especially since hunting areas are long distances from the community.

4.11 Potential Effects on Community Stability

To assess possible effects of the Polaris Mine on community stability we have selected and examined four indicators: alcoholism, crime, marriage breakdown and racial tension. For alcoholism and crime we have some baseline data substantiated by interview material, but for marriage breakdown and racial tension our data is subjective and incomplete and we can only make generalized assumptions of the impacts.

4.11.1 ALCOHOLISM

There are two conflicting points of view regarding the Resolute "alcohol question." One faction, mainly the white population, feels there is a serious alcohol problem in the community. Generally this group considers the problem to be with the Inuit people, and documents the problem with examples of alcohol related accidents, absenteeism from jobs and family disruption. The second faction feels there is no problem, or if there is a problem, it can be handled. This group is made up of both whites and Inuit, predominantly Inuit.

According to RCMP statistics the number of reported offences under the N.W.T. Liquor Ordinance was 5 in 1979 and 3 in 1978.[1] This was down considerably from 14 in 1977 and 24 in 1976. Although this decrease could reflect an improvement in any "alcohol problem" situation, it should also be noted that the total population of Resolute and the activity level there has declined over these years.

The RCMP officer in charge of the Resolute detachment did not feel there was an alcohol problem in the community. Although he was aware of the extent of alcohol consumption, he did not feel that alcohol abuse was either excessive or prevalent among the Inuit people.[2]

There is a tendency for people to think that increased income to native people will mean increased liquor consumption by these people, and there have been documented cases which attempt to prove this thesis. However, the increased liquor consumption is usually related to other influencing factors, not simply increased income.

Increased income to native people usually means entry into wage employment, or into a new type of wage employment, sometimes away from home, and often in unfamiliar situations. To cope with the stress caused by the new environment some people may purchase and consume more alcohol.

A number of studies dealing with increased income from work rotation jobs in the N.W.T. examine the alcohol expenditures related to the income of the participants. The evidence indicates that there will be some increase in liquor purchases but that it will not be excessive.

One of the first cases of Inuit moving into wage employment on a work rotation basis was the employment program of the Coppermine Inuit by Gulf Oil Canada in 1972. In this six month program, the people worked 14 days, followed by 7 days at home. A

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[1] Statistics Canada: Uniform Crime Reporting System, 1980.

[2] Personal interview, Cpl. W. MacLennan, March 1980.

breakdown of estimated expenditures by Gulf employees in Coppermine showed that 50.4 percent ($81,560) of earnings was spent on food and clothing; 28.3 percent ($46,100) was spent on capital equipment and 7.4 percent ($12,000) was spent on liquor expenditures. The author of the report says:

> "It should be noted that the distribution of expenses across various expenditure categories is generally a reasonable, sensible, rational one, perhaps not much different from what it would be in a more "sensible" southern Canadian community, if the cash flow into the community there were suddenly increased by 75 per cent during a 6 month period. While there was a distinct increase in the value of liquor consumed during the November 1, 1972 to June 1, 1973 employment remuneration period, this was a 29 percent increase (assuming *constant* white demand, here) as contrasted with the estimated 75 percent increase in cash flow in the community. It should be said further that during this period, the Coppermine population was temporarily increased by white construction workers, a group which might very well have ordered in a significant amount of liquor from Yellowknife to help moderate the boredom of their leisure hours.[3]"

In a recent study of the **socio-economic** impacts on North **Baffin** communities on **Inuit** employment at Nanisivik Mine, liquor import data did not show an increase in alcohol purchases while interview data indicated there was an increase in alcohol consumption. Following is the conclusion regarding alcohol consumption presented in the **Nanisivik** report:

> "There are obvious contradictions between the liquor import data and the interview responses reported in this section. The former show no indications of significant increases in liquor imported, while a large minority of the interview respondents reported that there was increased liquor consumption in their home communities as a result of the **Nanisivik** employment. We conclude that while we cannot be sure that there has been no increase in consumption, on the basis of the import data we may be confident that any increase has been modest, and there is not a liquor problem in any of these communities .4"

*(Note — **Nanisivik** rotation **is** six weeks at work, 2 weeks at home)*

In a discussion of the consequences of Pan Arctic Employment for the Pond Inlet Settlement (20 days on the job, 10 days at home) the question of alcohol purchases/consumption was examined in detail. The following excerpt from this report summarizes the situation:

> "Data supplied by the Liquor Control Board shows that for the 12 month period from August 1, 1973, through July 31, 1974, $11,866 worth of liquor was shipped from the Liquor Store in Frobisher Bay to Pond Inlet, a figure equal to $21.58 per capita for this 12 month period, or $1.80 per person per month. If we restrict ourselves to the oil exploration period, from November 1, 1973 through June 30, 1974, the value of liquor imports into Pond Inlet was $8,461 equal to a per capita expenditure of $15.39 for this 8 month period, or $1.92 per person per month. The value of liquor imported during the other four months of the year — August 1 to October 31, 1973 and July 1 through July 31, 1974 – was $3,405, equal to a per capita per month value of $1.55. There is a difference, accordingly in the per capita per month value of liquor consumed of $.37 between the winter drilling

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Charles W. Hobart and George Kupfer, *Inuit Employment by Gulf Oil Canada: Assessment and Impact on Coppermine, 1972-73.*

[3] B. R.I.A. *Nanisivik*, p. 348.

season and the summer season, with the former the higher of the two. This differential provided some basis for suggesting that the 20 day work period may result in the build up of stresses, in either the workers or their wives, which are coped with by means of increased consumption of alcohol. However, another plausible explanation for the higher consumption during the winter period might well be that people spend much more time indoors during this season, especially during the evening, and that the differences in consumption are reflective of this, rather than stress resulting from the rotation employment.

"... However we should note that liquor consumption of the order of almost $2.00 per person per month is a relatively low level of consumption. While almost twice that for Arctic Bay, the comparable figure for Coppermine during the same period was about $2.50 per capita per month, and the figure for the whole of the Northwest Territories was about $16.00 per capita per month."[5]

In all the preceding case studies, the communities discussed had limited contact with wage employment prior to starting work rotation schedules, and in all cases, the earned income represented a substantial increase in money in the communities. Even in spite of this "new" experience, separation from homes and increased income, there did not appear to be a substantial increase in alcohol consumption.

In Resolute there has been a much longer (25 year) contact with wage employment and related stresses. If the basic premise — that introduction to wage employment and related stress can lead to increased drinking — is accurate, then there should be at most only a limited increase in liquor consumption in Resolute, since most residents have been involved in wage employment for some time. This increase will likely be most obvious when individuals first arrive home after six weeks at a "dry" mine site.

4.11.2 CRIME

Reported offenses against the criminal code have maintained constant pattern over the past four years in Resolute.[6] Most of the crime is of a minor nature.

	1979	1978	1977	1976
Sex Offences	—	—	3	
Assaults	3	8	4	14
Break and Enter	10	12	4	8
Theft-Motor Vehicle	2	4	4	6
Theft — over $200	3	3	9	3
Theft – under $200	5	15	8	16
Possession of stolen property	1	0	0	0
Frauds (i.e. bad cheques)	2	0	0	2
Offensive Weapons	1	0	2	0
Other CC (i.e. breach of probation)	15	16	14	9
Total Criminal Code	42	58	40	58

Note: These statistics cover both the village and the base.

Charles W. Hobart, *Rotation Work Schedules in the Northwest Territories: A Study of Variations and Consequences.* (Government of the Northwest Territories, 1976) pp. 292-293.

[6] Statistics Canada: Uniform Crime Reporting System, 1980.

An article in the February 15, 1980 issue of the News *of the North,* summarized the crime situation in Resolute:

> "The first territorial court hearing since mid 1978 was held in Resolute Bay this week, and that lead to compliments from the judge.
>
> "Following his decision on the single case, Chief Territorial Judge James Slaven commended the people of Resolute Bay.
>
> " 'Resolute Bay is a very law abiding place, especially when compared with other places in the North,' he said."

Most increase in crime would likely be related to any increase in alcohol consumption, and since alcohol consumption increases are not expected to be substantial, it is not likely there will be a major increase in crime rates, although there might be some increases related to "binge" drinking on return from the mine site.

The number of people passing through Resolute on the way to and from the mine might have an effect on the crime rate. In general there will be little stopover time for this group, although some will be in Resolute for brief stays while waiting for a plane.

In discussion with the Resolute RCMP officer about this pass through traffic, he felt that mine employees will only comprise one more group moving through Resolute. He doesn't feel there will be any problems because "on the way in the individual has just left home and on the way out, is usually concerned with getting back home."

He feels that some might go to the village for social gatherings but as he pointed out, if current "pass throughs" get out of line, someone from the village calls the RCMP.

In a study of the social and economic impacts of a proposed Mackenzie Valley Pipeline, Gemini North concluded that crime rates rose in the Mackenzie Valley primarily due to two factors:

a) an increase in development pressures, including increases in cash income, population and exposure to the outside world.

b) the single most important factor in the increase in violent crime is the abuse of alcohol'

In the case of Resolute Bay, development pressures have been experienced for many years, including increases in cash income and exposure to the outside world. Increased population in Resolute will likely be gradual and will likely involve in-migration of Inuit people (likely ones who left the community in recent years) but this population growth could influence some increase in crime. Alcohol abuse could cause some increase in crime rates as well, but as stated earlier, a major increase in liquor consumption and subsequent abuse is not anticipated.

With less parental authority during the absences of the father from the community, there is a possibility of a small increase in juvenile offences (i.e. vandalism) but this could be alleviated if better recreation facilities were available in the community.

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[7] Gemini North Ltd.. *Social and Economic Impact of Proposed Arctic Gas Pipeline in Northern Canada,* (Canadian Arctic Gas Pipeline Ltd.. 1974) II. p. 740.

4.11.3 RACIAL TENSION

There is little to indicate "bad feelings" between the Inuit and white population in Resolute. Although a few Inuit mentioned what they considered discrimination (i.e. the base won't hire from the village, discrimination at the bar) no serious problem exists in Resolute.

Any racial tension that is expected to occur is usually linked to large numbers of whites coming into the community. If this is the case, then there would be little impact in Resolute, first because any groups moving through the community will be in small numbers, likely less than one dozen, and secondly, with the developments in the area over the past 10 years the residents are accustomed to groups of whites moving through the area.

Current contact between the Inuit and whites of Resolute ranges from tolerance to a certain degree of social interaction, particularly at organized events such as curling bonspiels. The movement is mainly of village people to the base, with very few base people going to the village for social visits, or participation in village activities. However in the village, the interaction of white village residents and Inuit appears to be more extensive, with whites more involved in the life of the community.

Since most of the workers will be just passing through and likely staying at the base, it is not likely that many will go into the community in any event.

4.11.4 MARRIAGE BREAKDOWN

There is no clear evidence available to indicate that marriage breakdown is a problem in the community. Interview data indicates that there may be some problems, but since this is subjective comment, we believe that the situation in Resolute is not dissimilar to that of most other small communities of similar size and isolation. Stress caused by a number of factors – need for money, separation, suspected infidelity – is a major cause of marriage breakdown. With a rotational work system, marriages are likely to experience some of the stress of separation while the availability of jobs may relieve some financial stress.

Potentially there could be more marriage breakdowns unless something is done to relieve possible stress for people separated by employment. The establishment of a good communications system between workers and families in Resolute could do much to relieve the stress.

CONCLUSIONS

Interviews with government staff – nurses, RCMP and residents indicated there are few problems in the community. The study group found no conclusive evidence of an alcohol problem in Resolute. Nor did they find any reason to assume one would develop because of the mine. It is expected that purchases of alcohol will increase, and that some "binge" drinking will occur when mine employees return on leave, but these developments would not constitute an alcohol problem.

The crime rate in Resolute is low. Any increases in crime are assumed to be related directly to alcohol abuse. Since no major increase in alcohol abuse is anticipated, no major increase in crime is foreseen.

In spite of the fact that the community is physically divided along racial lines, and although there is considerable traffic of southern visitors through Resolute, there is no racial tension. Racial tension is not likely to become a problem in Resolute since mine transients will not be a major influence on community life.

Marriage breakdown may increase as a result of mine employment, due to separation of father and family.

RECOMMENDATIONS

The local alcohol and drug committee which currently deals with any alcohol related problems in the community, should monitor the situation once the mine is in operation, and as is the case now, should implement ongoing alcohol education and control programs, in line with any problems which might develop in this area. Possibly the full time **Cominco** representative in Resolute could sit on this committee as an ex officio member of the committee.

Also, **Cominco** should maintain close contact with the RCMP in Resolute, to monitor any alcohol related incidents which may arise from the pass through mine traffic and if a problem arises, be prepared to develop required personnel policies for employees overnighting in Resolute.

At the mine site **Cominco** plans orientation programs for southern workers to familiarize them with the **Inuit** life style, and to assist in developing understanding between whites and **Inuit.** These programs should extend beyond the work environment and ensure that southern workers are sensitive to the **Inuit** community environment as well.

Separation from spouse could cause some marriage breakdown. An employee benefit to be considered to curtail marriage breakdown possibilities is one free telephone call home (of limited duration) each week. Also, if the wife were more familiar with her husband's activities, she might appreciate and understand his absence. To develop this understanding, an orientation program for wives could be conducted in Resolute, or at the mine site.

4.12 Potential Effects on Job "Satisfaction

The key factors in job satisfaction for Resolute residents are:[1]
— money
– variety in the job
– learning new things
– having enough time off to go hunting and trapping
– having jobs which are not just menial jobs

The women generally were satisfied with office jobs, and were not particularly interested in "washing dishes". The men on the other hand showed a preference for outdoor jobs, and jobs related to equipment and vehicles.

Money – Although "having a job you like" rated slightly higher than "having a high paying job" money emerged as an important indicator of job satisfaction. It appears that if the money is high, residents are prepared to take on the job, but look at the job more as a short term job to make money for a particular purpose.

Variety in the job – A number of people considered variety in a job as very important. They thought doing the same thing all day would be monotonous, and they liked the idea of having a range of things to do.

Learning new things – A few people interviewed were in apprenticeship or training programs. These people felt that learning new things was important, and viewed the training period as necessary to the ultimate job satisfaction they were seeking.

Having enough time off to go hunting and trapping – Many people interviewed were satisfied with their job, not because of the aspects of the job itself, but because the job allowed them to have evenings and weekends off to pursue other interests, mainly hunting and trapping.

Having jobs which are not just menial jobs – There was some indication that there would be a higher degree of job satisfaction if the position was at a higher level, and of a little more importance. On the other hand, some people were not happy with the "management" parts of their jobs, and preferred jobs which did not require this "decision making" process. This could relate to the fact that it is sometimes difficult to have a "decision making" job, when the decisions relate to community members who are likely family, relatives or close friends.

Although people tend to accept the type of job they have, (five out of 18 interviewed considered their current job as a good job to have while most others accepted their jobs for a variety of reasons) they generally have aspirations which go beyond their present positions.

In almost all cases to meet these aspirations, additional upgrading, or training would be required.

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[1] Interview data. see Appendix 6.

It is difficult to assess the overall level of job satisfaction because of what might be described as the 'acceptance" factor. The people appear to have accepted the fact that they will do certain types of jobs, and as long as the pay and time off is adequate, they are relatively satisfied.

To assess the effect the Polaris Mine will have on job satisfaction we examined Polaris jobs in relation to the key factors of job satisfaction.

Money – The Polaris jobs will provide a good annual wage, perhaps more attractive considering it covers a total of 31 work weeks rather than the usual 50. The fact that some of the training positions are at lower wages could have some initial negative effects, but this could be offset by the satisfaction sought in other areas, particularly training.

Variety in the job – The effect this will have on job satisfaction depends on the work arrangements and training provided at the Polaris Mine. If the person is required to do a single task, he will likely become bored with the job. However, if there is training for a range of jobs in one work area, the effect on job satisfaction could be positive.

Learning new things – Considering the training programs planned at all levels in the mine operation, there is ample opportunity to learn new things. Again, the effect this will have on job satisfaction will relate to several other aspects of the job, including money.

Having enough time off to go hunting and trapping – With the six-four work rotation, there should be ample time for the individual to go hunting during his time off, thereby having a positive impact on job satisfaction. However, the fact that there will be no time for hunting during the six week work period could neutralize the effect on job satisfaction.

Having jobs which are not just menial jobs – Initially many of the jobs at the mine which will be filled by Northern hires will be lower level jobs, although a few will be at higher levels. The advancement to higher level jobs (i.e. by completing training programs, apprenticeship programs) will have an effect on the level of satisfaction. Total effect on job satisfaction will depend on whether: it is perceived as more important to get training, or to have a higher level job; whether or not the person perceives the training as a step to a higher level job; and whether there are some Inuit holding higher level jobs who are models to those wanting higher level jobs. Initially the level of mine jobs will have no effect on job satisfaction, but this could change as some people move into higher level jobs.

CONCLUSIONS

Personal interviews revealed that a job that allows time off for hunting and trapping is important to residents of Resolute. Generally, people felt that four weeks off was sufficient for this activity although in spring more time off may be desired.

The Polaris Mine is expected to increase job satisfaction since it will offer tangible and intangible rewards selected as important by community residents, that is money, variety and learning new things.

Cominco Ltd.. *Operation Katak*, May 1980,

Initially, job satisfaction could be low, since residents will likely start in lower level jobs at the mine. Job satisfaction should increase as Resolute residents complete training programs and move to higher level jobs.

RECOMMENDATIONS

Cominco training programs and employment policies should be monitored on an ongoing basis by the company to measure job satisfaction levels among Inuit employees. There should be a strong and sustained effort on the part of Cominco to enable people to move to higher level jobs over time.

- 4.13 Potential Effects on Social Organization

"Social organization" means the formal and informal structuring by which people depend on one another, economically and socially. Examples would include the degree of sharing, the role of elders, the importance of family, leadership structures, and so on.

Resolute could be considered to be well into the mainstream of Canadian life. A 25 year association with the neighboring base appears to have influenced social organization to a considerable degree.

The study team found that money talks in Resolute, and considerable interest was expressed by residents in the financial gains to be made by working at Polaris.

However, this approach is softened considerably by more traditional values, which continue to be important.

The elderly are respected; so too are elected leaders, the council, and other committee members. Those who have a particular skill are also respected, whether this be a traditional or modern skill.

The family remains the focus of community life. Members form a closely knit group, and concern for the welfare of relatives is still an important part of community life.

To assess the impacts of the Polaris Mine on the social organization of the community, the study team examined the family, the community hierarchy, social events, leadership and community values.

The Family

The traditional Inuit family is strong in Resolute. Comments of those interviewed indicated that males were still expected to hunt and trap, and provide game meat for the family.

The extended family, which includes grandparents, children, and relations is no longer as important in the settlement lifestyle, but sharing of resources such as game meat is still common.

The wage economy is also important to the people of Resolute. Both men and women appear to recognize that wage employment is necessary to provide certain amenities, and to provide the cash with which to purchase needed supplies for hunting and trapping.

Both men and women are in the labour force. This has perhaps reduced the number of traditional activities carried out by the men and the women. Hunting, trapping and preparing hides and making clothes are less common than they might have been 20 years ago.

Sharing of resources does not always extend to sharing money. Some people interviewed were prepared to share wages with family members; others, while willing to share game meat,' were not eager to share money.

The family unit is still a strong force in Resolute. The Polaris Mine is likely to have little overall impact on the family structure, however there may bean adjustment required as the rotational work patterns take effect. The rotation is not perceived to be a problem for hunters or trappers as there would seem to be sufficient time for these activities between shifts.

Community Hierarchy

There are many roles to be played in the community – that of leader, of wage earner, of trapper and so on. These roles appear to be recognized by other members of the community and are respected.

The community also appears to accord some order of magnitude to these various tasks. The most obvious importance is the relative affluence of some members of the community. New trucks or skidoos are important in both the traditional and modern lifestyles, and prosperous members of the community have social standing.

