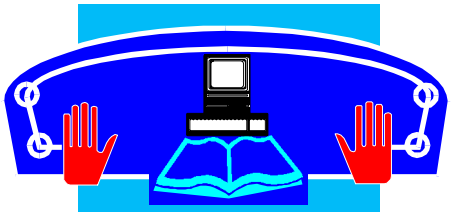

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COMMUNITIES OF THE MACKENZIE

EFFECTS OF THE HYDROCARBON INDUSTRY

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COMMUNITIES OF THE MACKENZIE
EFFECTS OF THE HYDROCARBON INDUSTRY

PREPARED BY VAN GINKEL ASSOCIATES LTD.

FOR CANADIAN ARCTIC GAS STUDY LIMITED

AND GULF OIL CANADA LIMITED
IMPERIAL OIL LIMITED
SHELL CANADA LIMITED

JANUARY 1975

FOREWORD

This document comprises the report of van Ginkel Associates Ltd., planning consultants, on their analysis of the effects of the Arctic Gas pipeline and related hydrocarbon activities on the relevant communities of the Mackenzie Valley region.

The study was commissioned by Canadian Arctic Gas Study Limited, Gulf Oil Canada Limited, Imperial Oil Limited and Shell Canada Limited, as part of a continuing effort to identify the potential socio-economic effects of hydrocarbon industry activity in the North and to determine the means by which the pipeline and related developments can yield maximum benefits for the people of the region.

The above companies provide the material in this report for the information of the Government of Canada and all interested parties, but of course reserve the right to differ with portions thereof.

1. INTRODUCTION

The objective of this study is to measure and define the potential economic and social impact of the proposed Mackenzie Valley natural gas pipeline and the related hydrocarbon industry activity on the communities and the people in the area; particular emphasis is placed on ways and means in which the planning of these projects will assure that the maximum benefit accrues to the people of the Mackenzie Valley.

A fundamental, underlying premise of the study is the assurance of freedom of choice for all individuals. This carries with it the implications of equality of opportunity, and social justice. This applies equally whether the individual is native or non-native, whether the style of life chosen is on the land or in the wage economy. If the latter, it assumes that for those lacking skills which would permit access into the wage economy relevant training will be available.

The assessment is based on the following:

1. An estimate of the requirements of the pipeline project and related hydrocarbon development in terms of the needed workforce, required goods and services, and transport and other inputs related to logistics.
2. A survey of the existing population, labour force, physical plant, community facilities and public and private programs that relate to the economic, social or physical life of the community.
3. Judgments as to what constitute beneficial effects and detrimental effects, with reference to such things as employment and income in the region, supply and quality of physical plant and the level of services

within the communities.

4. The implications of (3) above in terms of the structure and organization of industry activities in the study region.

Background data for this study has come from many sources, not all of which have proven consistent. An important input resulted from tours of the region and first hand observations in communities that will be affected. Conversations were held with persons directly involved in community planning, as well as with others concerned with or residing in such communities. Although this was limited by time constraints and the extensiveness of the study region, it did permit essential perceptions.

A major source of information relating to employment opportunities was Gulf Oil Canada Ltd., Imperial Oil Limited and Shell Canada Limited, the major oil companies operating in the Mackenzie Delta. Information from these companies and from Canadian Arctic Gas Pipeline Limited confirmed that the region in which the major development and the majority of the jobs can be anticipated is the Lower Mackenzie.

Another primary source of data was Section 14c of the material filed with the National Energy Board and the Department of Indian Affairs by Canadian Arctic Gas. The employment figures were developed further by the refinement of the estimates of jobs that will become available through such varied activities as exploration development and related activities of the oil companies operating in the Lower Mackenzie.

It became apparent that there will be more jobs in the region than there will be northern residents looking for jobs; assuming development, the major challenge will be to assure that as many jobs as possible are filled by qualified residents rather than "outsiders" and that the change resulting from total employment will have the most favourable impact.

This report is concerned with the assessment of prospects, opportunities and impacts, with an examination of the communities and with the definition of those procedures that will increase the probability of development having a favorable impact on the total community.

1.1 THE EXISTING SOCIO-ECONOMIC LIFE OF THE MACKENZIE

The current economic activity in the study area is largely dependent upon income and employment in primary resource development, and government activities in administration, research and defence.

Government was the largest single employer in the last year of record, 1972. Inuvik, being a centre of administration for the Federal and Territorial Governments, had the greatest concentration of government employees in the study area. In addition to administrative structures, defence establishments and research agencies, regional schools, hostels, and hospitals are concentrated in Inuvik, There is also a concentration of government people in Hay River -- a sub-regional centre for administration, education and health.

The major primary resource activity is in developments associated with gas and oil, supplemented by some mining activity adjacent to the study area. There has been activity in hydrocarbons since the 1920's when Imperial Oil Limited developed the oil field at Norman Wells and, in the 1930's, constructed a refinery. In subsequent years hydrocarbon activities have occurred throughout the study region, more recently concentrating in the Mackenzie Delta and the adjacent offshore area.

Hunting and trapping provide the major source of income for relatively few persons. The Gemini North Limited survey, made in 1972, estimated that a total of 84 persons were engaged in full time or regular part time trapping. Great Slave Lake is the only body of water that supports significant commercial fishing. The total value of the harvest of fur, fish and game in the study area constitutes a small proportion of total cash income. It is, however, an important proportion of the cash income in some smaller settlements and can be even more important as a source of income in kind. Some success has attended Government programs designed to encourage co-operatives related to fur harvest and the creation of related crafts.

Agriculture and forestry are essentially undeveloped. The potential exists for commercial forest operations in several areas and, in particular, along the Liard River.

There are occasional small tracts of fertile land along the length of the Mackenzie River and there are substantial acreages adjacent to the Liard and Slave Rivers which presumably have some agricultural potential. The resource is not commercially utilized to any great extent.

The region is large, the settlements are widely dispersed and most goods are supplied from southern Canada; as a consequence, transportation is a major economic activity that grows with development. Hay River is the major supply centre. Goods are shipped from the south by truck or rail, transferred to barges and shipped north during open water on the Mackenzie River. Winter roads are used extensively by the oil industry for movement of material and equipment between work locations and, to some extent, between settlements. People and a substantial volume of goods move by air and, since every settlement has some kind of airstrip, employment in airfield construction, maintenance and operation is widely dispersed through the study area.

According to a NWT Government survey of 1971, the population of the study area in 1971 (excluding Old Crow) was 12,182 of which Treaty Indian and registered Inuit numbered 6,462. Inuvik, Hay River and Norman Wells, where income is derived primarily from wage employment, are predominantly white. Even in the smaller communities, whose population is primarily of native ancestry, there is increasing reliance on wage employment, either in the settlement or on a temporary basis in some other location: this has had some effect on lifestyle in the smaller communities, as has the fact that the young people frequently go to the larger communities to complete their education.

Education and skill levels of the people of native ancestry, measured in terms of ability to deal with contemporary technology, continue to be lower than that of the white population in spite of rising skill levels among the younger people. Greater participation by the native people in the economic life of the study area is affected by the fact that wage employment tends to be concentrated in the major settlements--particularly Inuvik and Hay River.

The fact that some people prefer a lifestyle which is close to the land and

that implies a more tight knit social fabric has obvious implications, in terms of income. Further, if individual preferences shift toward wage employment that necessitates relatively sophisticated technological or managerial ability, the skills gained on the land are not likely to be transferable.

1.2 GENERAL ECONOMIC PROSPECTS

The expansion of the economy of the study area currently depends in significant measure on the activities of the hydrocarbon industrv. Quite apart from the fact that the industry itself provides much direct employment, hydrocarbon activities are directly and indirectly responsible for the existence of other employment-creating enterprises, such as in river, road, rail and air transportation, equipment maintenance, contracting and general service activities.

It is difficult to locate any other economic generator that might prove to be a substitute for the employment-creating capacity of the hydrocarbon industry, even if measured only in terms of sustaining current levels of economic activity. However, continuing exploration for deposits of hydrocarbons can presumably be justified only if there is a prospect of subsequent development and movement to market by means of a pipeline or an economically acceptable alternative. The exploration companies have stated that if there is no early prospect of moving hydrocarbons to markets, exploration would decrease appreciably and might virtually cease. This would eliminate the direct employment in exploration and development and also would eliminate employment in other enterprises that, directly or indirectly, prosper or fail in accordance with activity in hydrocarbon related enterprises.

If natural gas can be proved in sufficient quantities and moved to markets without undue delay the existing economy can be sustained and expanded.

1.3 IMPACTS OF THE HYDROCARBON INDUSTRY

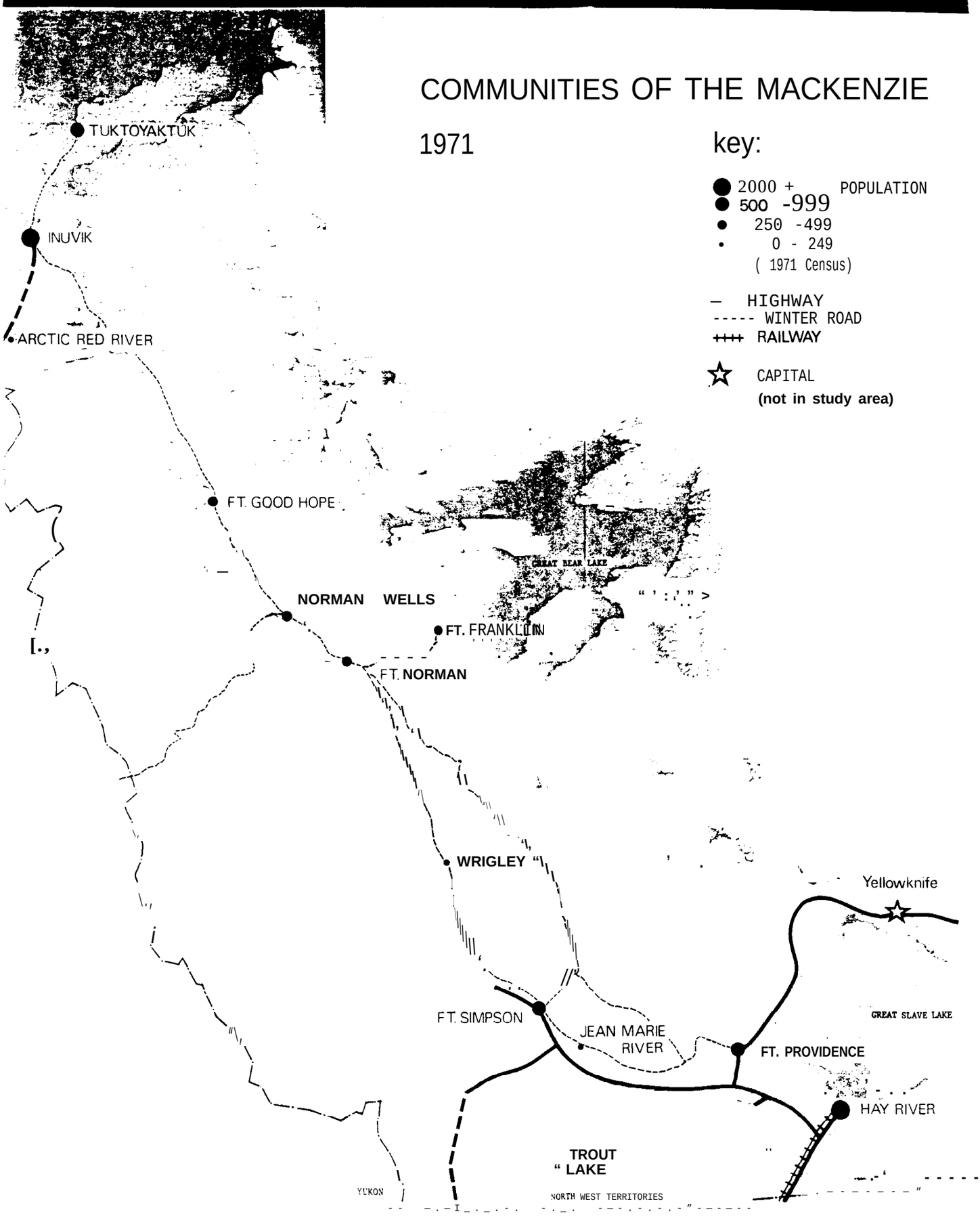
The initial impression of the consultant is that by creating employment, the construction of the proposed Mackenzie Valley pipeline can be a direct economic benefit in terms of jobs. A greater benefit would be the fact that the existence of a means of transporting natural gas to market would result in the hydrocarbon industry becoming an integral and persistent part of the economic base and fabric of the Mackenzie Region. It would create jobs, and equally, it would require services which stimulate local enterprises and so create additional jobs and entrepreneurial opportunities for northern residents.

The associated growth would create or intensify some social problems. But with the proposed starting date of pipeline construction there should be enough lead time to permit the institution of protective and ameliorative measures where this is considered necessary. Careful, rational and relevant planning can minimize possible negative impacts.

Positively, the stimulation of economic activity could be bent to the furthering of desirable programs for northern residents; it could broaden an individual's choice of employment and lifestyle and permit decisions by an individual as to whether or not to participate in the wage economy: unemployment and persistent poverty permit no such options.

The growth of population and employment associated with the hydrocarbon activities can be of demonstrable advantage to the larger centres. These centres are of a size and character that result in urban services being demanded, but they are not large enough to support the range and quality of services desired. In this context the result of development in these communities should be positive.

On the other hand, most of the smaller communities should not be directly affected in any substantial way by the pipeline and hydrocarbon development. The inhabitants would be free to choose the extent to which they wish to participate in new employment and in entrepreneurial activities. Moreover there would be a benefit to smaller communities in that transportation


COMMUNITIES OF THE MACKENZIE
1971
key:
2000 + POPULATION
500 -999
250 -499
0 - 249
(1971 Census)
HIGHWAY
WINTER ROAD
RAILWAY
CAPITAL
(not in study area)
TUKTOYAKTUK
INUVIK
ARCTIC RED RIVER
FT. GOOD HOPE
GREAT BEAR LAKE
NORMAN WELLS
FT. FRANKLIN
FT. NORMAN
WRIGLEY
Yellowknife
FT. SIMPSON
JEAN MARIE RIVER
FT. PROVIDENCE
GREAT SLAVE LAKE
HAY RIVER
TROUT LAKE
YUKON
NORTH WEST TERRITORIES

and communication links and improved facilities in the larger communities will provide better access to improved health, welfare and educational services.

2. IMPACT AND CHANGE

"Change is inevitable. In a progressive country change is constant." There is nothing that has happened in the century that has elapsed since Benjamin Disraeli made this statement to undermine its continuing validity.

Nothing that is alive is static. Change occurs in the natural biological process -- life, growth, death, regeneration. It occurs in the evolution of a culture, of social systems. Diverse events, not apparently causal, can produce remote impacts that accelerate change and alter lives.

A community is not static because a community is its people. The way in which they live and respond to each other, their means of earning a living, of finding food, shelter and clothing, shape the community in which they live. The changes which affect people and the pattern of daily life have a resultant in the physical character of the community. New jobs and more spending power can mean better housing. Conversely, the physical facilities, their quality and relationship create an environment which affects the way of life of the inhabitants and establishes parameters for change. For example, if there is no high school and children go away to school at an early age, the nature of family and community life is affected. In this study, which focusses on the settlements of the Mackenzie, the way of life and activities of the people and the character of the place where they live are considered indivisible.

It is irrational to consider the impact of hydrocarbon activities on the communities of the Mackenzie Valley as though this were the introduction of change to a previously changeless environment. The settlements do not exist

in isolation from a changing world. The life in the communities changes in response to every event -- events over which the residents typically have little or no control. The devaluation of the currency of the nation, a rise or a decline in the price of fur, a favorable or unfavorable shift in the balance of payments, a relevant technological breakthrough -- the individual has no more capacity to alter these events than he has to halt the forward progress of a cruising space vehicle. As an individual the Mackenzie Valley inhabitant shares with his fellow citizens of the world an inability to control many of the events which may affect his life. And, equally, he shares an inability to halt change.

2.1 CHANGE IN THE MACKENZIE REGION

The Mackenzie Region has experienced persistent change over many centuries. The first changes within the period of settlement by man presumably resulted from the migrations of Inuit and Indian. And that way of life was dramatically altered by the arrival of the first explorers -- many doubling as fur traders -- and the almost contemporaneous arrival of the Christian missionary. The migrants brought with them cataclysmic plagues. By generating appetites that could be satisfied only in the trading post, they irreversibly altered the economic tradition and the social structure of the native community and the social practices of the native people.

Since the early days of the fur trade one event has followed another and all have impacted, positively or negatively, on the Mackenzie Valley. The white trader, the Christian missionary and the whaler were followed by the representative of white law, the representative of white education, the representative of white government. And all, directly or indirectly, in the early periodof white intrusion in one way or another increased the pressure on the resources of fur, fish, game and sea mammals or altered the harvesting practices of the native residents. The lifestyle of the

native people was inevitably and irreversibly altered.

Change accelerated. Radio and aircraft transported words and influences into and out of even the smallest communities. White administrators managed the developing programs of welfare that increased as the commitment to the harvesting of game decreased; they administered health, education, resources and, in general, manned the machinery of government.

Administrative complexities increased and the seat of Territorial Government moved to Yellowknife, greatly increasing the total and the proportion of white residents and migrants throughout the western portion of the Mackenzie District. Work was begun and is proceeding on the construction of a highway through the Mackenzie River Valley, further reducing community isolation and insularity.

Other activities and southern interests have had varying impacts. These include such different things as tourism, national defence, meteorology and scientific interest in the unique Arctic environment. And, equally important, there has been the pervasive pressure for change resulting from developments in transportation and communications, the application of new technology, government programs in education, health and welfare, changes in adminstrative structures and, as a consequence of several causes, rapid population growth.

A relatively late arrival was the seismic and drilling crews of the oil industries. Unlike the earlier arrivals, oil company interest was in a resource that the native peoples had never developed and which they had no prospect of lifting. The pipeline proposed would pass by some communities but, once completed, would be almost invisible and would have no continuing direct impact on most communities. Pipeline operators and maintenance people would be concentrated in three communities, which are now predominantly white. Exploration and development work would be concentrated in the Lower Mackenzie, remote from the majority of the settlements in the Mackenzie Valley.

And, unlike the traders, whalers and administrators, the hydrocarbon industry will have an urgent need for workers and, directly and indirectly, will create thousands of jobs within the Mackenzie Valley -- more jobs than could be filled by all the workers resident in the region.

If Disraeli is to be believed that change is inevitable, there would appear to be merit in a change that has a potential to provide jobs in lieu of welfare, employment in lieu of unemployment, opportunity in lieu of poverty.

One of the objectives of this study is to measure this potential.

2.2 IMPACT IS DIRECT AND INDIRECT

The direct result of new activities, such as the construction of a Pipeline, is to increase the directly related jobs in the area and also to increase the jobs resulting from a demand for supplies and services. This can cause increased migration, and an increased demand for housing and community facilities which, in turn, increases employment in construction, transportation and ancillary services. The actual impact depends upon the capacity of the construction industry and the capability of local enterprises which can benefit from local contracting and the increased demand for a range of services.

Another example is that of a new highway. A highway, unlike a pipeline, will have a major and continuing impact on previously isolated settlements simply because of the increased accessibility to the region from the outside world. Because the "outside world" comes closer there will be, at a minimum, an indirect impact even in communities that are not touched by or close to the highway. To the extent that it reduces existing seasonal constraints on the movement of goods and people, the highway will affect the economy of the entire region. Tourist traffic will increase. And the sense of isolation will decrease, even if the number of physical contacts

is not appreciably increased in a particular settlement.

2.3 IMPACT FROM A SINGLE SOURCE CANNOT BE ISOLATED

The actual impact on a community of the construction and operation of a pipeline or of intensified hydrocarbon development programs, per se, cannot be isolated and precisely defined. It is affected by possible competing demands for labour. It is affected by the direct impact of other activities. It can be modified by the impact of any one of many other causal events.

The construction and operation of hydrocarbon-related facilities may accelerate change and cause specific changes. But a decision not to build a pipeline will not halt change. The critical question is the definition of policy that will result in the change being beneficial.

2.4 IMPACT DEPENDS ON OPTIONS

Impact on a community and change within a community is not an absolute that can be precisely defined as positive or negative. Whether it is positive or negative can alter in accordance with other impacts and other change.

An increase in the availability of employment is assumed to be a benefit. At the same time, the extent to which such an increase effects a real improve-

ment in lifestyles and standards of living may depend, in whole or part, on development or change in government social and educational policies, in community organization, in evolving personal attitudes.

The extent and the nature of the impact of any event may also depend upon the manner in which the community adjusts or accommodates -- on the resilience of the people and the capacity of the community to turn the resultants of an action to its own advantage. It may be simply a question of attitude, -- whether for example, a community will seize the opportunity to use a school facility to enrich the daily life of the individuals and the total community. Frequently it is a question of available skills, sometimes physical, sometimes management, sometimes leadership. One town may be more politically involved than another; in one metropolitan area one library may be used more than others; the reasons derive from intangibles as much as from quantifiable facts.

This does not imply an inability to influence impacts in the direction of greater benefit to people and community. Generally there are a number of alternative courses in order to achieve a goal. In the case of the pipeline construction and operation, for example, there are viable options in terms of the deployment of personnel, services and supply -- alternative procedures which will have different quantitative and qualitative impacts on communities and on the entire region.

In the final analysis the impact of any event depends in large measure on the determination to maximize new opportunities. The event, of itself, does not dictate whether advantage or disadvantage will accrue to the people and the community; this is dictated by the reaction to the event.

3. METHODOLOGY

The type of employment and the number of people employed provide a basic indicator of the impact of new activity in a region. New jobs increase total personal income and spending power; they reduce unemployment-and/or encourage migration; they broaden activity because employees and their families need housing, shops, personal services, school and health facilities. Similarly they result in larger demands on the infrastructure--transportation, utilities and governmental services. All the supporting requirements and services employ additional people. In the case of existing residents, increased spending power can result in a demand for a higher quality and a greater quantity of housing, goods, and services. If in-migration results from new employment opportunities demand is further increased.

The extent of the impact of a new activity depends first on the location of employment and secondly on where employees and their families live and spend their income. If an employee "commutes" to work from another community, his job generates a demand for goods and services in his home community to a much greater extent than in the community where he works.

Consequently, a development model was used in this study to measure in broad terms the impact of the gas pipeline and related development and to assess the options which are available to industry. The model is a tool for relating all elements which bear on an issue. The structure of the model represents the relation of elements. Such a model is reiterative, each part acting and reacting on another.

As a working tool, such models can be categorized as "approximation" and "fine" models. The approximation model is devised to produce a clearer understanding of relationships, policy options, priorities and the relative importance of elements. To measure the precise effect of policy decisions, a fine model is necessary.

This study is concerned with the general impact on the region and its communities and with identifying the options which can maximize net benefits. The scope of the study does not extend to the resulting policies and development implementation, two areas that are largely the responsibility of government. Consequently, this study employs an approximation model.

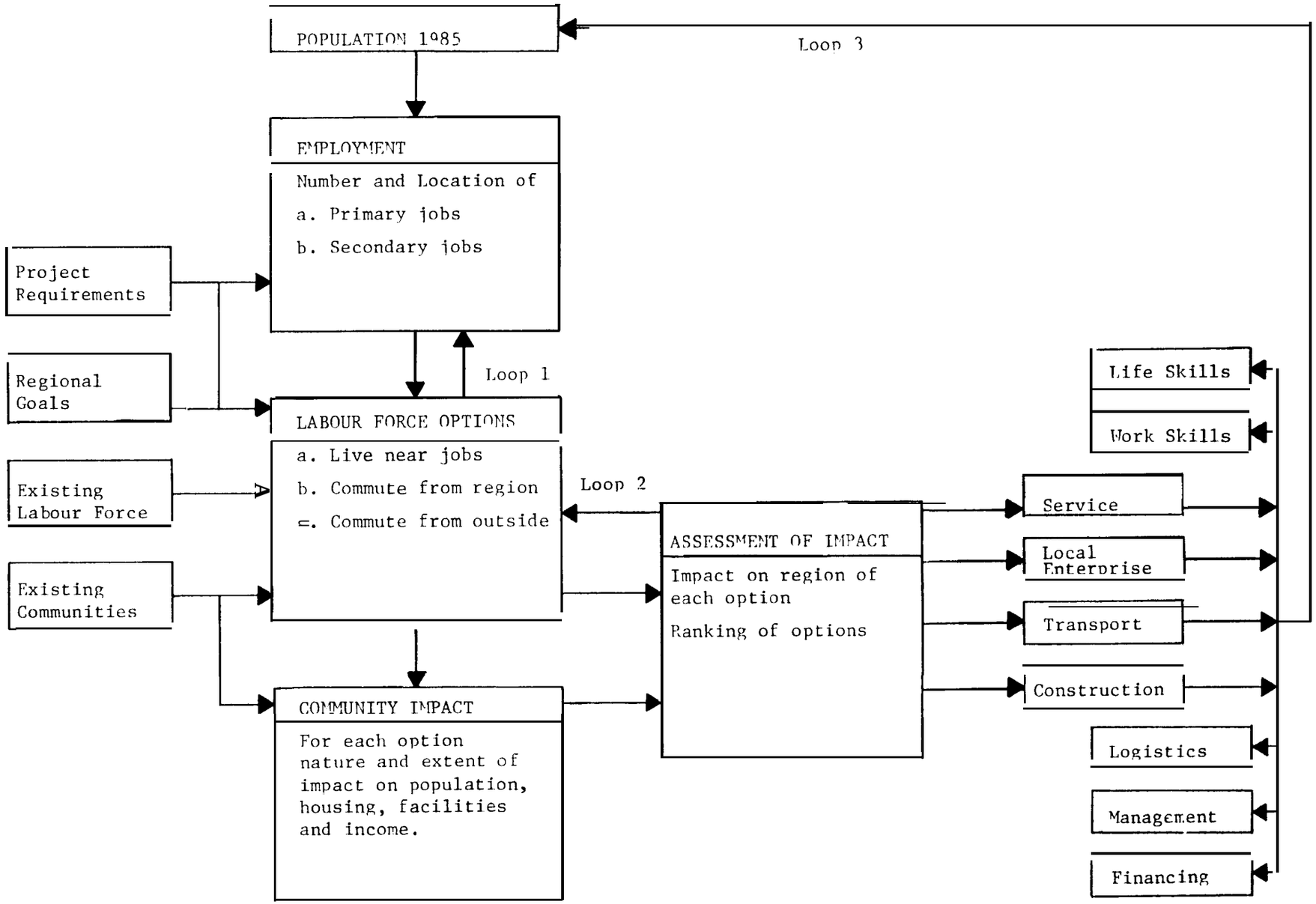
Since pipeline construction will be completed in the limited period of 5 years and since its construction logistics will not make direct demands on the communities, the approximation model has been used to assess the permanent, ongoing inputs to the region from 1985 on.

The computations of the model are contained in Appendix A - Technical Notes. The body of this report is based on the conclusions derived therefrom.

3.1 THE APPROXIMATION MODEL

Each element of the model, diagramed on page 15, consists of given conditions and/or areas of investigation. The relation of elements in the model forms a structure which represents a pattern of logic. The questions in each element are answered by working through the structure in an iterative manner.

APPROXIMATION MODEL



3.1.1 BASIC INPUTS

The following elements are identified as basic inputs to the model:

Projects and their requirements:

a. Gas pipeline construction
b. Hydrocarbon exploration and field development
c. Gas plants and gathering systems
d. Highway construction
e. Operation and maintenance of pipeline, gas plants, highway.

Regional Goals

The goals of individuals, as well as the collective goals of people in communities, can be expressed as components of the basic goal of improving the standard of living and increasing personal self-determination. The goals have been derived from the wealth of available material concerned with the region and its people.

Labour Force

The future resident labour force was derived from a projection of the existing labour force. Participation by the labour force in any new development will depend on the location of the work in relation to the place of residence of the worker.

Existing Communities

Basic inputs are the population, economic base, physical plant and constraints to or opportunities for growth in each community. Against these existing conditions can be measured the effects of events which produce change and growth.