Additional wage employment opportunities would tend to reinforce this distinction.

Some researchers in other areas of the country have discovered a "drag down effect" caused by the tradition of sharing combined with wage employment.

The drag down effect occurs when one member of the community who has a job feels forced to share his earnings with family or other members of the community, with the result that the worker deprives himself and his family of what he has worked for. The worker may eventually quit his job since he doesn't appear to be making any gains.

There are presently no obvious effects of "drag down" in Resolute. Since wage employment in one form or another has been available to residents for many years, it is not likely that "drag down" is going to be introduced by Polaris Mine employment. In addition, the study team found strong evidence of priorities among the people of Resolute. There appear to be certain definite goals in mind related to employment, and particularly employment at Polaris. While it is likely that Polaris employees will share their income with the family it seems unlikely that they will forego planned-for expenses.

Since the family is so important there is some reluctance to accept strangers immediately. Should new families move to Resolute as a result of Polaris employment practices, an adjustment period will be necessary prior to the strangers being accepted or rejected by the community. This may cause temporary stress in community relationships.

Social Events

The main social events within the community are organized events such as dances and bingos at the community hall. There will likely be little effect on these from mine employment. In the case of Coppermine after Gulf jobs were available, there was increased participation in community events, particularly if a fee was charged for the event.[1]

Hobart. *Inuit Employment,* p. 83.

Leadership

With such a small. number of people, of necessity, many are involved in leadership roles, as elected **councillors,** or heads of housing committees, education committees, alcohol committees, the hunters and trappers association and the co-op board of directors.

These positions are held by both men and women, with men holding the majority. The leaders come from all age groups.

Since men hold the majority of positions, there maybe some impact if those holding key positions elect to work at the mine. For example, council meets every week. However, the shift rotation system should ensure that a quorum is possible at any one meeting.

The likely impact of employment at Polaris is that women will take over a greater percentage of these elected positions, since they are not as likely to work at the mine as the men.

Values

In Resolute, there appears to be a balance between the more materialistic southern values and the traditional **Inuit** values.

Although money and the things it can buy now and in the future are important, the traditional values tend to soften this impact. **Inuit** values tend to centre on a satisfactory life today, the ability to continue a lifestyle long practiced and enjoyed and concern for the well being of the family.

As the Resolute **Inuit** enter the wage economy, they have maintained the traditional values, and used the wages earned principally to enhance or improve the life dictated by traditional values. For example, wages are used to purchase a skidoo to improve hunting harvests and provide the family with more food.

Although it is quite likely that the **Inuit** of Resolute will become more and more interested in material possessions, such as stereo equipment and better furniture, and will continue to be influenced by southern television, this influence can be attributed more to general acculturation than to the effects of the single new opportunity for employment provided by Polaris.

CONCLUSIONS

Relationships in the community could change if a stronger division between rich and poor develops. There could be some community alienation of workers, since they may be considered to be selling out traditional lifestyles in order to obtain material gain. This is not considered likely to happen to any great extent, however, since there is already a high concern for money in Resolute, any changes in relationships will likely develop slowly over a period of time.

New people coming into the community, who are neither friends nor relatives, could cause some stress on the existing social organization. This depends on who moves in and whether they are accepted or rejected by the existing population.

The family unit should remain strong, although it will be tested by the absence of the father from home for long periods at a time.

A temporary loss of men (on work rotations) could mean a shortage of leaders, (mainly because Resolute is so small) but considering the rotational schedule, these workers should be able to continue in leadership positions. Also, there could be a tendency for more women to move into leadership positions.

More materialistic values will become common over time but the study team concludes that this is more a result of the widespread influence of the mainstream culture than of the Polaris Mine.

.4.14 Potential Effects on Job and Education Aspirations

Education levels in Resolute, as in the rest of the N.W.T. are quite low. The Resolute school has kindergarten to Grade 8 and students must go to Frobisher Bay if they want to attend high school. Although more students are completing Grade 8, the high school drop out rate continues to be high. Of 15 students from Resolute who went to high school in Frobisher Bay in 1979 more than half had dropped out by March, 1980.[1]

Although no data are available to explain the drop out rate in high school, likely reasons are separation from family, strange new environment and little connection between educational achievement and job aspirations.

Very few Inuit in the Resolute work force have completed Grade 10, the eligibility level for many apprenticeship programs; however, a number have completed grade 8 or 9, which means upgrading to the educational requirements for entrance into an apprenticeship program is quite possible. Apprenticeship programs will be one main training area at the Polaris Mine,* and an area where Inuit can attain the training and qualifications to rise to higher levels and better paying positions in the mine.

A number of the local men have received some vocational training in southern institutions, and could qualify for other jobs at the site.

Currently there is high interest in training (see interview data – Appendix 6) which probably means that job and education aspirations could be increased by expanding the number and variety of jobs available locally.

The following chart summarizing the enrollment at the local school for the current year and the past five years shows the number of students in senior grades who could goon to high school:[3]

Grades	K	1	2	3	4	5	6	7	8	Total
1974-75	–	7	8	10	4	10	12	7	–	58
1975-76	7	11	12	6	4	7	1	1	5	3	66
1976-77	7	5	8	6	10	8	11	9	9	1	65
1977-78	5	9	5	6	8	6	4	8	7	58
1978-79	3	7	5	7	6	9	7	4	4	52
1979-80	9	8	6	7	4	7	8	5	5	59

Job aspirations in any society usually centre around what people know and understand. Inuit society is no different. Inuit who have grown up in small Arctic communities are familiar with heavy equipment, with construction, with the services provided in the community and with government operations. Job aspirations reflect this background and explain why a "heavy equipment operator" is considered a good job to have and is a popular vocational training course in the N.W.T. . . . or why people want to be social workers.

In interviews with Resolute people, certain job aspirations centred around types of employment not available in Resolute. In each case the person with these aspirations

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Conversation with school principal, Resolute, N. W. T., March 1980.

[2] Cominco Ltd., *Operation Katak, 1980.*

[3] N.W.T. Dept. of Education Statistics, 1980.

had learned about this type of job while living or working in another part of Canada. The Polaris Mine could introduce and develop a familiarity with many new types of jobs.

The Polaris Mine could have both positive and negative effects on the job and education aspirations of the Resolute people. On the positive side, students who are dropping out before completing Grade 10, may be encouraged to stay in school to obtain educational levels for entrance into an apprenticeship program, or to qualify for some other mine-related training program.

Also, the simple availability of job opportunities at Polaris could act as an incentive for a student to complete more education. . . .although he may ultimately select a completely different field which requires a similar or higher education level. Employment opportunities related to the mine, or local jobs (jobs in Resolute vacated by people who choose to work at the mine) will also improve the perceived link between education and resulting job opportunities.

Another positive effect is the type of training received. Often the training given to local people in mine jobs could be transferable training which could be used in community jobs, or jobs in other locations in the N.W.T. For example an electrician, once he has reached journeyman status, could move to a different mine, or to an electrician's position in his/her home community.

It is also possible that once people become familiar with mining and the job opportunities it provides, their aspirations could extend beyond trade skill levels, with the result that they set educational goals which prepare them for professional jobs, (i.e. engineers) either in mining or other areas.

There is also the possibility that the mine could negate some job and education aspirations. The availability of labourers' jobs at attractive wages, could deter people from entering training programs which offer lower wages in the short term. Or it could cause people to quit school after grade 10 and get a job, when they have the potential to successfully complete higher levels of education.

Data related to educational aspirations in two communities providing employees for Dome Canmar's Beaufort Sea operations also reported likely positive and negative effects but pointed out the information was largely subjective and not conclusive:

> "The principal of the Sachs Harbour Territorial School indicated that the drilling operations provide some incentive for the children to learn because they can see some reason for going to school. The principal at Tuktoyaktuk sees the opposite as being the case because persons with little or no education can make substantial amounts of money as unskilled labourers and as a result there is no incentive to attend school."[4]

The job and education aspirations of Coppermine children whose parents worked on drilling rigs in the early seventies were somewhat similar.

> "The boys saw it (employment with Gulf *on* drilling) as another future job alternative, a good way to make money. . . .Apparently, they felt positively about Gulf and would select a Gulf job or a similar one, if given the "opportunity . . . .

[4] *An assessment of the social, cultural and economic impact of Dome Canmar's Drilling activities: 1977.* (Social/economic/cultural review sub committee), Annex II.

> ".... However, several teachers and community people did indicate that one effect of the Gulf employment was that some of the older children, especially boys saw formal schooling as unnecessary for the future. Good jobs were available without school, so why work hard to get an education? School speared less relevant to some to getting good jobs and good wages".5

The above comments appear to highlight the potential negative effects, and similar situations could occur in Resolute. However, one major difference with the Polaris Mine is the higher number of training positions available and the higher education requirements for certain jobs.[6] Although there will be jobs available for labourers with little education, the more attractive positions, and the ones that will eventually offer higher salaries, require certain educational levels, usually Grade 10.

CONCLUSIONS

The success of people from Resolute who work for Polaris, and their advancement to higher level positions will be determining factors on the ultimate impact of the Polaris Mine on job and education aspirations. Also the attitude of the people . . . and their feelings towards a job at Polaris will have some effect. The Resolute people rate having a job they like slightly higher than having a high paying job. If they indeed like the jobs at Polaris, the impact on local education and job aspirations can only be positive.

If, on the other hand a mine job is seen only as a way to make money, this effect could rub off on the community, and cause a situation similar to the Coppermine one mentioned previously.

The effects cannot be predicted with any accuracy, since the results depend on Polaris training programs, and the degree to which local people do actually move into higher level jobs as a result of more education. There will be a net positive effect, however, in the association of education and jobs in community perceptions.

RECOMMENDATIONS

Cominco should have an ongoing program of school visits in Resolute to provide career counseling to students. Ideally, successful Resolute employees at Polaris should be part of the school visitation team.

Since the employee's attitude towards his job will effect his job aspirations, Cominco should attempt to maintain ongoing job attitudes of all employees, particularly Inuit employees. This could be done through ongoing job interviews and through exit interviews of employees who decide to quit Polaris jobs.

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[5] Hobart. *Inuit Employment*, p. 114.

- 4.15 Attitudes Toward the Project

The attitudes toward the project appear to work on two different levels. First there is resigned acceptance, best expressed in a Resolute interview as "The mine is going ahead anyway, so we might as well deal with it as best we can, and get jobs from it." From this acceptance level, the attitude develops into one of fairly high interest in job opportunities at the mine and income from mine jobs.

All of the people interviewed in Resolute were aware of the mine activities on Little Cornwallis Island and apparently having gone through the acceptance step, most discussed the mine positively, particularly as it related to employment.

When asked if it would be good to have people from Resolute working at the mine, 15 out of 18 respondents said yes; two felt it was too early to say, and one person said it was up to each individual to decide if it would be a good thing. Of the 15 positive responses, eleven specified jobs/money as the reasons it would be good.

Most people recognized an increased difficulty in getting jobs in Resolute, and some went so far as to say that Resolute was dying. Most felt the mine would provide needed jobs and life, but were concerned that these jobs go to Resolute people, ahead of people from other communities.

Other concerns about the project generally related to family separation, environmental controls at the mine and the availability of game meat if the husband is away working at the mine. People generally think that Resolute will grow larger because of the mine, but little concern was expressed about this growth. Rather, in most cases, it was considered a positive effect of the mine.

No definite conclusions regarding the acceptability of the six-four work rotation schedule can be drawn from interview material. The most common attitude presented, was "try it and see if it works." Others said 6-4 was okay, but maybe three weeks at the mine and two weeks at home would be better . . ..or two weeks at the mine and two weeks at home. Some people felt that six weeks was not a long enough work period; others felt 4 weeks at home was too long. Yet others were concerned about having more time off in the summer.

Generally it appears that the people in Resolute who might work at the mine are prepared to give it a try on the current rotation system . . ..then decide if they think it works for their needs.

Although there was high concern for the separation of families, the Resolute people did not show much interest in a townsite at the mine. Some women however said they might go there and camp to be near their husbands. If there was a townsite, the general attitude was that they would still come to Resolute during their time off, or they would only stay at the site for short periods of time (six months was suggested).

A small number did think a townsite would be good, and conversely, a small number felt Resolute would get too small if a townsite were established on Little Cornwallis Island.

The Resolute Settlement Council felt there was interest in the community in getting jobs at Little Cornwallis Island. At the same time they expressed a degree of skepticism about the project. . ..related to their fairly extensive experience with community consultations regarding other projects. They are concerned that they are "hearing only the good things about the mine, and are hearing many promises," but they have some doubts that the mine will follow through on these promises.

CONCLUSIONS

The study team found that the attitude to the project ranged from resigned acceptance to moderate enthusiasm. Community members appeared to think the project would go ahead, and that they should attempt to take advantage of it. The study team found the community to be interested in the project primarily from the point of view of jobs and money.

Community reaction to the proposed rotation system was relatively positive. Community members were willing to see how the system worked before criticizing it. There were some suggestions for more time off for spring hunting and fishing, and one suggestion for an adjusted rotation which would allow more time off in the summer, and less in the winter.

There appeared to be little interest in a townsite near the mine, although some felt that family accommodation where the family could live while the mine employee worked would be a good idea. However, the indication was that the family would return to Resolute on time off to retain ties with friends and the extended family.

5. Potential Socio-Economic Impacts on Arctic Coastal Communities

5.1 General Descriptions of Arctic Coastal Communities

Although most of the Arctic coastal communities were traditionally Inuit camping areas, none were permanently settled communities until well after the arrival of the Hudson's Bay Company, the missions and the RCMP. The Inuit at first only came into these communities to trade, or to celebrate special holidays. It was not until schools and houses were built that the Arctic coastal settlements were developed. Although some of the communities may have been named more than a hundred years ago by early explorers, the actual history of these communities seldom spans 50 years.

Cambridge Bay – The first trading post and RCMP detachment were established here in the early 20's. With the building of the Loran beacon in the late 40's a permanent settlement started to develop, later firmly established with the building of a DEW line site in 1955. Today the community has a population of close to 900, about 75 percent Inuit. Cambridge Bay is the transportation hub of the Arctic coast, with three jet flights weekly, connecting it with Yellowknife and Edmonton. There are also connecting flights to communities to the east and west of Cambridge Bay. The economy of Cambridge Bay is tied closely to government operations. The co-op is a major employer in the community, operating a commercial fishery, a bakery, a hotel, a retail store and craft shop, taxi service and cartage business. Other local employers include general contracting companies, expediters, the Bay and a few small businesses.

Although some Cambridge Bay people continue to hunt and trap, it is now mainly a seasonal or weekend activity, with few full time hunters. Unemployment in Cambridge Bay is high, with limited prospects for a young population who will soon enter the work force. Alcoholism and crime are problems in this community with nearly 600 reported offences under the Liquor Ordinance in 1978-79, and most other offences liquor related.[1] In 1978-79, this community also had the highest per case social assistance expenditures in the Arctic coastal area.[2]

Cambridge Bay will be "a Polaris Mine hiring centre, and some people from Cambridge are currently working at the Polaris site on construction jobs.

Coppermine – Coppermine is the second largest community on the Arctic coast, with a population of approximately 825, about 92 percent Inuit. Although the community has the highest dollar income from fur sales,[3] it is also involved and experi-

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[1] See Statistics p. 148.

[2] N.W.T. Department Social Services, 1980.

[3] N.W.T. Wildlife Service, *Trappers' Incentive Program, 1978-79.*

enced in wage employment, with" people from the community working on rotational programs with petroleum exploration companies and mining companies. There is a small private sector in Coppermine involved in construction, accommodation and retailing. Carvings and other forms of handicraft production provide income for some people.

Coppermine also has some social problems related to alcohol abuse, but they are not as severe as the problems in Cambridge Bay.*

Coppermine people have shown a high interest in wage employment, not only through jobs held with exploration com-panics, but also, in the fact that a number of men from Coppermine are currently working at the Polaris site. Apart from rotational employment, there are few opportunities for long term employment in Coppermine. Short term construction jobs are available, and will be available if the planned community centre proceeds.

Coppermine is serviced with four-flights weekly by N.W.T. Air out of Yellowknife. These flights connect Coppermine with Holman Island twice a week, and Cambridge Bay once a week. Coppermine will be a hiring centre for Polaris Mine employees.

Holman Island – With the establishment of a Hudson Bay post here in the early 40's, a permanent settlement developed. The community has a population of 325, mainly Inuit. The economy of the settlement centres on hunting, trapping, fishing and print and handicraft production, with some government wage employment. The community is serviced by N.W.T. Air twice a week out of Yellowknife, via Coppermine. A new airstrip and terminal building allow larger aircraft to come into the settlement. Holman is a stable community influenced by three churches; the Anglican, Roman Catholic and Pentecostal.

Some people from the community have worked on rotational programs at Beaufort Sea drilling operations, but the numbers are quite small compared to other communities in the area.[5]

Gjoa Haven – With a population of close to 500 (mainly Inuit) Gjoa Haven is one of the fastest growing communities in the N.W.T. The local economy is primarily hunting, trapping and crafts production, with only a small number of full time jobs available to local residents, and few prospects for full time jobs, apart from government, co-op and service jobs. The people appear to be interested in upgrading programs, with younger ones interested in apprenticeships. Many people in the community continue to hunt and trap, but the total income from fur export sales was not high in 1978-79 indicating that hunting may be more for domestic use. Air transportation into the community is three times a week via N.W.T. Air from Cambridge Bay and Yellowknife. The community airstrip is expected to be upgraded in 1981, which should overcome current problems, which make landing in Gjoa Haven difficult during the spring thaw period. Partly due to the lack of jobs, social assistance payments in Gjoa Haven are high. Gjoa Haven is one of two "dry" (alcohol prohibited) communities in the Arctic coast.

Spence Bay – This community was established in the late 40's when the people from Fort Ross moved to Spence Bay. The current population (mainly Inuit) is close to 500 people. The economy of the community is based on handicraft production, carving and hunting and trapping. Other jobs are with government services, the co-op and

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See Statistics p. 149,

[5] Terry Foster. *Socio-Economic Review of the Beaufort Sea Drilling Program: 1976-79* (Executive Committee Secretariat, Govt. of N. W. T., 1980) p. 5.

the Bay. It would appear that handicraft production is more important as a source of income than trapping, since only four people in the settlement earned more than $2000 through the sale of furs last year,[6] although the settlement lists 51 trappers. Apart from local construction programs, there are few job opportunities available. The territorial government is planning a major land assembly program in this community, in line with expected increases in the population. Spence Bay is serviced three times weekly by N.W.T. Air out of Yellowknife, via Cambridge Bay. With a large number of young people entering the work force, this community, like all Arctic coastal communities, is concerned about jobs for these people.

Pelly Bay – **Pelly** Bay was a traditional seasonal fishing camp for the **Inuit,** and was established as a permanent community after a school was built there in the early sixties. The community has over 300 people, who are mainly involved in hunting, fishing and carving, with some government and co-op employment. Since this community is inaccessible for resupply ships, all supplies must be flown in, giving it the highest cost of living in the Northwest Territories. According to the hamlet **Mayor**[7] there are 15 full time jobs in the community held by **Inuit** people. The only potential for additional wage income, is commercial fishing, which has been done there in the past, and is currently being investigated to determine future resources. The hamlet is "dry", but experienced few if any problems before it voted to become a dry community. The community is stable and the residents have a strong attachment to the locale and little desire to move permanently to another location. **Pelly** Bay is serviced twice weekly by N.W.T. Air out of Yellowknife via Cambridge Bay. It is the only community in the area which has hamlet status.

Note: Population estimates for all communities are based on 1978 N.W.T government statistics, adjusted according to information obtained in community visits.

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[6] *Trappers Incentive Program,* 1978-79.

[7] Personal interview. Mayor of Pelly Bay, 1980.

DEPARTMENT OF SOCIAL SERVICES

GOVERNMENT OF THE NORTHWEST TERRITORIES

SOCIAL ASSISTANCE PAYMENTS

By SELECTED communities and cause and by fiscal year.

YEARLY FIGURES

1978/79 Fiscal Year

LOCATION		CAUSE OF NEED						TOTALS
		HEALTH	DEPENDENT CHILDREN	ECONOMIC (UNEMPL/ABLE	ECONOMIC (OTHER)	SUPPLEMENTAR	UNIDENTIFIED	
	$	10,181	3.391	42,179	5,749	59,754	445	121,699
		23	3	22	9	20	11	88
SPENCE BAY	$	443	1.130	1.917	639	2.988	40	1.383
	$	47,852	49,029	37,119	13,536	46,985	350	204,871
		38	21	27	35	21	2	144
CAMBRIDGE BAY	$	1,259	2,335	1,375	672	2,237	175	1,423
	$	38,587	18,015	58,213	3.162	3,597	200	124,774
		57	7	57	10	4	1	136
COPPERMINE	$	677	2,574	1,021	316	899	200	917
	$	15,743	5,178	46,295	2,300	66,429	803	136,748
		27	4	26	5	32	7	101
GJOA HAVEN	$	583	1,295	1,781	460	2,076	115	1,354
	$	14,652	1.505	292	56	0	0	31.50
		17	5	1	1	0	0	2
HOLMAN ISLAND	$	862	3.301	292	36	0.00	0.00	1.31
	$	17,045	394	1,769	480	25,734	50	45,47
		20	1	3	3	22	2	5
PELLY BAY	$	852	394	590	160	1.170	25	89
	$	4,599	12,099	4,552	799	232	0	22,281
		5	8	7	3	1	0	24
RESOLUTE BAY	$	920	1.512	650	266	232	0.00	928

5.2 Potential Employment Impacts

To assess the potential impacts of the Polaris Mine on employment in the Arctic coastal communities, we first had to estimate how many people from each community will likely be Polaris Mine employees.

5.2.1 DIRECT EMPLOYMENT

To obtain these figures we used the same methodology used to estimate the number of employees from Resolute, but adjusted various factors. Basically the methodology is:

1. Determine the size of the labour force in each community.
2. Establish an interest factor for each community to determine the number of potential candidates in each community.
3. Establish success factors to estimate the number of potentially successful candidates from each community.

Size of Labour Force

To determine the number in the labour force for each community we used the following steps:

1. Using available population statistics, we aged the Inuit population to determine the number of people of labour force age in each community for the years 1985, 1990, 1995, and 2000. For this employment analysis we considered only the males of labour force age (18-50), since it is unlikely the number of females who would work at the mine would be significant. Although the male Inuit population in total is slightly higher than female, we assumed a 50-50 male/female ratio.

2. To determine the number of males actually in the labour force (that is employed, or would like to be employed, if jobs were available), we applied the national male average of 78 percent.

	1985	1990	1995	2000
Cambridge Bay	136	156	176	188
Coppermine	141	170	193	218
Holman Island	58	73	80	80
Gjoa Haven	91	96	108	119
Spence Bay	77	96	109	119
Pelly Bay	43	54	67	80
	546	645	733	804

These figures do not include any in-migration, out-migration or deaths.

Potential Candidates for Polaris Mine Employment

To estimate the number of potential candidates for Polaris Mine employment, we applied an interest factor to each community. To determine the interest factor, we examined each community and applied a standard set of criteria to arrive at the individual interest factors. The criteria used were:

1. Number of jobs currently available in the community.
2. Alternative job opportunities outside the community available to the community (i.e. Dome/Canmar).
3. Past contact with wage employment.
4. Past contact with rotational employment.
5. Skill/education levels within the community.
6. Extent of participation in hunting, trapping activities.
7. Interest in the project (either expressed verbally, or shown through the number of people currently working at the mine site).
8. Income levels within the community.
9. Level of community development.
10. Adherence to traditional lifestyle.
11. Distance from home community to mine site and reliability of transportation.
12. Work attitudes, motivation.

Community information related to the above criteria was gained during community visits, or as obtained from government sources or documentation presented in other studies.

The interest factors by community were estimated as follows:

Cambridge Bay	–	.25 interest factor
Coppermine	–	.20 interest factor
Holman Island	–	.15 interest factor
Gjoa Haven	–	.30 interest factor
Spence Bay	–	.30 interest factor
Pelly Bay	–	.35 interest factor

The explanations for these interest factors are as follows:

Cambridge Bay – Cambridge Bay people have been involved in some rotational work, at Dome Canmar, Contwoyto Lake and Nanisivik. Although some Cambridge Bay people have gone to work at the Polaris site, the labour force continues to have other job options available closer to home. There is a shortage of jobs within the community, but work attitudes and motivation are low in Cambridge) with a high incidence of social problems, particularly alcohol and crime problems. The Cambridge Bay population has had more contact with wage employment (from the mid 50's) than most Arctic coastal communities, and is probably the most developed community on the Arctic coast. For these reasons we estimated an interest factor of .25 – that is that 25 percent of the males in the labour force would be interested in employment at the Polaris Mine.

Coppermine – The interest factor assigned to Coppermine is lower than Cambridge Bay, although this community has had extensive experience with work rotation, has a good record of work attitudes, and currently has people working at the Polaris site. It

is felt that the distance from the site, and the availability of alternative job opportunities (Dome Canmar and Contwoyto Lake) both closer to home, and with shorter work rotation schedules would likely have an effect on lowering the interest in Polaris jobs. The interest factor assigned to Coppermine is 20 percent (.20).

Holman Island – Although some people in Holman Island have worked on rotational jobs with Dome Canmar, this community is more traditional than Coppermine or Cambridge Bay, with a solid hunting/trapping economy. The game harvests in this area are high, indicating high participation in hunting and trapping. Income in Holman is also earned through a flourishing print and handicraft production industry. Holman has had only limited contact with southern style wage employment, and is also the most distant community from the Little Cornwallis Island site. For these reasons we assigned it the lowest interest factor of all Arctic coastal communities — 15 percent (.15).

Gjoa Haven, Spence Bay, Pelly Bay – These communities are quite similar in that their basic economy centres around hunting, trapping and carving and there is very little other wage employment available on a year round basis in the communities. Unemployment is high especially among younger people who are only marginally involved in hunting/trapping activities.

Income levels, and skill and education levels within the communities are low, but interest in the Polaris Mine is quite high. In the case of Gjoa Haven and Spence the shortage of jobs, influenced the interest factor upward to 30 percent (.30) in both cases. For Pelly Bay, although a traditional community, the interest factor was assessed to be even higher at 35 percent (.35). This reflects the fact that this community has the highest cost of living, has few other earning options, with few developments anticipated in the future. According to Pelly Bay residents, people require additional dollar income to help support traditional activities such as hunting and trapping.

In all Arctic coastal communities the interest factor was lower than that recorded in Resolute. In Resolute the interest factor is highly influenced by proximity to the mine although there are alternate job opportunities in that community.

Using these interest factors, the potential number of candidates for Polaris jobs from each community would be: [1]

Community	Interest Factor	1985	1990	1995	2000
Cambridge Bay	250/o	34	39	43	47
Coppermine	20%	28	34	39	44
Holman Island	15%	9	11	12	12
Gjoa Haven	30%	27	29	32	36
Spence Bay	30%	23	29	33	36
Pelly Bay	35%	15	19	23	28

To estimate the potentially successful candidates (ones who are likely to complete one year on the job) we again followed the procedure used in the Resolute section. We applied a *success factor* to each community and an *improvement factor.* In the Arctic coastal communities the success factor used, was .2 or a 20 percent success rate. This success rate was based on the 1975-79 work durations of all Inuit employees of

[1] These figures assume no other project (i.e. Polar Gas) will be proceeding.

Nanisivik mine, which shows that 18 percent of all Inuit workers completed one year or longer. [2] We adjusted this upward slightly to reflect the employment duration times of communities closer to the Nanisivik mine. We also applied an improvement factor of 1.35 relative to the success rate at Nanisivik.

The equation used to determine the number of potentially successful candidates is:

Potential Number of Candidates × *Success Factor* × *Improvement Factor* = *Potentially Successful Polaris Employees*

Base Case

	1985	*1990*	*1995*	2000
Cambridge Bay	9	11	12	13
Coppermine	8	9	10	12
Holman Island+ Gjoa Haven+ Spence Bay+ Pelly Bay	4	5	5	6
	21	25	27	31

The low figure for the combined communities of Holman Island, Gjoa Haven, Spence Bay and Pelly Bay reflects the fact that people from these communities, under the current plan would have to pay their own fares to and from a hiring centre if they worked for the Polaris Mine. In some communities (Pelly Bay) the round trip fare to Cambridge Bay is close to $700. Since it is unlikely many people would work at Polaris if they had to pay this additional cost, we estimated low numbers of employees from these communities. Our estimate was based on the assumption that 20 percent of the residents who would work at Polaris if air fares were paid to and from home communities, would still work there even if air fares were not paid. In the alternative case which assumes that all travel costs to and from the mine site would be paid for residents of these communities who work at Polaris, the numbers would increase substantially.

Alternative Case

	1985	1990	1995	2000
Cambridge Bay	9	11	12	13
Coppermine	8	*9*	10	12
Holman Island	2	*3*	*3*	3
Gjoa Haven	7	*8*	*9*	10
Spence Bay	6	*8*	*9*	9
Pelly Bay	4	*5*	*6*	8
	36	44	*49*	55

In addition to the potentially succesful candidates, some people from each community will work at the mine for less than one year. Using adjusted percentages, based on the Nanisivik duration rates for Inuit workers'[3], we assessed the following:

- 31 percent of potential candidates from the Arctic coastal communities will work O-6 weeks.
- 20 percent will work seven weeks to four months
- 22 percent will work five months to less than one year

[2] B. R. I. A., *Nanisivik*, p. 96.

[3] *Ibid.*, pp. 95, 96.

Converted to man year equivalents, the additional employees from the Arctic coastal communities would be as follows:

	1985	1990	1995	2000
Cambridge Bay	8	9	9	10
Coppermine	6	7	9	10
Holman Island	2	2	3	3
Gjoa Haven	6	6	7	8
Spence Bay	5	6	8	8
Pelly Bay	3	4	5	6
	30	34	41	45

These figures assume that all travel costs will be paid to and from communities in addition to Coppermine and Cambridge Bay.

For the year 1985, the total number of employees from the Arctic coastal communities could be as low as 38 or up to 66, depending on travel policies implemented. Reflecting the growth in the labour force, the potential employment from these communities increases significantly from 1985 to 2000 under both the base case and the alternative case:

TABLE 14

Potential Employees from Arctic Coastal Communities

Base Case

Notes:

1) Base case assumes no paid travel costs to a hiring centre for other Arctic coastal communities.

2) Partial year rotational are the people who work less than one full year at the mine. Partial year rotational is given in man year equivalents.

Base Case

	1985	1990	1995	2000
Cambridge Bay				
Full time rotational	9	11	12	13
Partial year rotational	8	9	9	10
Coppermine				
Full time rotational	8	9	10	12
Partial year rotational	6	7	9	10
Other Arctic coastal comm.				
Full time rotational	4	5	5	6
Partial year rotational	3	4	4	5
	38	45	49	56

TABLE 15

Potential Employees from Arctic Coastal Communities

Alternative Case

In this case we assume that travel will be paid to hiring centres for people in **Spence** Bay, **Pelly** Bay, Gjoa Haven and **Holman** Island.

	1985	1990	1995	2000
Cambridge Bay				
Full time rotational	9	11	12	13
Partial year rotational	8	9	9	10
	17	20	21	23
Coppermine				
Full time rotational	8	9	10	12
Partial year rotational	6	7	9	10
	14	16	19	22
Holman Island				
Full time rotational	2	3	3	3
Partial year rotational	2	2	3	3
	4	5	6	6
Gjoa Haven				
Full time rotational	7	8	9	10
Partial year rotational	6	6	7	8
	13	14	16	18
Spence Bay				
Full time rotational	6	8	9	9
Partial year rotational	5	6	8	8
	11	14	17	17
Pelly Bay				
Full time rotational	4	5	6	8
Partial year rotational	3	4	5	6
	7	9	11	14
TOTAL EMPLOYMENT	66	78	90	100

Note: Partial year rotational figures are given in man year equivalents

If travel were paid to hiring centres, for people in other Arctic coastal communities, the following increases in the number of employees from the Arctic coastal communities would be realized:

	1985	1990	1995	2000
increase in # of employees	28	33	41	44

The percentage of the male labour force in each community who could be potentially successful candidates at Polaris Mine, indicates the extent of the impacts on the community.

Polaris employees as a percentage of the labour force in each community in 1985 are as follows:

Cambridge Bay	12%
Coppermine	10%
Holman Island	7%
Gjoa Haven	14%
Spence Bay	14%
Pelly Bay	16%

Potentially successful candidates at the Polaris Mine would be about 12 percent of the total male labour force of the Arctic coastal communities in 1985.

The above percentages are based on the statistics in the Alternative Case.

SUMMARY OF DIRECT EMPLOYMENT

1. The community in the Arctic coast which would feel the greatest employment impact could be Pelly Bay with a potential 16% of the male labour force working at the Polaris Mine if travel costs were paid. This impact on Pelly would have to be assessed as positive since this community currently has few jobs available, few prospects for steady wage employment and an expressed interest in obtaining jobs. This community has the highest cost of living in the Northwest Territories since all goods must be flown into the community, the lowest per capita return for fur sales in the Arctic coastal region[4] and the lowest per capita income in the N. W.T.[5]

2. Employment at the Polaris Mine could reduce unemployment in these communities, but will not have negative impacts on the labour supply within the communities. The number of people in each community seeking jobs will continue to be quite high, even with Polaris hirings, and there will continue to be an adequate number of people available in the communities to carry out regular community jobs, as well as seasonal, and part time jobs.

[4] *Trappers' Incentive Program, 1978-79.*

[5] *Northwest Territories Statistical Profile (planning and Resource* Development Division, Economic Development and Tourism, Govt. of N. W.T.) p. 22.

5.2.2 INDIRECT EMPLOYMENT

Indirect employment results from the purchase of supplies and services by the mine. Since the economic base of most of the Arctic coast communities is hunting, trapping, handicrafts and government employment, it is unlikely these communities will supply much to the mine, with two possible exceptions. Co-ops with commercial licences might sell char to the catering group, or possibly a local charter company in Cambridge Bay could be used to fly people from some communities into Cambridge Bay if the travel policy were adjusted. Since it appears at this time that any purchases from the Arctic coast communities will be small, we have assumed no indirect employment in these communities resulting from the Polaris Mine.

5.2.3 INDUCED EMPLOYMENT

The resending of income earned through direct employment at the mine will result in additional community jobs. This resending could beat the co-op, and could expand their services, or the Bay, or at some other business within the area. Jobs resulting from respending could be part time jobs, or full time jobs.

To determine the number of new jobs created through resending effects we are using the multiplier for employment outlined in Chapter 3. Since there will be no indirect employment from this mine in Arctic coastal communities, the induced employment is:

total number of direct jobs x .22 = jobs as a result of resending

Coppermine and Cambridge Bay

81 direct jobs x .22 = 7 jobs as a result of resending

Other Arctic coastal communities

Base Case – 7 direct jobs x .22 = 2 jobs as a result of resending
Alternative Case – 35 direct jobs x .22 = 8 jobs as a result of resending

In total, an additional 9 jobs, (or part time jobs equivalent to 9 full time jobs) will be created in the Arctic coastal communities as a result of Polaris Mine employment in 1985. This number could be increased to 15, if direct employment in other Arctic coastal communities increased as a result of a paid travel program.

Total employment in the Arctic coastal communities from the Polaris Mine in 1985 could be:

Base Case

Coppermine and Cambridge Bay	– Direct employment	31
	– Induced employment	7
		38
Other Arctic coastal communities	– Direct employment	7
	– Induced employment	2
		9
	TOTAL	47 jobs

Alternative Case ‘

Coppermine and Cambridge Bay	– Direct employment	31
	— Induced employment	7
		38
Other Arctic coastal communities	– Direct employment	35
	– Induced employment	8
		43
	TOTAL	81 jobs

CONCLUSIONS

The total number of direct Polaris and Polaris related jobs available in the Arctic coastal communities can be increased by 420/o if travel to hiring centres is paid for ‘ potential employees in all Arctic coastal communities.

Under the base case assumptions (travel costs paid from the hiring centres of Coppermine and Cambridge Bay) employment will only affect the hiring centre communities, since few people from the other communities will likely work at the mine if they have to pay their own transportation costs to hiring centres. Under the alternative case, which provides paid travel costs from home to the mine site for all six Arctic coast communities, the employment effects will be much greater. In total the Polaris Mine could result in the direct employment of 66 people in 1985 and through the responding effects of these people could create another 15 jobs. In an area where wage income is needed and wanted to support traditional activities, this would create a positive impact on the communities.

RECOMMENDATIONS

Some form of paid travel should be provided to residents of Holman Island, Gjoa Haven, Spence Bay and Pelly Bay who want to work at Polaris Mine. This paid travel should cover transportation costs from home communities to the mine site and return.

There is some concern in these communities about success in obtaining these jobs and also handling problems which could arise when the man is away from home. Therefore, the study team recommends that a part time recruiter/counsellor be hired in each community that wants and is seriously concerned about Polaris employment opportunities for its residents.

5*3 Potential Income in Arctic Coastal Communities from the Polaris Mine

Current income data for the Arctic coastal communities was not obtained, since it usually refers to wage income and does not reflect other sources of income in the community such as carving income, domestic harvest incomes etc.

According to 1976 statistics, Pelly Bay had the lowest per capita income in the Northwest Territories of all communities listed [1], and was far below the territorial average. Although per capita income figures were not listed for other Arctic coastal communities, it is likely that all are well below the N.W.T. average.

In the communities of Gjoa Haven, Pelly Bay, Spence Bay and Holman Island, wage employment available to Inuit residents is usually limited to 15-20 full time positions. These include territorial government, the Co-op, the Bay, the local housing association, and the nursing station. There are also part time/seasonal jobs available in construction, maintenance and some exploration work, depending on programs underway in the area.

In Coppermine and Cambridge Bay there are generally more jobs because of the somewhat larger business base in these communities. In the case of Cambridge Bay, the N.W.T. Government area office and the DEW line site also provide jobs to Inuit people.

In addition to wage income, other income is obtained from hunting and trapping. Much of this income could be measured in game meat and skins for domestic use, with a lesser amount for the sale of furs for dollar income.

Other income into the communities is in the form of transfer payments from social assistance and to a lesser degree unemployment insurance.

Fur Sale Incomes, 1978-79[2]

	Total # of trappers	# Earning over $600	# Earning over $5000	Total fur dollar income
Cambridge Bay	79	38	7	$111,638.50
Coppermine	156	84	24	$320,399.60
Gjoa Haven	62	22	2	$ 54,945.57
Holman Island	53	30	4	$74,806.00
Pelly Bay	25	10	—	$ 16,950.00
Spence Bay	51	28	—	$45,399.00

In order to examine part of the income from domestic use of harvests, we have examined the most recent caribou kill statistics.[3]

Northwest Territories Statistical Profile, p. 22.

Trappers" Incentive Program, 1978-79.

N.W.T. Wildlife Service, *Kill Statistics*, derived from G. H. L.'s. 1975-76.

Assuming that each animal produces 100 lbs. of meat for domestic use, and the value per pound is $2.00, income from caribou only (excluding its use in clothing and handicrafts) would be as follows:

	# of caribou harvested	Equivalent Income value
Cambridge Bay	385	$77,000.
Coppermine	1642	$328,400.
Gjoa Haven	141	$28,200.
Holman Island	526	$105,200.
Pelly Bay	98	$19,600.
Spence Bay	483	$96,600.