3.1.2 WORKING ELEMENTS (Calculations)

The working elements of the model contain the questions which arise as a result of inputs and the answers which in turn may represent an input to another element. It is in these elements that most of the iterated calculations are made.

Employment. This is used as an indicator of income. The projects and their requirements will create direct employment, some temporary and some long term. Some jobs will be within existing settlements, others at remote production centres or areas. Where are the jobs? How close in traveling time are they to existing population centres? What other jobs are induced by the primary employment? Which of the induced jobs are necessarily located at the place of primary employment; which of the induced jobs are in any particular centre or centres?

Options. There are options as to the filling of these jobs. It may require training programs, migration within the region or migration from outside. There may be various combinations. What is the likely range in quantitative terms for each of the options?

Community Impact. For each option in each community what is the nature and extent of impact on population, housing, municipal services, community facilities and income? What particular opportunities or disruptions may result because of the nature or location of the community?

Assessment of Impact. What is the aggregate regional impact of each of the options measured in terms of the regional goals? Can the options be ranked in terms of project requirements, regional and community impact?

3.1.3 PARAMETERS

In answering the above questions, parameters can be defined for organizing industry activities and for maximizing opportunities for communities and for the region as a whole. These parameters represent the third group of elements in the model. They can be most specific in indicating:

Service Level. To what extent can the development be expected to increase the level of services in communities? What standards should be applied in order to reduce disparities?

Local Enterprise. In what areas is there the best potential for local entrepreneurship? How can projects be organized to maximize opportunities for northern residents?

Transport. Are there constraints in the capacity of the transportation system? How can increased transportation movements be utilized for supplying community services?

Construction. What is the best organization of building construction activities that will meet the demand? What are potential benefits of this organization in terms of upgrading skills, retaining income in the region, developing construction methods and building forms suited to the north?

In addition, implications can be stated for development of work skills, life skills, management and financing capability within the region and for logistics of hydorcarbon industry activities.

4. BASIC INPUTS

The basic inputs to the approximation model are the existing conditions, the regional goals and the requirements associated with the anticipated projects. Specifically, the basic inputs include:

Projects and their requirements
Regional goals
Existing population and labour force
Existing communities

4.1 PROJECTS AND THEIR REQUIREMENTS

The following projects, which are either planned or projected, are of a scale to have an impact on the area:

1. Gas pipeline construction
2. Hydrocarbon exploration and field development
3. Gas plants and gathering systems
4. Highway construction
5. Operation and maintenance of the pipeline, gas plants and highways.

The requirements for manpower, material, transportation and housing are basic inputs to the calculation of the impact on the region and on the communities. Further, the timing of each project has a direct relevance to potential impacts because of the possibility of competing demands on transportation, physical facilities and the labour force.

4.1.1 Gas Pipeline Construction

If the application to build a pipeline is approved without significant delay, pipeline construction will begin in 1977. Preparatory work and stockpiling will begin in 1976. The actual construction of the pipeline will occupy the three year period 1977-90. Finishing and clean-up will take place during 1980. The pipe will be laid during the winter months and other work will be done during the summer months. The peak of employment will occur during the winters of 1977-78, 1978-79 and 1979-80.

The crews engaged in pipeline construction will operate out of temporary work camps, located along the route of the pipeline at some distance from any community. It appears that there will be no direct physical impact on the communities, since there will be no requirement for accommodation of the work force within any community and the pipeline construction crews on any given length will pass relatively quickly.

There will, however, be an economic impact on the communities as a result of employment of local people in the pipeline crews: there will be an increase in the disposable income in the communities.

The fundamental importance of the construction of the natural gas pipeline, expressed in impact terms, lies in the fact that other continuing sources of employment depend directly upon its completion: the basic input is the further hydrocarbon exploration and field development and the pipeline and gas plant operation and maintenance, all of which are directly dependent upon the construction of the pipeline.

4.1.2 Hydrocarbon Exploration and Field Development

Petroleum exploration has been actively proceeding in the region since the early 1960s: the activities of the hydrocarbon industry already have had a substantial impact on the area, particularly in the Lower Mackenzie. Activity is expected to continue if there is a prospect of approval of the natural gas pipeline. Given such approval, most of the activity in the near term will be in offshore exploration and in the further development of natural gas fields in the Delta.

If facilities exist for moving the natural gas to market, exploration and field development by the petroleum companies will provide employment over a period of many years. As noted, a proportion of this work will be during the winter months, but the direct requirements of the hydrocarbon industry and the increased demand for supply and transportation will result in increased year-round employment in the Delta area, in the major transportation centres and in some minor centres. The work sites will not be adjacent to the existing communities and, in fact, in most cases will be at a considerable distance from them.

4.1.3 Construction of Gas Plants and Gathering System

Two gas plants are presently projected -- one at Taglu and the other at Parsons Lake. Both are remote from existing communities. In fact, the location of gas plants and gathering systems is dictated by the location of the hydrocarbon resource and so would not ordinarily be expected to be close to existing settlements. This being the case, the actual impact on existing communities will depend substantially upon policies related to the residence of the workers.

The timing of the construction of these facilities relates directly to the construction schedule of the pipeline and, consequently, will be during the first three years of pipeline construction -- 1976-78 -- assuming projected schedules are realized. Employment in gas plant construction will be continuous during this interval and will peak at about 1,000 during the second year.

As in the case of gas pipeline construction, the economic input of the construction of the gas plants and gathering system will exceed the increase attributable to direct new jobs and enhanced income: it will cause increased activity in transportation and supply for the actual projects and, in the long term, it will result in permanent employment in the operation and maintenance of the facilities. There will be an economic spin-off throughout the region.

4.1.4 Highway Construction

The Mackenzie and Dempster Highways are under construction. There has been discussion of a third road, referred to as the Liard Highway.

The Mackenzie Highway from Hay River to Inuvik will have a total length of approximately 1,050 miles; a proposed -- but not yet planned extension north to Tuktoyaktuk would add a further 80 miles.

The southern section of 297 miles from Hay River to Fort Simpson is complete and the next section, north of Fort Simpson, is under construction. A northern section from Arctic Red River to Inuvik -- 22 miles -- is almost completed. The estimated cost of construction (DIAND) is $200,000 a mile and construction is presently proceeding at the rate of about 50 miles a Year; it is anticipated that this rate might possibly accelerate, perhaps to 150 miles a year. Right-of-way clearing is being done under the management of Hire North, using native workers and labour intensive procedures; a section of the highway is being constructed by Hire North as part of a training program for construction equipment operators, as well as unskilled workers. In 1974 the Hire North employment complement was 150 men.

The Dempster Highway extends from Dawson, Yukon Territory and joins the Mackenzie Highway near Arctic Red River. Apart from a 30 mile section from Arctic Red River to the junction with the Mackenzie Highway -- currently under construction -- the Dempster Highway is approaching completion.

The Liard Highway would extend from the British Columbia border to join the Mackenzie Highway south of Fort Simpson along a route south of the Liard River. A decision to construct has not been taken.

Highway construction is seasonal. The location of the work sites changes from year to year and are in or close to communities for relatively brief periods. The total work force is estimated by DIAND at approximately 200 during the period of construction of the proposed highways.

The value of the highways as an input is primarily in increased accessibility and in the effect on the transportation of goods and on the life in the

communities. It will result in permanent highway maintenance jobs over the length of the highway, with most of the jobs presumably being located in the major centres.

4.2 REGIONAL GOALS

The overriding regional goals are the improvement of the standard of living and quality of life of the people and increased self-determination.

At present little of the money spent on personal goods and services is retained or recirculated in the region: sources of supply of manufactured goods and of services are beyond the regional borders, resulting in a high degree of dependence on imports and very little offsetting export of either goods or services.

Average per capita income in the communities in 1973 was approximately $1,360, compared with the national Canadian average of $4,255. Per capita income varies widely by ethnic groups and also by community. The per capita income of the native people, however, is considerably lower than the average shown in the following table from the report of Chun-Yan Kuo prepared for DIAND :

TABLE 1. PER CAPITA INCOME BY ETHNIC GROUP 1970
Mackenzie Region

Indian	$ 667
Inuit	840
Metis	1,147
White	3,545

The cash income of the native population is supplemented by income in kind to a greater extent than that of the whites. Although this is important as a contributor to the standard of living in many communities, the gap between the income and resources of the white and native people remains wide.

Notwithstanding that there are a few native entrepreneurs, the level of skills and education of the native people is lower than that of the white population. The gap is narrowing in the younger generation, hut it is evident that there should be improved opportunities for the native people to gain diversified and sophisticated skills, as well as acquiring a higher level of education. It is critically important that there should be improved opportunities for using acquired skills. On the other hand, the option of retaining a lifestyle associated with living off the land should not be prejudiced. It is imperative that this remain as an option.

Whether native people and, more broadly, northern residents, elect to enter the wage economy or not, there should be as wide a range of options as possible in terms of lifestyles and means of earning a living. And for those who opt for the wage economy the opportunity to gain the relevant skills is imperative.

The goals of regional development within the study region can be expressed in the following terms:

a. Reduction of poverty
b. Possibility for choice of lifestyles
c. Equity for all races in terms of income and opportunity
d. Diversification of employment opportunities and skills, particularly for the native people
e. Maximum participation by northerners in all economic activities
f. Increased self sufficiency in terms of goods and services within the region

As a basic input to the model, these regional goals provide a measure against which to assess the resultants of growth and change.

4.3 EXISTING POPULATION AND LABOUR FORCE

The population of the study area in 1971 was 12,182, according to a survey of the Government of the Northwest Territories.

TABLE 2. POPULATION OF COMMUNITIES BY ETHNIC GROUP AND WORKING AGE - 1971

	Native*	Other	Total	Working Age (15-64)
Tuktoyaktuk	627	40	667	319
Inuvik	1,600	1,900	3,500	1,792
Aklavik	520	160	680	295
Fort McPherson	750	90	840	423
Arctic Red River	86	10	95	55
LOWER MACKENZIE AND DELTA	3,583	2,190	5,783	2,884
Fort Good Hope	355	25	380	204
Norman Wells	87	276	363	167
Fort Franklin	410	40	450	203
Fort Norman	226	42	268	140
CENTRAL MACKENZIE	1,078	383	1,461	714
Wrigley	155	30	185	105
Fort Simpson	450	550	1,000	519
Jean Marie River	45	5	50	25
Trout Lake	45	0	45	20
Fort Providence	406	242	648	345
Hay River	700	2,300	3,000	1,744
UPPER MACKENZIE	1,801	3,127	4,938	2,758
TOTAL	6,462	5,700	12,182	6,356

*Treaty Indian and Registered Inuit only

source: NWT Government

Note: Population of Old Crow was estimated by the DIAND in 1970 to be 185, consisting of 130 Treaty Indians, 35 Metis and 20 others. 46% were between the ages of 15 and 64.

The population of the Northwest Territories increased at an annual rate of 3.5 per cent during the period 1966-71 and by 5.1 per cent during 1969-71, compared with annual average increases in all of Canada of 1.3 per cent and 1.5 per cent respectively (Statistics Canada). The rate of natural increase in the Northwest Territories is high as compared to Canada -- 2.72 per cent and 1.01 per cent, respectively, in 1971 but the statistics indicate that in-migration has been a substantial contributor to the high rate of population increase in the Northwest Territories. The growth rates in the larger communities in the study area reflect this pattern as do the estimated figures for ethnic composition in Section 14c of the Arctic Gas application, as indicated in the following table:

TABLE 3. ETHNIC COMPOSITION BY SUB-REGION 1931-1971
"OTHER" as percentage of Total Population.

	1931	1941	1951	1961	1971
Lower Mackenzie/Delta	14.5	15.0	17.4	47.6	48.8
Central Mackenzie	7.9	10.0	27.8	34.5	32.4
Upper Mackenzie	16.2	12.7	22.8	26.6	38.1
Slave	10.2	10.1	67.4	72.7	81.0
Total	12.0	12.1	48.3	57.8	64.6

Participation in the labour force in the study area is approximately 30 per cent, compared with the Canadian average of 40 per cent.

The fact that, as noted, more of the young people of native ancestry are gaining higher education and skill levels, will elevate the skills of the native people closer to the national average. This should permit increased entry into managerial, professional and highly skilled employment sectors and tend to alter the employment spectrum of the native people. Training programs currently conducted by government and industry can be expected to contribute to this effect.

4.4 EXISTING COMMUNITIES

Fifteen of the 16 communities in the study area were mapped and described in the atlas, Communities of the Mackenzie, prepared by van Ginkel Associates and published in October, 1974. The difficulty in obtaining precise data is compounded by the mobility of the northern population, but secondary source material, supplemented by brief field trips, permitted the creation of an indicative profile of each community. A summary of the information that appears in the atlas is included in the Appendix of this report.

Natural conditions of terrain and climate and the characteristics of the communities vary widely. For example, the severe climate and permafrost conditions of Inuvik create greater difficulties than are experienced in Fort Simpson in such things as building construction and the piping of water and sewage. The population of the communities studied varied from a low of 45 to a high of 3,000 with all the implications this carries. In terms of economic life, Inuvik, Norman Wells and Hay River are technologically sophisticated and the base for sizable enterprises, while Old Crow and Jean Marie River, for example, have no large scale enterprises and the people to a great extent live off the land. The size of community and its income also produces differences in local administration and relative autonomy.

The general level of housing and services in the study area is low compared to southern standards but, again, fundamental differences appear within the region: in Hay River and Inuvik, for example, housing and services are not dissimilar to the south while the old trading centres have no public utilities and a variable stock of housing, some of which is below an acceptable standard.

5. EMPLOYMENT

Changes in employment characteristics which have been evident over the past decade will continue, irrespective of whether or not a pipeline is built through the Mackenzie Valley. The trend will continue to be away from the land in the direction of settlement-based employment, requiring special skills and relatively stable lifestyles. Within the communities--particularly the larger ones -- the trend will be for the employment spectrum to become more varied, providing an opportunity for individual lifestyles to be enriched through "a wider range of services and increased mobility.

This trend can be expected to apply to the entire study area, notwithstanding the possibility that in some smaller communities there will continue to be reliance on the land-based activities and that, to some extent, native people in wage employment will supplement their Income, in cash or kind, through hunting, trapping and fishing. Indeed, a basic premise in considering future employment opportunities is that this option continue to be available to the native people.

5.1 GENERATION OF EMPLOYMENT

It is fundamental to any consideration of employment prospects to recognize that increased activity in one sector of the economy generates activity in other sectors: further, because the relationship is broadly predictable, knowledge of the parameters of activity in one sector permits an approximate projection of the amount of activity that will be generated in other sectors.

In this study the commonly accepted classification of the activity sectors -- primary, secondary, tertiary and quaternary -- is used. Given that the impact of the pipeline and hydrocarbon activities in terms of employment creation in the primary and secondary sectors is measurable, it was possible to estimate the total employment that would result in the tertiary and quaternary sectors and so to project total anticipated employment.

Activities in the primary sector include mineral extraction, agriculture, forestry, fishing. The secondary sector includes manufacturing, processing and construction. Tertiary covers the range of services and facilities directly required by individuals or industry – transportation, communications, utilities, retail and wholesale services. The quaternary sector includes government and such things as personal and financial services provided to the primary, secondary and tertiary sectors.

New jobs will be created in the primary and secondary sectors as a direct result of pipeline construction. And these activities will generate additional employment in the tertiary and quaternary sectors as a result of:

(a) the requirements of the industry for supPlY, services and transportation, and

(b) the requirements of employees for housing, supply, services and community facilites.

In a fully industrialized economy -- such as Canada -- the ratio of primary and secondary employment to tertiary and quaternary employment is normally of the order of 40:60. In an agricultural or resource economy, on the other hand, this ratio is normally of the order of 60 primary and secondary jobs to 40 tertiary and quaternary. Given the immaturity of the economy

of the Northwest Territories it would be understandable if the 60:40 ratio was anticipated. In fact, [illegible] territories the ratio of primary / secondary: tertiary/quaternary [illegible] to 25:65, which might seem to imply that the rather limited [illegible] and secondary sectors are provided a very sophisticated [illegible] and that the ratios are distorted by the very large number [illegible] residents working in government establishments or providing [illegible] to the people.

The ratio can be expected to become more normal as industrial development proceeds and self-sufficiency [illegible] the number of jobs in government presumably will not grow [illegible] in primary activities. It is assumed that the ratio of primary/secondary to tertiary/quaternary will equal the national ratio of 40:60 [illegible] Norman Wells, Fort Simpson, Hay River. [illegible] smaller communities it is anticipated that it will approach [illegible] more probable in an unsophisticated economy.

As previously noted, [illegible] in the tertiary and quaternary sectors can [illegible] the number existing in the primary and secondary sectors. The exact number and location can depend upon a variety of [illegible] to which influence. In terms of location, jobs generated in transportation, for example, will frequently be remote from [illegible] activities.

The actual number of jobs generated in the tertiary and quaternary sectors by the new primary jobs [illegible] influence by the following factors:

a. The extent of the increase in the spending power of existing residents.

b. The proportion of [illegible] actually living in the study area, compared with the proportion commuting from outside. (The major proportion of income is spent at the location where the family resides.)

c. The total of employees currently employed in the study region who will move to another community and so create a demand for new housing, goods and services in the community to which they move.

d. The total of employees who migrate with their family to the study area from outside.

e. The possibility that new local service enterprises become more viable as a consequence of increased population and/or spending power.

5.2 EMPLOYMENT PROJECTIONS TO 1985

In order to assess impact in the study area estimates were made of the probable employment, assuming the application to construct a natural gas pipeline is approved in 1975, thus enabling construction to commence in 1976. The base year for calculation is 1985, chosen because it will be well into the period of production and operation and a steady pattern of exploration.

The lead time between exploration and production in the oil industry is long enough to allow reliable projections of development: this permits the assumption that the level of activity will continue after construction of the pipeline is complete and that, if and when it does slow, it will do so at a rate that allows diversification – an assumption consistent with experience in Alberta.

Pipeline construction will assure a continuing source of primary employment in hydrocarbon exploration and production. Of equivalent importance, it can become a focus for upgrading the skills of the labour force and for the restructuring of economic enterprise in the study area.

In the event that the pipeline is not built it is the view of the petroleum industry that hydrocarbon exploration will virtually come to a standstill. If it is delayed, exploration will slow, presumably in some proportion to the extent of the delay. In either instance, the construction of the Mackenzie Highway will remain as the only major new economic input into the study region. It is quite apparent that activity related to the highway will not be a strong enough generator to resolve the employment problems of the area, since the range of jobs and skills is very limited and the income from permanent jobs will not be high.

If the pipeline is built in the proposed' time schedule, employment in several sectors of the economy over the 1975–1985 time period can be calculated: this includes jobs directly connected with exploration for hydrocarbons and the

resulting development and production, as well as jobs in pipeline construction, maintenance and operation and general construction. There will be additional primary employment in agriculture, forestry, hunting, trapping and fishing; further, there will be additional secondary employment in processing and manufacturing -- which, as a proportion of total employment, will not be large and can be estimated with reasonable assurance.

In the expanding economy that will result from pipeline construction, employment in the primary and secondary sectors is expected to be approximately 40 per cent of the total number of jobs available (see Section 5.1). Consequently, from the knowledge of the primary and secondary jobs the tertiary and quaternary employment can be deduced and thus the total of jobs that will result after construction of the pipeline can be estimated.

5.3 PRIMARY EMPLOYMENT

Employment in the primary sector can be determined from the estimates and projections of the operating pipeline and petroleum companies and from the general assumptions of population growth and trends, influenced by the regional goals stated in Section 4.2 of this study. Secondary employment also can, in part, be determined from the companies, with estimates made of induced secondary employment. The projections for 1975-1985 are shown in Table 4 on the following page.

5.3.1 AGRICULTURE, FORESTRY AND FISHERIES

The promotion and encouragement of increased activity in agriculture and forestry would contribute to the advancement of stated regional goals, particularly in terms of the retention of earned income within the region, increased self-sufficiency of the region and the diversification of economic opportunities. It is currently a minor area of economic activity.

Employment in agriculture and forestry is estimated at some 25-30. Commercial fishing is largely concentrated on Great Slave Lake: on the basis of current activity at Hay River the employment in commercial fishing is estimated at 25 persons.

In view of the increased market that will result from development, the viability of farming and food-related activities can be expected to improve, resulting in some increase in the production of livestock and in the conventional and hydroponic production of vegetables. If the Liard Highway is built, exploitation of the forest and mineral resources of the Upper Mackenzie is likely to proceed, with implications in terms of future jobs.

TABLE 4. PRIMARY AND SECONDARY EMPLOYMENT IN THE STUDY AREA 1975-1985

PRIMARY EMPLOYMENT	1975		1976		1977		1978		1979		1980		1985	
	S	W	S	W	S	W	S	W	S	W	S	W	S	W
Agriculture & Forestry	50	50	75	75	75	75	75	75	75	75	75	75	200	200
Hunting Fishing Trapping	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Hydrocarbon: Seismic	300	1100	300	1100	300	1100	300	1100	300	1100	300	1100	300	1100
Drilling	100	500	100	500	100	500	100	500	100	500	100	500	100	500
Field Devel.	350	650	350	650	800	1100	1000	1100	1200	1200	1200	1200	1200	1200
Gas Plants			-	-					160	160	160	160	160	160
Pipeline							130	130	190	190	200	200	208	208
Sub Total	900	2400	925	2425	1375	2875	1705	3005	2125	3325	2135	3335	2268	3468
SECONDARY EMPLOYMENT														
Manufacturing & Processing	150	150	200	200	200	200	200	200	200	200	200	200	200	200
Construction; building	500	300	600	400	600	400	600	400	600	400	750	450	850	500
engineering	300	200	500	300	800	400	800	300	750	400	600	350	600	350
pipeline	-	-	275	475	1350	3800	1415	4550	1260	4215	220	-	-	-
gas plants	-	-	400	400	1000	1000	100	100	-	-	-	-	-	-
cleanup	-	-	200	200	200	200	250	250	250	250	250	-	-	
Sub Total	950	650	2175	1975	4150	6000	3365	5800	3060	5465	2020	1250	1650	1050
TOTAL	1850	3050	4100	4400	5525	8875	5070	8805	5185	8790	4155	4585	3918	4518

It is assumed that in 1985 the fish plant based at Hay River will employ 75 people and that forestry, primarily in the Fort Simpson hinterland, will employ 50. A projection of 200 jobs in agriculture, forestry and fisheries in 1985 is considered conservative.

5.3.2 FISHING, HUNTING AND TRAPPING

The arbitrary assumption is made that the present employment of 84 persons involved full time in hunting and trapping will increase to 100 by 1985.

5.3.3 HYDROCARBON INDUSTRY

As noted, employment in the hydrocarbon related activities -- current and projected -- can be determined from the estimates and projections of the pipeline and petroleum companies. These figures are on the public record.

Current hydrocarbon exploration and development involves three distinct activities and the construction of the pipeline will add two additional activities:

a) Seismic exploration
b) Exploratory drilling
c) Natural gas field development
d) Gas plant operation and maintenance
e) Pipeline operation and maintenance

Employment in seismic exploration and in natural gas field development is seasonal, the former taking place for three months in the summer and four in the winter and the latter for two months in the summer and six months in the winter. Employment in seismic exploration and in exploratory drilling will continue at the present level over the 1975-85 study period, assuming there is a prospect of moving the natural gas to market. Employment in field development, on the other hand, will be year-round, will increase with construction of the pipeline and will, of course, be concentrated in the

Lower Mackenzie.

Construction of the natural gas pipeline will result in two additional activities in the hydrocarbon extraction industry -- gas plant operation and maintenance and pipeline operation and maintenance. Both of these activities will provide permanent and year-round employment.

TABLE 5. EMPLOYMENT IN HYDROCARBONS 1975 and 1985.

	1975		1985	
	summer	winter	summer	winter
Seismic exploration	300	1100	300	1100
Exploratory drilling	100	500	100	500
Field development	350	650	1200	1200
Gas plants			160	160
Pipeline operation			208	208
	750	2250	1968	3168

5.4 SECONDARY EMPLOYMENT

5.4.1 Manufacturing and Processing

Existing employment in manufacturing and processing is principally concentrated in the refinery activities at Norman Wells, in fur garment and canvas goods manufacture in the Lower Mackenzie and in such small enterprises as box manufacturing in Hay River. It is assumed that the level of activity in these enterprises will continue, with some increase in persons employed and, further, that there will be additional new manufacturing as a consequence of population growth and as a result of policies designed to further stated regional goals.

5.4.2 construction

Employment in construction is considered in the following five categories:

a) building
b) engineering
c) pipeline
d) gas plants
e) clean-up

a) Building construction

The estimates of employment in building construction are based on the requirements for new housing, commercial and community buildings and the replacement of substandard housing units (Appendix A). Using these criteria building construction will grow as population grows, but the precise quantity will depend upon public policy with respect to standards, and on the availability of financial resources.

b) Engineering construction

This category includes the construction of highways and municipal works and the maintenance of both (Appendix A). It is assumed that there will be major highway construction over the period 1975-1979.

TABLE 6. EMPLOYMENT IN BUILDING AND ENGINEERING CONSTRUCTION

	Building		Engineering	
	Summer	Winter	Summer	Winter
1975	500	300	300	200
1976	600	400	500	300
1977	600	400	800	400
1978	600	400	800	300
1979	600	400	750	400
1980	750	450	600	350
1985	850	500	600	350

c) Pipeline construction

Employment in pipeline construction will extend over the period 1976-1980, with a peak in 1977-79 -- the three Year period during which the major sections will be laid (Table 7).

Given that the focus of this report is on the 1985 employment levels, the real significance of the construction of the pipeline in the years approaching 1985 is its causal relationship to continuing economic activity: it will result in related hydrocarbon activity and will stimulate the growth of small enterprises In supply and services. These enterprises will be in position to continue to supply permanent industries and the communities. Further, the construction of the pipeline can increase the level and broaden the range of skills of the native people through government and industry training programs and relevant experience -- also a continuing economic benefit.

d) Gas Plant Construction

Employment will be created over a limited time period by the construction of the gas plants; as with the pipeline it will bear a causal relationship to continuing economic activity by generating permanent employment. Because the gas plants will be located in the Delta area, which does not experience the seasonal transportation constraints of the rest of the Mackenzie River Valley, work will continue all year, as shown in Table 7 which follows.

e) Clean-up

Construction employment as discussed in the foregoing does not include the post-construction clean-up. It will, however, provide some employment, as shown in Table 7, which follows.

TABLE 7. EMPLOYMENT IN PIPELINE CONSTRUCTION, GAS PLANT CONSTRUCTION AND CLEAN-UP

	Pipeline		Gas Plants		Clean-up	
	Summer	Winter	Summer	Winter	Summer	Winter
1976	275	475	400	400	200	200
1977	1350	3800	1000	1000	200	200
1978	1415	4500	100	100	250	250
1979	1260	4215			250	250
1980						

5.5 TERTIARY AND OUATERNARY EMPLOYMENT

Employment in the primary and secondary sectors is assumed to have the potential of generating employment in the tertiary and quaternary sectors in the ratio of 40:60 (see Section 5.1). Although this does not appear to be a substantial change from the current 35:65, in fact it will result in the employment spectrum in the tertiary and quaternary sectors changing quite substantially: employment in government jobs presently accounts for approximately 50 per cent of the tertiary and quaternary employment in the study area; given the economic development implicit in the pipeline and related hydrocarbon activities, the number of service jobs will increase substantially and will result in improved job diversity and a greater availability of service jobs in the private sector.

5.5.1 Transportation

Employment in transportation will increase in response to the large volume of material and supplies required for construction of the natural gas pipeline and the gas plants. The increased demands of a larger population and the continuing development of the settlements will sustain a higher level than now exists.

Most transportation is now by water and air, but the completion of the highway system will result in an increased proportion of road transport-

-at ion. Increased trucking will stimulate the smaller, locally based trucking enterprises. However, because bulk transport will continue to be by water, and passengers, perishables and high value goods will continue to move by air, activity and employment will increase in all transportation modes. It is estimated that employment in transportation will be 10 per cent of all employment, being higher than the eight per cent average for all of Canada as a consequence of the relative distances and the wide dispersal of the settlements and of hydrocarbon related activities in the study area.