Additional income from domestic harvesting would also come mainly from fish and seal. This income should be considered as gross income, since there are some costs involved to produce this income. These costs include the purchase of hunting equipment and supplies. We can only assume that net income for domestic resource harvesting is at least as great as the gross income of caribou harvesting as estimated above. This means that net income from domestic resource harvesting is higher than fur dollar income in four of the six Arctic coastal communities.

TABLE 16

Summary of Community Income Resulting from Polaris Mine in 1985

Arctic Coastal Communities

Community	Employment[1]	Base Case*	Alternative*
Cambridge Bay	direct	$340,000	$340,000
	induced	64,000	64,000
		404,000	404,000
Coppermine	direct	280,000	280,000
	induced	48,000	48,000
		328,000	328,000
Gjoa Haven	direct	40,000	260,000
	induced	8,000	48,000
		48,000	308,000
Holman Island	direct	20,000	80,000
	induced	—	16,000
		20,000	96,000
Pelly Bay	direct	40,000	140,000
	induced	8,000	16,000
		48,000	156,000
Spence Bay	direct	40,000	220,000
	induced	16,000	48,000
		56,000	268,000
Totals		$904,000	$1,560,000

Employment numbers are presented in section 5.2.1 pp. 189 - 190. Direct employment is the potential number of hires x an average salary of $20,000. Induced is natural jobs created through resending x an average salary of $16.000.

' All figures are stated in 1979 dollars and are based on 1979 real wage rates and therefore 1979 productivity levels.

CONCLUSIONS

Employment at the Polaris Mine will result in a substantial increase in the wage income of Arctic coastal community residents, particularly if travel costs are paid to and from home communities. At the same time there could be a reduction in dollar income from trapping and dollar equivalent incomes from resource harvesting for domestic use. The extent of the reductions in trapping and hunting income will depend on the people who go to work at the mine, and the time spent on these activities by Polaris employees while they are at home on their work break.

Communities generally expressed a need for more wage dollars. Often the purpose of these dollars was to purchase equipment and supplies required in resource harvesting. To provide these wage dollars to the communities which expressed the greatest **need**[6] the alternative case would have more positive effects.

The relative impact of these increased wage dollars will be the greatest in communities where there are currently small dollar incomes from jobs and fur sales.

Although wages at the mine will be higher than most community jobs, (considering 31 weeks work per year) communities don't feel that the higher paying mine jobs will lure people with full time jobs, away from the community. The comments in the communities indicate that people would continue in lower paying, full time jobs, in order to be with their families. This in turn leads to the conclusion that many of the Polaris jobs will be **filled by** young people, who do not have full time jobs, are not generally among the top hunters/trappers in the communities, and will thus be adding new income dollars to the community.

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[6] Interview material Indicated Gjoa Haven, Spence Bay, Pelly Bay. had the greatest need

- 5.4 Potential Effects on the Economy of Arctic Coastal Communities

The economy of Holman Island, Gjoa Haven, Spence Bay and Pelly Bay centres around hunting, trapping, carving and handicraft production. Coppermine has the same economic base, but with the addition of rotational employment with drilling operations in the Beaufort Sea. Although there is hunting, trapping, carving and handicraft production in Cambridge Bay, the economy there depends on government employment, the transportation industry and co-op operations.

Base Case

In examining the effects of mine employment under the base case (travel to the mine site paid only from Coppermine and Cambridge Bay) new income dollars will range from $24,000 to $56,000 for the smaller communities of Holman Island, Gjoa Haven, , Spence Bay and Pelly Bay.

Although Coppermine is expected to provide more employees, it is unlikely that there will be any significant effect on the current economic base, especially its traditional economic activities. The community has had eight years experience in rotational employment, and continues to maintain a thriving hunting/trapping economy.'

In Cambridge Bay, the impact will likely be positive, since this community is more dependent on wage employment, and needs additional jobs for the many young people entering the labour force.

Under the base case, the only business in the Arctic coastal area which will be affected, will be the airline service which flies potential employees from the hiring centres of Coppermine and Cambridge Bay to the mine site. At present no direct northbound service links Cambridge Bay to Resolute. Resending of direct Polaris income will strengthen the local economies of Coppermine and Cambridge Bay since much of the earnings of the 31 potential employees from these communities will likely be spent in the home communities.

Alternative Case

Under the alternative case (travel costs paid to hiring centres from other Arctic coast communities) the number of people working at the mine from other Arctic coastal communities (Gjoa Haven, Spence Bay, Pelly Bay, Holman) increases from 7 to 36 people. If all of these people were trappers, this would represent about 25 percent of the trappers in these communities.[2] It is possible that mine employment 'could have an effect on the existing hunting/trapping economy if mine employees discontinued all hunting and trapping. However, the people in these communities generally felt that four weeks off was enough time to hunt and trap, and if harvests are maintained using this time off, then the effect of mine employment would be positive, since additional income would be coming into the communities.

There could be some effect on the carving income of these communities, although from interview material, it appears that many carvers are older members of the com-

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In 1978.79, Coppermine had the highest per trapper income on the Arctic coast. *Trappers' Incentive Program* statistics.

' *Trappers' Incentive Program,* 1978-79.

munity. The same is true of people in the commercial fishing industry. According to the co-op general manager, the fishermen in Cambridge Bay are "older people who won't work for the mine anyway."

CONCLUSIONS

With the exception of Cambridge Bay and to a lesser extent Coppermine, no impacts are anticipated on the economy of the coastal communities under the base case.

In Cambridge Bay employment at the mine is expected to have a positive effect, since the community is dependent on wage employment, and needs additional jobs for young people entering the labour force.

Resending of Polaris income will tend to strengthen the economies of Coppermine and Cambridge Bay.

The only impact identified for business, was the need for a direct northbound air connection between Cambridge Bay and Resolute.

Under the alternative case, involving paid travel for workers from all six communities, the number of employees is expected to be higher, and therefore the mine may be expected to have a greater positive impact on wage income.

Even if all the potential employees (including Cambridge Bay, Coppermine and the other Arctic coastal communities) were trappers, this would represent about 15 percent of the total number of trappers in these communities. Since the people interviewed felt that the work rotation allowed sufficient time to hunt and trap, the effects on the economy of these communities are considered to be minor.

5.5 Potential Effects on Transportation

Pacific Western Airlines has three flights weekly into Cambridge Bay from Edmonton, via Yellowknife. N.W.T. Air out of Yellowknife serves Coppermine, Holman Island, Cambridge Bay, Gjoa Haven, Spence Bay and Pelly Bay. Each community has three flights weekly, except Pelly and Holman which have two flights weekly and Coppermine which has four weekly flights. N.W.T. Air currently operates DC-3 service into all communities.

Under the base case, which assumes transportation costs are paid from the hiring centres of Cambridge Bay and Coppermine to the mine site there would be no effects on airline service since the total of 38 people from Cambridge Bay and Coppermine traveling to and from the mine could be accommodated on existing services.

Under the alternative case, which assumes paid transportation costs from all Arctic coastal communities there would be no negative effect on the local transportation system, providing the shift changes are properly staggered to ensure that all employees from one area are not going to the mine or coming back at the same time.

At present there are no direct flights from Cambridge Bay to Resolute, although there are direct flights from Resolute to Cambridge Bay. This means that employees from this area would have to overnight in Yellowknife enroute to Resolute. Although employees returning to Arctic coastal communities can fly directly from Resolute to Cambridge on Wednesdays and Saturdays, according to existing schedules they would have to stop in Cambridge Bay, sometimes for several days before they could return to their home communities.

Although these transportation delays will have no effect on the transportation system and its usage, they could have a negative effect on the attitudes of workers who are anxious to return home after six weeks at the mine.

CONCLUSIONS

Polaris Mine employee's use of scheduled air service in the Arctic coastal area will have no negative effects on the air service, and could have positive effects, if the regional air carrier were to stop in Cambridge en route to Resolute. This would mean passengers going to Cambridge Bay from the south could travel directly to that community without having to travel all the way to Resolute, then back to Cambridge, as is currently the case.

Under the base case, no negative impacts on transportation services are anticipated. However, scheduling of flights, and particularly the lack of a connecting flight could have a negative impact on workers en route home.

Under the alternative case scenario, residents of other Arctic coastal communities en route home, would often have stopovers of several days in Cambridge Bay unless some form of charter air service were used. Use of the Cambridge Bay air charter company[1] would not likely affect the level of service provided by this company.

[1] In March 1980 there was no air charter company operating out of Cambridge Bay. However at that time plans were underway to start a base operation in Cambridge. Regular use by Polaris employees could encourage such an operation to continue in Cambridge Bay. ultimately providing needed service to all residents of the Arctic coast.

5.6 Potential Effects on Population Growth

Under the base case, population growth as a result of the Polaris Mine could occur only in Cambridge Bay and Coppermine. If transportation costs are not paid from other Arctic coastal communities, there is a possibility that some people wanting employment will move to one of the hiring centres, to overcome high transportation costs from their home communities.

Since there appears to be a strong attachment to the home community, it is unlikely that many would move to the larger centres; however, there have been cases of people moving into Cambridge Bay particularly to get jobs. In these cases some stayed in Cambridge, and others returned to their home communities. Since Cambridge Bay is not well liked or considered a good community in which to live by people of the eastern communities, it is unlikely the number of families moving to Cambridge would be high.

Under the alternative case, there would be no increases in population growth in the communities as a result of the Polaris Mine. Any growth would be natural population growth, or in-migration for other reasons.

5.7 Potential Effects on Community Services

Under the base case, the only effects would be in Cambridge Bay and Coppermine if people moved to these communities to take advantage of paid transportation costs to the mine site.

This could produce some strain on local housing, but would have little effect on other services, since the number expected to move would be quite small.

Under the alternative case, which assumes paid travel costs to the hiring centres, a number of people would be staying in Cambridge or Coppermine on their way home from the mine. The main service they would use would be accommodation facilities, and if the numbers are staggered as outlined, there should be only positive effects.

In Coppermine and Cambridge Bay, where alcohol abuse is a problem, there could be some effects on policing and health services if there is a substantial increase in alcohol consumption.

5.8 Potential Effects on Hunting and Trapping

The effects of Polaris Mine employment on hunting and trapping in the Arctic coastal communities are examined under three headings: time available for hunting; purchase of hunting equipment; and seasonality.

Time available for hunting

Generally people in the communities agree that four weeks off after a six week work shift is enough time to hunt and trap. In the case of Inuit employment at Nanisivik mine from north Baffin communities, it was concluded that overall community harvests did not decline, although mine employees themselves did not harvest as much as previously.[1] It should be noted that in the case of the north Baffin employees at Nanisivik mine, the time off was two weeks rather than the planned four weeks for Polaris employees, which could have had some effect on the overall harvests of individual employees. Whether there will be a negative impact on hunting and trapping activities, will depend entirely on whether or not people use the time off for hunting and trapping activities.

Purchase of hunting equipment

Inuit employees of Nanisivik mine, from north Baffin communities spent the largest part of their earnings on new hunting equipment, mainly skidoos and boats.[2] In the early years of rotational employment with Gulf Canada, Coppermine people spent 28 percent of their earnings on hunting equipment, somewhat less than was spent on food.[3] If this spending pattern continues in the Arctic coastal communities, it is unlikely that there will be any negative effects on hunting and trapping harvests since wage income will be used for purchases to enhance these activities.

Seasonality

There are certain prime seasons for hunting, trapping and fishing particular species. Generally for seal hunting, polar bear hunting, caribou hunting and white fox trapping, it was felt that the seasons were long enough so that mine employment would not eliminate the opportunities to take part in these hunts. It should be noted however, that "spring" is the prime hunting season. A detailed survey per community might identify prime times (i.e. best char runs in July for Pelly Bay residents) for these activities, although weather might be an influencing factor in adjusting seasons.

The possible scenarios for effects on hunting and trapping activities range from maintenance of the same level of activity, to a complete stop in all hunting and trapping activity by Polaris Mine employees.

Using the worst possible scenario, which assumes that all Polaris employees are trappers, this would mean that 66 of 426 Arctic coastal trappers or 15 percent of the total number would go to work at Polaris mine.

Further assuming that this would reduce the total trapping income by 15 percent, there would be a $93,620 loss of fur income in the six communities. Under the same

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[1] B. R. I. A., *Nanisivik*, p. 31.

[2] *Ibid.*, p. 136.

[3] Hobart, *Inuit Employment*, p. 73.

"worst" scenario, hunting and the resulting meat supply could decrease by 15 percent overall in these communities. This "worst" scenario could result in some temporary shortages of game meat.

From information received in the communities it would appear that the younger people are not as heavily involved in hunting and particularly trapping activities, although they do some hunting and trapping. Since this group will likely make up a large part of the Polaris employees, it is expected that mine employment will have only a small negative effect if any, on the hunting and trapping in the Arctic coastal communities.

CONCLUSIONS

Whether there will be a negative impact on hunting and trapping depends to some extent on whether employees use their time off to hunt and trap. Increased income is expected to have a positive impact on these activities, since wage income may be spent on more efficient equipment.

An impact of mine employment on hunting and trapping is related to the rotational schedule, which may prevent some workers hunting or trapping in prime seasons. This impact is not expected to be severe if some changes to rotational schedules can be accommodated by the mine.

Initially, the suggested rotation should be tried, and the effects on domestic harvesting carefully monitored. If a shortage of meat which causes hardships develops, an adjustment in the length of the work period should be considered.

TRAPPERS INCENTIVE PROGRAM

978/79

Settlement	Total No. of Trappers	No. of Trappers Over $600	Total Fur Dollars	TRAPPER INCOME RANGES (in thousands of dollars								
				$600-1000	$1000-2000	$2000-3000	$3000-4000	$4000-5000	$5000-6000	$6000-7000	$7000-8000	$8000 & over
FORT SMITH REGION												
Cambridge Bay	79	38	$ 111,638.50	7	≈	6	2	2	4	–	1	2
Coppermine	156	84	320,399.60	11	27	13	3	6	6	3	6	9
Gjoa Haven	62	22	54,945.57	8	6	3	2			–	–	1
Ho man Island	5	30	74,806.00	8	11	3		3	2	1	1	–
Pelly Bay	25	10	16,950.00	2	7	1	–	–	–	–	–	–
Spence Bay	51	28	45,399.00	11	13	4	–	–	–	–	–	–
TOTALS	426	212	$ 624,138.67	47	78	30	8	12	3	≈		2

5.9 Potential Effects on Community Satisfaction

The main negative effect of Polaris Mine employment will relate to community satisfaction, particularly the separation of families.

In the Arctic coastal communities, especially the smaller communities, there is a strong attachment to the home community mainly for family reasons.

The extent of the negative impact will relate to the attitudes of the people to some degree. If, as many indicated, they want and need jobs and adequate income, they will have to assess whether the job is worth the absences from the family. At the same time, recognizing the strain caused by these separations, the Polaris Mine will have to mitigate this strain by ensuring good communications with the home community, adequate orientation for families left in the community, and efficient transportation back home after a six week work shift.

If a shortened work rotation is implemented for the people of Resolute, it is possible that a few Arctic coastal families could move to Resolute to lessen the strains of family separation, but it is unlikely that the number would be large, since most people consider their home areas to be superior hunting/fishing areas, and are not particularly interested in relocating to Resolute.

In each community there was some discussion of a townsite at the Polaris Mine. People felt this would lessen the strain on family separation. As a follow up to this discussion the interviewer asked if these people would be prepared to move to a new townsite, and the answers ranged from a flat no, to a consideration of living there for a short length of time.

The most common answer was to see how the rotation system worked for their community and then look at the question of a townsite and make a decision.

5.10 Potential Effects on Social Organization

Social organization in the Arctic Coastal communities is in a transitional phase, combining the traditional values related to the importance of hunting and trapping and the extended family, with the newly acquired materialistic values related to jobs, money and possessions. In some communities, especially Cambridge Bay, the more traditional values appear to hold a secondary position, while in more isolated communities, Holman Island, Pelly Bay, the traditional values appear to be more dominant.

As in the case of Resolute, it is expected that the southern materialistic values will become more prevalent over the years, as a result of many influences, only one of which could be Polaris Mine employment.

In the short term, the main effect anticipated by Polaris Mine employment on social organization will be on leadership roles within the community. Although elders continue to be respected in these communities, the leadership roles such as councillors, and committee chairmen are falling more to the younger people. If a large number of these people were to work at the mine there could be a shortage of leaders within the community. Or, on the other hand, new leaders could develop. However, considering the relatively small number of individuals from each community who will be Polaris Mine employees, it is not likely this will have a serious effect on the community.

5.11 Potential Effects on Job and Education Aspirations

Education and skill levels in the Arctic coastal communities are quite low. In smaller communities there is seldom a qualified tradesman resident in the community, and the number of people completing Grade 10 is low.

Although education and skill levels are improving, and will likely continue to improve, with or without the Polaris Mine, it is quite possible that the Polaris Mine could have a positive impact, since it could offer the jobs required to motivate people to complete higher levels of education or enter training programs.

At present there are few job or training opportunities within the communities. Usually opportunities which do occur require a move to a larger, regional or area centre. For Polaris employment, if the person is prepared to work on job rotation, it would be possible for him to acquire the required training, yet not have to move permanently away from his home community.

As pointed out in Chapter 4 (section 4.14) there can be negative impacts as well if people are only interested in labourers jobs and are not prepared to take the required upgrading programs, or if the training programs planned by the Polaris Mine are unsuccessful.

5.12 Potential Effects on Community Stability

To determine the effects on community stability, the study team examined three of the four indicators discussed in the Resolute chapter – alcoholism, crime, marriage breakdown. We did not examine racial tension, since it is unlikely the Polaris Mine will change the current population mix in Arctic coastal communities.

Alcoholism

Two of the six Arctic coastal communities are "dry" communities, where the people have voted to prohibit alcohol within the community. These are Gjoa Haven and Pelly Bay. Two other communities, Spence Bay and Holman Island do not appear to have serious alcohol problems at present. The final two communities, the larger communities of Coppermine and Cambridge Bay, do have alcohol problems, with Cambridge Bay having a severe alcohol problem, according to material provided in community interviews. Alcohol is available for sale only in Cambridge Bay. For other communities, (excluding the dry communities) alcohol must be ordered from Yellowknife.

It is quite likely that increases in income and related stress will mean increases in the purchase of alcohol but whether this will cause problems depends on the communities themselves. In the smaller, more stable communities, with more traditional lifestyles it is unlikely there will be severe alcohol problems. However, in the larger communities, particularly Cambridge Bay, where alcohol is already a problem, added income as well as additional stresses could increase the problem. In Cambridge Bay there could also be a problem with the mine employees who have to stop there while awaiting flights to their home communities. If these stopovers coincide with the day beer is on sale and if the stopover traffic includes "drinkers" there could be additional alcohol problems in this community caused by transients as well as residents.

At present, Cambridge Bay does not appear to recognize an alcohol problem in the community (a preliminary vote in 1979 indicated people were not prepared to have Cambridge Bay a dry community). Since the problem could worsen with Polaris, or any other project which increases community income and causes stress such as family separation, the community, in conjunction with the companies planning to use manpower resources of the community, should examine the problem and work on mitigative measures which both could implement.

As far as we know, no detailed study has been done regarding the cause of high alcohol abuse in Cambridge Bay. Possibly it could be related to the stress of moving into a wage economy, or the growth of the community as a result of the establishment of a government area service office there. Also, it could be related to the unemployment situation in the community, or as one person pointed out, the fact that people from other communities who are in fact "drinkers" move to Cambridge Bay to be near the supply.[1]

Whatever the reasons, the problem exists and will likely continue to exist with or without the Polaris Mine. Although new income into the community could heighten the problem, it could also lessen it depending on the reasons for the problem, and the actions which the local people themselves plan to take.

Personal Interviews. Cambridge Bay, 1980.

We can only conclude then that there is a possibility that the alcohol problem could be worsened in Cambridge Bay and would recommend that the problem be examined to determine possible solutions.

In Coppermine where alcohol abuse exists to a lesser degree, again it could be heightened by any additional income and stresses for the community. This is something the community in conjunction with major employers will have to cope with during the years of more movement into higher wage jobs.

Crime

The highest incidence of crime on the Arctic coast is also in Cambridge Bay, and is directly related to the alcohol problem.[2] If there is an increase in alcohol consumption and subsequent abuse, there will likely be an increase in crime.

Marriage Breakdown

As in Resolute, there will be a negative impact on marriages due to prolonged absences from home by Polaris employees. Since moving to a townsite at Polaris is not particularly popular with the Inuit people at this time, (and could cause other negative impacts) the only other way to lessen the impact appears to be to establish good communications between employees and their home communities and provide thorough orientation and ongoing counselling for wives and families left behind. At the same time adjustments to the length of the work period should be considered, if problems with marriage breakdowns occur.

Crime – Cambridge Bay

	1979	1978	1977	1976
Homicide	0	0	0	2
Sex offences	0	2	0	4
Assaults	42	55	50	42
Break and Enter	18	45	28	36
Theft – Motor Vehicle	9	10	11	16
Theft over $200	0	7	7	7
Possession of Stolen Goods	0	0	0	2
Theft under $200	23	36	31	20
Frauds	8	0	1	2
Offensive weapons	2	7	3	7
Other c.c. (i.e. breach of probation, escaping custody, etc.)	62	104	91	62
Total c.c.	164	266	222	200
Federal – drugs	1	3	6	0
– other	24	23	18	22
	25	26	24	22
Liquor Act	591	409	291	69
Other territorial	1	0	1	24
	592	409	292	93

Statistics Canada – Uniform Crime Reporting System

[2] Personal interviews, RCMP. Cambridge Bay, 1980.

Crime – **Coppermine (including Holman** Island)
RCMP Detachment located in **Coppermine**

	1979	1978	1977	1976
Homicide	2	0	0	0
Sex **offences**	2	1	0	**0**
Assaults	76	59	60	**39**
Break and Enter	14	33	25	20
Theft – Motor Vehicle	5	3	5	2
Theft over $200	9	4	3	7
Theft under $200	33	30	15	8
Possession of Stolen Goods	o	0	0	**1**
Frauds	1	4	3	**3**
Offensive weapons	12	0	1	1
Other **c.c.** (i.e. breach of probation, escaping custody, etc.)	87	85	50	42
Total **c.c.**	241	219	162	123
Federal – drugs	2	0	1	0
– other	10	33	28	9
	12	33	29	9
Liquor Act	159	130	174	65
Other territorial	12	7	6	14
	171	137	180	79

Statistics Canada – Uniform Crime Reporting System

Crime – Spence Bay, Gjoa Haven, **Pelly** Bay
Served by Spence Bay RCMP Detachment

	1979	1978	1977	1976
Sex **offences**	5	0	3	0
Assaults	16	15	13	8
Robbery	o	0	0	1
Break and Enter	13	6	16	10
Theft over $200	2	1	6	0
Theft under $200	8	22	10	1
Frauds	o	2	0	0
Offensive weapons	o	2	2	0
Other **c.c.** (i.e. breach of probation, escaping custody, etc.)	14	18	24	14
Total c.c.	58	66	74	34
Federal – drugs	o	0	2	0
– other	1	1	4	4
	1	1	6	4
Liquor Act	25	'26	39	34
Other territorial	4	28	43	12
	29	54	82	46

Statistics Canada – Uniform Crime Reporting System

'5.13 Attitudes Toward the Project

Like the people of Resolute, the Arctic coastal people feel that the Polaris Mine is going ahead whether they want it or not, so they should take advantage of it, and get as many jobs as possible.

In the job area, there was some concern that *there would not be enough jobs* at the mine for all the people who might be looking for jobs, and in the case of one community, they were concerned that a quota would be applied to each community . . ..and the quota might be too low for their community.

In most cases the communities felt there should be a resident part time **recruiter/counsellor** in their community, to ensure that people knew about available jobs, and would have access to these jobs.

In responding to questions about anticipated effects of the mine on communities, the people generally felt that it was difficult to delineate all the effects now. The prevailing attitude was to have people work there, then study the effects it would have on the family and communities.

Apart from obtaining jobs, the main concern centred around methods of getting money to families left behind in the communities.

Negative attitudes towards the mine usually centred on environmental concerns, particularly skepticism regarding the disposal of tailings.

6. Project Options and Alternative Cases

In the previous sections we examined the effects of the Polaris Mine on Resolute and the Arctic coast communities, if specified policies and programs were in place. We also examined effects if an adjustment were made to the travel policy and travel was paid to and from the mine site for potential employees from Arctic coastal communities, in addition to Coppermine and Cambridge Bay.

In this section we examine the effects of the Polaris Mine, if adjustments were made to the base Polaris plan as outlined in Chapter 2. Specifically, we examine:

Extended Recruitment Areas – If the recruiting areas were extended to other regions in the Northwest Territories, would the number of potentially successful Inuit employees increase . . . and by how many?

Shortened Work Rotation Schedule for Resolute – Would this increase the number of potentially successful candidates from Resolute and what effect would this have on the labour supply in Resolute and on community services and satisfaction?

Shortened Rotational Schedule for Arctic Coast Communities – Would there be an increase in the number of potentially successful employees from the Arctic coast communities, and how high would this increase be?

Variations in Transportation Policy – If paid travel were provided for all potential Northern employees, what would be the increase in the number of potentially successful employees?

Development of a Townsite at the Mine – Would the number of potentially successful candidates increase if a townsite were built at the mine?

Other Major Projects Proceeding in the N.W.T. – If other major projects start, will the number of Northern Polaris employees decrease?

6.1 Extended Recruitment Areas

In the employment analyses in this report we examined only the Arctic coast communities and Resolute as potential hiring areas. In this analysis we estimated the

number of potential employees from the Baffin and Keewatin Regions, considering(a) paid travel costs from Frobisher Bay only, and (b) paid travel from all communities.

To estimate the number of potentially successful employees, we applied the methodology used for each Arctic coastal community to an entire region. We also made the assumption that no other major projects are known to be going ahead at this time. As in the Arctic coast analysis, we considered only male candidates (although there could be some female candidates) and we only considered numbers for the year 1985.

To determine the number of males in the labour force in 1985, we used the N.W.T. government community population estimates and aged the population (to determine the people aged 18-50). In the Baffin region we eliminated (a) Nanisivik and Arctic Bay since it is unlikely they would work at the Polaris Mine, (b) Resolute, since potential employees from that community have been estimated in another part of the study, and (c) Sanikiluaq because of its isolated location. To this number we applied the percentage of Inuit in the region, (80 percent Baffin, 85,6 percent Keewatin) and the male percentage of the population (50.8 percent). To determine an actual number "in the labour force" we applied the Canadian male average of 78 percent.

Note: All population "figures, percentage of Inuit population in Region, and percentage of males in population were obtained from *Population Estimates, Statistical Cross Tabulations, Northwest Territories, December 31, 1978.*

Baffin Region

Population 18-50 in 1985 (via aging) less the 18-50 populations in Resolute, Nanisivik, Arctic Bay and Sanikuluaq	= 4026
x 80 percent Inuit population in region	= 3221
x 50.8 percent males	= 1636
x 78 percent participation rate	= 1276

Total of 1276 males "in the labour force" in 1985.

Keewatin Region

Population 18-50 in 1985 (via aging)	= 2262
x 85.6 percent Inuit	= 1936
x 50.8 percent male	= 984
x 78 percent participation rate	= 786

Total of 768 males "in the labour force" in 1985.

To the number of men in the labour force, we applied an interest factor to estimate how many would be interested in employment at the Polaris Mine. Since we did not visit these communities, we assessed a conservative interest factor of 10 percent (.1) for both the Baffin and Keewatin Regions

BAFFIN – 1276 in labour force x .1 interest factor	= 128 likely candidates for Polaris jobs.
KEEWATIN – 786 in labour force x .1 interest factor	= 79 likely candidates for Polaris jobs.

To determine the potentially successful candidates (ones who will continue employment for more than one year) we applied a success factor and a Polaris improvement factor (relative to Nanisivik) to the number of likely candidates. The success factor used was the 18 percent success rate for Inuit employees from Baffin communities at Nanisivik mine.[1] The improvement factor used was 1.35, the same as the one used in other analyses in this study.

	Potential Candidates	x	*Success Factor*	x	*Improvement Factor*	=	*Potentially Successful Candidates*
BAFFIN	128	x	.18	x	1.35	=	32
KEEWATIN	79	x	.18	x	1.35	=	19

In addition to those people who work more than one year at the Polaris Mine, a number will work for less than a year for varying periods. Using the Nanisivik work duration statistics and adjusting for improvement factor, we determined the man year equivalents for people who will work at the mine for less than one year:

	30% O-6 *weeks*		*25%* *7 weeks-4 months (av.-3 me.)*		*20%* 5 *months-1 year (av. 8 me.)*	÷ 12 =	*Man Year Equivalents*
BAFFIN							
number total	40	+	33	+	27		
months	40	+	99	+	216	- 12	= 30
KEEWATIN							
number total	23	+	19	+	15		
months	23	+	57	+	120	- 12	= 17

Travel Payment Adjustment

Since it is unlikely that many candidates will actually go to work at the mine if they have to pay their own transportation costs, we have further adjusted the employment figures in line with transportation policies. In the Baffin Region, since we are assuming paid transportation costs from Frobisher Bay, we are estimating that a maximum of 25 percent of potential candidates might go to work at the mine. In the case of Keewatin, where travel costs would be quite high, we estimate that only a maximum of 5 percent of the potential candidates would work at the Polaris Mine if they had to pay travel costs to hiring centres.

Using these percentages we estimated the number of potentially successful candidates under the base case (travel paid only from hiring centre of Frobisher Bay).

B. R. I. A., *Nanisivik*, p. 95

Base Case -

BAFFIN REGION		KEEWATIN REGION	
full time rotational	32 x .25 = 8	full time rotational	19 x .05 = 1
partial year rotational*	30 x .25 = 8	partial year rotational*	17 x .05 = 1
	16		2

In the alternative case we assume travel will be paid to and from all communities within the two regions.

Alternative Case

BAFFIN REGION		KEEWATIN REGION	
full time rotational	- 32	full time rotational	- 19
partial year rotational*	- 30	partial year rotational*	- 17
	62		**36**

*Figures in man-year equivalents

The effects of expanding the hiring areas are presented and summarized in the following tables. As Table 17 indicates, the alternative case involves 75 percent of the project's total employment going to Northerners (which incidently is well above the proportion used in the "high impact scenario" of Chapter 3).

TABLE 17

Potential Number of Northern Employees
Including Baffin and Keewatin Regions

BASE CASE

	1985	Increases*
Resolute		
Full time rotational	7	
Partial year rotational	3	
Cambridge and Coppermine		
Full time rotational	17	
Partial year rotational	14	
Other Arctic coast communities		
Full time rotational	4	
Partial year rotational	3	
Baffin Region		
Full time rotational	8	
Partial year rotational	8	
Keewatin Region		
Full time rotational	1	
Partial year rotational	1	
Total on Mine Site	66	+ 18
Yellowknife office		
Resolute expediter/recruiter		
Total all Northern employees		
Northern Hires		
Expressed as % of mine site positions.	26%	+ 6 %
Expressed as % of mine site jobs.	29%	+ 8 '/0
All Northern employees as % of Total Polaris staff	36%	+ 7 %

*Increases — are the additional number of potential hires if Baffin and Keewatin regions were added as hiring areas.

TABLE 18

Potential Number of Northern Employees
Including Baffin and Keewatin Regions

ALTERNATIVE CASE
(assuming paid travel to and from all N.W.T. communities)

	1985	Increases*
Resolute		
Full time rotational	**7**	
Partial year rotational	**3**	
Cambridge and Coppermine		
Full time rotational	17	
Partial year rotational	14	
Other Arctic coast communities		
Full time rotational	19	
Partial year rotational	16	
Baffin Region		
Full time rotational	32	
Partial year rotational	30	
Keewatin Region		
Full time rotational	19	
Partial year rotational	17	
Total on Mine Site	**174**	+ 98
Yellowknife office	25	
Resolute expediter/recruiter	1	
Total all Northern employees	200	+98
Northern Hires		
Expressed as % of mine site positions.	690/o	+ 38%
Expressed as % of mine site jobs.	72°10	+ 39%
All **Northern employees as % of Total Polaris staff**	**75%**	**+ 35%**

*Increases — are the additional number of potential hires if Baffin and Keewatin regions were added as hiring areas.

6.2 Shortened Rotational Schedule for Resolute

Resolute is the closest centre to the mine and the resupply centre for men and supplies. Three flights weekly will connect Resolute and the mine site. Since Resolute is closely linked to the mine and is the home community of many potential workers, an advantage which they might want, or be offered, could be a shortened work rotation, possibly three weeks at the mine followed by two weeks at home, or some other variation.

If the work rotation schedule were shortened, it is likely more residents would be interested in Polaris jobs and more people from other communities would be interested in moving to Resolute to take advantage of the shorter work rotation schedule.

Some of the possible effects of this change would be:

1) Less stress caused by family separation
2) More jobs and income to local residents
3) Improved frequency in time available for hunting, trapping
4) Additional population growth
5) Need for more housing to accommodate additional people who might move in
6) Some shortages in local labour supply, depending on how many go to work for the mine
7) Strain on wildlife around Resolute if more people move in
8) Possible increases in alcoholism and crime

If the people of Resolute are interested in a shorter work rotation, they should weigh the positive effects against the possible negative effects it could have on the community. In the next chapter we provide recommendations related to a shorter work rotation for Resolute employees at the Polaris Mine.

The number of potentially successful Polaris employees in Resolute could increase by four to six people if a shortened work rotation schedule were implemented.

Assuming that a shortened work rotation period increases the interest in Polaris employment, we have increased the Resolute interest factor for males from .46 to .6 and for females from .12 to .2. We have also assumed that the success rate would improve from .3 to .35. Using the previously described equation for estimating the number of potentially successful candidates, the shortened work rotation would produce the following results:

	# in Labour Force	x	Interest Factor	x	Success Rate	x	Improvement Factor	=	Potentially Successful Candidates
1985 M	33		.6		.35		1.35		9
F	21		.2		.35		1.35		2 11 (7)
1990 M	44		.6		.35		1.35		12
F	22		.2		.35		1.35		2 14 (9)
1995 M	52		.6		.35		1.35		15
F	24		.2		.35		1.35		2 17 (11)
2000 M	51		.6		.35		1.35		14
F	34		.2		.35		1.35		3 17 (11)

Note: Figures in brackets are the number of potentially successful candidates under the proposed 6-4 rotation system.

The number of people who could move to Resolute to take advantage of a shortened work rotation schedule will depend on the success of the 6-4 work rotation schedule, and the travel payment policies adopted for employees from these other communities.

6.3 Shortened Rotational Schedule for Other Communities

The main negative impacts anticipated as a result of the Polaris Mine relate to family separation and ability to continue resource harvesting activities. A possible way to alleviate these impacts is to adjust the work rotation schedule.

In a recent study of **Inuit employees** from North **Baffin** communities who work(ed) at the Nanisivik Mine, the author also identified the above negative impacts and concluded that the work rotation period should be adjusted from the current six weeks on the job, two weeks at home. In its place he suggested two weeks on the job, one week at home for closer communities (Arctic Bay, Pond Inlet, **Igloolik**).[1]

The Polaris Mine's work rotation plan for **Inuit** people is also based on six weeks on the job, but the time at home has been extended from two to four weeks. This extended time at home could alleviate some negative impacts related to hunting and trapping, but does not alleviate the problem of family separation. Since family separation will be a major consideration when deciding to work for the mine initially, or continuing on as a Polaris employee, we can only conclude that a reduction in the work time (the time away from home) would improve the success of hiring and retention at the mine site. With a shorter work period at the mine, (say four weeks) we would assume that the success rate would be higher, as would the initial interest in employment at the mine.

In an examination of the Arctic coastal communities, we would assess the interest factors and success rate as follows to determine employment for 1985 if the work rotation schedule were adjusted to four weeks at work, three or four weeks at home.

	Males in Labour Force	x	*Interest Factor*	×	*Success Rate*	x	*Improved Factor*	=	*Potentially Successful Candidates*
Cambridge Bay	136		.30		.25		1.35		**14**
Coppermine	141		.25		.25		1.35		12
Gjoa Haven	91		.35		.25		1.35		11
Holman Island	58		.20		.25		1.35		4
Pelly Bay	43		.40		.25		1.35		6
Spence Bay	77		.35		.25		1.35		9
									56

Notes:
1) This assumes paid travel costs for all communities.
2) All interest factors have been increased by 5 percent to reflect the shorter work period.
3) All success rates have been increased by 5 percent to reflect the shorter work period.

This reduction in the work period could increase the number of potentially successful candidates from the Arctic coastal communities by 64 percent from 36 using the 6-4 rotation system (See Chapter 5, section 5.2) to 56 using the shortened work period.

B.R.I.A., *Nanisivik*, p. 408,

A further reduction in the time at the mine site would likely cause further increases to the interest and success factors, therefore increasing the total number of potentially successful candidates.

As the number of potentially successful candidates increases, the number of partial year rotational (those who don't complete one full year – measured in man year equivalents) decreases, but overall there would appear to be a very substantial gain in the numbers employed and subsequent income, if the work rotation schedule were shortened for Arctic coastal communities.

'6.4 Variations in Transportation Policy

The present employment plan provides for paid travel from the hiring centres of Coppermine, Cambridge Bay, Yellowknife, Edmonton and Montreal. This policy will limit the number of Inuit employees who will work at the Polaris Mine, since travel costs within the Arctic coastal area are very high. If an Inuit from Pelly Bay were interested in working at Polaris Mine, it would cost him nearly $700 each work rotation to fly to and from the hiring centre of Cambridge Bay. For a potential worker from Gjoa Haven the additional travel costs would be approximately $400.

In Chapter 5.2 (Employment Impacts – Arctic Coast), we determined that the potential number of employees from that area could increase from 38 to 66 if travel were paid to and from the home community.

In a previous sensitivity analysis we examined the potential number of employees from the Baffin Region, if Frobisher Bay were a hiring centre, with transportation paid to and from that community. We concluded that having this additional hiring centre could add another 16 potential employees at the Polaris Mine.

A further analysis, which included paid travel from any community in the Keewatin and most communities in the Baffin region, showed that the number of potential Northern hires would increase dramatically.

The following chart indicates the variations in the travel payment policy and relative effects on potential Northern employees. In each case travel paid includes travel both to and from the mine.

Travel Paid from Coppermine and Cambridge Bay		= 38 employees
Add Travel Paid from all other Arctic coastal communities	+ 28	= 66 potential employees
Add Travel Paid from Frobisher Bay	+ 16	= 82 potential employees
Add Travel Paid from most Baffin communities	+ 46	= 128 potential employees
Add Travel Paid from all Keewatin communities	+ 36	= 164 potential employees

With the addition of 10 potential workers from Resolute, it is possible there could be 174 Inuit employees on the payroll at the mine site if travel costs were paid to and from all N.W.T. communities in the Arctic coast, Baffin and Keewatin.

One hundred and seventy four Inuit employees on 6-4 work rotation could fill 69 percent of the mine positions depending on the work duration of the ones who do not complete a full year. With 174 Inuit employees as an average, 72 percent of the actual payroll at the mine would be Inuit.

Subsidized travel-would not only provide additional direct jobs, but would also provide jobs through resending effects.

With base case analysis (travel paid only from Coppermine, Cambridge Bay and Yellowknife), total employment in the N.W.T. as a result of the Polaris Mine, including direct, supplier-related and re-spending effects is 128 in 1985. If travel subsidies were provided to all communities in Baffin, Keewatin and Arctic coastal regions, the total employment number would more than double from 128 to 283, and the personal income as a result of this project would also double from 4.5 million to 9.1 million. (See Exhibit G).