5.5.2 Communications and Utilities

It is assumed that the level of service in utilities and communications in the communities will be improved to satisfy the increased demand of the people and consistent with the regional goal of improving living conditions. Increasing population, indeed, will necessitate a higher level of service in some communities, as will the growth of industry. Social reasons require a higher level of services than now exist in some of the smaller communities. The necessary improvement of the utilities and of communications will result in an increased number of jobs.

5.5.3 Retail and Wholesale Trade, Personal and Business Services.

Trade and personal and business services will respond to increases in employment in the primary and secondary sectors. Enterprises, not now economic, will become viable as a consequence of the increased population and spending power in the communities: this, in turn, will increase employment and, further, will widen the range of specialized jobs which only can be supported by a larger population and increased financial capacity. The construction of highways will be additional to the impact of the hydrocarbon activities: it will increase employment by stimulating travel and tourism and by creating a demand for services and accommodation.

5.6 EMPLOYMENT SUMMARY

It is estimated that [illegible] employment in the study area will have grown to approximately 10 ( ) [illegible],500 as indicated in Table 8. It should be restated that the employment peak in the intervening years during pipeline construction is not relevant to the actual impact on the communities and the region. The actual site of pipeline construction and the lodging of workers employed on the job will be outside the settlements and, further, some [illegible] of the workers will commute [illegible] outside the study area.

There is no likelihood of the availability of jobs fall[illegible] now the availability of workers at the conclusion of the period of pipeline and gas plant construction [illegible] from the continuing primary [illegible] secondary jobs, tertiary and quaternary employment will be augmented by the demand of industry for support services, and by the increased spending power that will continue in the communities.

TABLE 8. ESTIMATED [illegible] EMPLOYMENT, 1985.

	1975		1985	
	Summer	Winter		Winter
PRIMARY				
Agriculture, forestry	50	50	[illegible]	[illegible]50
Hunting, fishing, trapping	100	100	[illegible]0	100
Hydrocarbons	770	2250	1962	1962
sub-total	920	2400	[illegible]	[illegible]2[illegible]2
SECONDARY				
Manufacturing & processing	150	150		
Construction, building & engineering	800	500	[illegible]	[illegible]95[illegible]
sub-total	950	650		[illegible]
TERTIARY AND QUATERNARY (@ 40:60 ratio)			[illegible]	[illegible]6
Total			[illegible]9	[illegible]1[illegible]5

6. POPULATION AND LABOUR FORCE

The rate of increase of population in the Northwest Territories is considerably higher than in Canada as a whole. This is due to a high rate of natural increase, but has been re-enforced by the in-migration of people from the south -- a movement of people to which the oil industry has contributed directly and indirectly.

The population projections made by Gemini North Ltd., visualize increases in population of approximately 18 per cent between 1971 and 1975 and 36 per cent between 1975 and 1985. These estimates are predicated upon a continuation of the present level of hydrocarbon activity. The projection is useful in determining the size of the resident labour force in the post-pipeline period and for comparison with population estimates based on the likely employment opportunities at that time.

During the next decade the size of the labour force will be determined by the increase of population and by the rate of participation in the labour force. In fact, the size of the labour force is disproportionately influenced by the low participation of the native population: less than 30 per cent of the native population is now in the labour force, compared with 40 per cent of the non-indigenes. To the extent that the participation of indigenes is low because of a lack of skills, the participation rate should increase substantially, as the level of education rises and training programs become more effective.

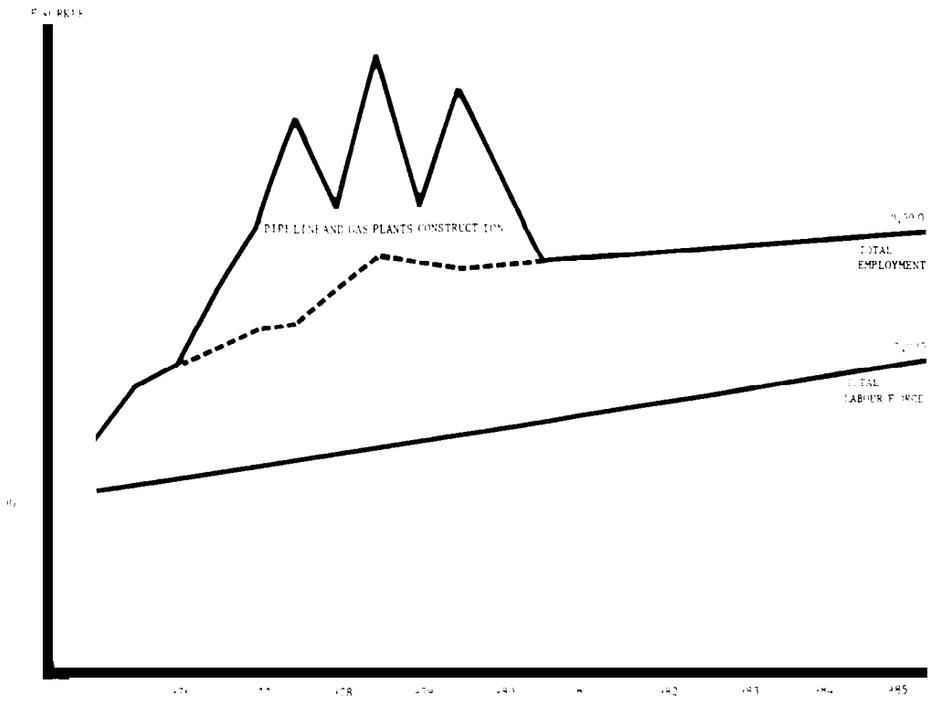
Reliable estimates of existing participation rates are difficult to make because of the short term and seasonal nature of much employment. The

projection of future participation rates is compounded by the added difficulty of assessing the extent to which training programs and increased opportunities will induce people to enter the labour force.

In settlements with a fully developed wage economy -- Inuvik, Norman Wells, Fort Simpson and Hay River -- participation will approximate the Canadian average of 40 per cent. In the other, smaller centres the maximum likely participation rate, even though influenced by the increased availability of training, is expected to be 30 per cent -- the existing average rate for the study area as a whole.

Assuming this rate of participation and applying it to the projected population indicates a labour force in the study area in 1985 of 7,035, (Table 11). The following graph, Projected Total Employment and Labour Force, indicates that the long term employment opportunities will exceed the capacity of the resident population to fill them. At maximum participation rates there will be a continuing demand for labour imported from outside the study area.

PROJECTED TOTAL EMPLOYMENT AND LABOUR FORCE



7. OPTIONS FOR GROWTH

The communities of the study area will experience increased growth as a result of the economic impetus of pipeline construction. However, the extent to which specific communities grow and the nature of the impact on all communities depends on several variables. Among the variables which are susceptible to quantification are the options open to industry in its employment policy.

Some of the industry jobs dictate residence at or near the place of employment. But others may be satisfactorily filled by workers who commute from their place of residence on a daily basis or work a schedule of shifts of several days or longer duration. In the last option there are the further alternatives of employed families living either within the study area or outside the study area. The location of jobs in the tertiary and quaternary sectors will depend on the location of new primary and secondary employment and where the employees and their families live.

Arctic Gas projects a requirement for 208 permanent employees in pipeline maintenance and administration at the following locations:

Inuvik	79
Norman Wells	66
Fort Simpson	63

The gas plants at Taglu and Parsons Lake will each employ 80 but the place of residence of the employees has not yet been defined. There remain 1,600 year-round and 1,200 winter jobs in the hydrocarbon industry (Section 5.3), most of which are located in the Delta area or off-shore and for which the place of residence of employees has not yet been defined.

After assigning as many of these hydrocarbon jobs as possible to existing residents in order to create full employment, the following options for filling the remaining jobs were examined and their impact quantified.

1. These jobs are filled by transient workers from outside the study area.
2. These jobs are filled by persons living in the Delta:
    a) in all Delta communities proportionate to population
    b) in Inuvik
    c) in a new settlement in the Delta
3. These jobs are filled by persons living throughout the study area:
    a) in all communities in proportion to present population
    b) in Inuvik and Fort Simpson
    c) in Norman Wells, Fort Simpson and Hay River

Each option will have a different impact on the individual communities and on the study area as a whole as a result of:

a) the number of families requiring accommodation;
b) the demand for utilities, municipal services, education;
c) spending power within the community;
d) induced economic activity and employment within the community;
e) induced economic activity and employment in the study area (e.g. in transportation, supply, construction) .

Under any circumstances visualized in the options the larger communities will continue to act as service centres for the smaller communities. The hospitals, high schools, wholesale and retail trade establishments, professional services, transportation facilities and administrative headquarters, which serve the region as a whole, will be located in the larger communities . The extent to which all these services will be required will depend on the number of residents in the study area.

The estimate of the population in each community in 1985, under each option was based on the following premises, developed in the preceding sections:

a) Employment in primary and secondary sectors, other than hydrocarbons, would develop as described in Section 5.3.

b) The ratio of primary and secondary to service jobs would be

in the ratio of 40:60 in Inuvik, Norman Wells, Fort Simpson and Hay River and in the ratio of 50:50 in the remaining communities .(Section 5.1)

c) The rate of participation in the labour force by the population would be 40% in Inuvik, Norman Wells and Fort Simpson and 30% in all other communities. (Section 6)

The method of calculating the results of the application of each option appears in Appendix A. The approximate size of communities resulting from the application of each option is in Table 9, which follows.

The smallest total population in the study area -- 21,590 -- results from Option 1. In this option there are 789 jobs in excess of the number of residents available for employment in the primary and secondary sectors which are assumed to be filled by transients, as shown at the foot of Table 9. The other options result in a total population between 26,130 and 26,520 -- not a significant difference. However, there are considerable differences in the population of individual communities. The net result in terms of impact depends on the capacity of those communities to expand.

It should be noted that it is generally desirable that those who work in a community have a stake in its well being. From a social viewpoint a large population of transient people from outside the region tends to cause the deterioration of social relationships. From the economic viewpoint, a large population of transient workers means that earning power in the region becomes spending power outside the region, and so reduces the possible creation of jobs in the service sectors.

These considerations are of particular significance in the case of the North: most of the communities lack an adequate social, economic and cultural infrastructure. The loss of local spending power implicit in the employment of transient workers not only reduces the total of service jobs but prejudices the opportunity to improve facilities and services in the community and fails to make an input into the social and cultural life of the region.

The economic activity that will be directly and indirectly induced by the

TABLE 9 APPROXIMATE SIZE OF COMMUNITIES FOR EACH OPTION

Option	1	2.a	2.b	2.c	3.a	3.b	3.c
Tuktoyaktuk	1,005	1,585	1,005	1,005	1,285	1,005	1,005
Inuvik	6,035	9,270	10,950	5,630	7,580	9,805	6,035
Aklavik	1,060	1,665	1,060	1,060	1,355	1,060	1,060
Old Crow	345	545	345	345	420	345	345
Fort McPherson	1,350	2,130	1,350	1,350	1,715	1,350	1,350
Arctic Red River	150	235	150	150	190	150	150
New Settlement				5,320	-	-	-
Lower Mackenzie and Delta	9,945	15,430	14,860	14,860	12,545	13,715	9,945
Fort Good Hope	600				765	600	600
Norman Wells	680				845	685	1,100
Fort Franklin	695				840	695	695
Fort Norman	415				530	415	415
Wrigley	305	Same as Option 1			390	305	305
Fort Simpson	1,880				2,335	3,030	3,010
Jean Marie River	80				100	80	80
Trout Lake	65				80	65	65
Fort Providence'	1,040				1,320	1,040	1,040
Hay River	5,625				6,975	5,630	9,015
Central and Upper Mackenzie	11,385	11,385	11,385	11,385	14,180	12,545	16,325
Total	21,330	26,815	26,245	26,245	26,725	26,260	26,270
Transient Workers	789	-	-	-			

Options for filling additional Delta jobs (page 43) by residents of:

1. Outside study area
2.a All Delta communities
2.b Inuvik
2.c New Delta settlement
3.a All communities
3.b Inuvik and Fort Simpson
3.c Norman Wells, Fort SimPSon, Hay River

hydrocarbon industry should result in a large number of jobs being created in the study area, relative to the resident population. Additional workers from beyond the borders of the study area will be required if all the jobs are to be filled. But it is not necessary that they should all be transients: every effort should be made by employers to encourage new employees from the outside to move with their families and take up residence in the study area. This will not necessarily mean that everybody will reside at his place of work. But it will help to develop a more harmonious social environment and it will improve both the level of prosperity and of services in the northern communities.

8. ASSESSMENT

8.1 General Impact

Construction of the gas pipeline will have an impact on the study area on a long term basis through increasing levels of employment and income and by attendant changes in lifestyle. Lifestyle in the area has already changed and change will continue and carry with it continuing side effects. The benefits may be great, both in the immediate and long term; problems of adjustments are implicit. Increased employment and income will bring a demand for better housing and community facilities. This can be a critical area in maximizing benefits and minimizing disruptions of the increased economic activity. Disorientation can be decreased by continuity of development in the communities; this implies the maintenance of normal Population growth except in those communities already oriented to economic expansion and accelerating population growth. Friction between social and ethnic groups can be reduced by ensuring that employment and income is equally available to all groups and--that housing, community facilities and services are equal for all.

In this chapter, impact is assessed for each of the options defined in Chapter 7. The following sections represent the major points at issue:

8.2 Physical constraints to growth.

8.3 The pros and cons of creating a new community in the Delta.

8.4 Capacity of the building industry as a constraint to growth if a good standard of housing and community facilities and services is to be achieved.

8.5 Relative impact on the Delta communities and the remainder of the study area.

8.6 Impact on individual communities.

8.2 PHYSICAL CONSTRAINTS TO EXPANSION

Constraints are examined here relative to the populations estimated in TABLE 9., APPROXIMATE SIZE OF COMMUNITIES FOR EACH OPTION. In most cases the projected growth is not excessive relative to the land area for expansion. Physical constraints are most critical in larger communities where considerable areas already have been developed and where a commitment to further growth is implicit in the economy of the community.

Inuvik

Problems of expansion of Inuvik are listed in a Makale, Holloway report of September, 1973. Expansion will be expensive and, barring development of a satellite town (which would not resolve the problems of the existing site) the degree of possible expansion is limited. Despite this, some growth is necessary to consolidate and improve existing services, and to satisfy the increased demand on services supplied from Inuvik that will result from population growth in the surrounding Delta communities.

It is assumed that by 1985 services will be generated in the Delta as a whole at a rate of 60 tertiary and quaternary jobs for each 40 primary and secondary jobs filled by residents of the area; in Delta communities other than Inuvik service jobs will be generated at a lesser rate - 50 for each 50 primary and secondary jobs. It is assumed that the remaining services for the smaller communities will be provided out of Inuvik. A population of approximately 6,000 would allow Inuvik to fulfill its role as the administrative and service centre for the Delta and the Eastern Arctic. Options 2a., 2.b, 3a, and 3.b require that Inuvik grow far beyond this limit. These options, therefore, are rejected as being impractical.

Norman Wells

Because of swamps and the expense of the crushed rock required for fill, potential expansion of the present townsite is limited. Because of its location and the potential for new employment, there is no doubt that Norman Wells will be under pressure to expand beyond its limits. Even at present, there are a large number of transients and squatters living in shacks outside the town. Unlike Inuvik, which is tied to its site by the massive investment in physical plant and infrastructure, the present site of Norman Wells need not be limiting to its potential growth: ideal sites for expansion are available on the rock terraces east of the present site.

For the purposes of this analysis, it is assumed that the town site can move and that there is no further constraint to its expansion.

Fort Simpson

In terms of its location -- at the confluence of the Liard and Mackenzie Rivers, at the junction of the Liard and Mackenzie Highways and close to areas of mineral and hydrocarbon exploration, forestry, agriculture and tourist potential -- Fort Simpson is well situated for expansion. The fact its present island site, fully developed except for institutional lands, is subject to flooding severely constrains growth. Irrespective of hydrocarbon activities a site for expansion is needed for Fort Simpson, as for Norman Wells. Engineering and planning reports have indicated that even a very limited growth would have to be accommodated off the island. Once this step is taken there should be no hindrance to growth.

Hav River

Though expansion of the "new town" of Hay River is at present restricted by the location of the railway and highway, these cannot be considered serious constraints in the light of the geographic location of the town, the investment in services and infrastructure that has already been made and the pattern of regional development which relies on Hay River as a supply and service centre. Hay River will continue to expand with development of the region. The area north of the "new town" is ideal for expansion. If this

necessitates moving the rail line or building new crossings, it can readily be done. Hay River is not considered to be constrained by physical limits to expansion.

However, in some of the smaller communities there are constraints to growth which influence assessment of the options:

Tuktoyaktuk

In a planning and engineering assessment of March, 1972, Makale, Holloway and Associates recommend that

> "Even with an increased density the ultimate capacity of the townsite is limited and it is doubtful whether more than 200 additional population could be accommodated. Anything over approximately that number will require a new town site."

Estimated 1971 population of Tuktoyaktuk is 627. If the limit is considered to be 850, normal growth will have to be curtailed before 1985 when it is projected that it could be slightly in excess of 1000. Options 2a. and 3a. require, by definition, that Tuktoyaktuk and all other communities grow faster than normal. Because of the definite limit in Tuktoyaktuk and unsatisfactory, even if less severe, conditions found in other Delta communities these options are rejected as being impractical.

Aklav ik

Problems of expansion are less clearly defined in Aklavik but, nonetheless, further growth can be accommodated at the same low densities as in the past only with some difficulty. It is not recommended that growth be encouraged beyond the normal growth that might ordinarily be anticipated.

Fort McPherson

In Fort McPherson, the available area of well drained land appropriate for construction is limited and growth beyond the normal increase should not be encouraged.

Other communities in the study area have specific physical problems in terms of growth, but none are considered critical in terms of the level of growth that might result from any of the options.

8.3 A NEW SETTLEMENT

Option 2.c visualizes construction of a new settlement in the Delta in the vicinity of the hydrocarbon jobs. The population resulting from this primary employment would be in the order of 5,500 persons. This population would require an extensive physical infrastructure and an array of services, many of which would duplicate those that exist in Inuvik. For the first few years the new settlement would depend on Inuvik for manpower and services, placing a great strain on the resources of Inuvik and of the Delta as a whole. Construction of the new settlement would divert resources from ongoing programs in other communities and would contribute to inflation of the price of goods and services in the area. The new settlement would contribute little to the area in terms of increased services, since its population would be similar to that of Inuvik. It is unlikely, therefore, that it would provide a wider variety of trade enterprises, business or professional services. For these reasons Option 2.c is rejected.

8.4. CONSTRUCTION DEMAND

8.4.1 Normal Growth

The demands that will be made on the building industry under each option must be assessed against the capacity of the industry to construct the required dwellings and facilities. The capacity of the construction work force is a hard constraint that determines maximum possible growth, assuming good housing, community facilities and services are to be provided.

As calculated in the Appendix (A.5.3) the requirement for construction under conditions of normal growth will average 488 man-years annually between 1975 and 1985. It should be noted that this is a theoretical figure based on population size alone: the employment and income necessary to support this required rate of construction is not determined. However, given existing income in the area and the current potential of the building industry, it is unlikely that such a rate can be achieved without lowering the standards that have been accepted in this study. The occupancy rate of 3.5 used in the calculations would have to be raised, sub-standard and obsolete dwellings could not be replaced as quickly as required and community facilities and services might be less than adequate.

8.4.2 Options - Construction Demand

Construction of the pipeline and consequent full employment will result in increased population growth due to inducement of service jobs and in-migration. But pipeline construction also should mean increased incomes and increasing labour sophistication -- both of which are necessary to achieve a higher standard and a higher rate of housing construction.

In the previous sections of this chapter it was determined that many of the apparent options for growth are, in fact, unworkable or undesirable because of constraints in particular communities. The options which remain are:
(1) Option 1, in which growth occurs close to normal with full employment in all communities, a balance between primary and secondary jobs and services and an additional 789 year-roundjobs filled by transients from outside the study area.
(2) Option 3.c., based on the same premises as Option 1 but with population growth greater than normal so that by 1985 all hydrocarbon jobs can be filled by residents of the study area.

As calculated in the Appendix (A.5.3.2) Option 1 requires 575 man-years of construction annually, below the estimated construction capacity of 600 man-years. There should be no problem in achieving this requirement.

Option 3.c. requires 795 man-years of construction annually. This is substantially greater than the estimated construction capacity of 600 man-

years. In this option, however, the increase of population takes place in the larger communities, particularly in Fort Simpson and Hay River. It is conceivable that much construction in these centres could be industrialized and that a greater proportion of components and pre-assemble units could be shipped from the south. Option 3.c. is directed toward residence of all hydrocarbon employees within the study area. As noted, this is considered desirable in order to retain within the area a larger proportion of earned income: it may therefore follow that importing construction capacity is a net benefit.

8.5 RELATIVE IMPACT IN THE DELTA

The greatest impact of further hydrocarbon development will be in the Delta since most of the hydrocarbon jobs that will be available in 1985 are in the Delta or adjacent to it. However, since most of these jobs are outside the communities, their impact on Delta communities will not necessarily be more direct than on the Communities located farther south. Except for the 79 pipeline operation jobs headquartered in Inuvik, all hydrocarbon jobs in the Delta are in the field or at processing plants, base camps or sites 'outside' the communities. Some communities in the Delta may be within daily commuting range of some installations. But it will be necessary to provide transient accommodation (camps as at present or some form of lodges) for employees living in communities beyond commuting range -- in the middle and upper Mackenzie or outside the study area. Employees migrating to the Delta from outside the study area will settle in Inuvik rather than in the smaller communities

It has been assumed in estimates of employment and population (Appendix A) that through commuting, all communities in the study area can have equal opportunity to participate in employment in the Delta. However, the relative proximity of Delta communities to these jobs and the fact that employees in the Delta can travel back and forth from job to home more frequently may mean that a larger proportion will elect to take these jobs than will be the case in the communities farther south.

8.6 IMPACT ON COMMUNITIES

Impact on a community is determined by analyzing its role, employment characteristics and requirements for housing and community facilities in the period following pipeline construction. The physical aspect of a community is used as a measure of the quality of life. The standards applied in estimating the requirements are those generally accepted for Canada as a whole. Detailed information on each community and on the application of these standards is included in the Appendix.

The population figures used in the assessment are those of Options 1 and 3.c., modified to limit Tuktoyaktuk to 850 people. For both options the population figures of the communities are the same except for the four service centres -- Inuvik, Norman Wells, Fort Simpson and Hay River. For these centres the larger population implicit in Option 3.c is used since this represents maximum impact. As a result of increased migration to the larger centres, the smaller communities could grow at lesser rates than that assumed. However, if there is access to hydrocarbon jobs as assumed, and if housing, community facilities and services are, as a result, improved in the smaller communities, growth rates could be as estimated. Again, the greater population is taken as the case of maximum impact.

Tuktovaktuk

The impact of increased economic activity in the area will he felt in Tuktoyaktuk through the availability of steady year-round jobs at the gas processing plants at Parsons Lake and Taglu. Both plants are within 50 miles of the settlement so that residents could commute to jobs on a daily basis. The Imperial Oil base camp and the Northern Transport Company harbour facilities will be active, providing further year-round employment. If the highway is completed tourism will increase.

The adequacy of the economic base presents no problems in Tuktoyaktuk, although physical constraints do. Pipeline or not, the problems of water supply and sewage disposal require thorough design work. However, with increased income the community will be in a better position to solve these

expensive problems. In estimating the number of dwelling units required, 240 in 1985 compared to 115 in 1974, an occupancy rate of 3.5 persons per unit was used, compared with the existing 5.5. This need not mean an increased land requirement since densities per acre should, in any case, be increased.

Inuvik

Impact will touch all areas of Inuvik's life and economy. Though the level of activity will increase, no change in direction is foreseen. Government administration and operations will continue. The northern division of gas pipeline administration, operation and maintenance will be in Inuvik. Supply of goods and services to communities and industry in the area will expand and local services and amenities will increase. The degree to which the town continues to function as a stop-over for transient workers depends to a great extent on the policies of the hydrocarbon producers and their suppliers. Expansion of the town is feasible but will continue to be increasingly expensive. The existing townsite should be increased in density -- particularly the central commercial area. The proposal by Makale, Holloway and Associates, September 1973, to relocate industrial facilities could result in further residential space becoming available.

It has been estimated that a population of approximately 6,000 will allow Inuvik to fully perform its role as a regional service centre. This has been assumed as the maximum to which the town should grow.

Aklavik

There is little doubt that residents of Aklavik will elect to fill many of the available hydrocarbon jobs in the post-pipeline period since they are noted as a mobile population and many have experience in the hydrocarbon industry. To expedite the increased air traffic that must be anticipated, the air strip should be surfaced for all-weather use. Increased income will allow consolidation and upgrading of services and community facilities,

drainage and improvement of the site and protection from erosion.

Fort McPherson

In the Appendix A.3.5 it is indicated that 65 additional primary and secondary jobs are required to achieve full employment. Though the Dempster Highway will have some degree of impact on employment, a significant economic base can only be generated by additional manufacturing within the community, (which the highway could make economic) or from large scale participation in hydrocarbon activities by commuting.

Arctic Red River

Arctic Red River is well located to take advantage of highway and hydrocarbon employment and is physically attractive to growth. It is in a healthy position economically, with a large number employed in local resource activities. The community is sufficiently small and self contained that the degree to which it participates in the new activity will largely be a question of choice by the people themselves.

Old Crow

Old Crow is an isolated community of good quality. It appears to have established its own stable way of life in harmony with the environment, with a high degree of self-sufficiency and a physical grouping of buildings suited to its needs. Some inhabitants may elect to commute to hydrocarbon jobs. If they do, the increased income should be used to advantage, since Old Crow seems to have a strong sense of community purpose.

Fort Good Hope

Traditional activities will continue to play a role in the economy of Fort Good Hope. Because of its distance from other settlements, particularly to the north, it could become a major highway service centre. This would

mean additional commercial services as well as employment. Commuting to hydrocarbon jobs could be an important source of employment for the community.

Norman Wells

With construction of the highway, increased air traffic, and establishment of the pipeline operation district office, the economic base of Norman Wells will become more stable. The town is well located and organized to serve as a regional centre, which it undoubtedly will become. Population will be sufficient in the area for establishment of a regional high school and hospital. Commercial and community facilities will expand. As stated in Section 8.2, due to physical constraints to expansion a new site should be selected to the north. This will allow expansion of industry in the present area. A site farther north would not only be more suitable from an engineering standpoint but would provide improved physical amenities. The town also could become an attractive stop-over for tourists.

Fort Franklin

Fort Franklin is removed from areas of direct impact but its size is such that a considerable labour force could be available for commuting to hydrocarbon jobs. Otherwise, income, other than from government, will be derived mainly from traditional activities, commercial fishing and services to tourists.

Fort Norman

Construction of the highway and river crossing will position Fort Norman ideally for employment in transportation and tourist services. The proximity of Norman Wells could, however, detract from this potential. Inversely, there will be employment opportunities in Norman Wells for Fort Norman residents if commuting is considered desirable. There will be hydrocarbon jobs in the wider area. In any case, employment opportunities will be sufficient to substantially improve income and services in the settlement

and residents will have access to the health, education, recreation and commercial facilities of Norman Wells.

Wrigley

The impact on Wrigley will depend on the decision as to the route of the highway and the extent to which residents commute to hydrocarbon jobs. New employment opportunities in the area will be available to residents. The community is likely to retain its present character but it will benefit from improved regional services.

Fort Simpson

Fort Simpson is in a position, both geographically and functionally, to assure that its quality of life and economy will be improved by increased hydrocarbon activity. A decision must be taken on relocation or expansion to a new site in any event, as described in Section 8.2. Increased population will justify complete high school education in the community as well as expanded health services. Commercial, recreational and other community services would all be expanded. Employment opportunities will occur in services to industry, in transportation, equipment maintenance and supply and in light manufacturing.

Jean Marie River

Life at Jean Marie River is likely to continue unchanged. A greater range of services will be available in nearby Fort Simpson. Jobs will be available in Fort Simpson and elsewhere. But the community itself is likely to retain its character and traditional functions.

Fort Providence

Fort Providence is similar to Fort McPherson and Fort Franklin in that, by 1985 it also will require a large number of primary and secondary jobs to

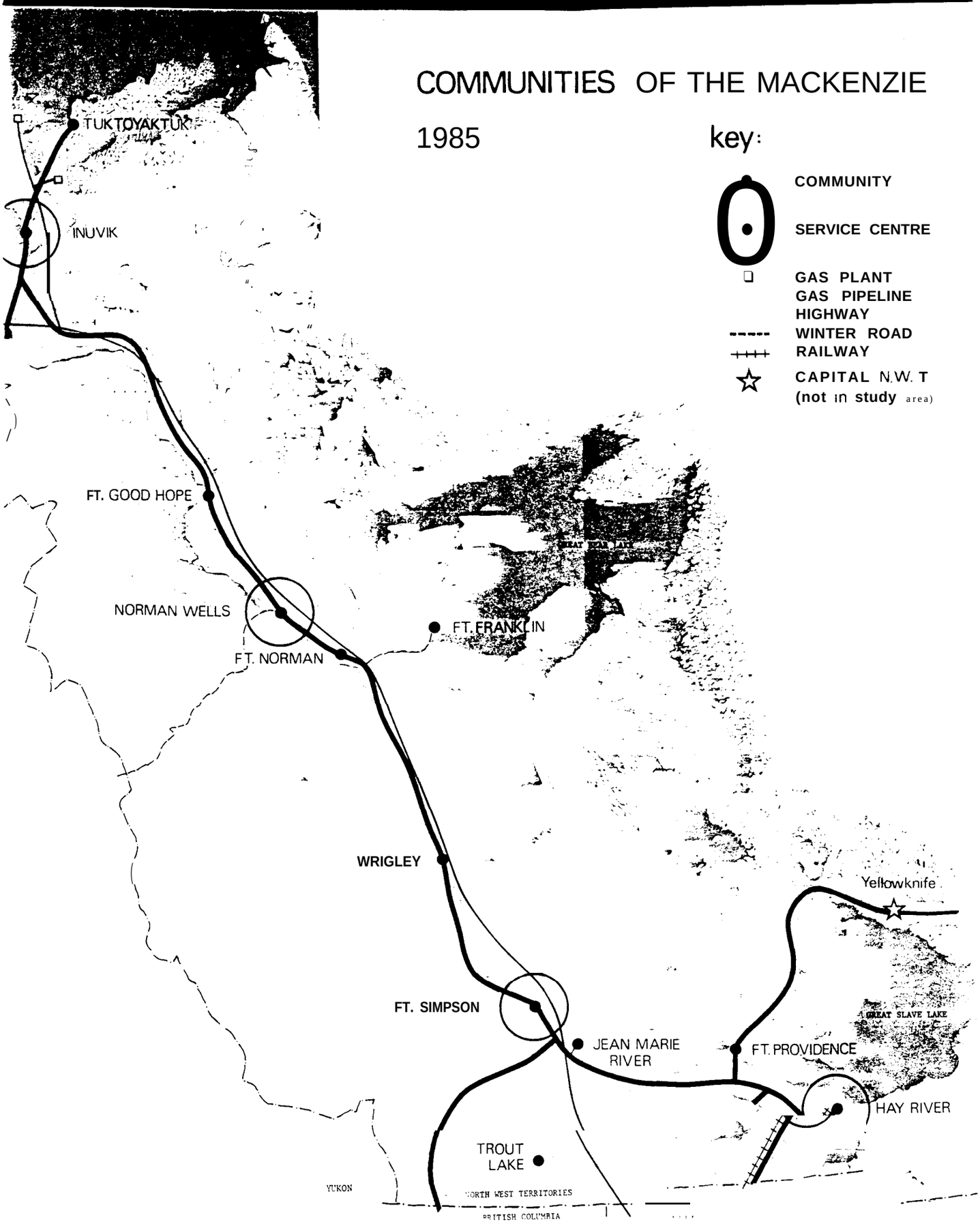
achieve an adequate economic base. These jobs will be available in the hydrocarbon industry. As with the other two settlements, the larger number of potential employees could justify a regular air shuttle service to jobs in one particular location. This could be organized on the basis of a regular workforce or the labour pool concept. Though employment in highway services will continue, it is unlikely to increase substantially once the highway is extended further north, particularly if a permanent river crossing is constructed on the Yellowknife route.

Trout Lake

Employment in Trout Lake, which is presently in traditional activities and some small amount in tourist accommodation, can be supplemented by hydrocarbon jobs. The character and function of the community is not likely to alter to any degree.

Hay River

The dominant function of Hay River in development of the north is as a transportation hub and supply centre. This role will be continued and increased during and following construction of the pipeline. Existing enterprises will be expanded and new ones established in all activities in the community -- manufacturing and supply, trade and services, health, education and recreation facilities. Planning of the town must be rationalized to accommodate the pressures that will occur with or without the pipeline. A long range plan for expansion should be prepared.


COMMUNITIES OF THE MACKENZIE
1985
key:
COMMUNITY
SERVICE CENTRE
GAS PLANT
GAS PIPELINE
HIGHWAY
WINTER ROAD
RAILWAY
CAPITAL N.W.T
(not in study area)
TUKTOYAKTUK
INUVIK
FT. GOOD HOPE
NORMAN WELLS
FT. NORMAN
FT. FRANKLIN
GREAT BEAR LAKE
WRIGLEY
FT. SIMPSON
JEAN MARIE RIVER
FT. PROVIDENCE
Yellowknife
GREAT SLAVE LAKE
HAY RIVER
TROUT LAKE
YUKON
NORTH WEST TERRITORIES
BRITISH COLUMBIA

9. DELAY OF PIPELINE CONSTRUCTION

Hydrocarbon exploration has had a marked effect on the Mackenzie River communities . Several large and many small enterprises in transportation, equipment maintenance and supply have been established in the area in the last few years and are almost exclusively dependent on the continuation of hydrocarbon exploration. A large number of employment opportunities in tertiary and quaternary activities can be traced to the generating influence of the primary employment in the hydrocarbon industry.

If, as a result of any circumstance, there should be a significant delay, such as 5 years, in granting permits to construct a pipeline, much of this activity may collapse. The uncertainty caused by such a delay will most likely slow down the pace of exploration, thus substantially reducing employment in the primary sector. This in turn could have a severe effect on the service sector. Many of these establishments are new and relatively small and reduction of exploration may prove to be economically fatal. Employment of native people in these enterprises is significant and can be an important instrument in the gradual improvement of skills. A substantial delay in pipeline construction may well eliminate this opportunity.

Of equal importance is the standard of housing in the smaller communities. It has been stated before that the quality of housing generally is low and requires attention. A delay in pipeline construction would undoubtedly defer much investment in the area and it is difficult to foresee any significant improvement of the community environment if incomes stay at their present low level.

Increased incomes should mean that more personal incomes can be spent on housing -- thus improving and increasing the housing stock at a higher rate than is possible at present. The longer an improvement of incomes is delayed, the greater will be the deterioration of existing housing, since it is doubtful whether public expenditure alone can keep pace with normal growth and replace substandard units.

This study has estimated the growth of communities over a 10 year period, has expressed the consequent building and engineering requirement on a per annum basis, and has concluded that this requirement can be met by the work-force, which was estimated at 600 man-years per annum in building construction in the early 1980's. However, it is predicated on there being a sufficiently sophisticated workforce as a result of experience/training in pipeline construction, gas plant construction and other jobs resulting from hydro-carbon activities.

The construction industry also should benefit from the fact that pipeline construction and hydrocarbon activities should result in the support and expansion of existing service enterprises. The construction industry, in order to operate effectively, requires a complement of services -- procurement of materials, transportation, professional and business services. If the pipeline is not constructed within a short time and if, consequently, hydrocarbon activities decline, it is probable that the existing service enterprises will reduce staff -- and some may fail. This would mean that there will not be available in the area the supporting services which are essential to the effective operation of the construction industry. Further, a high level of activity in the service sector during the pipeline and gas plant construction period should mean an increase in experience and diverse skills in the labour force which should be useful to the construction industry itself in the subsequent years.

The issue of investment in the communities is of equal importance. Although higher levels of government can provide housing, schools, hospitals and other facilities, local municipal funds are needed for road maintenance, street lighting, utilities, recreation and local administration. Adequate local funding, via municipal taxes, is possible only if income in the

community increases. Delay of pipeline construction would mean a delay in increasing incomes and a delay in community improvements. In some cases this may also mean increasing deterioration: when it does become possible to effect improvements there will be a greater volume accumulated in a "backlog" of improvements, which in terms both of financial capacity and skilled labour may be extremely difficult to achieve.

Delay of pipeline construction seems undesirable from a socio-economic viewpoint. It will temporarily slow down developments, will severely inhibit existing enterprises within the area, will delay the needed improvement of skills and incomes and as a consequence will allow further deterioration of the communities.

10. OPPORTUNITIES

It is unrealistic to suppose that any significant proportion of the manufactured materials and equipment required for pipeline construction can be produced in the region; however, considering the magnitude of the requirements and the narrow existing economic base, even a very small proportion would generate a considerable increase in economic activity in the region.

New enterprises can be beneficial to the region in a number of ways:

1. Retention of more of the earned income in the region.
2. Increased self-sufficiency and self-determination.
3. Reduced energy consumption in the transportation of goods.
4. Diversification of skills and employment opportunities, particularly for the native population.
5. Improved nutrition.

Increased population and income, particularly in the larger settlements, increases the viability of local enterprises. The viability and possible interaction of new opportunities should be studied in detail. Some studies already have been undertaken by Government. Most of the enterprises have a purely local market, while others serve a regional market: and some, including fur clothing manufacture and forest industries along the Liard, might export to southern Canada.

In construction, the hauling of fill material is already a sizable industry. Other possibilities exist in:

sawmills
housing prefabrication
portable concrete block manufacture

During the next 25 years the requirements for housing and institutional, commercial and industrial facilities will place demands on the construction industry which cannot be met by the existing workforce. Dependence on the transport of building material from the south will further inhibit development of the industry. Introducing prefabrication on a local scale in the major centres would allow operation of a substantial part of the construction industry during the winter months, thus greatly increasing the annual capacity.

Highway related services and tourism will offer new opportunities in:

highway service centres
accommodation and food catering
tourist and fishing camps

The food industry deserves particular attention because of the potential for improvement of nutrition and the standard of living. Despite the poor experience with the reindeer herd and with the experimental farm at Fort Simpson, abandonment would be regrettable. In the upper Mackenzie Valley, agriculture can be practiced on a conventional southern basis. Indeed, records of Fort Simpson indicate that it once had a high degree of self-sufficiency in food. A dairy farm and a potato farm appear to be operating successfully near Fort Providence.

The potential of livestock production should be further assessed. There are large acreages of fertile land between Fort Smith and Great Slave Lake and also southwest of Fort Simpson along the Liard. There are pockets of fertile land dotted throughout the Mackenzie Valley. Cattle are raised on the prairies in an environment that is almost as rigorous. The development of hardy breeds and further improvement in management practices may improve the prospect of viable cattle operations.

The musk-ox is indigenous to the north and the reindeer -- a species closely related to the barrenground caribou -- is fully hardy in the northern environment. An approach to management and marketing which is part of a total program for northern development might make the herding of either of the species viable or, indeed, other species such as, for example, the North American bison.

Spin-off activities from animal husbandry might include the freezing and canning of meat, processing of hides, production of wool, and new craft enterprises.

A better supply of fresh vegetables would improve nutrition. In the smaller communities, market gardens on an individual or co-operative basis are viable since they are not judged according to economic criteria. There have been many examples of successful vegetable plots as far north as Tuktoyaktuk. Community programs could stimulate vegetable production on a "self-help" basis. The benefits might be extended by community canning and freezing facilities.

The development of hydroponic growing of produce could be a benefit, particularly to the larger communities. Capitalizing on the long hours of summer sunlight could result in very rapid growth and heavy crops. Apart from the large scale commercial application to vegetable production, hydroponics could be used to advantage to start seedlings for growing outdoors or in cold frames.

There are several small enterprises of a local nature which could benefit a community not only by providing employment -- which may involve only a small number -- but by greatly improving the quality of life and by increasing self-sufficiency. To have a few people highly skilled in repairs of all kinds -- domestic, electrical, clothing, shoes, mechanical -- could increase the life of consumer goods and result in personal economies. Similarly, small scale food processing, such as a bakery, could be an asset. Enterprises which depend on a local market will become viable as population grows.

There are benefits available from an imaginative use of existing and future communication and transportation facilities. Medical and para-medical services, particularly in the area of preventive medicine could be greatly improved if personnel were to be flown on regular scheduled and charter aircraft into each community at regular intervals. With increased economic activity, seat capacity on aircraft throughout the region will increase -- which would facilitate improving these services.

Sending children to high school outside the community has created hardship. The possibility of flying high school teachers from the larger centres into the small communities for short periods of time should be examined. Rotation systems could allow an elementary school in a settlement to grow into a combined elementary-high school -- each community having a few high school teachers in residence at all times during the school year. The expenses of such a system would be considerably lower than those of present high schools and hostels and, furthermore, the social cost would be reduced.

Communications can play an increasing role in the life of the small community. The use of television, radio, video-tape and other audio-visual aids in elementary and high school can be expanded. Moreover, the communications networks could be used increasingly in furthering skill development, home economics, community development and in general to diminish the gap between the standard of living of the native people and the rest of Canada.

A major concern in the development of the north is that of assuring a high measure of self-determination and freedom of choice of lifestyle for the native population, Varied community-based enterprises widen the range of possibilities and choices for living at a reasonable contemporary standard and with reduced pressures for a radical change of lifestyle.

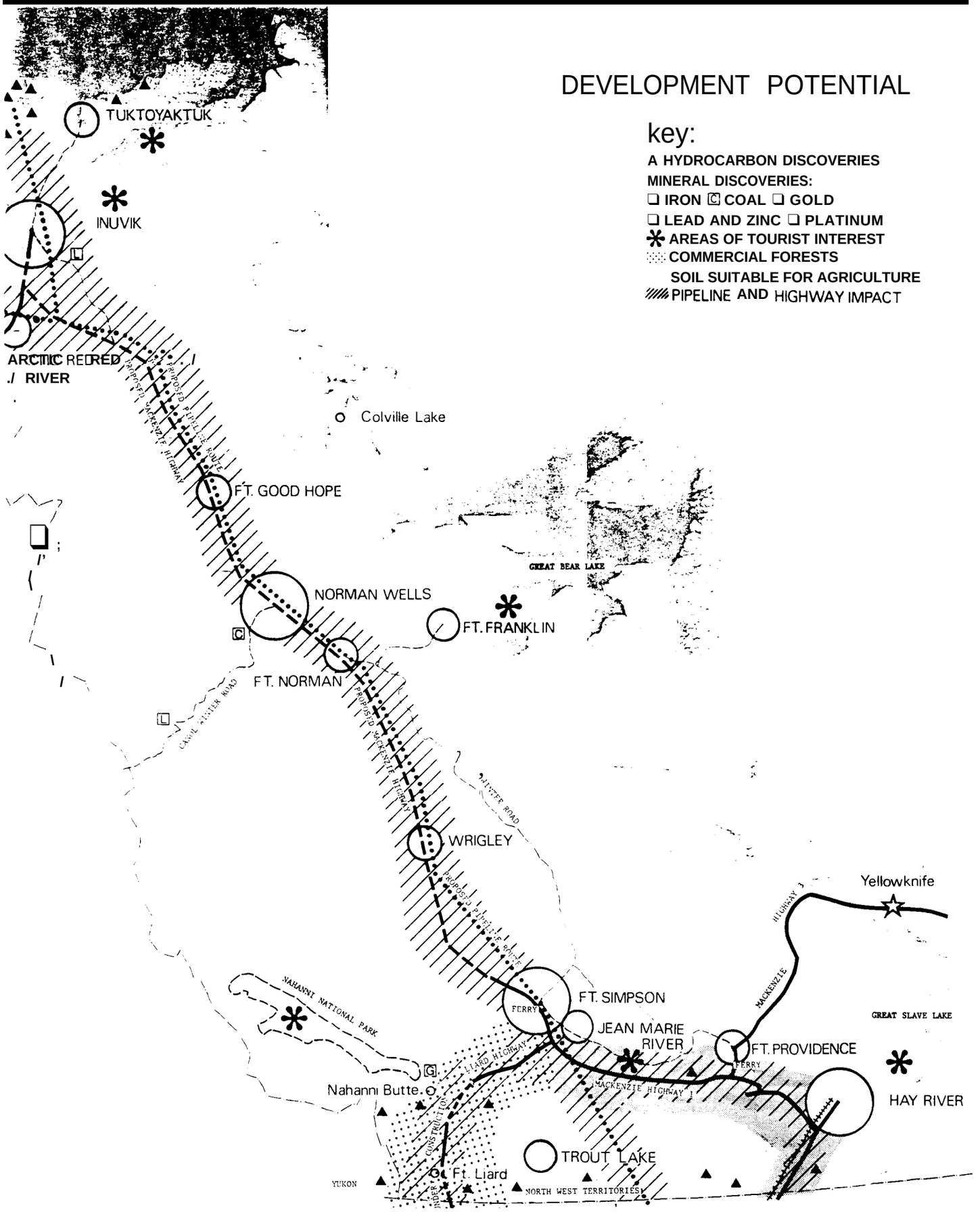
Many of these opportunities could be realized now. In the majority of cases the capital requirements are not large and incentives in the form of financing and management could create considerable benefits to the community as a whole.

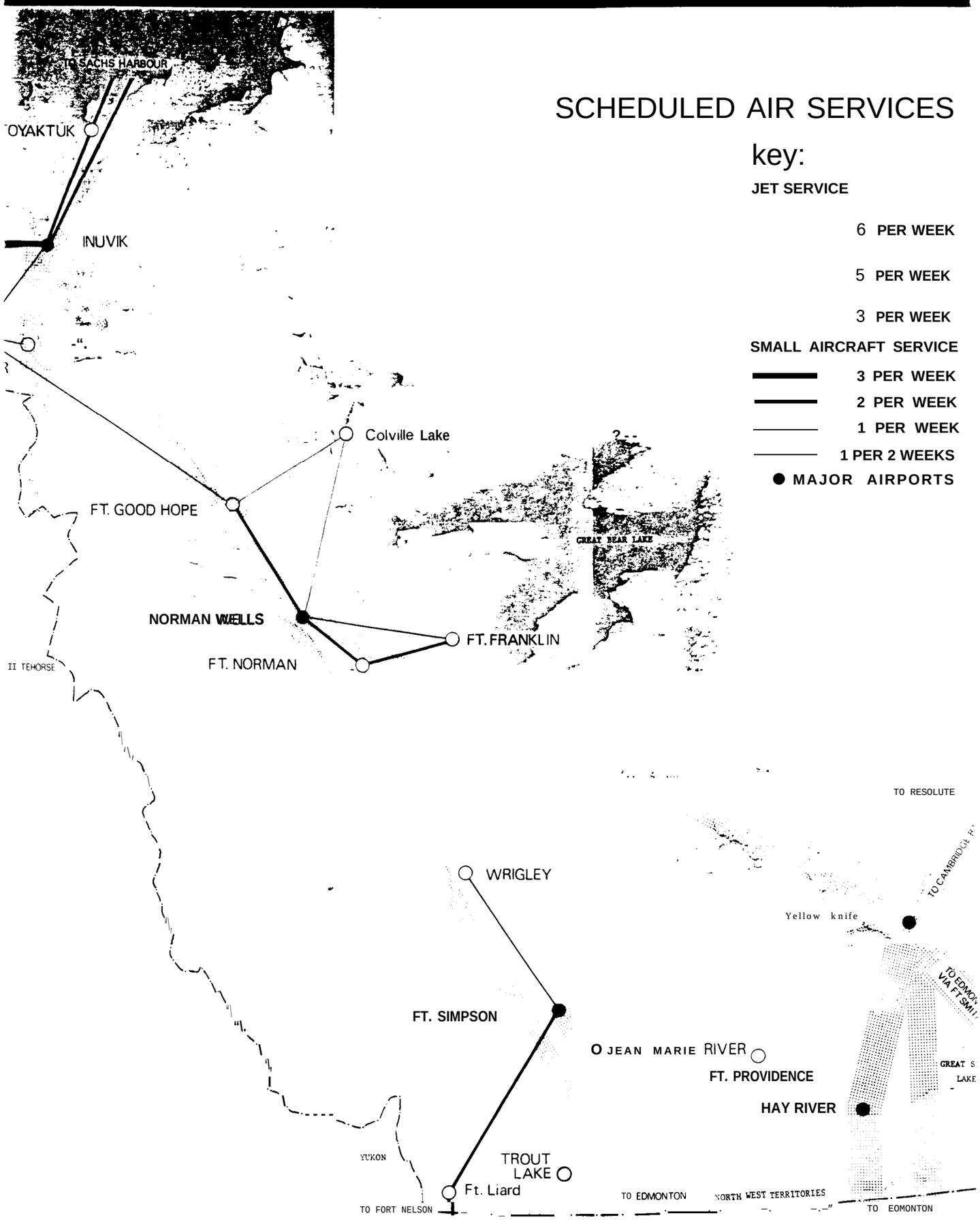
Construction of the gas pipeline will bring an alternative source of energy

close to many communities. This can be a direct benefit to the community and also can enhance the viability of some opportunities.

The two maps which follow, "Development Potential" and "Scheduled Air Service", show the location of resources and of existing and proposed installations which are some of the potential assets for the development of opportunities in the study area.

DEVELOPMENT POTENTIAL





SCHEDULED AIR SERVICES

key:

JET SERVICE

6 **PER WEEK**

5 **PER WEEK**

3 **PER WEEK**

SMALL AIRCRAFT SERVICE

3 PER WEEK

2 PER WEEK

1 PER WEEK

1 PER 2 WEEKS

● **MAJOR AIRPORTS**

11. CONCLUSIONS

The objective of this study is to measure and define the economic and social impact of the proposed Mackenzie Valley natural gas pipeline and the associated hydrocarbon exploration and development activities, on the people and the communities that will be directly affected.

Implicit in this objective is consideration of the prospects of the individual northern resident, of equality of economic opportunity, of social justice, of a widened freedom of choice or occupation and lifestyle and of an improved level of income and a better standard of living.

A parallel concern was the impact on the communities of the decision to build the proposed pipeline and, equally, the future of the communities if the pipeline is not built.

It is unrealistic to divorce the welfare of a people from the circumstances that prevail in the community in which they live. If the community lacks amenities, if housing is substandard and services are inadequate, if education lacks quality and relevance to the cultural mores of the people and if medical, hospital and social services are low in quality, it is clear that the social needs of the people are badly served,

The conclusions of this report must, of necessity, relate specifically to the impact of the proposed hydrocarbon-related activities on the people, as such, and the communities, as such, in the area within which an impact will be felt. Concurrently, it is necessary to note the existing circumstances and to speculate on the probable impact of a decision not to continue

and expand the hydrocarbon-related activities.

11.1 THE PEOPLE

A conclusion as to the impact of the increased economic activity inherent in pipeline construction and the associated hydrocarbon activities, must consider the current circumstances of the people and measure the projected impact against this standard.

It was noted in the report that participation in the labour force in the study area is of the order of 30 per cent -- significantly lower than the participation rate in Canada as a whole. Because much of the work is casual., seasonal and short term,it is probable that the 30 per cent participation rate overstates the actual involvement in the wage economy. Further, because the white population in the study area participates in the labour force at a level close to the national average, non-involvement in the wage economy is concentrated in the Indian and Inuit racial groups. It was concluded that, although the participation of the Indian and Inuit people could not be precisely stated, the assumption could be made that it is well below the average of 30 per cent of all the people in the study area.

It was also noted that the average income in the study area in 1973 was $1,360. The per capita income by racial groups revealed that the Indian, Inuit and Metis were below this average: in 1970 the average income of the three racial groups was, respectively, $667, $840 and $1,147, compared 'ith an average annual income for whites in the study area that year of $3,545. It became apparent that the current circumstance for the native people was generally one of unemployment, underutilization, lack of options and opportunity, and endemic poverty.

It was concluded that jobs and income were needed within the study area if the unsatisfactory circumstances of the people involved were to be improve.

It became apparent that the resources that had the potential to provide jobs and income were severely limited. With a participation rate of 40 per cent in the large communities and 30 per cent in the smaller communities the number of jobs required for full employment in 1?85 totalled 7,035 and, beyond that date, the number could be expected to grow.

It was concluded that hunting and trapping might provide full time employment for 100 persons. The fishing industry, including catching and processing, might provide another hundred. Forestry, if the harvestable resources of the Liard River area were developed, might provide an equivalent or somewhat larger number of jobs. There is a considerable acreage of potentially arable land in the Upper Mackenzie and Liard areas, but even if fully developed, which is not expected, it would provide limited employment. And the growth of the service sector, which currently provides a considerable number of jobs, is constrained by the absence of a major primary and associated secondary sector to which to merchandise services.

Examination of the actual construction of the proposed Mackenzie Valley pipeline did not reveal a satisfactory solution. It would provide a very large number of jobs for the five year make-ready, construction and clean-up period, but operating and maintaining the line would require only 208 full time workers.

However, it was concluded that the construction of the pipeline and the connection of the natural gas resources of the Lower Mackenzie region to the markets of the south, would induce major and sustained activity in the development of the hydrocarbon resources.

Assuming that the pipeline would be built and that activity would continue in the hydrocarbon-related activities in the proportions stated by the operating companies, the number of jobs that would exist in 1985 was estimated. It was concluded that employment within the communities in primary and secondary activities could be projected with reasonable assurance as totalling 2,158. Within the study area but outside the existing Communities there would be an additional 1,760 full time jobs and a further 1,200 winter time jobs. It was concluded that the full time jobs in the primary

and secondary sectors -- 2,158 plus 1,760 for a total of 3,918 -- would induce jobs in the tertiary and quaternary sectors in the ratio of 40:60 in the communities of Inuvik, Norman Wells, Fort Simpson and Hay River and in the ratio of 50:50 in the remaining, smaller communities in the study area.

A consequence of the decision to build the pipeline will be the creation of jobs and resulting income. However, it is critically important that northern residents be provided the skills and afforded the opportunity to man these jobs. It was concluded that there is no other resource in the study area, the development of which would provide an equivalent number of jobs. Consequently, the impact of a decision not to build the pipeline is to forego most of this increased employment and to perpetuate the circumstances of today.

Increased economic activity and increased income will create a demand for a wider range of services and encourage the growth of small enterprises. This will increase the range of activities and kinds of jobs and so offer to the people a greater opportunity for choice in the type of skills and employment that they wish to pursue.

It was concluded that, in economic terms -- jobs and income -- the impact of a decision to build the pipeline should he more favorable to the people in the study region than the impact of the decision not to build a pipeline.

In terms of the social impact of the decision to build the conclusions are, of necessity, subjective. On the one hand, it is argued with some apparent relevance that increasing income will increase social dislocation, that a growing white population will impact negatively on the lifestyle of the native people and that the cultural values of the native people will be eroded by increased non-native population and activity. To a greater or lesser extent all of these alleged negative impacts might materialize. There is nothing in this report that justifies a conclusion that they will not. On the other hand, it is also acknowledged that poverty and lack of opportunity result in disorientation which, in turn, breeds hostility. Jobs and income are the only solution for poverty; improved opportunities to gain needed income will

reduce anti-social behaviour and so improve the social circumstances in the study area.

11.2 THE COMMUNITIES

There is much that is good in the communities in the study region. In particular, it is important to preserve the character of some of the smaller settlements . Although these communities will increase in population during the next decade, they still will be of a size that can maintain their intimacy, human scale and relation to the natural environment.

Nonetheless , with the exception of the new town in Hay River, housing, facilities and services generally are inferior to those in southern Canada. That they should be improved emerges from the report. Norman Wells and Fort Simpson should expand into adjacent areas; Tuktoyaktuk is approaching the physical limits of its growth: expansion of Inuvik is going to be very expensive. Although housing is good in some sections of the larger communities, in all communities there is housing that ranges from unacceptable to primitive. In most communities many of the services require improvement t.

Details of inadequacies appear in the body of the report and there is little purpose in repetition. It emerges from the report that there is a need for substantial and costly improvement in the physical facilities and service levels throughout the study area. Moreover, there is a growing disposition in the communities to demand improvements.