If travel costs were paid to and from home communities for all Northern hires, total travel costs for mine staff would increase as the percentage of Northern staff increases.

Assuming that the average air fare for a Southern hire is $550 and the average fare for a Northern hire is the same (Cambridge Bay $200, Pelly Bay $880) travel costs, using regular scheduled service would increase as follows:

% of Northern Hires on staff	# of on site jobs	x	Average travel cost	x	Annual # of rotations	=	Annual Expenditures
20%	North 50	x	$550	x	5	=	$137,500
	South 178	x	$550	x	3	=	293,700
							$431,200
40%	North 101	x	$550	x	5	=	$277,750
	South 133	x	$550	x	3	=	219,450
							$497,200
60%	North 151	x	$550	x	5	=	$415,250
	South 89	x	$550	x	3	=	146,850
							$562,100
80%	North 202	x	$550	x	5	=	$555,500
	South 44	x	$550	x	3	=	72.600
							$628,100

Note: Since some of the Northern hires are expected to be from Resolute, there will be a reduction of $2750 (5 x $550) from the annual expenditure for Northern hires, for each Resolute resident who works at the mine.

The increase in travel costs could be as high as $200,000 annually, if fares were paid to home communities for all Northern hires and if 80 percent of the positions were filled by Northern hires. This assumes use of regular scheduled air service. An analysis of the use of chartered air service for transporting Northern hires has not been done; however, it is possible that costs could be reduced through the use of chartered aircraft. Also, charter service could provide more efficient transportation home for employees from communities which are not on direct air routes.

EXHIBIT G

Community Distribution of Polaris Impacts in 1986
(including the **Baffin** and Keewatin Regions)

ALTERNATIVE CASE

TOTAL **N.W.T.** IMPACTS

Employment		Personal Income	**($'000)**
Direct:	200	Direct:	6410
Supplier related:	31	Supplier related:	1122
Resending:	52	Resending:	1629
Total:	283	Total:	9161

RESOLUTE IMPACTS		COPPERMINE & CAMBRIDGE BAY		OTHER COASTAL ARCTIC		YELLOWKNIFE, ETC.		BAFFIN & KEEWATIN REGIONS	
Employment		**Employment**		**Employment**		**Employment**		**Employment**	
Direct:	11	Direct:	31	Direct:	35	Direct:	25	Direct:	98
Supplier related:	8	Supplier related:	–	Supplier related:	–	Supplier related:	23	Supplier related:	–
Resending:	3	Resending:	7	Resending:	8	Resending:	12	Resending:	22
Total:	22	Total:	38	Total:	43	Total:	60	Total:	120
Personal Income ($ '000)		**Personal** Income 4$ '000)		**Personal Income ($ '000)**		**Personal Income ($ '000)**		**Personal Income ($ '000)**	
Direct:	332	Direct:	906	Direct:	1023	Direct:	1284	Direct:	2865
Supplier related:	288	Supplier related:	–	Supplier related:	–	Supplier related:	834	Supplier related:	–
Responding:	81	Resending:	163	Resending:	184	Resending:	424	Resending	777
Total:	701	Total:	1069	Total:	1207	Total:	2542	Total:	3642

N.B. Some totals may not add due to rounding.

6.5 Development of a Townsite at the Mine

There are no plans to develop a townsite at the Polaris Mine, but as discussed in a previous section, family separation will likely be a major negative impact of the Polaris Mine on communities surveyed. One possible way to alleviate this impact would be to develop a townsite at the mine and move employees to the town on a permanent basis.

Although a townsite could reduce the family separation impact, many other effects of a townsite must be considered. First, although it would reduce the negative impacts of immediate family separation, it would increase the impacts of separation from the extended family, which includes parents, grandparents and other relatives. Since all these people would not be moving to the site, a certain amount of loneliness/separation would occur, which could ultimately lead to the employee giving up employment at the mine and moving his family back to his home community.

Next to family, resource harvesting, (hunting, trapping and fishing) is one of the most important facets of Inuit life. The area around the mine site is not considered a prime hunting/trapping area, and possibly could not meet the expectations of the people who move there. In addition, use of this area by a new population could interfere with the harvests of the traditional users, the people of Resolute. If a townsite were established there, it is likely some resource harvesting restrictions would have to be implemented.

A new townsite could also cause some social problems which would have to be carefully examined. In addition to separation from the extended family, the new residents of such a townsite, would have to adjust to living among "strangers" (i.e. the people of the coastal Arctic have few family ties with the people of the North Baffin. and indeed speak a different dialect) and coping with the stresses of a new lifestyle. This could lead to a number of problems, unless a good integration program was set up in advance.

In community visits, the townsite idea was frequently raised. At the same time, people voiced a strong attachment to their home communities and were not prepared to make a commitment to a permanent move to a townsite; (some, however, said they would move there for limited periods of time.) The townsite is generally viewed only as a means to avoid family separation, without considering other aspects such as hunting and trapping or separation from other members of the family and friends who stay behind in the home community.

The expense of a townsite is another consideration. Although Cominco would recognize substantial savings each year (estimated annual rotational expenses projected at $888,000 in 1979 dollars) [1] the cost of a townsite has not been determined, and it is not known if it would exceed total rotational expenses during the lifetime of the mine. At the same time, there would be substantial cost to the government in the development and maintenance of the required infrastructure and services for the community (i.e. settlement council, school, nursing station, etc.)

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[1] Cominco Budget, Polaris Project, 1980.

The people of Resolute although concerned about the growth of their community because of the mine, also expressed some concern that the population would dwindle if a townsite were established at the Polaris Mine. A further-reduction in the population of Resolute (which was initially designed for a much larger population) could have adverse effects on that community and its services, i.e. school closing, not enough people left in Resolute to carry out routine work such as garbage collection, etc.

In our analysis of the comments of people in Resolute and other Arctic coastal communities, we do not envision an increase in the potential number of Polaris employees if a townsite were established. Initially more people might go to work at the mine if they could bring their family with them, but once they begin to compare hunting with their home area (particularly caribou hunting) and start to miss relatives in the home community or area, it is likely they would return home.

6.6 Other Major Projects Proceeding in the N.W.T.

All employment projections in this report are based on a scenario where no other major projects are going ahead and current ones, i.e. Dome Canmar, are operating at the same level of activity.

At this time it is impossible to predict if and when other major projects will start. What is known for certain, is that during the construction phases of projects such as the Arctic Pilot project, Polar Gas pipeline, there will be many jobs available for the Inuit. Many will probably be of an unskilled or semi skilled nature.[1]

This will no doubt cause a severe strain on the labour force, particularly in the more immediate areas of these projects.

The effect of these projects on Polaris employment will relate closely to their timing. If nothing starts until 1985, the Polaris Mine could have an established, skilled Inuit work force, if Cominco's training programs are successful. Depending on the work experience at the mine and the salary levels, the existing work force may be prepared to continue at the mine in full time positions. On the other hand, if positions open in or close to home communities of Polaris employees (i.e. Cambridge Bay or Coppermine for Polar Gas employment if they proceed with their current suggested routing) and involve shorter or no work rotation programs, they could opt for a job closer to home.

However, if projects go ahead in the next few years, there could be a scramble among the companies to recruit Inuit. Likely some Inuit will choose short term construction jobs, while others will prefer full time jobs. Influencing the choice, in addition to proximity to home, will be wages, work schedules, skill requirements, training programs, to name only a few.

In general we would estimate a reduction in the number of Northern hires at Polaris if a major project went ahead. Skilled Inuit, particularly tradesmen, could be the most likely people to be lost, since they would be in high demand. The hiring and retention of employees by the Polaris Mine in light of other projects going ahead, will depend on its ability to provide competitive and satisfactory jobs, which fill the needs and desires of the Inuit people.

Arctic Pi/of Project, III, pp. 13.14

7 Recommendations

The Polaris Mine will provide up to 162 jobs and $3.5 million in wage income to Northwest Territories residents once it is in full operation in 1986. More than half of these jobs could be filled by inuit residents of Resolute and the Arctic coast communities.

The Inuit want wage employment and are interested in jobs at the Polaris mine.[1] They recognize a need for money to support their families and carry on traditional resource harvesting activities. At the same time, Inuit do not want to be separated from their families nor do they want to give up their traditional activities.

The major problem in matching available jobs to Inuit who wish jobs, is the geographical distance between communities and the mine. How can the Inuit maintain family relationships and traditional lifestyles when jobs are far from communities and involve extended periods of time away from home?

There are a number of possible solutions to this problem:

1. Build a townsite at the mine
2. Develop a work rotation system which more closely meets the needs of the people
3. Develop a nearby community such as Resolute as a dormitory town, with employees able to return home on the weekends.

Since family separation appears to be the main negative impact of employment at the Polaris Mine, we have dealt with this problem in detail in our recommendations, weighing the pros and cons of each of the above options. We conclude that in the short term there is no apparent solution to the problem, although a number of mitigative measures will lessen negative impacts related to mine employment. In the long term, we expect that the combined experience of the Inuit and Cominco will lead to a solution agreeable to both groups.

RECOMMENDATION 1

A townsite should not be established at Polaris Mine at this time

The main function of a townsite at the Polaris Mine would be to lessen the impacts of family separation caused by long periods away from the family while employed by Polaris. Employees could move to the new town with their wives and children, but parents, grandparents and relatives would be left behind in the home communities far from the site. Since the Inuit conception of family is that of the extended family, it

[1] Interviews, March 1980.

. is likely that moving to the mine site would only partially alleviate the problems of family separation. This would appear to create the additional problem of turnover when families decide to return to relatives, home communities and better hunting areas.

Hunting and trapping activites are considered very important by the Inuit. Living at a Polaris townsite could cause several negative impacts on these activites. First of all, the wildlife resource, particularly caribou, is in limited supply in the vicinity Of the mine site. For successful hunting the new townsite residents would have to travel great distances, usually to areas south of the mine. If Polaris employees pursued these activities, they would be using areas currently used by Resolute Inuit, and this could have a negative impact on Resolute harvests. A townsite could mean that Inuit workers must limit their hunting activities, which goes against the expressed desires of Inuit who were interviewed.

The idea of a townsite poses a number of questions:

1. What happens to the townsite once the project has ended? Are the people simply moved out and the town dismantled? And if so, where do these people go?
2. Could a new townsite deplete the population of some existing communities, e.g. Resolute Bay, leaving semi-ghost towns with expensive infrastructure and services in place?
3. Can the government afford to service another community in the N.W.T. when there are already many small communities with established services and infrastructure?

A townsite would be costly, not only for Cominco (although it would be offset to some degree by a reduction in annual travel costs) but also for the governments of the Northwest Territories and Canada who would be expected to provide services such as schools and nursing stations. The government may well prefer to spend amounts required for a new community on rotation travel expenses for Inuit employees working at Polaris.

Rather than a townsite, the study team recommends that work rotation schedules be adjusted if the impacts of family separation are having negative effects on the hiring and retention of Inuit people.

If altered work rotations are not sufficient to alleviate the problem, only then should a townsite be considered. At that time, employees and the mine should be made fully aware of the impacts this new townsite may have on resource harvesting activities.

Another possible alternative to a townsite if altered work rotation does not alleviate the problem of family separation, could be the development of Resolute as a Polaris Mine dormitory town. The study team has not investigated this option in detail, since interview data both in Resolute and the other Arctic coastal communities did not appear to favour such a move at this time.

RECOMMENDATION 2

Work rotation schedules for Inuit should be closely monitored and adjustments made where possible

Family separation will be the main negative impact of rotational employment at

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B. R.I.A. *Nanisivik*, p. *394.*

Polaris Mine. This was also identified as a main negative impact in the case of Nanisivik mine workers.[1] Although a shortened work rotation period (as suggested for Nanisivik employees from North Baffin communities) could make mine employment more attractive and increase the length of employment, few people interviewed for this study expressed dissatisfaction with the planned six weeks on site, four weeks at home (6-4) rotation. From some comments, it appears this acceptance was based on short term (several years) employment at the mine, rather than long term employment.

It should be noted that a shortened work rotation schedule could have its costs:

1. **Fewer Inuit progressing to higher positions at the mine**
   To obtain the required training, hence advancement to higher positions, a minimum number of training weeks per year is required. The availability of training and promotions should be a major consideration in any adjustments to work rotation schedules.

2. Increased transportation costs
   Since most potential Northern employees could be coming from communities quite far from the mine, transportation costs will be high. Shortening the work rotation period will increase these costs. If the individual pays part of the costs, this means an increase in the employee's expenses; if Cominco pays the costs, this could necessitate cutbacks in other programs. This may also create a tendency in mine management to hire more Southern labour who work longer rotations and are therefore less expensive to employ.

3. Travel difficulties
   Weather, distance and airline schedules are ongoing considerations in Northern travel. If the work rotation schedule were shortened dramatically to two weeks on site, one week at home, it is likely a large part of the time off could be spent in transit, with the time at home actually quite brief.

Considering the above, we make the following recommendations for work rotation schedules:

1. Start with the planned 6-4 rotation for Arctic coastal communities. Provide good transportation service to home communities and monitor the program closely during the first year or two of operation.

2. For Resolute employees, provide the option of a shortened work rotation period, possibly three weeks on site, two weeks at home. Since Resolute is quite close to the mine and is considered a day's trip by locals, this shortened work rotation period could reduce the number of family visitors to the site and eliminate possible accidents enroute. In adjusting the work rotation period for Resolute, consider training requirements so Resolute people can progress within the mine system.

   A shortened work rotation program could attract people to move to Resolute to take advantage of this schedule. For this reason, Cominco should be prepared to consider staff housing in Resolute. This housing could be made available only to employees who have completed at least one full year's employment at the mine site.[1]

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[1] Establishment of staff housing in Resolute and a move of employees to Resolute would require consultation with and the approval of the Resolute settlement council,

3. If after testing the 6-4 rotation for several years, it proves unsatisfactory, alternates offered the people in Arctic coastal communities could be:

a) A shortened work rotation. We would suggest four weeks at the mine, plus four weeks at home, with one double work shift of eight weeks per year, to ensure that required training needs and adequate income are provided. Although this could be more expensive in the short term, a reduction in staff turnover could make this shortened work rotation more cost efficient in the long term.

b) A move to Resolute Bay to be nearer the mine and take advantage of shortened work rotation options available to Resolute employees. In this case, housing should be provided in Resolute by Cominco, for employees interested in long term employment at the mine. This in essence could make Resolute a dormitory community for the mine, and would require advance planning by Cominco, the community and governments, if this alternative proved the most successful solution to the family separation problem.

COMMENDATION 3

A system of paid or subsidized transportation costs should be developed for all Polaris Mine employees from the Northwest Territories

The current base case provides paid travel costs from the hiring centres of Cambridge Bay, Coppermine and Yellowknife.

Under the base case, it is unlikely there will be many interested applicants from other Arctic communities since high air transportation costs would negate any positive effects realized through Polaris employment. For this reason we recommend a broader travel payment policy.

Since paid travel costs for all potential N.W.T. employees would be costly, we suggest the development of a program whereby these costs are shared by Cominco and the government, for individuals outside the set hiring centres. The actual terms of such an arrangement would have to be worked out between the government and Cominco. The arrangement would presumably be based on an evaluation of both the net additional costs to Cominco (after considering effects on transportation costs, wages and productivity) and the economic and social impacts on N.W.T. communities and the N.W.T. as a whole.

In the transportation area, we also recommend that travel funds be applied to charter air service to ensure that employees whose home communities are far from hiring centres are able to return home with minimum delays enroute. Such delays could detract from continuing mine employment.

RECOMMENDATION 4

The Polaris **administrative/operating office should be located in Yellowknife**

In the Cominco *Polaris Mine Project Summary Report, July 1979,* the suggested location for the Polaris administrative/operating office is Yellowknife. This office would also house the mine's senior staff (those who will work on rotation at the site for 31 weeks each year). In our assessment of the impacts of the Polaris Mine on the N.W.T. economy, we determined that much of the economic benefit to the North from this project (up to 50 percent) would result from the Yellowknife office location. For this reason, we strongly recommend that the office be located in Yellowknife.

RECOMMENDATION 5

Cominco should implement a Northern purchase policy for the operation of the Polaris Mine

Cominco has stated it will give preference to Northern businesses in the supply of goods and services during operations if prices are competitive. We recommend that **Cominco** define this preference and make the following suggestions for their consideration:

1. If cost differences are less than 5 percent, award the contract to a Northern company.
2. Develop a list of all potential Northern suppliers and encourage these suppliers through prior notification or long time lead time in contract tenders. Regular publication of a newsletter outlining future contract opportunities would assist this process.
3. In cases where several Northern firms are available for certain types of jobs, identify the jobs which can be handled by these Northern firms and tender them first in the North. Subsequent tenders can be used as a form of measurement, if Northern tenders appear to be exceptionally high.
4. Work closely with Northern businesses to explain tenders and ensure they have the proper understanding of the job.
5. Provide backup financial assistance. such as letters of intent, to Northern contractors who may require this assistance to borrow needed capital.

RECOMMENDATION 6

Government's small business development policies should take into account the requirements of proposed major resource development projects.

Many of the supplies and services the Polaris Mine will require are simply not available in the Northwest Territories. This situation will re-occur as other major projects start.

In some cases these services could be provided in the North, as the market for these services strengthens and expands. In line with these future requirements, N.W.T. small business development (particularly government funded programs) should be geared to developing support services for resource projects.

To identify prospects, large corporations operating in the North should meet together to discuss their needs (i.e. catering, food wholesaling, repair and administrative services) and outline the commitments they would be prepared to make to Northern business if such services were developed in the Northwest Territories.

This could ensure spinoff effects from Polaris and other major projects in the form of jobs, income and profits to Northerners and Northern businesses.

RECOMMENDATION 7

Recruitment and training programs should be given high priority in all Polaris project planning and operations

As the population in southern Canada ages and the baby boom's effects on the labour force come to an end, companies like Cominco will have growing difficulties in recruiting rotational skilled labour in southern Canada. These difficulties will increase during the decade and could become acute by the end of the 1980s. This situation will be further aggravated by the increasing employment opportunities in the resource industries in western Canada and growing concerns among many Canadians regarding increased immigration into Canada. .

Viewed in this light, special expenditures on the recruitment and training of Northerners now, can be seen as a necessary investment in the future. To ensure that recruitment and training benefit Northerners we make the following recommendations:

1. Cominco should establish goals for the employment, retention and promotion of native people and develop programs to meet these goals. (Note that there is a difference between goals and inflexible quotas). In line with this, the company should employ a co-ordinator for native recruitment/training.

2. There should be a full time recruiter/counsellor/liaison person in Resolute and part time recruiters/counsellors resident in other communities in the Arctic coastal hiring area.

3. Cominco should work with the appropriate government agencies to set up and provide necessary training programs in home communities, or communities within the home region. If a prerequisite for a training program is attendance at an educational institution (i.e. AVTC) the government should consider providing this course nearer to home. The Inuit show a reluctance to attend courses in Fort Smith, and possibly could be more successful, if such courses were arranged in their home areas.

In addition to these overview recommendations, a number of other specific recommendations are provided in the sections dealing with potential impacts on Resolute, and potential impacts on Arctic coastal communities. Following is a summary of these recommendations:

1. Cominco should establish an office within the village section of Resolute and should staff it with a local person if possible. This person should be on staff at least six months before the mine starts operation.

2. Priority in hiring and training programs should be given to Inuit residents of Resolute who are interested in Polaris jobs. Resolute residents should also be given priority in seasonal hiring related to ship loading and unloading.

3. The Cominco employee in Resolute should monitor the employment situation to ensure that the hiring of Resolute residents does not create negative effects on the provision of local services.

4. Resolute businesses should be given priority in the awarding of contracts for mine services which can be provided by local companies.

5. The Government or the Inuit Development Corporation should examine needed services which could be provided locally and attempt to match these needs with services people are interested in providing.