The continuing development of hydrocarbons and the construction of a pipeline will make it possible that this demand for improvements can be met. Further, a larger population and increased industry activity in the region

will increase the use and viability of transportation and communication networks. This circumstance, coupled with improved education and health services in the larger communities can be used to advantage to make available improved services to the small communities.

The creation of jobs and income, as detailed in the report, will increase the revenues of the communities and will contribute to financing the improvement of the communities. The implication of the decision not to build the pipeline and so to deny the associated hydrocarbon activities, will be to forego these improvements or to effect them at the cost of the general Canadian taxpayer.

It is concluded that, in terms of the improvement of the communities, the further development of the hydrocarbon industry through the decision to build the pipeline should be positive in its effect.

APPENDIX A - TECHNICAL NOTES

This appendix contains the technical and mathematical calculations of this study. Section 3, the description of the methodology, explains that the calculation of future employment and population is iterative. The reasons why this is necessarily so -- the generative capacity of individual communities and the options open to industry in the organization of its activities -- have been enlarged upon in Sections 5, 6, 7 and 8. Since the calculations are iterative the calculations do not follow the sequence of the functional titles in the body of the report, e.g. employment, population, labour force.

Although the Technical Notes are a reference for the main report and are intended to explain the process of arriving at a mathematical conclusion, the Notes have been presented so that they can stand as a self-contained document. The Technical Notes may be read alone as a statement as to the availability of labour and the prospective availability of jobs.

SUMMARY OF TECHNICAL NOTES

1. The population in the study area in 1985 is calculated and it is concluded that it will total 19,350.

2. Participation in the labour force will be 40% in the larger communities, 30% in the smaller communities: applying these figures to the 1985 projected population of 19,350 indicates that the total available labour force in 1985 will be 7,035.

3. Employment in the primary and secondary sectors, relative to the tertiary and quaternary sectors in 1985 will be 40:60 (the 1974 average ratio for Canada) in the larger communities: Inuvik, Norman Wells, Fort Simpson and Hay River. It will be 50:50 in the smaller communities, due to a smaller proportion in the service sector.

4. Employment in the primary and secondary sectors in 1985 will be 3,918 in the summer season and 5,018 in the winter season: most of the jobs will be year-round but work will intensify in some activities during the winter (seismic, drilling) and some will intensify during the summer (building and engineering construction) . The actual number of jobs is determined by totalling the estimates given by Arctic Gas and the petroleum companies for hydrocarbon related work and projections and estimates of workers required in agriculture, forestry, hunting, fishing, trapping, and building and engineering work in the communities.

5. Employment within the individual communities in primary and secondary activities in 1985, where the number of jobs and the nature of the work can be projected with reasonable assurance, will total 2,158.

6. In addition to the 2,158 primary and secondary jobs actually located within communities, there will be a further 1,760 year-round jobs in the hydrocarbon related activities that will be beyond the borders of any community and which implies that the workers must be moved to the work.

7. In addition there will be a further 1,200 winter hydrocarbon jobs, also beyond the borders of any community.

8. The total number of persons resident in the study area that will require employment in the primary and secondary sectors will be 3,040 in 1985. This figure is derived by applying the participation rate of 40% in the larger communities and 30% in the smaller communities to the 1985 population of

19,350 (Point 1) to arrive at a 1985 labour force of 7,035: application of the ratio of primary and secondary to tertiary and quaternary of 40:60 and 50:50 (Point 3) indicates the requirement for primary and secondary jobs for people in the communities of 3,040, cited above.

9. Primary and secondary employment required by persons resident in the communities(arrived at by applving the 40:60 and 50:50 ratios to the labour force in, respectively, the larger and smaller communities)will exceed by 971 the number of primary and secondary jobs actually located in the communities -- the difference between the 3,040 primary and secondary jobs actually required (Point 8) and the 2,158 primary and secondary jobs that will be actually available within the communities (Point 5).

10. Employment for the 971 members of the labour force resident in the communities who might seek work in the primary and secondary sectors will be available in the 1,760 jobs available in the hydrocarbon related activities beyond the borders of the communities -- jobs noted in Point 6.

11. The result of these placements means that the entire labour force in the communities in the study area can be employed, assuming that the employment in the primary and secondary sectors create employment in the tertiary and quaternary sectors in the ratios of 40:60 and 50:50 in, respectively, the larger and smaller communities.

12. The 1,200 winter hydrocarbon jobs will he filled by persons from the communities who require additional work to compensate for the fact that building and engineering work in the communities will be largely summer time employment.

13. Because there will be a total of 1,760 full time jobs in the hydrocarbon related activities beyond the borders of the communities and because only 971 persons will be available after the 2,158 primary and secondary jobs in the communities are filled, a total of 789 hydrocarbon related jobs will remain unfilled.

14. The 789 hydrocarbon jobs that remain unfilled will require in-migration to the study area by this number of workers from beyond the borders of the study area. The residence of these workers is an important policy question: it

can have a significant relevance in terms of the extent and nature of the impact on the communities. Because the 789 jobs will be located in the Lower Mackenzie/Delta area the major impact will fall on the communities within this area, failing policies designed to spread or ameliorate the impact.

15. There are, in the view of the consultants, three optional courses, two of which can take any of three forms:

Option 1: The 789 jobs can be filled by transients from beyond the borders of the study region.

Option 2: The 789 jobs can be filled by persons who take up permanent residence within the study region located as follows:

2a. -- in all communities of the Delta in proportion to their population

2.b. -- all in Inuvik

2.c. -- all in a new settlement in the Delta, with regional service split between Inuvik and the new settlement.

Option 3: The 789 jobs can be filled by persons living throughout the study area, located as follows:

3a. -- in all communities in proportion to their population.

3.b. -- in Inuvik and Fort Simpson, in proportion to their population.

3.c. -- in Norman [Jells, Fort Simpson and Hay River, in proportion to their population.

16. Physical or other constraints effectively eliminate the three alternatives discussed under Option 2 as well as Options 3a. and 3.b. In the view of the consultants the location of the 789 persons required to fill the 789 jobs that will remain unfilled after all permanent residents in the study region are employed will have to be a compromise or an accommodation between Option 1 and Option 3.c.

A.1. 1985 POPULATION BY COMMUNITY

1985 population is calculated on the basis of estimates of existing population and growth rates made by Gemini North Ltd. and included in the submission of Arctic Gas, Section 14.c., 3.1. For initial calculations the growth rates are assumed to apply consistently to all communities:

1971-1975 growth rate 18% (14.c, 3.1 (6))
1975-1985 " " 36% " " "

This produces a total population in the study area of 19,350 in 1985 as follows

1971 population for study area 12,056 (14.c table 3.1)
1975 " " " " 14,225
1985 " " " " 19,350

TABLE 10 POPULATION BY COMMUNITY

	1971		1985	
Lower Mackenzie				
Tuktoyaktuk	627		1,005	
Inuvik	3,249		5,220	
Aklavik	660		1,060	
Old Crow	216		345	
Fort McPherson	841		1,350	
Arctic Red River	95		150	
sub-total		5,688		9,130
Middle & Upper Mackenzie				
Fort Good Hope	375		600	
Norman Wells	363		585	
Fort Franklin	434		695	
Fort Norman	260		415	
Wrigley	191		305	
Fort Simpson	1,004		1,610	
Jean Marie River	50		80	
Fort Providence	647		1,040	
Trout Lake	40		65	
Hay River	3,004		4,825	
sub-total		6,368		10,220
Study Area Total		12,056		19,350

A.2. 1985 LABOUR FORCE BY COMMUNITY (Reference to Section 6)

In the larger communities which already have a fully developed wage economy -- Inuvik, Norman Wells, Fort Simpson and Hay River -- participation in the labour force is currently close to 40% of total population. This rate has been used to estimate the labour force likely to be available in these communities in 1985. For all other communities labour force participation in 1985 was assumed as 30% of the population -- the existing average in the Mackenzie corridor. Based on these assumptions the total available labour force will be 7,035 in 1985 as in the following table.

TABLE 11: PROJECTED LABOUR FORCE - 1985

	1985 Labour Force	
Lower Mackenzie		
Tuktoyaktuk	300	
Inuvik	2,090	
Aklavik	320	
Old Crow	105	
Fort McPherson	405	
Arctic Red River	45	
sub-total		3,265
Middle & Upper Mackenzie		
Fort Good Hope	180	
Norman Wells	235	
Fort Franklin	210	
Fort Norman	125	
Wrigley	90	
Fort Simpson	645	
Jean Marie River	25	
Fort Providence	310	
Trout Lake	20	
Hay River	1,930	
sub-total		3,770
Study Area Total		7,035

A.3. EMPLOYMENT (Reference to Section 5)

A.3.1 OBJECTIVE

The purpose of the calculations in this appendix is to determine the maximum impact on communities that is likely to result from employment generated by hydrocarbon activity as a result of and after completion of pipeline construction. Maximum impact will occur if there is full employment of the labour force in the study area.

A.3.2 ASSUMPTIONS

The calculations are based on the assumption that with the achievement of full employment in the study area, a balance will be created between primary and secondary employment and tertiary and quaternary employment. Employment in the study area in 1985 in the primary and secondary sectors includes agriculture, forestry and commercial fisheries, hunting, trapping and fishing, hydrocarbons, manufacturing and processing and construction. In the tertiary and quaternary sectors is included utilities and communication, transportation, wholesale and retail trade, finance, business, personal and professional services, and government.

It is assumed that by 1985 the ratio in the study area between jobs in the primary and secondary sector and jobs in the tertiary and quaternary sector (hereafter known as service jobs) will approximate the average ratio for Canada as a whole -- which is 40:60 -- although, of course, public policy will influence this relationship. It is further assumed that many of the service jobs will be concentrated in the larger communities -- Inuvik, Norman Wells, Fort Simpson, Hay River -- which have a well developed wage economy and good transportation. Since service establishments are dependent on population and market size, a lesser ratio of service jobs to primary and secondary jobs in the other smaller communities is assumed: one service job for each primary or secondary job -- a 50:50 ratio is adopted.

A.3.3. PRIMARY AND SECONDARY EMPLOYMENT

In order to estimate total employment in 1985, primary and secondary employment is determined as follows:

A.3.3.1. Agriculture, Forestry, Commercial Fisheries

Employment in fisheries in Hay River is assumed to be 75 by 1985. Forestry is assumed to be concentrated in the Fort Simpson area with an employment of 50, including sawmill operation. Development of vegetable production is assumed for all communities with a minimum employment of 3 persons per operation. It is estimated that a total of 200 will be employed in this category. A breakdown per community is given in Table 13 "LOCATION OF JOBS."

A.3.3.2. Hunting, Trapping and Fishing

The existing employment of 84 in the study area communities is assumed to increase to 100 by 1985.

A.3.3.3. Hydrocarbons

Current Activity

Hydrocarbon employment is presently in three activities at the following levels:

	summer	winter
Seismic exploration	300	1100
Exploratory drilling	200	1100
Field development	250	150

Seismic exploration work is conducted during a four month period in the winter and three months during the summer. Exploratory drilling and field development continues for six months in the winter and two months in the summer.

Future Activity

In the period following pipeline construction totals will be as follows:

	Sumner	Winter
Seismic exploration	300	1100
Exploratory drilling	100	500
Field development	1200	1200

In addition, two natural gas processing plants will start operation following pipeline construction, each employing 80 persons year-round.

	Summer	Winter
Gas plant operation	160	160

Pipeline operation will provide year-round employment for maintenance workers, compressor station operators and inspection and administrative personnel.

	Summer	Winter
Pipeline operation	208	208

79 of these employees will be located at Inuvik, 66 at Norman Wells and 63 at Fort Simpson.

Total hydrocarbon employment in 1985 will be 1,760 year-round jobs beyond the borders of the communities consisting of 300 seismic, 100 drilling, 1200 field development, 160 gas plant operation plus 208 jobs in pipeline operation and maintenance within the communities -- a total of 1,968 full time jobs. There will be 1,200 additional winter jobs, consisting of 800 seismic and 400 drilling jobs.

A.3.3.4 Manufacturing and Processing

It is assumed that by 1985 fur garment manufacture will employ 20 people in Tuktoyaktuk, 20 in Inuvik and 30 in Aklavik; canvas goods manufacture will employ 30 people in Fort McPherson; oil refinery operations will employ 40 people in Norman Wells. It is assumed 40 people will be employed in Hay River in existing and new manufacturing operations, and 20 will be so employed in Fort Simpson.

A.3.3.5 Construction

Employment in building construction is calculated on the basis Of population growth as estimated in section Al. It is assumed that many employed in pipeline construction will gain skills that later could be applied in the building industry. The average building work force therefore will be increased after 1980 when pipeline construction is complete. Employment in building construction in summer is normally higher than in winter.

In these calculations it is assumed that with increased local prefabrication during the winter more people can be employed on a year-round basis. The average employment in construction over the next decade is thus calculated at 600 man-years per annum as in Table 6.

Employment in engineering construction is based on estimates of the year-round requirement for maintenance of highways, roads and municipal works and a higher summer employment in new construction in these areas.

A.3.3.6. Totals of the foregoing employment are shown in the table below.

TABLE 12. PRIMARY AND SECONDARY EMPLOYMENT, 1985

		Summer	Winter
PRIMARY			
Agriculture & Forestry		200	200
Hunting, Fishing & Trapping		100	100
Hydrocarbon:	Seismic	300	1100
	Drilling	100	500
	Prod. & Devel.	1200	1200
	Gas Plants	160	160
	Pipeline	208	208
	Sub-Total	2268	3468
SECONDARY			
Manufacturing & Processing		200	200
Construction:	Building	850	500
	Engineering	600	350
	Sub-Total	1650	1050
	Total	3918	4518

A.3.4 LOCATION OF PRIMARY AND SECONDARY JOBS

The jobs discussed in Section A.3.3 fall into three categories:

A.3.4.1 Jobs for which potential employees are known to he located in certain communities. This includes agriculture, forestry and commercial fisheries, hunting, fishing and trapping, pipeline operation and manufacturing and processing jobs.

A.3.4.2 Jobs which can be assumed to be proportionate to population. Construction jobs are in this category.

A.3.4.3 Jobs outside communities, not directly linked to any community. Thi S includes the majority of hydrocarbon jobs. Of these jobs, 1,760 are in summer operations and there are an additional 1,200 in winter operations. However, employment in the building industry and transportation is reduced during the winter. It is therefore assumed that the additional 1,200 winter employees in the hydrocarbon industry will find employment in the building industry and transportation during the summer.

Location of jobs in the first two categories is shown in TABLE 13, LOCATION OF PRIMARY AND SECONDARY JOBS, 1985, which follows. Calculations determining the possible location of employees in the third category are in Sections A.4 and A.5.

TABLE 13 LOCATION OF PRIMARY AND SECONDARY JOBS, 1985

1. IN THE COMMUNITIES	Hunting, Trapping & Fishing	Agriculture, Foresty Commercial Fishery	Hydrocarbons	Manufacturing & Processing	Building/Engineering Construction	SUB-TOTAL
Tuktoyaktuk	5	5		20	80	110
Inuvik	18	10	79	20	400	527
Aklavik	12	3		30	80	125
Old Crow	4	8			2	14
Fort McPherson	2	3		30	105	140
Arctic Red River	6	3			12	21
sub-total	47	32	79	100	679	937
Fort Cood Hope	2	3			46	51
Norman Wells		5	66	40	45	156
Fort Franklin	2	3			40	45
Fort Norman		3			32	35
Wrigley	3	3			25	31
Fort Simpson	4	50	63	20	125	262
Jean Marie River	3	10			5	18
Fort Providence	5	6			80	91
Trout Lake	10	10			3	23
Hay River	24	75		40	370	509
sub-total	53	168	129	100	771	1221
Total	100	200	208	200	1.450	2158

2. NOT LOCATED IN A COMMUNITY:

Hydrocarbon jobs year round - 1,760

Additional winter hydrocarbon jobs - 1,200

A.3.5 PRIMARY AND SECONDARY JOBS REQUIRED FOR FULL EMPLOYMENT

As described in Section A.3. the object of these calculations is to determine how full employment may be achieved. The 1985 labour force was determined in Section A.2. Primary and secondary jobs located in communities were determined in Section A.3. The ratio of primary and secondary jobs to service jobs in a condition of full employment was described in Section A.3. as 40:60 for Inuvik, Norman Wells, Fort Simpson and Hay River and 50:50 for the remaining communities. Thus In 1985 one half of the labour force in the smaller communities and 40% of the labour force in the larger communities are assumed employed in primary and secondary jobs.

The following Table 14 shows the difference between the jobs located and the jobs required. The difference is 971: this number of persons living in the communities will require employment in the primary and secondary sectors and will be unable to find such employment within the boundaries of the communities. There will, however, be more than enough jobs to accommodate them in the 1,760 full time hydrocarbon jobs outside the communities (Table 13) all of which, at this point in the analysis, remain unfilled.

The 1,200 part time jobs during the winter season have not been included anywhere in the calculations. Employment in construction and transportation is much higher during the summer than during the winter. Since many of the jobs in the hydrocarbon industry, construction and transportation are semi-skilled and require similar personnel, it was assumed that these activities combined would provide year round employment.

TABLE 14 PRIMARY AND SECONDARY JOBS REQUIRED FOR FULL EMPLOYMENT

	1985 Labour Force	primary and Secondary Jobs Required	Primary and Secondary Jobs Located	Difference
Tuktoyaktuk	300	150	110	40
Inuvik	2,090	840	527	313
Aklavik	320	160	125	35
Old Crow	105	55	14	41
Fort McPherson	405	205	140	65
Arctic Red River	45	25	21	4
sub-total	3,265	1,435	937	498
Fort Good Hope	180	90	51	39
Fort Franklin	210	105	45	60
Fort Norman	125	65	35	30
Wrigley	90	45	31	14
Fort Providence	310	155	91	64
Hay River	1,930	775	509	266
sub-total	2,845	1,235	762	473
Total				971

In four of the communities the number of primary and secondary jobs is greater than the calculated requirement:

				Excess
Norman Wells	235	95	156	61
Fort Simpson	645	250	262	12
Jean Marie River	25	15	18	3
Trout Lake	20	10	23	13
sub-total	925	370	459	89
Total	7,035	3,040	2,158	

In the case of Norman Wells and Fort Simpson this means that an adequate service level requires the growth of population to be greater than normal. In the case of Jean Marie River and Trout Lake, services will continue to be provided from the larger centres. These jobs were taken into account

in calculating the total employment and population, Section 4.3.1.

A.3.6 DISTRIBUTION OF REMAINING HYDROCARBON JOBS

A.3.6.1 Required Jobs

In Section A.3.5. it was determined that for the full employment of the labour force in all communities, approximately 971 primary and secondary jobs are required in addition to those which can be anticipated in these sectors within the communities. As noted in Table 14, there are 1,760 full time jobs available in the hydrocarbon industry. Assuming that 971 are filled by these workers and further, that service jobs are thereby created in the 50:50 and 40:60 ratios as assumed, the full labour force would be employed in each community: population then would be as projected in Section Al.

A.3.6.2 Alternate Distribution of Remaining Jobs

After full employment is achieved in a11 communities in the manner described above, 789 hydrocarbon jobs (1,760 full time jobs minus 971) will remain unallocated to people in the communities.

If service jobs are not created in the communities in the proportions assumed some additional number of these 789 jobs could be filled by the available labour force.

However, it is probable that the service jobs assumed will, in fact, be created. Incomes in the hydrocarbon industry are relatively high and there will be a demand for expanded services. This being the case, the 789 additional hydrocarbon jobs must be filled by transient workers from outside the corridor, or by workers who move into the area with their families. The latter will cause population growth beyond that estimated in Section Al. If such growth in population does occur it may take place in proportion to the projected rate of population growth in each community or it may all be in the Delta in proportion to community rates of growth or, in either case, some centres may grow more than others. Alternatively, a new town could he built in an area where jobs are located.

A.4. OPTIONS FOR GROWTH (Reference to Section 7)

A.4.1. CALCULATIONS

The following options have been defined to determine how the 789 hydrocarbon jobs, not yet allocated to communities, may be filled--by workers from within or outside of the study area--and to determine in total the impact of the resulting population growth. In estimating the population of the individual communities there are initially four factors to consider:

a. population as calculated in Section Al.
b. additional hydrocarbon jobs, as allocated in the options detailed below.
c. the total of service jobs induced by these hydrocarbon jobs at a ratio of primary and secondary to service jobs of 40:60 in Inuvik, Norman Wells, Fort Simpson and Hay River and 50:50 in all other communities.
d. the total of service employment generated in Inuvik, Norman Wells, Fort Simpson and Hay River by total regional primary and secondary employment.

This last factor can only be calculated when the distribution of the employment between all the communities is known: it relates to the fact that the larger communities will act as service centres for the others. Hospitals and high schools, wholesale and some retail trade establishments, most professional and business services, transportation, etc. will be located in the larger communities and will serve the region as a whole. Applying a 40:60 ratio to the total number of persons employed in primary and secondary activities in the study area reveals the total regional service employment. That service employment which has already been allocated is subtracted from the total and the difference is applied to the four service centres proportionate to their population. The final population for each community in each option is calculated on the basis of labour force participation--40% in the four service centres and 30% for all other communities, as described in Section A.2.

A.4.2 OPTIONS

Option 1.

The 789 jobs are filled by transient workers from outside the study area.

Option 2.

The jobs are filled by persons who come into the Delta to live permanently. There are three ways in which this can be done:

2a. The employees locate in all Delta communities proportionate to their population.

2.b. The employees all live in Inuvik.

2.c. The employees all live in a new settlement in the Delta. In this case regional service employment is split between Inuvik and the new settlement.

Option 3.

The employees live in the communities throughout the study area. There are three alternatives here:

3a. The employees live in all communities proportionate to their population.

3.b. The employees live in Inuvik and Fort Simpson, proportionate to their population.

3.c. The employees live in Norman Wells, Fort Simpson and Hay River proportionate to their population.

A.4.3 APPROXIMATE SIZE OF COMMUNITIES UNDER EACH OPTION

A.4.3.1 OPTION 1

All communities reach populations as indicated in Section A.1 except Inuvik, which will provide services for the Delta communities and Norman Wells, Fort Simpson and Hay River which will experience additional growth in providing services for the remainder of the region.

Calculation of growth for these communities is based on a 40:60 ratio of primary and secondary jobs to total jobs in each of the sub-regions.

DELTA

Total primary and secondary jobs = 1,435

Total jobs = 2.5 x 1435 = 3,590

Jobs already located by community (labour force) = 3,265

Additional jobs for Inuvik = 3,590 - 3,265 = 325

Additional population for Inuvik - 325 x 2.5 = 815

Total population of Inuvik = 5,220 + 815 = 6,o35

REMAINDER OF AREA

Total primary and secondary jobs = 1,235 + 459 = 1,694

Total jobs = 2.5 X 1,694 = 4,235

Jobs already located by community (labour force) = 3,770

Additional jobs for service centres = 4,235 - 3,770 = 465

Additional population for service centres = ?.5 x 465 = 1,165

This population is distributed in proportion to projected population as in Section Al.

	Existing Population	Percentage Distribution	Additional Population	Total Population
Norman Wells	585	8.33	95	680
Fort Simpson	1,610	22.94	270	1,880
Hay River	4,825	68.73	800	5,625
		100.0%	1,165	

A.4.3.2a. OPTION 2.a

Additional 789 jobs (A.3.6.2) for Delta Communities distributed in proportion to population:

	Percentage Distribution	Additional Primary & Secondary	Additional Total Jobs	Additional Population
Tuktoyaktuk	11.01	87	174	580
Inuvik	57.17	451	1,128	2,820
Aklavik	11.16	91	182	605
Old Crow	3.78	30	60	200
Fort McPherson	14.7?	117	234	780
Arctic Red River	1.64	13	26	86
Total	100. 00%	789	1,804	

Total primary and secondary jobs in the Delta area = 1,435 + 789 = 2,224

Total jobs in the Delta area = 2.5 x 2,224 = 5,560

Jobs allocated to residents of Delta communities

= 3,265 (labour force) + 1,804 above

= 5,069

Additional jobs for Inuvik (service centre)

= 5,560 - 5,069 = 491

Additional population for Inuvik = 2.5 x 491 = 1,230

Total population of Delta communities:

Tuktoyaktuk	1,005 + 580	= 1,585
Inuvik	5,220 + 2,820 + 1,230	= 9,270
Aklavik	1,060 + 605	= 1,665
Old Crow	345 + 200	= 545
Fort McPherson	1,350 + 780	= 2,130
Arctic Red River	150 + 86	= 235
		15,430

Population of all other communities as in Option 1.

A.4.3.2b OPTION 2b

All 789 jobs (A.3.6.2) go to Inuvik residents.

Additional population resulting from these jobs is 789 x 2.5 x 2.5 = 4,930

Additional population resulting from service centre function:

Total jobs in the area as in Option 2a = 5,560

Jobs already located

= 3,265 (labour force) + 1,975 (total induced by the 789 jobs)

= 5,240

Additional jobs for Inuvik = 5,560 - 5,240 = 320

Population resulting from these jobs = 320 x 2.5 = 800

Total population of Inuvik = 5,220 + 4,930 + 800

= 10,950

Population of all other communities as in Option 1.

A.4.3.2c OPTION 2c

The 789 jobs go to a new settlement, resulting in a population of 789x 2.5 x 2.5 = 4,930

The additional population resulting from service centre function -- 800 as in Option 2b -- is split between Inuvik and the new settlement in proportion to their population.

	Population	Percentage Distribution	Additional Population	Total population
Inuvik	5220	51.42	410	5630
New Settlement	4930	48.58	390	5320

Population of all other communities as in Option 1.

A.4.3.3a OPTION 3a

The 789 jobs are distributed to the labour force of all communities in proportion to their population:

	Percentage Distribution	Additional Primary & Secondary	Additional Total Jobs	Additional Population
Tuktoyaktuk	5.27	42	84	280
Inuvik	27.32	21	540	1,350
Aklavik	5.55	44	88	295
Old Crow	1.42	11	22	75
Fort McPherson	7.05	55	110	365
Arctic Red River	.80	6	12	40
Lower Mackenzie Valley	47.41	375	856	2,405
Fort Good Hope	3.15	25	50	165
Norman Wells	3.05	24	60	150
Fort Franklin	2.84	22	44	145
Fort Norman	2.19	17	34	115
Wrigley	1.60	13	26	85
Fort Simpson	8.45	67	167	420
Jean Marie River	.35	3	6	20
Trout Lake	.25	2	4	15
Fort Providence	5.45	42	84	280
Hay River	25.26	199	497	1,245
Central & Upper Mackenzie	52.59	414	972	2,640
TOTAL	100.00	789	1,828	5,045

Additional population resulting from the service centre function for Delta communities:

Primary and secondary jobs as in Option 1	= 1,435
Additional primary and secondary jobs as above	= 375
	1,810

Total jobs in the area, on 40:60 basis = 1,810 x 2.5 = 4,525
Jobs already allocated = 3,265 (labour force) + 856 (as above) = 4,121
Additional service jobs for Inuvik = 4,525 - 4,121 = 404
Additional population for Inuvik = 404 x 2.5 = 1,010

Total population of Delta communities:

Tuktoyaktuk	1,005 + 280	= 1,285
Inuvik	5,220 t 1,350 + 1,010	= 7,580
Aklavik	1,060 + 295	= 1,355
Old Crow	345 + 75	= 429
Fort McPherson	1,350 + 365	= 1,715
Arctic Red River	150 + 40	= 190
Total Lower Mackenzie Delta		12,545

Additional population resulting from service centre function for remainder of the area:

Primary and secondary jobs, as in Option 1 = 1,694
Additional primary and secondary jobs, as above = 414
2,108

Total jobs in the area, on a 40:60 basis = 2,108 x 2.5 = 5,270
Jobs already allocated = 3,770 (labour force) + 972 (as above) = 4,742
Additional jobs for service centres = 5,270 - 4,742 = 528
Additional population for service centres = 528 x 2.5 = 1,320

	Percentage Distribution	Additional Population
Norman Wells	8.33	110
Fort Simpson	22.94	305
Hay River	68.73	905
	100.00Z	1,320

Total population of communities of Middle and Upper Mackenzie

Fort Good Hope	600 +	165		= 765
Norman Wells	585 +	150	- 110	= 845
Fort Franklin	695 +	145		= 840
Fort Norman	415 +	115		= 530
Wrigley	305 +	85		= 390
Fort Simpson	1,610 +	420	- 305	= 2,335
Jean Marie River	80 +	20		= 100
Trout Lake	65 +	115		= 80
Fort Providence	1,040 +	280		= 1,320
Hay River	4,825 +	1,245	- 905	= 6,975
TOTAL		5,045	+1,320	= 6,365

A.4.3.3b OPTION 3b

The 789 jobs are distributed to Inuvik and Fort Simpson in proportion to their population:

	Percentage Distribution	Additional Primary & Secondary	Additional Total Jobs	Additional Population
Inuvik	76.43	604	1,510	3,775
Fort Simpson	23.57	185	460	1,150
	100.00%	789	1,970	4,925

Additional population resulting from service centre function for Delta communities:

Primary and secondary jobs as in Option 1 - 1,435
Additional primary and secondary jobs as above = 604
2,039

Total jobs in the area, on a 40:60 basis = 2,039 x 2.5 = 5,100
Jobs allocated already = 3,265 (labour force) + 1,510 (as above) - 4,775
Additional service jobs for Inuvik = 5,100 - 4,775 = 325
Additional population for Inuvik = 325 x 2.5 = 810
Total population of Inuvik = 5,220 + 3,775 + 810 = 9,805

Additional population for service centres in the remainder of the area:

Primary and secondary jobs as in Option 1 = 1,694
Additional primary and secondary jobs as above = 185
1,879
Total jobs in the area, on a 40:60 basis = 1,879 x 2.5 = 4,700
Jobs already allocated = 3,770 (labour force) + 460 = 4,230
Additional jobs for service centres = 4,700 - 4,230 = 470
Additional population for service centres = 470 x 2.5 = 1,175

Population of all other communities as in Option 1.