6. To ensure that Resolute residents, other than those on rotational employment are able to get seats on planes out of Resolute, a certain number of seats should be reserved for residents on each flight, to be released 10 to 12 hours before flight time.

7. To accommodate any larger than anticipated number of people who move to Resolute during the construction or early operation phase, territorial government staff housing should be made available on temporary loan to the local housing association.

8. Housing needs should be carefully monitored by the local housing association to determine if more housing is needed through the operational stage, and to plan for this need, in conjunction with Cominco and the N.W.T. Housing Corporation.

9. In government's future planning, the Department of Education should consider the expansion of the school in Resolute.

10. Flexibility in the work rotation system should be considered to allow for spring hunting.

11. If the Resolute population grows, wildlife populations, particularly caribou should be closely monitored to ensure over-harvesting does not deplete the supply.

12. A shortened work rotation schedule should be considered for Resolute residents. At the same time, a Resolute residency requirement (i.e. two years) should be applied by Polaris, to dissuade people from moving en masse to take advantage of the shortened rotation.

13. Cominco orientation programs for southern workers should extend beyond the work environment and ensure that southern workers are sensitive to the Inuit community environment as well, to properly prepare them for stop-overs in Resolute.

14. To ease the strain of family separation, an orientation program should be conducted for wives-of Polaris workers and an employee benefit to be considered is one free telephone call home per week, of limited duration.

15. Cominco training programs and personnel policies should be monitored on an ongoing basis, to measure job satisfaction levels and progress among Inuit employees.

16. There should be a strong and sustained effort on the part of Cominco to enable people to move to higher level jobs over time.

17. A part time recruiter/counsellor should be hired in each Arctic coastal community interested in Polaris employment.

18. Cominco should maintain contact with the Resolute RCMP and settlement officials to monitor any potential incidents arising from "pass through" traffic, and if problems arise, should be prepared to develop the required personnel policies for Polaris employees overnighting in Resolute.

19. The full time Polaris employee in Resolute should be involved with the settlement's alcohol committee in order to be aware of and work with the committee on any alcohol problems which may arise related to the Mine.

20. Cominco should have a program of school visits to provide career counseling related to possible Polaris positions for Northerners.

Appendices

Field Interviews – Resolute

Appendix 1-A

Resolute Residents

Minnie Allakariallak
Mary Amarualik
Simeonie Amarualik
Ekaksak Amarualik
Noah Idlout
Carmen Idlout
Martha Idlout
Sampson Idlout
Herodier Kalluk
Sam Killiktee
Philip Manik
Tony Manik
Levi Nungaq
Minnie Nungaq
Ludy Pudluk
Allie Salluviniq
Susan Salluviniq
Daniel Salluviniq
David Salluviniq
Louisa Salluviniq

Resolute – N.W.T. Gov't

Bruce Beattie – field services officer
Lionel Dobson – DPW supervisor
Noel McDermitt – School Principal
*Aleesak Ekalook — Settlement Secty-Mgr.

Federal Government

Cpl. Wilson MacLennan, RCMP
Kay Semple, Nurse, Dept. of Health & Welfare
Jean Matheson, Nurse, Dept. of Health & Welfare
Fred Alt, Polar Shelf
George Hobson, Polar Shelf

Businesses

Dale Williard, Co-op Manager
Tom Frook, Kenn Borek Air
James Silversides, Bradley Air
Eugene Blake, Hudson Bay Co.
John Goodman, Tower Arctic
Manager, Imperial Oil
Ed Landry, Arctic Resources
Tom Wallace, Narwhal
Bank Manager, CIBC

*This was a very brief interview since she was preparing to leave town the next day.

Field interviews – Arctic Coast Communities

Appendix 1-B

Cambridge Bay

A. Guissert, general manager, co-op
Manager, Fred Ross & Associates
Paul Laserich, Manager, Kingmik Services
Jack Sacha, Hotel Manager
Roger Connolly, Area Economic Development supervisor, Gov't of N.W.T.
Roger Jones, Area Local Government supervisor, Gov't of N.W.T.
Steve O'Neill, social worker
RCMP (officer in charge)
Mrs. Connolly, nurse in charge of Cambridge Bay nursing station
Don Boxer. Area Wildlife Officer

Spence Bay

Spence Bay Council
Ernie Lyall, wildlife officer
Hudson Bay Co. manager
Adult educator
Co-op Manager

Gjoa Haven

Wendy Nixon – N.W.T. Gov't field service officer
Randy Bergen – Settlement secretary manager
George Porter – Department of Public Works, Gov't of N.W.T.
Adult Educator

Pelly Bay

Hamlet Council
John Nungarq – Hamlet secretary manager
Several individuals who came to ask about jobs at Little Cornwallis Island

Material Reviewed - **Appendix 2**

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Northwest Territories Statistical Profile, (Interim Publication) Dept. of Economic Development and Tourism, Government of the Northwest Territories, 1979.

Social/Economic/Cultural Review Sub Committee, *An Assessment of the Social, Cultural and Economic Impact of Dome/CanMar's Drilling Activities, 1977. 1978.*

Detailed Construction Schedule **Appendix 3**

CONSTRUCTION SITE MANPOWER PROJECTION CHART*

Date end of	**Activity**	**Projected Manpower Requirements**
March 1980	on-site work — to prepare camp, communications, generators, ice strip, soil testing	25
April 1980	upgrade airstrip, continue above site preparation work	55
May 1980	water and fuel tank foundation work, airstrip, plus further site preparation work including temporary unloading dock	60
June 1980	roads, ditches, pipeline right of way, erect fuel tank earthwork, foundation for accommodation	60
July 1980	roads, ditches continue, earthwork, foundation for (accomm.) continues, laydown area continues, prepare site for temporary accommodation	60
August 1980	roads, ditches, pipeline system con'd, boat unloading starts August 16, earthwork foundation for accommodation continues	60
September 1980	freshwater pumphouse, harbour causeway, foundation continues, ace. work starts on perm. accommodation, batch plant, emergency generators	160
October 1980	erect water tank, freshwater pumphouse, pipeline, causeway con'd, communication, foundations, accommodation, erect permanent accommodation, mining work starts	
November 1980	freshwater pumps, pipeline, communication, earthwork for concentrate storage and loadout, foundation construction work on accommodation unit, mining	158
December 1980	water pipeline work con'd, communication, earthwork for concentrate storage, accommodation construction. mining	105
January 1981	pipeline, excavate barge beaching, foundation for concentrate storage building, erect permanent accommodation, mining	240
February 1981	drive piles for harbour facilities, excavate barge beaching foundation for concentrate storage building, start erecting concentrate storage building, erect permanent accommodation, mining	260

Construction Site Manpower Projection Chart*

Date end of	Activity	Projected Manpower Requirements
March 1981	sewage system piping, drive piles for harhour facilities, fill piles, excavate barge beaching, erect concentrate storage building, concentrate storage lighting, permanent accommodation, continued, mining	260
April 1981	fill harbour facility piles, excavate barge beaching, erect concentrate storage, building, erect permament accommodation, mining	260
May 1981	fill piles, harbour facilities, upgrade and construct airstrip, steam cleaning facilities; excavate barge beaching, erect concentrate storage building; permanent accommodation con'd, mining	260
June 1981	yard lighting and power lines, steam cleaning facilities, support steel concrete for primary crushers and coarse ore handling, instrumentation systems, concrete storage building, concentrate storage lighting, permanent accommodation, mining	260
July 1981	yard lighting and power lines, causeway, support steel for crushers etc., lighting electrical for crushers, coarse ore handling, foundation for concentrate storage building lighting, concentrate storage, power and control, erect conveyors, in concentrate storage building, permanent accommodation continued, mining	258
August 1981	yard lighting and power lines, causeway, primary crushers and coarse ore handling, support steel, crushing equipment and u/g conveyors, u/g lighting, electrical, concentrate storage power and control, foundation for ship loading and loadout conveyor, conveyors in concentrate storage building, mining concentrate areas	230
September 1981	causeway, fuel oil piping and pumps, primary crushers and coarse ore handling work, barge beaching and back fill: concentrate storage and loadout work, mining, tailings disposal system	190

[redacted] Site Manpower projection Chart*

[redacted]	Activity	Projected Manpower Requirements
[redacted]	causeway, fuel oil piping and pumps, primary crushers, coarse ore handling work, barge beaching and back fill, erect bridge to barge, connect power and services to concentrate storage and loadout, mining	130
[redacted]	tailings disposal system, primary crushers, finish connecting concentrate power and services, shiploader and conveyors for concentrate storage, testing soil, mining	90
[redacted]	finish tailings disposal pipelines, shiploader and loadout conveyors, testing, mining	20
[redacted]	start up with minor work left on shiploaders and conveyors	

[redacted] — [redacted]tel Progress Report, March 1980.

— Potential Construction Contracts for Northern Companies

Appendix 4

Tenders
Polaris Project (Arvik Mine)

Andy Easton of
Bechtel Canada Limited,
the prime contractor
for Cominco's Polaris Project

will be available in Yellowknife and Frobisher Bay towards the end of March to explain opportunities for northern contractors and invite tenders for parts of the project:

1. Permanent dock construction, approx. 200,000 yds. of fill, April - Sept. 1981
2. Excavations. Concentrate storage building, approx. 400,000 cu. yds. cut. 15,000 cu. yds. fill, Oct. - Dec. 1980
3. Barge Beaching Area, approx. 118,000 cu. yds. cut, Jan. - May 1981
4. Water Line and Tailing Line Sleepers, approx. 2,000 sleepers. Sept. 1980- mid summer 1981.
5. Backfill, Barge Beaching Area. approx. 25.000 cu. yds., Sept. 1981
6. Piping — Install one fresh water and two tailings pipelines. approx. 10,OOO li. ft. plastic pipe
7. Foundations. concrete and rebar for permanent accommodations, starting Immediately, Aug. 1980. approx. 200 cu. yds. concrete: 30.000 cu. yds. earthworks
8. Yard lighting, approx. 80 poles. 15,000 li. ft. cable. June- July 1981
9. Concentrate storage building, electrical, approx. 5.000 li. ft. cable, July - Sept. 1981.
10. Underground power and control, install major electrical equipment, approx. 20.000 li. ft. cable, Aug. - Oct. 1981
11. Operate and maintain aggregate screening plant. starting April 1980 for 15 months
12. Install freshwater pumphouse and pumps. two 800 GPM pumps. approx. 20.000 cu. yds. earthworks. Oct. - Nov. 1980
13. Erect underground crusher and conveyor, Aug. - Oct. 1981
14 Erect Reclaim feeders and chutes. Aug. . Sept. 1981
15. Erect conveyors, Concentrate load-out, July - Sept. 1981
16 Foundations. Concentrate storage building. approx. 1,000 tons steel. Jan. - Feb. 1981
17 Erect shiploader and load-out svstem. Oct. 1981 Jan.. 1982.
18 Miscellaneous other packages

Contact: Andy Easton
c/o Explorer Hotel. Yellowknife
March **19.20.21 (403) 873.3531, or**
c/o Frobisher Inn,
March 25 (819) 979.5241

BECHTEL

Northern newspaper ad — March, 1980

Labour Force Statistics

Appendix 5-A

RESOLUTE INUIT POPULATION OF LABOR FORCE AGE
1580-2000

	1980			1985			1990			1995			2000			
	M.	F.	T	M.	F.	T	M.	F.	T	M.	F.	T	M.	F.	T	
[illegible]	3	5	8	2	2	4	3	1	4	4	–	4	1	2	3	*
[illegible]	3	1	4	2	5	7	2	1	3	2	1	3	2	1	3	*
[illegible]	3	–	3	2	1	3	4	1	5	1	2	3	1	2	3	*
[illegible]	1	3	4	3	2	5	3	3	6	2	4	6	1	2	3	
[illegible]	1	1	2	–	2	2	–	–	–	1	1	2	–	6	6	
[illegible]	–	1	1	3	5	8	2	2	4	3	1	4	4	–	4	
[illegible]	–	2	2	3	1	4	2	5	7	2	1	3	2	1	3	
[illegible]	–	–	–	3	–	3	2	1	3	4	1	5	1	2	3	
[illegible]	–	3	3	1	3	4	3	2	5	3	3	6	2	4	6	
[illegible]	4	1	5	1	1	2	–	2	2	–	–	–	1	1	2	
[illegible]	–	3	3	–	1	1	3	5	8	2	2	4	3	1	4	
[illegible]	1	2	3	–	2	2	3	1	4	2	5	7	2	1	3	
[illegible]	–	1	1	–	–	–	3	–	3	2	1	3	4	1	5	
[illegible]	2	1	3	–	3	3	1	3	4	3	2	5	3	3	6	
[illegible]	–	–	–	4	1	5	1	1	2	–	2	2	–	–	–	
[illegible]	1	–	1	–	3	3	–	1	1	3	5	8	2	2	4	
[illegible]	1	–	1	1	2	3	–	2	2	3	1	4	2	5	7	
[illegible]	1	1	2	–	1	1	–	–	–	3	–	3	2	1	3	
[illegible]	–	–	–	2	1	3	–	3	3	1	3	4	3	2	5	
[illegible]	1	1	2	–	–	–	4	1	5	1	1	2	–	2	2	
[illegible]	–	–	–	1	–	1	–	3	3	–	1	1	3	5	8	
[illegible]	–	–	–	1	–	1	1	2	3	–	2	2	3	1	4	
[illegible]	1	2	3	1	1	2	–	1	1	–	–	–	3	–	3	

Labour Force Statistics **Appendix 5-B**

NUMBER OF PEOPLE IN LABOR FORCE - RESOLUTE

Age	1980 M	F	T	1985 M	F	T	1990 M	F	T	1995 M	F	T	2000 M	F	T
18	3	3	6	2	2	4	3	1	4	4		4	1	2	3
19	3		3	2	2	4	2	0	2	2	1	3	1	2	3
20	3		3	2	1	3	4	0	4	1	1	2	1	2	3
21	1	1	2	3		3	3	1	4	2	2	4	1	1	2
22	1		1							1	0	1		3	3
23		1	1	3	3	6	2	2	4	3	1	4	4		4
24		2	2	3		3	2	2	4	2	0	2	2	1	3
25				3		3	2	1	3	4	0	4	1	1	2
26		2	2	1	1	2	3		3	3	1	4	2	2	4
27	4		4	1		1						-	1	0	1
28		2	2		1	1	3	3	6	2	2	4	3	1	4
29	1	1	2		2	2	3		3	2	2	4	2		2
30		1	1				3		3	2	1	3	4	0	4
31	2		2		2	2	1	1	2	3		3	3	1	4
32				4		4	1		1						
33	1		1		2	2		1	1	3	3	6	2	2	4
34	1		1	1	1	2		2	2	3		3	2	1	3
35	1		1		1	1				3		3	2	1	3
36				2		2		2	2	1	1	2	3		3
37	1		1				4		4	1		1			
38				1		1		2	2		1	1	3	3	6
39				1		1	1	1	2		2	2	3		3
40	1	2	3	1		1		1	1				3		3
41							2		2		2	2	1	1	2
42				1		1				4		4	1		1
43	1		1				1		1		2	2		1	1
44							1		1	1	1	2		2	2
45		1	1	1	2	3	1		1		1	1			
46										2		2		2	2
47	1		1				1		1				4		4
48				1		1				1		1		2	2
49	1		1							1		1	1	1	2
50					1	1	1	?	3	1		1		1	1
TOTALS	26	16	42	33	21	54	44	22	66	52	24	76	51	34	85

Notes: 1) All males are counted in work force as they turn 18
2) Adjustment in number of females over 18 coming into labour force - based on current mothers with small children figures.
3) No in- or out-migration considered

Appendix 6

Summary of Responses – Resolute Questionnaire Interviews

Resolute Bay, March 15-26, 1980

Do you like living in Resolute?

Yes 7 **No 2** Indifferent (Sometimes) 8

What's good about living in Resolute? – Why do you like it?

1. My job
2. Seeing the people I know
3. Know the country well for hunting
4. It's my home town – I was born here and grew up here
5. Home to me – grew up here
6. Having my parents closeby
7. Close to family, friends, enjoy the quiet life
8. You get used to living here. The hunting's good. Meet people passing through (one of the original residents from Pond Inlet)
9. Family ties established in Resolute. Has to like it because government told them to move there.
10. Not too many good things about Resolute, but a good place to raise kids. Likes the quiet aspect, and the fact that there are not too many gossips.
11. Easier to earn a living here.
12. Like it because it's nice and small. Also he grew up in Resolute.
13. Like it because he lived in Resolute most of his life.
14. Family and friends here. It's a challenge living in Resolute with storms, etc.
15. Resolute is okay because he can get a job in Resolute now that he can't hunt and trap anymore.
16. Likes it because he's used to it and knows what's going on.

What don't you like about living in Resolute?

1. The wind.
2. Nothing to do that he likes to do, like hunting and trapping.
3. Ice never goes away.
4. Nothing much that he doesn't like.
5. The weather – it's not warm enough in summer.
6. Not as much food as Creswell Bay – no game food.
7. High cost of living and the weather.
8. Winter darkness.
9. The weather, the darkness and lack of game around Resolute.
10. Blizzards.
11. No caribou meat or Arctic Char. Too cold.
12. Shortage of game animals. Have to go too far for hunting.
13. Dark season.
14. Wind. High cost of living. Only one store for groceries.
15. Nothing he doesn't like.
16. Don't like the discrimination. Also the fact that there is little hiring done from the village.
17. The game is too far away. Government won't pay for them to return to Northern Quebec.
18. Doesn't like having to get up for work, but okay after he's had a holiday.

Do you want your children to live in Resolute?

1. They can decide for themselves.
2. If they want to stay here. Some are in Resolute and some are away from home.
3. Yes, if they want to. But if they have a good reason for going elsewhere the parents would understand.
4. Doesn't matter.
5. Yes.
6. It's up to them.
7. Don't know – it's up to the children.
8. No. Not when they are grown up.
9. They'd be used to it, but it's their decision.
10. Doesn't matter because they are living in many different places now.
11. No. I'd like them to live in the place where they were born, if they want to.
12. Don't mind if they live here.
13. I guess so.
14. Doesn't matter.
15. Yes, for going to school (from a Creswell Bay family)
16. Don't know.

Are you able to spend enough time with your family and friends?

Yes -14 – although one person said he couldn't get his family to spend time hunting with him

No -1 – territorial councillor who is out of a town a great deal

n/c -3

Are you satisfied with the services in the community?

Yes – 9 No – N/A – 2

1. Yes, they are organized well from what I can see
2. Yes, but the nurses don't always know what's wrong with you
3. depends on the personnel in the jobs. i.e., good leaders, good services
4. activities are good
5. pretty well satisfied
6. they are okay
7. satisfied with what services they have, but not completely satisfied with what they do. Some groups have to have more meetings to get things going.
8. satisfied, although he thinks they are using more services, although there are fewer people in Resolute
9. okay for the size of the community

Are there any other services needed?

1. **No**
2. Curling rink in village
3. Hockey arena
4. Higher grades in school
5. Doctor, dentist
6. More dental care, eye examinations
7. Need doctors, dentists who come more often, stay longer

8. Need many services, but government have to approve funding
9. More funding for recreation
10. Dentist, skating rink
11. Dentist
12. Better snow removal
13. Curling rink, bar in the village with native people setting their own rules, dog control, **dog team**

What can't you buy in Resolute?

1. Certain groceries
2. Snowmobile parts – can't get most things
3. Skidoo parts
4. If can't buy – order from South
5. Meat, fresh fruits, fresh milk
6. In-style clothes that are reasonably priced, buy when go out
7. Luxury items – cars, trucks, furniture
8. Motors, skidoos, trucks
9. Order from South
10. Fresh vegetables, fruit, winter clothing, furniture
11. Good leather, sheepskin for clothing
12. Gas – the price is too high
13. Vehicle parts
14. Skidoo parts, fresh vegetables, hardware stuff
15. Skidoo parts
16. kids clothing, food variety, particularly fresh stuff
17. Hardware, skidoo parts, right size of clothing
18. Anything if you want **choice – rifles, outboard motors**

– several mentioned concern about the high prices
– Think there should be more than one food store

Are you earning enough money to have the things you want for family/self?