	Percentage Distribution	Additional Primary & Secondary	Additional Total Jobs	Additional Population
Norman Wells	585	8.33	100	658
Fort Simpson	1,610	22.94	270+1,150	3,030
Hay River	4,825	68.73	805	5,630
		100.00%	1,175	

A.4.3.3c OPTION 3.c

The 789 jobs are distributed to Norman Wells, Fort Simpson and Hay River in proportion to their population. Population of Delta communities remains as in Option 1.

	Percentage Distribution	Additional Primary & Secondary	Additional Total Jobs	Additional Population
Norman Wells	8.33	66	165	415
Fort Simpson	22.94	181	452	1,130
Hay River	68.73	542	1,355	3,390
		789	1,972	4,935

Additional population resulting from service centre function:

Primary and secondary jobs as in Option 1 = 1,694
Additional primary and secondary jobs as above 789
2,483

Total jobs in the area, on a 40:60 basis = 2,483 x 2.5 = 6,210
Jobs already allocated = 3,770 (labour force) + 1,972 (as above) = 5,742
Additional jobs for service centres = 6,210 - 5,742 = 468
Additional population for service centres = 468 x 2.5 = 1,170

Population for all other communities remains as in Option 1.

	Existing Population	Percentage Distribution	Additional Population	Total Population
Norman Wells	585	8.33	100+415	1,100
Fort Simpson	1,610	22.94	270+1,130	3,010
Hay River	4,825	68.73	800+3,390	9,015
		100.00%	1,170	

The following table summarizes the results of the computations for each of the foregoing options.

TABLE 15 APPROXIMATE SIZE OF COMMUNITIES FOR EACH OPTION

Option	1	2.a	2.b	2.c	3.a	3.b	3.c
Tuktoyaktuk	1,005	1,585	1,005	1,005	1,285	1,005	1,005
Inuvik	6,035	9,270	10,950	5,630	7,580	9,805	6,035
Aklavik	1,060	1,665	1,060	1,060	1,355	1,060	1,060
Old Crow	345	545	345	345	420	345	345
Fort McPherson	1,350	2,130	1,350	1,350	1,715	1,350	1,350
Arctic Red River	150	235	150	150	190	150	150
New Settlement				5,320	-		
Lower Mackenzie and Delta	9,945	15,430	14,860	14,860	12,545	13,715	9,945
Fort Good Hope	600				765	600	600
Norman Wells	680				845	685	1,100
Fort Franklin	695				840	695	695
Fort Norman	415				530	415	415
Wrigley	305	Same as Option 1			390	305	305
Fort Simpson	1,880				2,335	3,030	3,010
Jean Marie River	80				100	80	80
Trout Lake	65				80	65	65
Fort Providence	1,040				1,320	1,040	1,040
Hay River	5,625				6,975	5,630	9,015
Central and Upper Mackenzie	11,385	11,385	11,385	11,385	14,180	12,545	16,325
Total	21,330	26,815	26,245	26,245	26,725	26,260	26,270
Transient Workers	789	-	-	-			

A.5 ASSESSMENT OF OPTIONS (Reference to Section 8).

The options for place of residence of employees in all jobs including the additional hydrocarbon jobs, result in varying impact on communities. In this section the impact on the area as a whole and on the individual communities is assessed.

A.5.1 PHYSICAL CONSTRAINTS TO GROWTH

Growth of some communities is constrained by physical conditions. Constraints which affect the options for growth are listed below.

Tuktoyaktuk: Makale, Holloway and Associates in March. 1972 recommended that growth of Tuktoyaktuk should be limited to 850 -- a further 200 people. This limit of a total population of 850 was accepted. All options resulted in a population in Tuktoyaktuk in excess of this figure. The projected population of Tuktoyaktuk beyond the 850 limit would have to occur in Inuvik or any of the other centres.

Inuvik: Problems of expansion of Inuvik are listed in a Makale, Holloway report of September, 1973 but no precise population limit is stated. In these calculations it is accepted that, because of many severe problems growth should not occur beyond that required for Inuvik to perform its function as a regional service and administrative centre. As indicated in Option 1, this is a population of approximately 6,000. All options which go beyond this limit -- Options 2a., 2.b., 3a., and 3.b., are rejected as being impractical.

Other communities: As discussed in Chapter 8 of this report there are no serious physical constraints to growth in other communities. In the course of normal growth both Norman Wells and Fort Simpson will require new sites. Hay River requires changes in railway alignment or crossings of the rail line. These community adjustments will be necessary whether a pipeline is built or not. Given this fact, for the purposes of these calculations none of these communities are considered to be limited in their potential to grow.

A.5.2 NEW SETTLEMENT

Option 2.c requires construction of a new settlement in the Delta. Because of construction logistics, potential inefficiency and duplication of services, this option is rejected as being impractical.

A.5.3 CONSTRUCTION CALCULATIONS (Reference to Section 8.4)

The requirement for residential construction is calculated by dividing total population by a dwelling occupancy rate: the Canadian national average is 3.7 but, because of the high proportion of single people in the North, the figure of 3.5 used in the Arctic Gas application, Section 14.c Is accepted. Multiplying the number of units by the current cost per square foot and assuming a dwelling unit of 1,050 square feet, the total cost of new residential building is determined. To this is added replacement of existing structures, also based on an occupancy rate of 3.5.

An annual average number of man-years required for the period 1975 to 1985 is derived by calculating all building requirements on residential unit equivalents: this permits ready conversion to man-years of employment through the application of the rule of thumb that the average output of the construction industry is equivalent to one housing unit per man per year. The total expenditure on commercial, institutional, industrial and other buildings was calculated from Canadian national ratios of types of building construction. As building costs are unpredictable over the long term, building requirements were expressed in square feet equivalents using the 1974 N.W.T. building cost. It is assumed that all structures will be replaced over the 25 year period from 1975 to the year 2000.

A.5.3.1 NORMAL GROWTH

The requirement is first calculated for the study area population in conditions of normal growth as determined in Section A1.

1975 population = 14,225

Number of units to be built to re-house this population by the year 2000

$$= \frac{14,225}{3.5} - 4,065$$

Number of units to be replaced by 1985

= 10 x 4,065 = 1,620

1975 population = 14,225

1985 population = 19,350

Population growth, 1975 to 1985, = 5,125

New units required = $\frac{5,125}{3.5}$ = 1,465

Total units required by 1985: 3,085

Annual average 1975 to 1985 = $\frac{3,085}{10}$ = 310

Residential construction represents 53% of all building construction. Therefore all construction in equivalent units,

annual average = $\frac{100}{53} \times 319$ = 585

Approximately 1/6th (97 man-years) of the annual requirement is in replacement of such existing community facilities as hospitals, schools, etc. In fact, most existing facilities in the region were built quite recently and would not require replacement during the 10-year period of the calculation so the 97 man-years can be deducted and, as a result, the actual requirement up to 1985 under the circumstances of normal growth is 488 units. This represents an annual requirement for 488 man-years of construction.

A.5.3.2 OPTION 1

Number of units replaced

1975 population 14,225

1985 population 21,3

Population growth 1975 = 7,105

New units requi = 7

Total dwelling units r

Annual average 75 to 1985 = 3,650 = 365

Total construction as = 53

As noted in the calcu s for normal g the actual requirement is 1/6th less, or 575 units because most community facilities were built relatively recently and not require replacement in 1975-1985. The circumstances of Option 1 imply an annual requ for 575 man-years of construction

A.5.3.3 OPTION 3.c

Number of units replaced from A.5.3.1.

1975 population = 14,2

1985 population = 26,270

Population growth, 1975 to 1985, = 12,0

New units required = 12,045 = 3,440

Total dwelling units required by 1985: 5,060

Annual average, 1975 to 1985, = 5,060 = 506

Total construction as above = 100 x 506 = 955

As noted in the calculations for normal growth above, the actual requirement is 1/6th less or 795 units because most community facilities were built relatively recently and will not require replacement in the circumstances of Option 3.c imply an annual requirement of 795 man-years of construction.

A.5.3.4. Construction Capacity

As determined in Section '5 the construction industry in the study area will have an average annual capacity of 600 man-years between 1975 and 1985. The requirement for construction to accommodate normal population growth in this period is 488 man-years annually. In the case of Option 1 the requirement increases to 575 man-years annually but remains within the capacity of the workforce.

In the case of Option 3.c the annual requirement is for 795 man-years, one third more than capacity as calculated. In this Option however the increased growth takes place in Norman Wells, Fort Simpson and Hay River. In Fort Simpson and Hay River, where most of the growth takes place, *it is* possible to industrialize the building process to a greater extent than elsewhere. In addition, because of their locational advantages, much of the required building in these centres can be imported from the south, either in the form of components or of prefabricated units.

Option 3.c is based on migration *to* the study area of 789 additional employees in the hydrocarbon industry, along with their families and employees in the resulting service industries. In Option 1 these 789 employees do not move permanently into the area with their families but instead commute back and forth from elsewhere, as many workers do at present. Option 3.c furthers the regional goal (Section 4.2) of retaining earned income within the region. However, recognizing the capacity of the construction and service industries to accommodate the resulting population growth, and the potential for increasing construction capacity by industrialization or imports from outside the area, indicates that an accommodation between Option 1 and Option 3a. would be desirable.

APPENDIX B - COMMUNITY INVENTORY

In this appendix the possible level of service in the communities which may be achieved under the conditions described in Option 3.c. -- that of maximum growth -- is compared with existing condtions.

The facilities listed for 1985 represent the desirable level of service which may possibly be achieved under Option 3.c, as a result of the increased population and full employment. The actuality will depend on many factors, such as government policy and the choices which will be made by the people themselves.

It should be noted that the consultants do not predict that the maximum impact described in Option 3.c. will occur. The relevance to the study of the 1985 service levels is to indicate, as a point of reference, the maximum level of service which can occur under conditions of full employment and with all employees of the hydrocarbon industry resident in the area.

B.1. EXISTING COMMUNITY SERVICES AND FACILITIES

information on the existing facilities and services in each community in the study area is summarized in the following tables:

- Economic Activities
- Community Facilities
- Municipal Services

The relation between the number of people and the facilities is an indication of the level of service in each community. Sources of information are:

- Communities of the Mackenzie, Atlas, October 1974
- Arctic Gas Submission, Section 14.c
- Northwest Territories Government, "Community Data, 1974"
- Northwest Territories Directory, January 1974.

	INDUSTRIES																TRANSPORT			ENERGY		TRADE										SERVICES								GOVERNMENT			
	hunting/trapping/fishing	hydrocarbon exploration	" production	mining exploration	food production	logging/sawmilling	commercial fishing/process	handicraft production	fur garment manufacturing	other manufacturing (1)	ship repair	contracting and trades					land	water	air	electricity supply company	fuel supply companies	wholesale/warehousing	hardware supplier	general store/co-op	craft shop	liquor store	other retail outlets	restaurants, cafes, bars	hotels, motels and lodges		barber/beauty salon	banking	insurance, real estate	professional services	services to business	laundry/dry cleaners	travel agency/services	other personal services		community status (g)	N.W.T.	federal	police
Tuktoyaktuk	*	*					*		1			*					1	2	1	1	*		1	1	1						(f)								H	*	*	2
Inuvik	*	*						*		b		18					*	3	12	1	3	6	2	3	1	1	11	13	3		2	2	2	4	3	1	1	3		T	*	*	18
Aklavik	*	*							1	b		2					3		1	1	1			2				1	1			(f)								H	*	*	2
Old Crow	*					1		*				1							1	1																			U	*	*	1
Fort McPherson	*					(e)		*		a		3					5		1	1	*			2	·	1			1		(f				1				S	*	*	3
Arctic Red River	*					(e)													1		1																		U	*		0
Fort Good Hope	*	*				(e)						1							1		1							2			(f								S	*	*	2
Norman Wells		*	*									1					3	2	6	1	1					1	1	2	1			1								S	*	*	1
Fort Franklin	*						*	*				1					*		2	1	*			2	1				1		(f)								H	*	*	0
Fort Norman	*	*										2					2			1				1	1			1	2		(f)								S	*	*	2
Wrigley	*	*		*		(e)														1	*			2	1			1			(f								S	*	*	0
Fort Simpson	*	*		*	*	1		*				3					3	2	8	1	3	1	1	2	1	1	2	4	3		1			1		*			V	*	*	6
Jean Marie River	*					1														1	*			1															U	*		0
Fort Providence	*	*		*	*							2						1	1		*			2	1		1	8	2		(f)								S	*	*	2
Trout Lake	*																							1															U	*		*
Hay River	*	*				1	1			bcd		* 23					10	4	6	1	8	7	3	3		1	11	12	6		3	2	4	9	7	2	*	2		T	*	*	10

NOTES • existing activity
'a' canvas goods
'b' bakery
'c' soft drink bottlers
'd) reconstruction of vehicles
'e) sawmill intermittent
'f) flying bank
(g) T - town
V - village
H - hamlet
S - settlement
U - unorganized

ECONOMIC ACTIVITIES

	HEALTH						EDUCATION					RE					
	hospital - beds and cribs	- doctors	nursing station - beds & cribs	- nurses	health centre	clinic	dentist	grades	kindergarten	students	teachers	student hostel beds	library	hall	cinema	arena	gymnasium
Tuktoyaktuk			4	2				9	*	195	10		1	1			
Inuvik	100	5			1	1	2	12	*	1164	74	300	1	1	1	1	*
Aklavik			4	4				9	*	254	12		1	1	1		1
old Crow			*					8		73	3		1	1			
Fort Mc Pherson			5	3				9	*	228	12	80	1		1		1
Arctic Red River			(e)					6		18	1						
Fort Good Hope			4	2				8	*	118	5	36	1	1			1 (
Norman Wells			13	2				7	*	76	3		1	1			
Fort Franklin			5	2				8	*	131	6		1	1			(
Fort Norman			4	1				6		54	3		1	1			
Wrigley			2	1				6	*	33	2		(b)	1			
Fort Simpson	26	1			1	1	1	10		362	20	50	1	1	1	1	1
Jean Marie River								6		24	1		1	1	(a)		
Fort Providence			5	2				9	*	194	9			1	1		1
Trout Lake								6	*	15	1			1			
Hay River	22	4			1		2	12	*	898	42	120	1	1	1	1	1

NOTES : ***existing** facility
nsi not sufficient information

(a) movies at co-op
(b) library service only
(c) proposed

(d) short wav
(e) health st
(f) in genera

	TRANSPORTATION														WATER SUPPLY					SEWAGE DISPOSAL						GARBAGE			POWER			ENERGY				FIRE	
	highway link to south	- to regional centre	cars (1973)	trucks and heavy vehicles	gasoline ¢/gallon	car service/garage	car rental	taxi/local bus	local carrier	freight-truck service	wharf	wharf equipped	barge ($/ton from Hay River)	airstrip - 1000 ft.	- surface (e)	utilidor - % served	source (f)	treatment plant	piped to point of use	trucked	piped	holding tank/truck	honey bag/truck	septic tank	pit privy	sewage treated	removed by truck	dumped/covered	dumped only	capacity KW, '000	use 10^6 KWH/yr	rate ¢/KWH	oil ¢/gallon	propane	wood	volunteers number	fire hall
Tuktoyaktuk		13	78	*	*		*	*	*	*	*	59	3.5	G	0	L/B					*	*				*		*	(d	(d)	12	*		*			
Inuvik		453	943	44	*	*	*	*		*	*	52	6.0	A	50	M	*	*		*		*			#	*		*	11.0	24.	5-7	32			18	1
Aklavik		5	31	50				*	*	*		52	2.0	E	0	L	*	*	#		*	*				*	*		.76	1.4	12	32			15	
Old Crow		nsi	nsi	nsi				nsi				(c)	5.0	E	0	R										*		*	.15	nsi	15	*		*	0	
Fort McPherson	(b)	3	61	85			*	*	*			52	1.5	E	10	L	*	*	#	*		*			#	*		*	. 9	1.6	12	39			10	
Arctic Red River	(b)	nsi	nsi	75				*				49	2.5	E	0	L/R						*				*		*	. 5	.25	16	38			5	
Fort Good Hope		4	52	89				*	*	*		41	3.6	E	10	L/M			#	*	*	*	*			*		*	. 6	.81	12	38		*	8	1
Norman Wells		42	150	39	*	*	*	*	*	*	*	34	6.0	A	80	R/M	*	*					*		*		*	*	1.8	3.0	10	25			nsi	
Fort Franklin		nsi	nsi	90				*		*		69	2.8	E	0	L			*		*	*		*		*	*		.6	.63	12	45			8	
Fort Norman		0	24	69				*	*	*		34	3.0	E	0	M/R			*			*	*			*		*	.35	.52	12	38		*	12	
Wrigley		nsi	nsi	75				*	*	*		31	4.2	E	0	W/M			*			*	*	*		*		*	.15	nsi	12	40		*	≡	
Fort S	(a)*	149	522	66	*	*	*	*	*	*	*	26	6.0	E	0	R	*	*		*	*	*	*	*		*		*	1.2	4 3	8	34	*		12	1
Jean Marie River		nsi	nsi	nsi				*				20	1.4	E	0	W/M			*					*				*	0.8	nsi	12	*	*	*	0	
Fort Providence	(a)*	nsi	nsi	67	*	*	*	*	*	*		16	3.3	G	0	M			*		*	*	*	*		*	*		nsi	nsi	12	*	*		15	1
Trout Lake		0	1	nsi				nsi					*	E	0	nsi			nsi					*				nsi		nsi		*	*		
Hay River	*	998	1392	56	*	*	*	*	*	*	*	*	6.	A	0	L	*	*	#	*			*	*	*	*	*		*	6.0	nsi	12	35	*		24	3

NOTES:
- * existing facility
- # not all of community
- n.s.i not sufficient information
- (a) ferry across river
- (b) highway under construction
- (c) $161/ton from Dawson
- (d) power from Inuvik
- (e) A - Asphalt; G - gravel; E - earth
- (f) B - bay; L - lake; M - Mackenzie River; R - river; W - well

MUNICIPAL SERVICES

INCLUDES TRANSPORTATION

B.2. COMMUNITY FACILITIES AND SERVICES, 1985

B.2.1. STANDARDS

The following set of information sheets indicates the possible changes in service level and physical plant requirements in each community by 1985. In general, standards applied are based on the assumption that increased employment and income from hydrocarbon developments will result in availability of services approximating that of Canada as a whole. In the larger communities this will happen as a matter of course. In smaller and more remote communities availability of services will depend to a great extent on government policy. Increased transportation and communication acitivity will make possible improved distribution of goods and services from the regional centres. This is particularly applicable to health and education services.

B.2.2. ECONOMIC ESTABLISHMENTS

All communities were considered to have at least one of the following major functions as an economic base by 1985:

1. resource based - hydrocarbon or minerals
   - forestry, hunting, fishing
2. transportation centre
3. government administration centre

The volume of supporting industry, construction, transportation, communications, utilities, trade, personal and business services and government will be related to a community's population. As the population grows so the number and level of services will increase. For 1985 the allocation of new establishments was based on an assessment of existing facilities in terms of the increase in population in each community.

B.2.3. COMMUNITY FACILITIES

B.2.3.1. Health

By **1985** there could be hospitals in each regional centre -- Inuvik, Norman Wells, Fort Simpson and Hay River -- as well as in Yellowknife. In determining facilities for these, the regional population was used and the following standards derived from the 1972 Canadian averages were applied:

hospital beds per 1,000 people	9.8
hospital staff, full time, per bed	1.91
number of people per doctor	690
number of people per dentist	1,000

(less than current average due to the increase in preventive dentistry)

In the Northwest Territories the smallest unit for health services is the nursing station which is staffed by full time trained nurses, and has treatment facilities.

The following standards were applied:

community population	health facility	No. beds	doctors	nurses	community aid
0-49	none				
50-190	health station				1
200-299	nursing station	2		1	
300-699	"	3-5		2	
700-999	"	6-7		3	
1000+	"	8+	1	3+	

Number of staff varies according to local conditions. (e.g. high incidence of T.B.)

B.2.3.2. Education

To calculate number of children in each grade level age group the following 1970 Canadian average figures were used:

Kindergarten	2.5% of total population	
Grades 1-6	" " " "	(2.5% per grade)
Grades 7-9	" " " "	(2.5% per grade)
Grades 10-12	" " " "	(1.75% per grade)
Fost secondary	2.2% " " "	

The Canadian average ratio of students to teachers in 1970 was 22.3. In the Northwest Territories it is presently 15.8 because of the small size of many settlements. As population increases the ratio can be expected to increase. A ratio of 20 students to one teacher is applied here.

No commitment has been made with regard to location of schools except for regional high schools. By 1985 a regional high school could be justified at Inuvik, Norman Wells, Fort Simpson and Hay River. Vocational training is considered desirable and could be justified at Inuvik and Hay River as well as Fort Smith, although industrial activity at Norman Wells and Fort Simpson could encourage vocational and apprenticeship training at these communities also.

Much of the specialized teaching that now takes place at concentrated points could by 1985 be effected within the smaller communities by means of visiting teachers, communication links and teaching machines. This would allow children to remain longer in their home communities and could encourage greater participation in the higher grades.

B.2.3.3. Recreation

By 1985 all communities are considered to have at a minimum, a community hall and library/information centre and some form of outdoor recreation facility. Beyond this, facilities are dependent on population, location, and ethnic mix.

B.2.3.4. Housing

The number of dwelling units required by 1985 is calculated at 3.5 persons per dwelling, slightly lower than the Canadian average of 3.7 because of the higher Proportion of singles in the north.

B.2.4. COMMUNICATION AND TRANSPORTATION

The standards for communication assume that by 1985 all communities should have radio reception, telephone and television reception via the communications sattelites and remote reception facilities. This is significant in terms of education and access to professional, commercial and social services. Number of telephones and automobiles (where noted) are based on one per dwelling. All communities could have all-weather airstrips.

B.2.5. MUNICIPAL SERVICES

The following standards were used in estimating the community requirement for municipal services.

Water supply - based on 36 gallons per person per day. The present consumption varies widely. This figure is reasonable but assumes that some conservation measures will be practiced, as is common now.

Sewage and waste water - 36 gallons per person per day.

Garbage - Canadian average of 2.5 lbs per person per day.

Energy - the standard fuel is presently oil. For comparative purposes the increase in energy consumption has been calculated in terms of gallons of oil, at the rate of 62.5 x 10^6 BTUs per person per year but, with construction of the pipeline, natural gas is assumed to be available

in most communities.

Power - consumption rates were based on the assumption that they would be slightly higher than at present. For Arctic Red River, Wrigley, Jean Marie River and Trout Lake, 2000 KWH/person/year is assumed. In Fort Franklin, Fort Providence, Fort Norman, Fort Good Hope, Fort McPherson, Aklavik and Tuktoyaktuk this is doubled to allow for commercial and community facilities, consistent with existing consumption. In Fort Simpson 5000 KWH/person/year includes some industry. The figure for Inuvik is 6000 KWH/person/year. In Norman Wells domestic and commercial consumption in 1985 is assumed to be 4000 KWH/person/year with an additional 1.5×10^6 KWH/year for the refinery and other industry. No figures were available for existing industrial consumption in Hay River but domestic and commercial consumption is calculated at 4000 KWH/person/year.

B.2.6. REPLACEMENT

This study has assumed as a standard that all facilities will require replacement over the next 25 years.

Although the following data sheets give an indication of the facilities and level of services which may be in each community by 1985, they do not quantify the amounts to be built. Sewer systems, power systems and other municipal services in many cases can not be enlarged and should be replaced.

The same holds true for commercial and residential structures. Although some of these can be improved, many should be replaced.

ECONOMY

1971

A traditional Inuit community of trading post, supply depot and church missions. Now a government defence establishment and an arctic transportation base. Imperial Oil has an exploration base here. Traditional activities including whaling and reindeer herding are still pursued. Fur garments are manufactured. The government has a research base here.

1985

With the pipeline, there will be increased and permanent hydrocarbon activities in the area. The transportation base will continue and expand though there are definite limits to expansion of the town. Tuktoyaktuk will continue as a cultural centre for Inuit people of the western Arctic. Tourism will become increasingly important.

EMPLOYMENT

1971

In traditional pursuits including whaling and a few in reindeer herding. Most jobs are in hydrocarbon exploration, transportation and in government.

1985

Hydrocarbon jobs will continue and their number will increase, more permanent and full time jobs being available for those who want them. Traditional pursuits will continue though perhaps become oriented towards the tourist market.

ECONOMIC ACTIVITIES	'74	'85
hunting/trapping/fishing	x	x
hydrocarbon exploration	x	x
production		+
pipeline operation		+
mining exploration		
food production		
logging/sawmilling		
comm. fishing/process		
handicraft production		
fur garment manufact.	x	x
other manufacturing		
ship repair		
contracting & trades		+
trucking, long dist.		
local freight hauling	x	x
car/truck rental		
taxi/bus service		
car service/garage	x	x
water transport	x	x
airline	x	x
aircharter	x	x
telecommunication		
radio broadcasting	x	x
fuel supplier	x	x
wholesale/warehousing		
hardware supplier		
general store/co-op	x	x
liquor outlet	x	x+
other retail outlet		+
laundry/dry cleaner		+
barber/beauty salon		
other personal service		
banking	fly in	+
insurance, real estate		
professional service		
service to business		
hotel, motel	x	x+
restaurant/café/bar	x	x+
administration:		
Local (incl. municip. serv.)		x+
NWT (incl. community serv.)	x	x+
Federal (" ")	x	x

COMMUNITY FACILITIES	'74	'85
HEALTH ('71)		
facility	nursing station	nursing station
beds (& cribs)	4(1)	7(1)
staff	2 nurses doc. mthly	3 nurses doc. 2 mth
dentist	2 yearly	3 yearly
EDUCATION ('73)		
no. of students	h-9 195	1-6 153
		7-9 63
		10-12 44
no. of teachers	10	11
high school; 10-12	Inuvik	
vocation training	Inuvik	
hostel, no. of beds		
RECREATION ('73)		
library	x	x+
cinema		+
community hall	x	x
gymnasium		+
sports centre		
curling rink	x	x
skating rink		
tennis		
swimming pool		
other		+
ACCOMMODATION ('71)		
hotel, motel	0	+
capacity, people		+
HOUSING		
no. of dwelling units	115	240
persons/unit	5.5	3.5

COMMUNICATION & TRANSPORT	'74	'85
COMMUNICATION		
mail-weekly	3	x+
post office	in store	+
radio reception	x	x
local radio reception	x	x
tv reception	x	x
telex		
no. of telephones	54	240
local newspaper		
LAND TRANSPORT		
highway		+
connection to h-way	x	
no. of cars	13	240
no. of trucks	18	x+
car service/garage	x	x
WATER		
docking facility	x	?
barge service	x	x+
AIR		
runway length, ft.	3,500	
surface	gravel	
annual movements	n.s.i.	x+
scheduled flights	2	x+

MUNICIPAL SERVICES	'74	'85
WATER SUPPLY		
domestic (gal/day)	n.s.i.	30,600
distribution	trucked	piped
SEWAGE		
domestic (gal/day)	n.s.i.	30,600
method of disposal	honey bag, holding tank	piped; treated
GARBAGE		
domestic (lbs./day)	n.s.i.	2,100
method of disposal	dumped	landfill
ENERGY		
domestic (gal. oil/yr.)	x	425,000
other fuel		gas
POWER		
capacity kw	Inuvik	
consumption kwh/yr.	n.s.i.	3.4×10^6
POLICE		
no. of men	?	3
FIRE	x	x+

KEY x = existing
\+ = new
x+ = expansion

TUKTOYAKTUK

1971 627 hamlet — POPULATION — 1985 850 village

MUNICIPAL STATUS

EMPLOYMENT

1985	1971	1985
Government administration centre Headquarters of the northern division of gas pipeline administration and district office for operation and maintenance. Supply and service function to the region will expand and a greater variety and number of services and enterprises will locate here.	In government, transportation, service industries and hydrocarbon exploration. Many jobs are at present filled by transients from the south. Some native people hunt, trap and fish.	Increased regional population will mean more jobs in existing service activities and many additional jobs in new enterprises. Jobs in hydrocarbon activities will continue and to a greater extent can be filled by permanent resident employees.