N o – 9 **Yes – 3** Not now – **2** Not really – 1 N/A -3

1. Has to pay telephone bill and house first. Little left for food and food too expensive.
2. Need to be a millionaire to buy things in Resolute.
3. Yes, with combination of job and hunting and trapping.

If you earned more money, what would you do with it?

1. Buy food/groceries (5)
2. Buy clothing (4)
3. Buy new skidoo (4)
4. Buy a motorbike (1)
5. Buy luxuries (1)
6. Buy a truck (2)
7. Pay debts (2)
8. Save it (3)
9. N/A (3)

10, Make living easier (1)
11. Buy supplies to go camping for a month. Take kids out for a month.
12. Spend it on essentials
13. Buy basics, then luxuries
14. Use some, save some

If you have a job, do you enjoy it? What do you enjoy? What needs changing?

1. Maintenance – Enjoys the variety and range of jobs he does.
2. Maintenance – Job okay because he likes inside jobs.
3. Likes job because he doesn't have to get up in morning.
4. Clerical – Enjoys challenge. Likes paperwork, math. Doesn't enjoy management aspect too much.
5. Enjoys job sometimes because learning new things about retailing. Would enjoy job if the retail outlet were larger.
6. Likes job, because no heavy lifting.
7. Hunter/trapper – Enjoys his work, but will look for a job after the trapping season is over.
8. Likes working in office and providing services to young people. Would like more benefits in a job.
9. Enjoys the position of decision making. Likes dealing in federal, territorial relations.
10. Yes, enjoys job.
11. Does it because has to work part time to get money to hunt.
12. Enjoys it, but not enough Inuktitut material available for teaching.
13. Heavy equipment operator – Satisfied with work. Enjoys the variety, because feels it would be monotonous to do the same thing all the time.
14. Enjoys it because there is no heavy work involved (older man)
15. Has been in same job for seven years. Likes nights off. Says the work is not really hard.

Are jobs readily available in Resolute?

1. Can't get job with Panarctic because they say there are enough jobs around here. Before Polaris there weren't any jobs.
2. Yes, at times it's hard. It is now.
3. Yes, in the last couple of years.
4. Usually find something (indicating not always what wanted)
5. Yes if you really want something
6. Sometimes. Easy for long time residents because they know it well.
7. Hard if you don't like dishes and like paper work.
8. Not at all times. Only if something opens from time to time.
9. Yes, if you're willing to learn.
10. Used to be more companies, more jobs. Now hard to find a job.
11. Jobs come and go. It's hard sometimes. Not hard sometimes.
12. The longer you live here, the harder to find a job. Now it's almost impossible.

Is the hunting, trapping, fishing good in the area? Do you do much?

1. Seals closeby. Do some hunting occasionally. Fishing not good at Resolute (full time worker)
2. Mostly seals available in the area. Also polar bears and some white fox. Does a lot of trapping, hunting in Creswell Bay, where he lives part time. Lots of caribou there. Has about 45 white fox so far this season. Good fishing in Creswell Bay area.

3. Varies from year to year. Had 14-15 seals, 6 or 7 foxes and no polar bears this season. Fishes at Somerset.
4. Tries to hunt as much as he can, although has job. In winter hunts closeby; in summer, Somerset, Creswell. Has enough spare time to hunt caribou, has about a dozen foxes, no polar bears.
5. Woman – likes to go out hunting in spring time. Goes down to Somerset for a couple of weeks.
6. Very good hunting at Creswell Bay. Sometimes the caribou are on the beach in front of the house. When at Creswell, they do lots of hunting. They sell caribou meat to Resolute. Also traps white fox, polar bear. There's lots of char at Creswell. They freeze some, dry some. Sell to co-op in Grise Fiord. There's an airstrip access at Creswell for twin otters. D-C's land on the ice.
7. Not too good in immediate Resolute area. Goes to Somerset for fish.
8. If you have enough ambition and patience, there's enough trapping, hunting, etc. Has arthritis so doesn't get out much. Also has job, but managed to get about 25 foxes.
9. Fair – but not many foxes for the past few years. Caribou is mainly at Somerset Island. Fox – got about 100 in 1979, around 90 so far this year. Polar bear has one so far. Fishing is only in spring time at Creswell.
10. Good hunting. Close for seals. Somerset Island – Caribou. Polar bear 25-30 miles. Resolute Lake, Eleanor Lake for small fish. Creswell for char. Doesn't do much hunting. Go if they have the gas.
11. Has trouble going to Creswell in summertime, say no boats going to Somerset Island
12. Hunting is really good when the sun comes up.
13. Hunts when gets a chance. Goes in spring time. Everybody goes out late May and June. No time for trapping. Goes fishing in spring and fall and sometimes at nearby lake. Walrus pass by. Can also get Beluga whales.
14. Does some hunting at end of dark season. Not much fishing around Resolute anymore. Somerset has the only real char. In June on his holidays goes down.
15. Hunts seal on the weekend. Traps white fox. In springtime goes for walrus, polar bear. Not enough for a living because animals disappeared this season.

Would it be good to have people from Resolute working at the mine?

1. Yes. It would keep them out of the bar.
2. Yes. It would provide a chance to see what's going on there.
3. Yes... but it's up to the people... but it would be good to get jobs, and maybe hire people to move in.
4. Yes – because it's close to Resolute. Maybe more people would move to Resolute and with more people the community might get an arena.
5. Yes. Resolute is dying and there aren't many jobs available. It would be good for making money.
6. Yes... for the money. Also, it would be good if going in and out of the mine.
7. Yes... for someone who needs a job it would be okay so they can earn money.
8. Doesn't know what it's going to be like. Only way to know is after it's been going on for a few years.
9. Too early to say
10. Yes – so people can earn money which they need especially with inflation.
11. Yes...is's very important because there are no jobs.
12. Yes... wants Cominco to be useful for employ ment...helpful to Grise Fiord and Resolute. Students could get jobs after school.
13. Yes... provides more income. People need more than part time jobs.

14. It's up to the individual to assess.
15. It would provide constant jobs. At certain seasons there are no jobs in Resolute.
16. Yes... mainly the money would be good.
17. Yes...so people can make money for themselves.
18. Yes, because it's close and you get time off back at the community.

What would be bad about having people from Resolute work at the mine?

1. It would be bad if you don't leave enough people behind to look after Resolute.
2. Maybe all the noise and jets would be bad.
3. It wouldn't be good if family can't follow.
4. The man being away from his wife - can't get caribou/food unless man is hunting.
5. Leaving the family. Maybe the company should allow kids under the age of 5 to go there – while they don't have to go to school.
6. Worried about the environment.
7. Accidents – concerned about safety.
8. Leaving families behind. Food for families.
9. Caribou could be scared away.

Would you be interested in a job at the Polaris Mine?

YES –M – 7

What kind of job?

- burner mechanic
- heavy equipment operator
- truck driver
- maintenance/janitorial
- fork lift operator
- mechanics (training on job)
- heavy equipment operator (above ground)

YES – F – 3

- payroll/clerical
- chambermaid
- if family can go too - cooking
- personnel expediting (from Res)

N o – M – 2

- will stay with government
- plans to retire soon

N O – F – 1

- family in Resolute

MAYBE – M – 4

- heavy equipment operator
- only if laid off or unemployed
- hard to say. Doesn't know about the future.

WORK ROTATION

1. 6-4 okay
2. Six weeks okay if it has to be that amount of time – maybe a bit too low – 4 weeks allows hunting
3. Give more time off in summer

4. "In" 6 weeks okay. 2 or 3 weeks at home is better.
5. About rotation – try and see if it works
6. Six weeks at mine, kids could forget who their father is (said facetiously). Two weeks in, two weeks out are possibility.
7. Go there with 6-4 and find out if it works. Around May and June, men would rather hunt than work.
8. 6-4 okay for husband, because husband is closeby. Maybe the wife would live there in a tent in the summer.
9. Rotation depends on family. Can do it for a short stretch, but not for years.
10. 6-4 okay but maybe 3-2 better
11. 4 weeks okay for hunting/trapping

TOWNSITE

1. Having houses there okay, but I'd still come down here in time off.
2. Better off if families there. He would move family if his wife agreed (he was one person who said "maybe" re working there)
3. A townsite is good. Six weeks is a long time and people with families should bring their families.
4. (Perceives townsite without school) – no school, awkward for family
5. Not in favour of townsite because Resolute would get too small . . . although the swimming pool at the site is an attraction
6. Thinks the local people will move to L.C.I.
7. May stay there 6 months at a time with whole family, if townsite.

OTHER CONCERNS/COMMENTS

1. Might affect sea mammals.
2. Concern about waste materials.
3. The mine could affect community but it's probably already going ahead anyway.
4. Good that jobs are opening.
5. Can't stop it (the mine) . . . so deal with it the best we can.
6. Concerned about leaving the site, after finished mining 20 years from now. Will it be left like Rankin Inlet?
7. Happy that there is no liquor on Little Cornwallis. "people can't drink too much, so can't make fools of themselves."
8. Concern about people from other places taking jobs away from Resolute people.
9. As soon as the mine is underway, think Resolute will grow bigger. People have been leaving since it started. No way they're going to come back. People from other settlements will move in. Wait to see what happens in the future... too early to tell what's going to happen.
10. Resolute could get a lot bigger.
11. Can't do anything to stop mine, so get people from Resolute to work there.
12. Would like to be kept informed, and said that's already happening.
13. Quite a few from Resolute will go there.
14. Worried about "fluids" into the ocean.

Grade 'Completed	Training Courses Completed	Would you take Upgrading or Training for a Better Job
Grade 8	–	Yes, currently in a training program
Grade 6	No	Yes
Limited at hospital	–	Yes
Grade 9	Churchill – vocational Ottawa, upgrading	Yes
Partial Grade 12	AVTC – upgrading, Edmonton	Yes, courses or on-the-job training
Grade 7	No	Yes, if required for a job she'd like
Grade 10	hostessing, typing, nursing assistant	is in a co-op training program
–	limited – through adult education, on-the-job training	–
–	Heavy Equipment Operator on-the-job training	–
Grade 9	Nurses Aide Training Counseling Training	Yes, when young children are older
Grade 3	–	maybe
Grade 9	4 years apprenticeship in Rankin Inlet, Churchill	a tradesman already.
Grade ?	vocational in Churchill, upgrading, Ottawa	Yes, maybe
Grade 10	clerk typist, secretarial	Yes
Grade 10	vocational, Churchill, Winnipeg	Yes
Grade 4/ hospital	–	Yes, upgrading to learn more

Consider to be good jobs	Best job you ever had
current job	current job (apprentice)
Equipment operator	Expediting, North Magnetic
no response	Survival Training School
Driving	Working in a bank
Bookkeeping	Post Office worker
Traveling jobs	no answer
Social worker	Receptionist
Area administrator	
Co-op manager	
no answer	Instructor, Survival
Heavy equipment operator	Training school
Social worker or position at the top	Heavy equipment operator
no answer	Nurses Aide training
	Instructor, Survival courses
Driving, heavy equipment operator, Office job	Conducting tour groups
current job	current job (tradesman)
Mechanic	nothing stands out
Radio announcer/operator	Radio announcer/operator
Pilot	current (Heavy equipment operator)
Carpenters/House builders	no answer
Heavy equipment operator	no answer

Outcrop
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December 19,1979

Mr. Cy Lambert
Personnel and Administration Manager
Cominco Ltd. , Northern Group
P.O. Box 1979
Yellowknife, N.W. T.

Dear Cy:

As requested, I am providing an outline work plan, schedule of work and cost estimates for a study to determine the social and economic impacts on Resolute and surrounding communities during the construction and operation of the Polaris Project.

Outcrop proposes doing the study in association with DPA Consulting of Vancouver. Outcrop would act as study manager. Ken Harper was contacted but will not have time to work on this study, although he may be able to assist in the analysis and formulation of final recommendations.

Our approach to the study would examine three areas. First and most important we would conduct a detailed analysis of Resolute and determine impacts of the project on this community. Secondly we would investigate (in less detail) the impacts on other communities affected, concentrating on the hiring points of Cambridge Bay and Coppermine, but touching on the other communities. In the third area we would present an overview of the impact of the project on the Northwest Territories in total. This part would not be a detailed or time-consuming part of the report, since we would generally be using information gathered for other parts of the study.

Although we initially discussed analyzing only the impacts on Resolute, we feel the other communities should be done at the same time, since much of the required baseline data could be assembled when doing the research for Resolute.

To carry out the study we would follow three steps: gather baseline data; obtain detailed data, particularly for the community of Resolute; analyze the data to assess impacts and suggest methods of enhancing positive impacts and mitigating negative impacts.

.....2

In the community research work, particularly in Resolute, we would address the following topics as they relate to the Polaris Project in the construction and operations phases:

Effect on community services - schools, health services, housing, recreational services

Effect on commercial services - hotels, restaurants, air charter companies, fuel suppliers, etc.

Effect on the community's infrastructure - water supply, sewage disposal, power generation

Effect on transportation, communication - airlines, resupply, etc.

Strains on local (settlement) government

Effect on hunting and trapping by members of the community

Effect on the commercial vitality of the community

Effect on population growth or decline

Employment effects -
direct employment and income
indirect employment - new business potential, business expansion purchase of local services
induced employment - effects of resending money earned at the mine on development or expansion of community businesses

Effect on broadening the local economic base

Effect on the cost of living - possible increased costs of goods and services within the community

Effect on migration patterns - people moving out of or into the community

Assessment of "community satisfaction" - how do people feel about their life style and how will the project affect these feelings

Social organization - are patterns of leadership disturbed? what activities are the community built around and will they change?

Community Stability - alcoholism, crime, suicide, marriage breakdown, racial tension

Job and Education Aspirations - What are they now and will the mine change them?

Job Satisfaction - What is the current level of job satisfaction? What is the desired level?

The information on the above topics would be assembled through baseline data collection and extensive interviews in Resolute and limited interview work in other communities.

In some cases the topics set out for analysis for Resolute would not be applicable to other ArcticCoastcommunities, since they are removed from the activity and would not likely experience impacts related to infrastructure, communications, at this time.

From this information we would analyze the impacts of the project on Resolute and the other communities and present our recommendations in the final report.

The overview impact of the project on the Northwest Territories would examine the total direct employment benefits to the NWT in direct income, indirect income and induced income. would examine the impact on government revenue and expenditures and would comment on external economic impacts which could result from this project.

We feel we can complete this project in the required time and are confident that our study and findings will provide well defined directions for your operation.

Yours truly,

Marion LaVigne
President

WORK PLAN OUTLINE

I. PRELIMINARY

1.1 Review work programs

1.2 Identify individuals, groups, companies, organizations to be contacted.

1.3 Identify requirements and sources for baseline data collection

II. BASELINE DATA COLLECTION

2.1 Polaris Project information - Assemble all available information on the project from basic project description, costs, construction schedule and life span, to extensive information on actual operation i.e. numbers required at various skill levels, training programs, hiring practices, rotation schedules. Extensive information would be required for both the construction and operation phases.

2.2 Data on similar projects - Obtained from review of existing studies, interviews with personnel at Nanisivik, Gulf (Coppermine) Echo Bay, Esso (Northern Saskatchewan). We would also examine projects and related impacts apart from mining - Panarctic at Resolute, Dome Canmar at Tuk.

2.3 Community data - Concentrate on Resolute, but assemble baseline data for all arctic coast communities which could be affected by the mine as potential suppliers of workers. Much of this data could be obtained from government statistics, reports and studies.

2.4 NWT overview data - again, much of this could be obtained from reports and studies. Also, interviews with government would be done.

III. DETAILED DATA COLLECTION

3.1 Community Consultation - Resolute - In this community we would conduct in depth interviews with many people (government, business, co-o?, hunters, housewives, etc.) to determine exactly what life is like in the community, looking at economic and social aspects such as employment, transfer payments, cultural structures, life style, satisfaction with life style. We would also do some attitudinal work to assess the perceived impacts of the mine, and how these perceived impacts may have an actual effect on the community.

outline work plan continued

3.2 To a lesser extent we would examine other communities, visiting Coppermine and Cambridge Bay and possibly Gjoa Haven or Spence Bay, and conducting some interviews in these communities.

IV. ANALYSIS

4.1 Identify and provide an assessment of the most probable impacts during the construction and operational phases.

4.2 Examine variables and interrelationships of impacts and produce possible and probable scenarios.

V. RECOMMENDATIONS/FINAL REPORT

5.1 Suggest methods of enhancing positive impacts and mitigating negative impacts.

5.2 Present and review report with client

5.3 Present findings to communities concerned. We would suggest that the findings be presented in a straight forward, simplified method, possibly in the form of an audio visual show with Inuktitut voice over. Also, a summary of the findings in the report could be circulated to the people concerned.

Cominco Ltd./P.O. Box 1979/Yellowknife, N.W.T. XIA 2P5
Tel (403) 873.2621 Telex 034-45500

Cominco
North of Sixty

February 13, 1980

Marion LaVigne
President
Outcrop
P. O. Box 1114
YELLOWKNIFE, N.W.T.

Dear Ms. LaVigne:

Thank you for submitting to us your outline work plan and schedule regarding the socio-economic study in connection with our new Polaris Mine on Little Cornwallis Island. We have studied this plan and we are pleased now to award this contract to you.

As agreed, the primary impact zone will be Resolute with a detailed analysis being provided of that community. The impacts on the Central Arctic Communities would be investigated in less detail.

Since you have already met with a number of government groups, I would appreciate it if you would keep me informed of any other information you feel they might require.

Insofar as timing, of course we now know that the public hearings will be held in Resolute May 22. Therefore, the final report must be finished sometime prior to that date.

I will look forward to your up-to-date report every two weeks, but we can talk together, either by phone or in person at any time. On my part I will endeavour to keep you informed of all our comings and goings, new developments and announcements.

As discussed at our meeting today, you will let me have your ideas as to communication setup with regard to all our developments and future announcements.

May I wish you the very best on this study. I am certain it will be very interesting for both parties.

Yours very truly,

C. F. Lambert
Manager, Personnel and Administration

CFL/cr

The Study Team . Appendix 7

STUDY TEAM MEMBERS

Marion LaVigne, President of Outcrop Ltd., was the project manager for this study and was responsible for the overall organization, direction, and execution of the study. In addition, Ms. LaVigne carried out the bulk of the data collection (including the field data collection), data analysis, and report writing.

Douglas Williams, Vice President of DPA Consulting Limited, was an advisor to Ms. LaVigne with regard to the methodology used for the analysis of potential socio-economic impacts of the Polaris Mine on Resolute Bay and other Arctic coastal communities. Dr. Williams also participated in the field data collection. .

Derek Ireland, Senior Economist with DPA Consulting Limited, was an advisor to Ms. LaVigne with regard to the methodology used for the analysis of economic impacts of the Mine on the N.W.T. economy as a whole, and was responsible for the bulk of the analysis in Chapter 3.

Ronne Heming, Vice President of Outcrop Ltd. assisted Ms. LaVigne in writing the report, and acted as copy editor.

Lupcia Klowak, of Outcrop Ltd. assisted with research and data collection, assembling back-up materials from across the Northwest Territories and southern Canada.

THE PARTNER FIRMS

Outcrop Ltd., the prime contractor for this study, is a Yellowknife-based firm specializing in communications, community consultations, and socio-economic impact studies. Marion LaVigne, the President of Outcrop, has lived in the North for five and a half years and has travelled extensively throughout the Northwest Territories.

DPA Consulting Limited, a sub contractor to Outcrop for this study, is an economic consulting firm with offices in six locations across Canada. Douglas Williams and Derek Ireland are with the Western Division of DPA, which specializes in the analysis of impacts and benefits from industrial and resource development projects.