COMMUNITY FACILITIES	'74	'85
HEALTH ('71)		
facility	hospital regional	hospital regional
beds(& cribs)	100	100
staff	6 doc. 30 nurses	12 doc. 190 staff
dentist	2	6-9
EDUCATION ('73		
no. of students	K-6 705 7-12 459	1-6 1086 7-9 452 10-12 492
no. of teachers	74	101
high school: 10-12	Inuvik	
vocation training	Ft.Smith	Inuvik
hostel, no. of beds	300	300+
RECREATION ('73)		
library	x	x+
cinema	x	x+
community hall	x	x+
gymnasium	x	x
sports centre	x	x
curling rink	x	x
skating rink	x	x
tennis		
swimming pool	x	x
other	x	x+
ACCOMMODATION ('71)		
hotel, motel	3	x +
capacity, people	335	x+
HOUSING		
no. of dwelling units	750	1,725
persons/unit	4.6	3.5

COMMUNICATION & TRANSPORT	'74	'85
COMMUNICATION		
mail-weekly	6	6
post office		+
radio reception	x	x
local radio reception	x	x
tv reception	x	x
telex	x	x
no. of telephones	751	2,715
local newspaper	x	x
LAND TRANSPORT		
highway		+
connection to h-way	x	
no. of cars	453	1,724
no. of trucks	943	x+
car service/garage	x	x+
WATER		
docking facility	x	x
barge service	x	x+
AIR		
runway length, ft	6,000	
surface	asphalt	
annual movements	25,200	x+
scheduled flights	21	x+

SERVICES		'74	'85
WATER SUPPLY			
domestic (gal/day)		n.s.i.	21 300
distribution		piped trucked	
SEWAGE			
domestic (gal/day)		n.s.i.	217,300
method of disposal		honey bags piped	piped
		treated	treated
GARBAGE			
domestic (lbs./day)		n.s.i.	
method of disposal		dumped	landfill
ENERGY			
domestic (gal.oil/yr.)		x	3.0×10^6
other fuel			gas
POWER			
capacity	kw	$11,000_6$	x+
consumption	kwh/yr.	22.2×10^6	42.2×10^6
POLICE			
no. of meo		3-18	20-30
FIRE		x	x+

KEY x = existing
\+ = new
x+ = expansion

INUVIK

1971	MUNICIPAL STATUS	1985
3,249		6035
town		town

ECONOMY

1971

Until 1953 centre of trade and of government administration in the Delta. Present economy based on fur trapping, garment and handicraft Production. and on hydrocarbon exploration.

1985

With continued hydrocarbon exploration and field development, many additional jobs will be available to residents of Aklavik, throughout the Delta. Fur garment and handicraft production should continue. There is potential for commercial fishing and tourism.

EMPLOYMENT

1971

Presently in hydrocarbon exploration, traditional pursuits, fur garment and handicraft manufacture and in government .

1985

Traditional pursuits will continue, snd supply goods for tourists - Continued jobs in hydrocarbons will be available either locally or by commuting elsewhere in the Delta.

ECONOMIC ACTIVITIES	'74	'85
hunting /trapping/fishing	x	
hydrocarbon exploration	x	x
production		Inuvik
pipeline operation		
mining exploration		
food production		+
logging/sawmilling		
comm. fishing/process		+
handicraft production		+
fur garment manufact.	x	x+
other manufacturing		+
ship repair		
contracting & trades	x	x
trucking, long dist.		
local freight hauling	x	x
car/truck rental		
taxi/bus service		t
car service/garage		+
water transport		
airline	x	x
aircharter		
telecommunication	x	x
radio broadcasting		
fuel supplier	x	x+
whole sale/ warehousing		
hardware supplier		
general store/co-op	x	x+
liquor outlet		+
other retail outlet		+
laundry/dry cleaner		
barber/beauty salon		
other personal service		
banking	fly in	+
insurance, real estate		
professional service		
service to business		
hotel, motel	x	x+
restaurant/café/bar	x	x+
administration:		
Local (incl. municip. serv.)	x	x+
NWT (incl.community serv.)	x	x+
Federal (" ")	x	x+

COMMUNITY FACILITIES	'74	'85
HEALTH ('71)		
facility	nursing station	nursing station
beds(& cribs)	4(1)	8(2)
staff	3 nurses 1 dot.	
	doc. mthly	3 nurses
dentist	2 yearly	1
EDUCATION (73)		
no. of students	K-9 250	1-6 190
		7-9 79
		10-12 55
no. of teachers	12	14
hip}, school: 10-12	Inuvik	
vocation training	Inuvik	
hostel, no. of beds		
RECREATION ('73)		
library	x	x+
cinema	x	x
community hall	x	x+
gymnasium	x	x
sports centre		+
curling rink	x	x
skating rink		+
tennis		
swimming pool	x	x
other	x	x+
ACCOMMODATION ('71)		
hotel, motel	1	x+
capacity, people	n.s.i.	x+
HOUSING		
no. of dwelling units	150	300
persons/unit	5	3.5

COMMUNICATION & TRANSPORT	'74	'85
COMMUNICATION		
mail-weekly	6	6
post office	x	x
radio reception	x	x
local radio reception		+
tv reception	x	x
telex		
no. of telephones	51	30(3
local newspaper		
LAND TRANSPORT		
highway		+
connection to h-way	x	
no. of cars	5	300
no. of trucks	31	x+
car service/garage		+
WATER		
docking facility	x	x
barge service	x	x+
AIR		
runway length, ft.	2,000	3,500
surface	earth	gravel
annual movements	n.s.i.	x+
scheduled flights	3	x+

MUNICIPAL SERVICES	'74	'85
WATER SUPPLY		
domestic (gal/day)	n.s.i.	38,000
distribution	piped, trucked	piped
SEWAGE		
domestic (gal/day)	n.s.i.	38,000
method of disposal	honey bags, holding tanks	piped; treated
GARBAGE		
domestic (lbs./day)	n.s.i.	2,650
method of disposal	landfill	landfill
ENERGY		
domestic (gal. oil/yr.)	x	530,000
other fuel		gas
POWER		
capacity kw	760	x+
consumption kwh/yr	$1.4X10^6$	$4.2X10^6$
POLICE		
no. of men	2	3
FIRE	x	x+

KEY x = existing
\+ = new
x+ = expansion

AKLAVIK

1971		1985
660	POPULATION	1,060
hamlet	MUNICIPAL STATUS	village

ECONOMY

1971

For a decade it has been a wage oriented community relying heavily on hydrocarbon exploration and government services.

1985

With many young people leaving in search of jobs and there being no economic activity other than government in the community, its future is uncertain. There is. a large potential for hunting and trapping but this is being less and less realised.

EMPLOYMENT

1971

The major job provider is the Yukon government. There is also seasonal work in hydrocarbon exploration.

1985

Jobs in hydrocarbon activities and in larger centres could attract Old Crow residents on a commuter basis. Tourism could provide local jobs in service industries and handicrafts.

ECONOMIC ACTIVITIES	'74	'85
hunting/trapping/fishing	x	x
hydrocarbon exploration		
production		
pipeline operation		
mining exploration		
food production		+
logging/sawmilling		
comm. fishing/process		
handicraft production	x	x
fur garment manufact.		
other manufacturing		
ship repair		
contracting & trades	x	x
trucking, long dist.		
local freight hauling	x	x
car/truck rental		
taxi/bus service		
car service/garage		
water transport		
airline	x	x
aircharter		
telecommunication	x	x
radio broadcasting		
fuel supplier		
wholesale/warehousing		
hardware supplier		
general store/co-op	x	x
liquor outlet		
other retail outlet		
laundry/dry cleaner		
barber/healtv salon		
other personal service		
banking	fly in	
insurance, real estate		
professional service		
service to business		
hotel, motel		
restaurant/cafe/bar		
administration:		
Local (incl. municip. serv.)		+
YWT (incl. community serv.)	x	x+
Federal (" ")	x	x+

COMMUNITY FACILITIES	'74	'85
HEALTH ('71)		
facility	nursing station	nursing station
beds (& cribs)	2	3(1)
staff	1 nurse	1 nurse
	dot. mthly.	
dentist	2 per year	
EDUCATION ('73)		
no. of students	x	1-6 62
		7-9 25
		10-12 18
no. of teachers	n.s.i.	4
high school: 10-12	Inuvik	
vocation training	Inuvik	
hostel, no. of beds		
RECREATION ('73)		
library	x	x
cinema		
community hall	x	x
gymnasium		x
sports centre		
curling rink		
skating rink		+
tennis		
swimming pool		
other		+
ACCOMMODATION ('71)		
hotel, motel		+
capacity, people		
HOUSING		
no. of dwelling units	59	100
persons/unit	3.9	3.5

COMMUNICATION & TRANSPORT	'74	'85
COMMUNICATION		
mail-weekly	x	x+
post office	in the co-op	
radio reception	x	x
local radio reception		
tv reception		+
telex		
no. of telephones	x	98
local newspaper		
LAND TRANSPORT		
highway		
connection to h-way	x	x
no. of cars	n.s.i.	?
no. of trucks	n.s.i.	x+
car service/garage		
WATER		
docking facility	x	x
barge service	x	x
AIR		
runway length, ft.	5,000	3,500
surface	earth	gravel
annual movements	n.s.i.	x+
scheduled flights	2	x+

MUNICIPAL SERVICES	'74	'85
WATER SUPPLY		
domestic (gal/day)	n.s.i.	12,400
distribution	bucket	piped
SEWAGE		
domestic (gal/day)	n.s.i.	12,400
method of disposal	honey bag; dumped	septic; treated
CARRAGE		
domestic (lbs./day)	n.s.i.	860
method of disposal	dumped	landfill
ENERGY		
domestic (gal.oil/yr.)	x	173,000
other fuel	wood	
POWER		
capacity kw	150	x+
consumption kwh/yr.	n.s.i.	690,000
POLICE		
no. of men	1	1
FIRE	fire extinguishers	

KEY x = existing
\+ = new
x+ = expansion

OLD CROW

1971		1985
216	POPULATION	345
unorganized	MUNICIPAL STATUS	hamlet

ECONOMY

1971

A traditional settlement; fur trading post and anglican mission. Trapping is still important. A canvas goods factory has been successfully established and saw milling is done intermittently. Also functions as a minor educational and government administrative centre.

1985

With the completion of the Dempster Highway there will be an increased demand for road service and tourist facilities.

EMPLOYMENT

1971

Many people are still involved in hunting, trapping, fishing and handicraft production. Wage jobs have been in hydrocarbon exploration, the Dempster highway construction, the canvas goods factory, sawmill and in government.

1985

Full time traditional pursuits can continue. Hydrocarbon activities will expand and the new highway will provide jobs in transport, road maintenance and in the service industry.

ECONOMIC ACTIVITIES	'74	'85
hunting/trapping/fishing	x	
hydrocarbon exploration		
production		
pipeline operation		
mining exploration		
food production		+
logging/sawmilling	x	x
comm. fishing/process		
handicraft production	x	x+
fur garment manufact.	x	x
other manufacturing		
ship repair		
contracting & trades	x	x+
trucking, long dist.	x	x+
local freight hauling	x	x+
car/truck rental		+
taxi/bus service	x	x
car service/garage		+
water transport		
airline	x	x
aircharter		
telecommunication	x	x
radio broadcasting		+
fuel supplier	x	x
wholesale/warehousing		
hardware supplier		+
general store/co-op	x	x+
liquor outlet	x	x
other retail outlet	x	x+
laundry/dry cleaner	x	x+
barber/beauty salon		
other personal service		
banking	fly in	+
insurance, real estate		
professional service		
service to business		
hotel, motel	x	x+
restaurant/café/bar	x	x+
administration:		
Local (incl.municip. serv.)	x	x+
NWT(incl.community serv.)	x	x+
Federal (" ")	x	x+

COMMUNITY FACILITIES	'74	'R5
HEALTH ('71)		
facility	nursing station	nursing station
beds(& cribs)	4(1)	11(2)
staff	3 nurses 1 dot. dot, 2mthly	4 nurses
dentist	2 yearly	1 mthly.
EDUCATION ('73)		
no. of students	K-9 '228	1-6 243
		7-9 101
		10-12 70
no. of teachers	12	17
high school; 10-12	Inuvik	
vocation training	Inuvik	
hostel, no. Of beds	80	x+
RECREATION ('73)		
library	x	x+
cinema	x	x
community hall		+
gymnasium	x	x
sports centre		
curling rink	x	x
skating rink	x	x
tennis		
swimming pool		+
other		+
ACCOMMODATION ('7])		
hotel, motel	x	x+
capacity, people	n.s.i.	x+
HOUSING		
no. Of dwelling Units	160	385
persons/unit	5	3.5

COMMUNICATION & TRANSPORT	'74	'85
Communicating		
mail-weekly	5	5
post office	'The Bay	+
radio reception	x	x
local radio reception		+
tv reception	marginal	+
telex		
no. of telephones	50	385
local newspaper		
LAND TRANSPORT		
highway		+
connection to h-way	x	
no. of cars	3	385
no. of trucks	61	x+
car service/garage		+
WATER		
docking facility	x	+
barge service	x	x
AIR		
runway length, ft.	1500	3,600
surface	earth	gravel
annual movements	n.s.i	x+
scheduled flights	5	x+

MUNICIPAL SERVICES	'74	'85
WATER SUPPLY		
domestic (gal/day)	n.s.i.	48,600
distribution	trucked,	piped
SEWAGE		
domestic (gal/day)	n.s.i.	48,600
method of disposal	honey bag; piped	piped treated
GARBAGE		
domestic (lbs./day)	n.s.i.	**3,400**
method of disposal	dumped	**landfill**
ENERGY		
domestic (gal. oil/yr.)	x	**675,000**
other fuel		**gas**
POWER		
capacity kw	**900**	**x+**
consumption kwh/yr.	1. 6×10^6	**5.4×10^6**
POLICE		
no. of men	3	**4-5**
FIRE	x	**x**

KEY x = existing
\+ = new
x+ = expansion

FORT McPHERSON

1971		1985
841	POPULATION	1,350
settlement	MUNICIPAL STATUS	village

ECONOMY

1971

A traditional community, originally a summer fishing camp, missi On community and fur trading post. Hunting and trapping are still important. Lumber is produced intermittently at a local sawmill.

1985

With the completion of first the Dempster and later the Mackenzie Highways the community is well located to provide service to road transport and tourists i f it elects to do so.

EMPLOYMENT

1971

It is estimated that 13 people work full time in traditional pursuits. Other jobs are in logging and the sawmill operation, construction work on the new Dempster Highway and government services.

1985

Traditional activities can cent - inue though many additional jobs will be available in services for transport and tourists and highway maintenance. Some people may commute to hydrocarbon jobs elsewhere in the Delta.

ECONOMIC ACTIVITIES	'74	'85
hunting/trapping/fishing	x	
hydrocarbon exploration		
production		
pipeline operation		
mining exploration		
food production		
logging/sawmilling	x	
comm. fishing/process		
handicraft production		
fur garment manufact.		
other manufacturin g		
ship repair		
contracting & trades		+
trucking, long dist.		
local freight hauling	x	x+
car/truck rental		
taxi /bus service		
car service/garag e		
water transport		
airline	x	x
aircharter		
telecommunicat ion	x	x
radio broadcasting		
fuel supplier	x	x
whole sale/ warehousing		
hardware supplier		
general store /co-op	x	x
liquor outlet		
other retail out let		
laundry/dry cleane r		
barber/beauty salon		
other personal se rv ice		
banking		
insurance, real estate		
pro fessional service		
service to business		
hotel, motel		
restaurant/café/bar		+
administration:		
Local (incl. mun icip. se rv.)		+
NWT (incl. community serv.)	x	x
Federal(")		+

COMMUNITY FACILITIES	'74	'85
HEALTH (' 71)		
facility	health station	health station
beds (& cribs)	2	3(1)
staff	community aid	
	dot. visits mthly.	
dentist	twice per year	
EDUCATION (73)		
no . of students	K-6 18	1-6 27
		7-9 11
		10-12 7
nn. of teachers	1	2
high school: 10-12	Inuvik	
vocat inn tra ining	Inuvik	
hostel, no. of beds		
RE CR EAT ION (' 73)		
1 ibrary		+
c ine ma		
community hall		+
gymnasium		+
sports centre		
curling rink		+
skating rink		
tennis		
swimming pool		
other		+
ACCOMMODAT ION (' 71)		
hotel, motel		+
capac ity, people		+
HOUS ING		
no. of dwellin g units	28	40
person s/unit	3.4	3.5

COMMUNICATION & TRANSPORT	'74	'85
COMMUNICATION		
mail-weekly	2	x+
post office	in The Bay	
radio reception		+
local radio reception		
tv reception		+
telex		
no. of telephones	10	42
local newspaper		
LAND TRANSPORT		
highwa y		+
connection to h-way	x	
no. of cars	n.s. i.	42
no. of trucks	n.s. i.	x+
car service /garage		+
WATER		
docking facility		+
barge service	x	x
AIR		
runway length, ft.	2,500	
surface	earth	gravel
annual movements	n.s. i.	x+
scheduled flights	2	x+

MUNICIPAL SERVICES	'74	'85
WATER SUPPLY		
domestic (gal/da\')	n.s. i.	5,400
distribution	truck, indiv.	pipe
SEWAGE		
domestic (gal/da v)	n.s. i.	5,400
method of disposal	honey bag: dumped	septic; treated
GARBAGE		
domestic (lbs./day)	n.s. i.	37'5
method of disposal	dumped	landfill
ENERGY		
domestic (gal . oil/yr.)	x	75,000
other fuel		gas
POWER		
capacity kw	45	x+
consumption kwh/yr.	250,000	400,000
POLICE		
no. of men	from Ft	McPherson
FIRE	x	x+

KEY X = existing
\+ = new
x+ = expansion

ARCTIC RED RIVER

1971		1985
95	POPULATION	150
unorganized	MUNICIPAL STATUS	settlement

ECONOMY

1971

Ministry of Transport radio relay, regional school, traditional pursuits.

1985

Highway services could locate here. Participation in hydrocarbon activity by commuting could generate additional trade and services within the settlement.

EMPLOYMENT

1971

Some hunting, trapping and fishing, primarily general labour.

1985

Highway and tourist services; hydrocarbon jobs by commuting; increased trade and services within the settlement.

ECONOMIC ACTIVITIES	'74	'85
hunting/trapping/fishing	x	x
hydrocarbon exploration		
production	Norman Wells	
pipeline operation		
mining exploration		
food production		
logging/sawmilling		
comm. fishing/process		
handicraft production		
fur garment manufact.		
other manufacturing		
ship repair		
contracting & trades	x	x+
trucking, long dist.		+
local freight hauling	x	x+
car/truck rental		
taxi/bus service		
car service /garage		+
water transport		
airline	x	x
aircharter		
telecommunication	x	x
radio broadcasting		
fuel supplier	x	x+
wholesale/warehousing		
hardware supplier		
general store/co-op	x	x+
liquor outlet		
other retail outlet		+
laundry/dry cleaner		
barber/beauty salon		
other personal service>		
banking	fly in	+
insurance, real estate		
professional sel-vice		
service to business		
hotel, motel		+
restaurant/caf,/l,,l r	x	x-
administration:		
Local (incl. municip. serv.)	x	x
NWT(incl .community serv.)	x	x
Federal(" ")	x	x+

COMMUNITY FACILITIES	'74	'85
HEALTH ('71)		
facility	nursing station	nursing station
beds(& cribs)	2(1)	5(1)
staff	1 nurse	2 nurses
	doc. visits monthly	
dentist	twice per year	
EDUCATION ('73)		
no. of students	K-6 67	1-6 108
		7-9 45
		10-12 31
no. of teachers	3	8
high school; 10-12	Inuvik	[Norman W.
vocation training		Inuvik
hostel, no. of beds		
RECREATION ('73)		
library	x	xi
cinema		
community hall	x	x+
gymnasium	x	x
sports centre		+
curling rink	x	x
skating rink	x	x
tennis		
swimming pool		+
other	x	x+
ACCOMMODATION ('71)		
hotel, motel		+
capacity, people		+
HOUSING		
nn. of dwellingunits	103	17
persons/unit	3.9	3.5

COMMUNICATION & TRANSPORT	'74	'85
COMMUNICATION		
mail-weekly	2	x+
post office	x	x
radio reception	x	x
10CS1 radio reception		
tv reception		+
telex		
no. of telephones	28	170
local newspaper	X	x
LAND TRANSPORT		
highway		+
connection to h-way	x	
no. of cars	4	170
no. of trucks	52	x+
car service/garage		+
WATER		
docking facility	x	x
barge service	x	x
AIR		
runway length, ft.	3,600	
surface	earth	gravel
annual movements	n.s. i.	x+
scheduled flights	2	x+

MUNICIPAL SERVICES	'74	'85
WATER SUPPLY		
domestic (gal/day)	n.s.i.	21,000
distribution	trucked	piped
SEWAGE		
domestic (gal/day)	n.s.i.	21,000
method of disposal	septic , honey bag; dumped	septic, piped; treated
GARBAGE		
domestic (l bs./day	n.s.i.	1,500
method of disposal	dumped	landfill
ENERGY		
domestic (gal. oil/yr.)	x	30,000
other fuel	wood	gas
POWER		
capacity kw	600	x+
consumption kwh/yr.	810,000	2.4×10^6
POLICE		
no. of men	2	2
FIRE	x	x+

KEY x = existing
\+ = new
x+ = expansion

FORT GOOD HOPE

1971		1985
375	POPULATION	600
settlement	MUNICIPAL STATUS	village

ECONOMY

1971

Oil field and oil refinery supplying Mackenzie Valley with fuels since 1920's. Staging point for hydrocarbon explorations. Refueling points for air and water transport.

1985

Supply and service centre for central Mackenzie. District H.Q. for pipeline operation. Continued importance as air and water transport staging point.

EMPLOYMENT

1971

Primarily dependent on hydrocarbon development and production, as well as airport and water transport functions. Substantial temporary work force involved in seasonal employment.

1985

Hydrocarbon employment will continue its primary role, but with pipeline operation will expand and stabilize. Increased demand for services by the local and regional population will provide more varied employment.

ECONOMIC ACTIVITIES	'74	'85
hunting /trapping /fishing		
hydrocarbon exploration	x	x
production	x	x
pipeline operation		+
mining exploration	x	x
food production		+
logging/sawmilling		
comm. fishing /processing		
handicraft production		
fur garment manufact.		
other manufacturing		
ship repair		
contracting & trades	x	x+
trucking, long dist.		+
local freight hauling	x	x+
car /truck rental	x	x
taxi/bus service	x	x+
car service /garage	x	x+
water transport	x	x
airline	x	x
aircharter	x	x+
telecommunication	x	x+
radio broadcasting		+
fuel supplier	x	x+
wholesale /warehousing		+
hardware supplier	x	x+
general store /co-op	x	x+
liquor outlet	x	x+
other retail outlet	x	x+
laundry/dry cleaner		+
barber/beauty salon		+
other personal service		
banking	x	x+
insurance, real estate		
professional service		
service to business		
hotel, motel	x	x+
restaurant/café/bar	x	x+
administration:		
Local (incl. municip. serv.)	x	x+
NWT (incl. community serv.)	x	x+
Federal (" ")	x	x+

COMMUNITY FACILITIES	'74	'85
HEALTH ('71)		
facility	nursing station	hospital regional
beds (& cribs)	13	27
staff	2 nurses	4 doc. 50 staff
dentist	2 yearly	3 yearly
EDUCATION ('73)		
no. of students	K-7 76	1-6 198
		7-9 82
		10-12 145
no. of teachers	3	21
high school: 10-12	Inuvik	Norman W.
vocation training	Inuvik	+
hostel, no. of beds		
RECREATION ('73)		
library	x	x+
cinema		+
community hall	x	x+
gymnasium		+
sports centre	x	x+
curling rink	x	x
skating rink	x	x
tennis	x	x
swimming pool	x	x
other	x	x+
ACCOMMODATION ('71)		
hotel, motel	1	x+
capacity, people	60	x+
HOUSING		
no. of dwelling units	127	315
persons/unit	2.8	3.5

COMMUNICATION & TRANSPORT	'74	'85
COMMUNICATION		
mail-weekly	6	6
post office	x	x+
radio reception	x	x
local radio reception		
tv reception	x	x
telex	x	x
no. of telephones	130	495 +
local newspaper		+
LAND TRANSPORT		
highway		+
connection to h-way	x	
no. of cars	42	314
no. of trucks	150	x+
car service /garage	x	x+
WATER		
docking facility	x	x
barge service	x	x
AIR		
runway length, ft.	6,000	
surface	asphalt	
annual movements	18,900	x +
scheduled flights	11	x+

MUNICIPAL SERVICES	'74	'85
WATER SUPPLY		
domestic (gal/da Y)	n.s.i.	39,600
distribution	piped	piped
SEWAGE		
domestic (gal/day)	n.s.i.	39,600
method of disposal	septic, holding tanks	septic, piped; treated
GARBAGE		
domestic (lbs./day)	n.s.i.	2,750
method of disposal	landfill	landfill
ENERGY		
domestic (gal. oil/yr.)		550,000
other fuel		gas
POWER		
capacity kw	1,800	x -
consumption kwh/yr.	3.0×10^6	6.0×10^6
POLICE		
no. of men	1	4
FIRE	x	x-

KEY x = existing
\+ = new
x+ = expansion

NORMAN WELLS

1971		1985
363	POPULATION	1,100
settlement	MUNICIPAL STATUS	village

ECONOMY

1971

The settlement consolidates previously scattered Indian groups who fish Great Bear Lake and do some trapping and hunting.

1985

Resources of the lake will continue to be of prime importance to the community. A small degree of processing could prove economic. Tourism will increase.

EMPLOYMENT

1971

Primarily in traditional pursuits, some in providing services for sport fishermen and in Production of handicrafts.

1985

Tourism could increase local employment in guiding, hostelling and handicrafts. Relative proximity to hydrocarbon jobs could mean income for commuters and create some further service jobs in the settlement.

ECONOMIC ACTIVITIES	'74	'85
hunting/trapping/fishing	x	x
hydrocarbon exploration		
production		
pipeline operation	Wells	
mining exploration		
food production		+
logging/sawmilling		
comm. fishing/process	x	x
handicraft production	x	x+
fur garment manufact.		
other manufacturing		
ship repair		
contracting & trades	x	x+
trucking, long dist.		+
local freight hauling	x	x+
car/truck rental		+
taxi/bus service		+
car service/garage		+
water transport		
airline	x	x+
aircharter	x	x+
telecommunication	x	x+
radio broadcasting		+
fuel supplier	x	x+
wholesale/warehousing		
hardware supplier		
general store/co-op	x	x+
liquor outlet		+
other retail outlet	x	x+
laundry/drv cleaner		
barber/beauty salon		
other personal service		
banking	fly in	+
insurance, real estate		
professional service		
service to business		
hotel, motel	x	x+
restaurant/café/bar		+
administration:		
Local (incl. municip. serv.)	x	x+
NWT (incl. community serv.)	x	x+
Federal (" ")	x	x+

COMMUNITY FACILITIES	'74	'85
HEALTH ('71)		
facility	nursing station	nursing station
beds (& cribs)	4(1)	6(1)
staff	2 nurses	3 nurses
	dot. visits	monthly
dentist	twice per year	
EDUCATION ('73)		
no. of students	K-8 131	1-6 125
		7-9 52
		10-12 36
no. of teachers	6	9
high school: 10-12	Inuvik	Norman W.
vocation training	Inuvik	Inv./Hay
hostel, no. of beds		
RECREATION ('73)		
library	x	x+
cinema		
community hall	x	x+
gymnasium		+
sports centre	x	x
curling rink	x	x
skating rink	x	x
tennis		
swimming pool		
other	x	x+
ACCOMMODATION ('71)		
hotel, motel	1	x+
capacity, people	8	x+
HOUSING		
no. of dwelling units	80	700
persons/unit	4.6	3.5

COMMUNICATION & TRANSPORT	'74	'us
COMMUNICATION		
mail-weekly	2	x+
post office	The Bay	+
radio reception		+
local radio reception		+
tv reception		+
telex		
no. of telephones	12	200
local newspaper		
LAND TRANSPORT		
highway		
connection to h-way		+
no. of cars	n.s.i.	140
no. of trucks	n.s.i.	x+
car service/garage		+
WATER		
docking facility	x	+
barge service	x	x+
AIR		
runway length, ft.	2,800	3.500
surface	earth	gravel
annual movements	n.s.i.	x+
scheduled flights	3	x+

MUNICIPAL SERVICES	'74	'85
WATER SLIPPLY		
domestic (gal/day)	2,900	25,000
distribution	trucked	piped
SEWAGE		
domestic (gal/dav)	n.s.i.	25,000
method of disposal	honey bags, holding	piped treated
GARBAGE		
domestic (lbs./day)	n.s.i.	1,740
method of disposal	landfill	landfill
ENERGY		
domestic (gal. oil/yr.)	x	348,000
other fuel		propane
POWER		
capacity kw	600	x+
consumption kwh/yr.	630,000	2.8×10^6
POLICE		
no. of men	Ft. Norman	2
FIRE	x	x+

KEY x - existing
\+ = new
x+ = expansion

FORT FRANKLIN

1971		1985
434	POPULATION	695
hamlet	MUNICIPAL STATUS	village

1985	EMPLOYMENT 1971	1985
s The highway will require a river crossing near the settlement, and will generate considerable service employment.	Primarily in hunting, trapping and fishing and general labour for hydrocarbon exploration.	Highway and tourist services; increased trade and services within the settlement; the possibility of commuting to other hydrocarbon jobs.

5 COMMUNITY FACILITIES	'74	'85
HEALTH ('71)		
facility	nursing station	nursing station
beds(& cribs)	2(1)	4(1)
staff	1 nurse	2 nurse
dentist	doc. once monthly	twice yearly
EDUCATION ('73)		
no. of students	1-6 54	1-6 74 7-9 31 10-12 21
no. of teachers	3	5
high school; 10-12	Inuvik	Norman W.
vocation training	Inuvik	
hostel, no. of beds	12	x+
RECREATION ('73)		
library	x	x
cinema		
community hall	x	x
gymnasium		
sports centre		+
curling rink		+
skating rink		+
tennis		
swimming pool	x	x
other	x	x+
ACCOMMODATION ('71		
hotel, motel	2	x+
capacity, people	n.s.i.	x+
HOUSING		
no. of dwelling units	69	120
persons/unit	4.1	3.5

COMMUNICATION & TRANSPORT	'74	'85
COMMUNICATION		
mail-weekly	2	x+
post office	in The Bay	
radio reception	x	x
local radio reception	x	x
tv reception		+
telex		
no. of telephones	1[illegible]	118
local newspaper	x	x
LAND TRANSPORT		
highway		+
connection to h-way	x	
no. of cars	0	18
no. of trucks	24	+
car service/garage		+
WATER		
docking facility	x	+
barge service	x	x+
AIR		
runway length, ft	3,0[illegible]	
surface	earth	gravel
annual movements	n.s.i.	x+
scheduled flights	2	x+

MUNICIPAL SERVICES	'74	'85
WATER SUPPLY		
domestic (gal/day)	n.s.i.	15,000
distribution	trucked	piped
SEWAGE	n.s.i.	15,000
domestic (gal/day)		septic
method of disposal	honey bag, dumped	piped; treated
GARBAGE		
domestic (lbs./day)	n.s.i.	1,040
method of disposal	dumped	landfill
ENERGY		
domestic (gal.oil/yr.)	x	210,000
other fuel	wood	gas
POWER		
capacity kw	350	x+
consumption kwh/yr	520,000	1 7x10[6]
POLICE		
no. of men	2	2
F-R	x	x+

KEY x = existing
\+ = new
x+ = expansion

FORT NORMAN

1971		1985
260	POPULATION	415
settlement	MUNICIPAL STATUS	hamlet

ECONOMY

1971

Ministry of Transport air radio station, otherwise a traditional settlement.

1985

If the highway is built near the town, some service functions will locate there.

EMPLOYMENT

971

Some fishing, trapping and hunting is pursued. A sawmill is operated intermittently.

=85

If the highway is built near the town it could result in maintenance and service employment. Some residents could commute to hydrocarbon jobs, increasing the cash income of the settlement and stimulating commerce.

ECONOMIC ACTIVITIES	'74	'85
hunting/trapping/fishing	x	x
hydrocarbon exploration	x	x
production		
pipeline operation		+
mining exploration		
food production		
logging/sawmilling	x	x
comm.fishing/process		
handicraft production		+
fur garment manufact.		
other manufacturing		
ship repair		
contracting & trades		+
trucking, long dist.	x	x+
local freight hauling		
car/truck rental		+
taxi/bus service	x	x
car service/garage		+
water transport	x	x
airline		
aircharter		
telecommunication	x	x
radio broadcasting		
fuel supplier	x	x
wholesale/warehousing		
hardware supplier		
general store/co-op	x	x+
liquor outlet		
other retail outlet	x	x+
laundry/dry cleaner		
barber/beauty salon		
other personal service		
banking	fly in	
insurance, real estate		
professional service		
service to business		
hotel, motel		+
restaurant/café/bar	x	x+
administration:		+
Local(incl.municip.serv.)		
NWT(incl.community serv.)	x	x+
Federal(" ")	x	x+

COMMUNITY FACILITIES	'74	'85
HEALTH ('71)		
facility	nursing station	nursing station
beds(& cribs)	2	3(1)
staff	1 nurse	2 nurses
	doctor monthly	
dentist	twice per year	
EDUCATION ('73)		
no. of students	K-8 33	1-6 54
		7-9 22
		10-12 16
no. of teachers	2	3
high school;10-12	Hay R.	Ft.Simp.
vocation training	Ft.Smith	Hay R.
hostel, no. of beds	service	+
RECREATION ('73)		
library	x	x
cinema		+
community hall		+
gymnasium		
sports centre		
curling rink		
skating rink	x	x
tennis		
swimming pool	x	x
other		+
ACCOMMODATION ('71)		
hotel, motel		+
capacity, people		
HOUSING		
no. of dwelling units	26	85
persons/unit	7.0	3.5

COMMUNICATION & TRANSPORT	'74	'85
COMMUNICATION		
mail-weekly	½	2
post office	in The Bay	
radio reception	x	x
local radio reception		
tv reception		+
telex		
no. of telephones	x	87
local newspaper		
LAND TRANSPORT		
highway		+
connection to h-way	x	
no. of cars	n.s.i.	87
no. of trucks	n.s.i.	x+
car service/garage		+
WATER		
docking facility	x	x
barge service	x	x+
AIR		
runway length, ft.	4200	4200
surface	earth	
annual movements	n.s.i.	x+
scheduled flights	1	x+

MUNICIPAL SERVICES	'74	'85
WATER SUPPLY		
domestic (gal/day	n.s.i.	11,000
distribution	truck	piped
SEWAGE		
domestic (gal/day)	n.s.i.	11,000
method of disposal	septic,	septic,
	honey bag,	piped:
	cess pit	treated
GARBAGE		
domestic (lbs./day)	n.s.i.	760
method of disposal	dump/burnt	landfill
ENERGY		
domestic (gal.oil/yr.)	x	1,500
other fuel	wood	gas
POWER		
capacity kw	150	x+
consumption kwh/yr.	n.s.i.	610,000
POLICE		
no. of men	0	1
FIRE	x	x+

KEY × = existing
\+ = new
×+ = expansion

WRIGLEY

1971		1985
191	POPULATION	305
settlement	MUNICIPAL STATUS	HAMLET

ECONOMY

1971

A base for hydrocarbon and mineral exploration, a service centre for the upper Mackenzie and a transportation centre--transfer from highway to barge, traffic between Liard & Mackenzie Highways and a base for air charter and scheduled flights.

1985

Development of this area will increase demands on Fort Simpson for staging and supply. Its function as a water/land transfer point will increase. District H.Q. for pipeline operation.

EMPLOYMENT

1971

There is considerable employment in trade and services as well as predictable transportation and construction jobs.

1985

Trade and services will expand with the regional population. Small manufacturing operations are likely. Forestry and agriculture could expand. Pipeline operation will employ 63.

ECONOMIC ACTIVITIES	'71	'85
hunting/trapping/fishing	x	
hydrocarbon exploration		
production		
pipeline operation		+
mining exploration	x	x
food production	x	x+
logging/sawmilling	x	x+
comm.fishing/process		
handicraft production		
fur garment manufact.		
other manufacturing	x	x+
ship repair		
contracting & trades	x	x+
trucking, long dist.	x	x+
local freight hauling	x	x+
car/truck rental	x	x+
taxi/bus service	x	x+
car service/garage	x	x+
water transport	x	x+
airline	x	x
aircharter	x	x
telecommunication	x	x
radio broadcasting	x	x
fuel supplier	x	x+
wholesale/warehousing	x	x+
hardware supplier	x	x+
general store/co-op	x	x+
liquor outlet	x	x
other retail outlet	x	x+
laundry/dry cleaner		+
barber/beauty salon		+
other personal service		+
banking	x	x+
insurance, real estate		+
professional service		+
service to business	x	x+
hotel, motel	x	x+
restaurant/café/bar	x	x+
administration:		
Local(incl.municip.serv.)	x	x+
NWT(incl.community serv.)	x	x+
Federal " ")	x	x+

COMMUNITY FACILITIES	'74	'85
HEALTH ('71)		
facility	hospital	hospital regional
beds(& cribs)	26	34
staff	1 doctor; 5 nurses	5 doctors 64 staff
dentist	4 visits per year	3
EDUCATION ('73)		
no. of students	K-9 362	1-6 540 7-9 245 10-12 187
no. of teachers	20	48
high school;10-12	Hay R Ft.Smith	Ft. Simp. Hay River
vocation training		
hostel, no. of beds	50	x+
RECREATION ('73)		
library	x	x
cinema	x	+
community hall	x	x
gymnasium	x	x+
sports centre	x	x
curling rink	x	x
skating rink		+
tennis	x	x
swimming pool	x	x
other	x	x+
ACCOMMODATION ('7		
hotel, motel	3	x+
capacity, people	42	x+
HOUSING		
no. of dwelling units	189	860
persons/unit	6.8	3.5

COMMUNICATION &		
COMMUNICATION		
mail-weekly	4	5
post office	1	x
radio reception	x	x
local radio reception	x	x
tv reception	x	x
telex	x	x
no. of telephones	161	1355
local newspaper	1	x
LAND TRANSPORT		
highway	x	x
connection to h-way		
no. of cars	149	860
no. of trucks	522	x+
car service/garage	x	x+
WATER		
docking facility	x	x+
barge service	x	x+
AIR		
runway length, ft.	6,000	
surface	asphalt	
annual movements	4500	x+
scheduled flights	6	x+

WATER SUPPLY		
domestic (gal/day)	n.s.i.	108,000
distribution	piped	piped
		40,000
SEWAGE		
domestic (gal/day)	n.s.i.	108,000
method of disposal	honey bag	piped
	piped	
	dumped	treated
GARBAGE		
domestic (lbs./day)	n.s.i.	7,540
method of disposal	dumped	landfil
ENERGY		
domestic (gal.oil/yr.	x	$1.5x10^6$
other fuel	propane	gas
POWER		
capacity kw	1200	x-
consumption kwh/yr.	$4.3x10^6$	$15x10^6$
POLICE		
no. of men	6	13
FIRE	x	x-

KEY x = existing
\+ = new
x+ = expansion

FORT SIMPSON

1971		1985
1,004	POPULATION	3,010
village	MUNICIPAL STATUS	town

EMPLOYMENT

1971	1985	1971	1985
The community has a traditional economy based on fishing, hunting and trapping and occasional logging and sawmill operation.	The present basis of the community should continue.	The Jean Marie co-op provides wage employment in the sawmill and store. A native fur trader operates in the community.	Within the community little is likely to change. Some could seek seasonal or commuting work elsewhere, providing additional income, but Fort Simpson will continue to be the service centre

ECONOMIC ACTIVITIES	'74	'85
hunting/trapping/fishing	x	x
hydrocarbon exploration		
production		
pipeline operation		
mining exploration		
food production		
logging/sawmilling	x	x+
comm.fishing/process		
handicraft production		
fur garment manufact.		
other manufacturing		
ship repair		
contracting & trades		
trucking, long dist.		
local freight hauling		
car/truck rental		
taxi/bus service		
car service/garage		
water transport		
airline		
aircharter		
telecommunication	x	x
radio broadcasting		
fuel supplier	x	x
wholesale/warehousing		
hardware supplier		
general store/co-op	x	x
liquor outlet		
other retail outlet		
laundry/dry cleaner		
barber/beauty salon		
other personal service		
banking		
insurance, real estate		
professional service		
service to business		
hotel, motel		
restaurant/café/bar		
administration:		
Local(incl.municip.serv.)		
NWT(incl.community serv.)	x	x
Federal(" ")		

COMMUNITY FACILITIES	'74	'85
HEALTH ('71)		
facility	none	health station
beds(& cribs)		2
staff	doctor monthly	community aid
dentist	1 visit per yr.	2 visits per yr.
EDUCATION ('73)		
no. of students	1-6 24	1-6 14 7-9 6 10-12 4
no. of teachers	1	1
high school; 10-12	7-12 at Ft. Simp.	
vocation training	Ft.Smith	Hay R.
hostel, no. of beds		
RECREATION ('73)		
library	x	x
cinema	in the co-op	
community hall	x	x
gymnasium		
sports centre	for 1985 suggest	
curling rink	combined facility	
skating rink	incorp. school,	
tennis	health station,	
swimming pool	comm.hall, library	
other	and gymnasium.	
ACCOMMODATION ('7		
hotel, motel		
capacity, people		
HOUSING		
no. of dwelling units	14	25
persons/unit	4.5	3.5

COMMUNICATION & TRANSPORT	'74	'85
COMMUNICATION		
mail-weekly	½	1
post office	the co-op	
radio reception		x
local radio reception		
tv reception		
telex		
no. of telephones	x	x+
local newspaper		
LAND TRANSPORT		
highway		
connection to h-way	x	x
no. of cars	n.s i	x+
no. of trucks		
car service/garage		
WATER		
docking facility		
barge service	x	
AIR		
runway length, ft.	1,400	1,400
surface	ea th	
annual movements	n.s.i.	x+
scheduled flights		

MUNICIPAL SERVICES	'74	'85
WATER SUPPLY		
domestic (gal/day)	n.s.i.	3,000
distribution	trucked	piped
SEWAGE		
domestic (gal/day)	n.s.i.	3,000
method of disposal	honey bag pit privies dumped	septic piped treated
GARBAGE		
domestic (lbs./day)	n.s.i.	200
method of disposal	dumped	landfill
ENERGY		
domestic (gal.oil/yr)	x	10,000
other fuel	propane wood	propane
POWER		
capacity kw	80	x+
consumption kwh/yr.	n.s.i.	16,000
POLICE		
no. of men	administered from Fort Simpson	
FIRE	extinguishers	

KEY x = existing
\+ = new
x+ = expansion

JEAN MARIE RIVER

1971		1985
50	POPULATION	80
unorganised	MUNICIPAL STATUS	unorganised

ECONOMY

1971

Nearby the Mackenzie River Ferry crossing, functions as a highway service centre and caters to some tourist traffic.

1985

No great change in function is foreseeable. Continued construction of the Mackenzie Highway and a possible year-round river crossing weigh against any great increase in the transport and service function.

EMPLOYMENT

1971

There is some employment in highway related enterprises and in government services but little elsewhere.

1985

If residents choose to take part in hydrocarbon activities by commuting or in the increased river and land transport additional trade and service employment could be generated in the community.

ECONOMIC ACTIVITIES	'74	'85
hunting/trapping/fishing	x	x
hydrocarbon exploration	x	
production		
pipeline operation		
mining exploration		
food production	x	x+
logging/sawmilling		
comm. fishing/process		
handicraft production		
fur garment manufact.		
other manufacturing		
ship repair		
contracting & trades	x	x+
trucking, long dist.		
local freight hauling	x	x+
car/truck rental	x	x+
taxi/bus service	x	x+
car service/garage	x	x+
water transport	ferry	
airline		
aircharter	x	x
telecommunication	x	x
radio broadcasting		
fuel supplier	x	x+
wholesale/warehousing		
hardware supplier		+
general store/co-op	x	x+
liquor outlet		+
other retail outlet		+
laundry/dry cleaner		+
barber/beauty salon		+
other personal service		+
banking	fly in	+
insurance, real estate		
professional service		
service to business		
hotel, motel	x	x+
restaurant/café/bar	x	x+
administration :		
Local (incl. municip. serv.)	x	x+
NWT (incl. community serv.)	x	x+
Federal (" ")	x	x+

COMMUNITY FACILITIES	'74	'85
HEALTH ('71)		
facility	nursing station	nursing station
beds (& cribs)	4 (1)	8(2)
staff	2 nurses	1 dot. 3 nurses
dentist	4 visits a year	1
EDUCATION ('73)		
no. of students	K-9 194	K-6 187, 7-9 78, 10-12 54
no. of teachers	9	13-15
high school: 10-12	Hay Riv.	Ft. Prov.
vocation training	Ft. Smith	Hay River
hostel, no. of beds		
RECREATION ('73)		
library		+
cinema	x	x
community hall		+
gymnasium	x	x+
sports centre		+
curling rink		+
skating rink	x	x
tennis	x	x
swimming pool	x	x+
other		x+
ACCOMMODATION ('71)		
hotel, motel	2	x+
capacity, people	45	x+
HOUSING		
no. of dwelling units	84	295
persons/unit	7.6	3.5

COMMUNICATION & TRANSPORT	'74	'85
COMMUNICATION		
mail-weekly	3	4
post office	the Bay	+
radio reception	x	x
local radio reception		
tv reception	x	x
telex	x	x
no. of telephones	33	300
local newspaper		+
LAND TRANSPORT		
highway	ferry	bridge
connection to h-way	x	x
no. of cars	n.s.i.	300
no. of trucks	n.s.i.	x+
car service/garage	x	x+
WATER		
docking facility	x	x
barge service	x	?
AIR		
runway length, ft.	3,300	3,300
surface	gravel	gravel
annual movements	n.s.i.	x+
scheduled flights	0	+

MUNICIPAL SERVICES	'74	*85
WATER SUPPLY		
domestic (gal/day)	n.s.i.	40,000
distribution	trucked	piped
SEWAGE		
domestic (gal/day)	n.s.f.	40,000
method of disposal	honey bag, holding: dumped	septic, piped: ponded
GARBAGE		
domestic (lbs./day)	n.s.i.	2,560
method of disposal	landfill	landfill
ENERGY		
domestic (gal.oil/yr.)	x	416,000
ocher fuel	propane	propane gas
POWER		
capacity kw	x	x+
consumption kwh/yr.	n.s.i.	4.16×10^6
POLICE		
no. of men	2	3
FIRE	x	x

KEY x = existing
\+ = new
x+ = expansion

FORT PROVIDENCE

1971		1985
647	POPULATION	1,040
settlement	MUNICIPAL STATUS	village

ECONOMY

1971

The settlement was built around 1963 by the Slave Indians who to that time were scattered throughout the area and lived off the land. A tourist lodge has recently been built.

1985

Will continue as a traditional settlement. Tourist potential exists and with improved access this will be realised.

EMPLOYMENT

1971

Most men are trappers. During the summer there is work at the tourist lodge and in community projects, e.g. a new airstrip designed to improve facilities in and transport connections to the settlement.

1985

Full time trapping could continue. Work will be available at tourist lodges, in service industries and in hydrocarbon exploration.

ECONOMIC ACTIVITIES	'74	'85
hunting/trapping/fishing	x	x
hydrocarbon exploration		
production		
pipeline operation		
mining exploration		
food production		+
logging/sawmilling		
comm.fishing/process		
handicraft production		+
fur garment manufact.		
other manufacturing		
ship repair		
contracting & trades		
trucking, long dist.		
local freight hauling		
car/truck rental		
taxi/bus service		
car service/garage		
water transport		
airline		
aircharter		
telecommunication		
radio broadcasting		
fuel supplier		
wholesale/warehousing		
hardware supplier		
general store/co-op	x	x
liquor outlet		
other retail outlet		
laundry/dry cleaner		
barber/beauty salon		
other personal service		
banking		
insurance, real estate		
professional service		
service to business		
hotel, motel	x	x
restaurant/café/bar		
administration:		
Local(incl.municip.serv.)		+
NWT(incl.community serv.)		
Federal(" ")		

COMMUNITY FACILITIES	'74	'85
HEALTH ('71)		
facility	none	health station
beds(& cribs)		2 beds
staff	doctor monthly	community aid
dentist	1 visit per year	2 visits per year
EDUCATION ('73)		
no. of students	K-6 15	1-6 11
		7-9 4
		10-12 3
no. of teachers	1	1
high school;10-12	7-12 at Ft.Simpson	
vocation training	Ft.Smith	Hay River
hostel, no. of beds		
RECREATION ('73)		
library		+
cinema		
community hall	x	x
gymnasium		+
sports centre		
curling rink		
skating rink		
tennis		
swimming pool		
other		+
ACCOMMODATION ('71)		
hotel, motel	1	x+
capacity, people	16	x+
HOUSING		
no. of dwelling units	13	20
persons/unit	3	3.5

COMMUNICATION & TRANSPORT	'74	'85
COMMUNICATION		
mail-weekly	n.s.i.	1
post office	in co-op	
radio reception		+
local radio reception		
tv reception		+
telex		
no. of telephones	radio	+
local newspaper		
LAND TRANSPORT		
highway		
connection to h-way		x
no. of cars	0	+
no. of trucks	1	x+
car service/garage		
WATER		
docking facility		
barge service		
AIR		
runway length, ft.	yes	x
surface	n.s.i.	
annual movements	n.s.i.	x+
scheduled flights	0	+

MUNICIPAL SERVICES	'74	'85
WATER SUPPLY		
domestic (gal/day)	n.s.i.	2,400
distribution	hand	piped
SEWAGE		
domestic (gal/day)	n.s.i.	2,400
method of disposal	pit privies	septic or piped treated
GARBAGE		
domestic (lbs./day)	n.s.i.	160
method of disposal	n.s.i.	landfill
ENERGY		
domestic (gal./oil/yr.)	x	32,500
other fuel	wood	wood
POWER		
capacity kw	x	x+
consumption kwh/yr.	n.s.	130,000
POLICE		
no. of men	Admin.	Ft. Simpson
FIRE	Fire extinguishers	

KEY x = existing
\+ = new
x+ = expansion

TROUT LAKE

1971		1985
40	POPULATION	65
unorganized	MUNICIPAL STATUS	unorganized

ECONOMY

1971

Rail and truck to barge transhipment point for supply to Slave and Mackenzie areas; centre for commercial fishing in Great Slave Lake; sub-regional service centre in an area of agricultural, mineral and tourism development.

1985

Despite completion of the Mackenzie Highway, river traffic and the role of Hay River will continue and increase. With proper management, fisheries will continue to be productive. Supply of goods and services to the sub-region will continue

EMPLOYMENT

1971

Jobs are mainly concentrated in fishing, transport and construction at one end of the scale and professional, technical and managerial areas at the other.

1985

Expansion of Hay River's service function will mean more diversification of jobs -- an expansion of trade and services, additional manufacturing and processing. Jobs in transportation will continue to increase.

ECONOMIC ACTIVITIES	'74	'85
hunting/trapping/fishing	x	
hydrocarbon exploration		
production		
pipeline operation		
mining exploration		
food production		
logging/sawmilling	x	?
comm.fishing/process	x	x
handicraft production		
fur garment manufact.	x	x+
other manufacturing	x	x
ship repair	x	x
contracting & trades	x	x
trucking, long dist.	x	x
local freight hauling	x	x
car/truck rental	x	x
taxi/bus service	x	x
car service/garage	x	x
water transport	x	x
airline	x	x
aircharter	x	x
telecommunication		+
radio broadcasting	x	x
fuel supplier	x	x
wholesale/warehousing	x	x
hardware supplier	x	x
general store/co-op	x	x
liquor outlet	x	x
other retail outlet	x	x+
laundry/dry cleaner	x	x+
barber/beauty salon	x	x+
other personal service	x	x+
banking	x	x+
insurance, real estate	x	x+
professional service	x	x+
service to business	x	x+
hotel, motel	x	x+
restaurant/café/bar	x	x+
administration:		
Local(incl.municip.serv.)	x	x+
YWT(incl.community serv.)	x	x+
Federal(" ")	x	x+

COMMUNITY FACILITIES	'74	'85
HEALTH ('71		
facility	hospital	hospital regional
beds(& cribs)	22	99
staff	4 doc.	13 doc. 188 staff
dentist	2	9
EDUCATION ('73)		
no. of students	K-6 542 7-12 356	1-6 1622 7-9 676 10-12 527
no. of teachers	42	142
high school:10-12	Fort Smith	
vocation training	Hay River	
hostel, no. of beds	120	x-
RECREATION ('73)		
library	x	x+
cinema	x	x+
community hall	x	x+
gymnasium	x	x+
sports centre	x	x+
curling rink	x	x+
skating rink		+
tennis	x	x+
swimming pool	x	x
other	x	x+
ACCOMMODATION ('71)		
hotel, motel	6	x+
capacity, people	169	x+
HOUSING		
no. of dwelling units	665	2575
persons/unit	5.0	3.5

COMMUNICATION & TRANSPORT	'74	'85
COMMUNICATION		
mail-weekly	6	6
post office	2	2
radio reception	x	x
local radio reception		x
tv reception	x	x
telex	x	x
no. of telephones	639	4050
local newspaper	2	2
LAND TRANSPORT		
highway	x	x
connection to h-way	x	x
no. of cars	998	2576
no. of trucks	1392	x+
car service/garage	x	x+
WATER		
docking facility	x	x+
barge service	x	x
AIR		
runway length, ft.	6000	
surface	asphalt	
annual movements	n.s.i.	x+
scheduled flights	6	x+

MUNICIPAL SERVICES	'74	'85
WATER SUPPLY		
domestic (ga /day)	n.s.i.	324,500
distribution	piped hand	piped
SEWAGE		
domestic (gal/day)	n.s.i.	324,500
method of disposal	piped septic privies	piped septic ponded
GARBAGE		
domestic (lbs./day)	n.s.i.	32,500
method of disposal	dumped	landfill
ENERGY		
domestic (gal o l/yr	x	4.5×10^6
other fuel	propane	propane gas
POWER		
capacity kw	6,000	x+
consumption kwh/yr.	n.s.i	63×10^6
POLICE		
no. of men	10	30
FIRE	x	x+

KEY x = existing
\+ = new
x+ = expansion

HAY RIVER

1971		1985
3,004	POPULATION	9,015
town	MUNICIPAL STATUS	town