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046 Business Opportunities  
Related to  
Oil and Gas Exploration  
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in Northern Canada

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BUSINESS OPPORTUNITIES RELATED TO  
OIL AND GAS EXPLORATION AND PRODUCTION  
IN NORTHERN CANADA

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## EXECUTIVE SUMMARY

This study was commissioned under the Environmental Studies Revolving Fund. It was carried out by Canadian Resourcecon (1983) Limited and Novacorp Consulting Inc. over the period from May through November, 1985.

### Study Objectives were Aimed at Improving Northern Content of Oil and Gas Industry Purchases

Principally, the work carried out during this project was to provide the following:

- an understanding of business resources and capabilities in Northern Canada (... encompassing Yukon and the western portion of the Northwest Territories);
- an appreciation of the types of goods and services required now and in the future, by oil and gas companies operating in Northern Canada;
- identification of areas where Northern businesses can penetrate or increase their penetration of the oil and gas industry markets in the North; and
- development of specific recommendations which could assist both Northern businesses and the oil companies in increasing Northern content in an acceptable and meaningful way to all concerned.

### Our Approach Focused on Practical Opportunities

During the study, special emphasis was placed on obtaining a first-hand appreciation of Northern supplier characteristics and constraints as well as the requirements of the major oil and gas companies operating in Northern Canada. A considerable number of personal interviews were undertaken to ensure that problems and opportunities on both sides were identified and understood. Oil industry activity and purchasing analyses enabled the Study Team to relate Northern capabilities and resources to oil company needs.

It was recognized from the outset that major changes to current supply patterns were unlikely to arise from this evaluation. The study was therefore oriented

towards identifying incremental opportunities for Northern suppliers to expand their sales or to generate new sales to oil company markets. Combined, these opportunities could provide a significant impact on Northern economies. Individually, they represent solid opportunities where oil companies can expand Northern content in a manner which recognizes their standards for high quality and fair pricing.

### Many Unique Factors Affect Business Development in Northern Canada

Our research has shown that a large number of factors and issues have a bearing on the extent to which Northern supply of the oil and gas industry can be achieved. While many of these represent constraints to business development, they also represent a challenge for Northern entrepreneurs, many of whom approach these challenges with enthusiasm and skills not found in the South.

Specifically, the following factors are identified as important considerations in expanding Northern business involvement in the oil and gas industry:

- Northern suppliers are generally small while oil industry needs are large;
- while technical skills are generally sound, many Northern companies need to improve their management skills;
- Northern companies often have difficulties in securing appropriate bonding levels;
- suppliers vary widely in their marketing efforts and success tends to parallel the intensity and effectiveness of a company's marketing program;
- oil company requirements and purchasing procedures need to be understood by prospective suppliers, but this is too often not the case in Northern Canada;
- many Northern companies have reduced their output because of the Northern economy, resulting in excess capacity which, in some cases, can be marketed to the oil industry;
- a variety of assistance programs already exist in Northern Canada and more advantage can be taken of these programs by Northern suppliers than at present;



### Opportunities Identified were Both Short-Term and Long-Term in Nature

The Study Team did not set out to compile an exhaustive list of opportunities for Northern suppliers, but rather a representative list which would guide and encourage Northern businesses. Those which were identified included prospects for business expansion, business diversification and new business development.

Business prospects were separated into those associated with exploration activity and those associated with production activity. This was important since the nature and longevity of the opportunities vary considerably in each case. Furthermore, the timing and extent of new production activity in Northern Canada is uncertain.

Exploration phase opportunities included some which are immediate, some which are short-term and some which are medium-term in nature. They range from housekeeping/janitorial services for the base camps, to metal fabrication and electrical motor rewinding. Those where existing business could expand their operations to supply oil industry markets represent the least risk. Greater risk will be associated with new ventures which therefore will require more careful research and planning. Twelve specific exploration phase opportunities were identified and evaluated as listed below:

- . housekeeping and janitorial services;
- . transport and survival suit repair;
- . metal fabrication;
- . motor repair and rewinding;
- . drilling tool rental;
- . navigation and communications equipment servicing;
- . drill bit dealership;
- . safety equipment service centre;
- . glycol warehousing and distribution centre;

- . philosophies on the meaning of "Northern" content vary considerably, which results in greater constraints to some businesses relative to others, depending on location;
- . as Native land claim settlements are concluded in Northern Canada, capitalization for business ventures will lead to opportunities for some and increased competition for others;
- . oil company contracts are often too small or too short to support major investment, or too large to be met by existing manpower, plant and equipment;
- . exploration phase purchases have an uncertain time horizon whereas many production phase opportunities are long-term in nature, except those associated with construction; and
- . the availability of debt and equity capital for new business development and business expansion is limited.

An appreciation of these factors and issues is critical for successful business development related to the oil industry in Northern Canada.

#### Success Achieved To Date Provides Guidance for the Future

The oil and gas industry has gradually expanded Northern content over the years. In general, Northern companies appear to have succeeded in obtaining contracts for one or more of the following reasons:

- . careful, aggressive and effective promotion;
- . available plant, equipment and manpower previously used to service other markets;
- . financial investment, at some risk, in equipment to supply the oil industry;
- . location of offices and/or supply bases close to exploration activity areas; and
- . solid and fair performance on initial supply contracts received from the industry.

These general success factors should be recognized by Northern firms wishing to establish or expand sales to the oil and gas industry market.

- . insulation warehousing and distribution centre;
- . light vehicle/equipment maintenance garage; and
- . seismic services.

Production phase supplier development prospects differ considerably from exploration phase opportunities. They are certainly longer-term in nature, relating directly to a production decision. Those associated with production facility construction will have a limited duration, while operationally-oriented opportunities offer solid, long-term business prospects. A total of seventeen production phase opportunities were identified and evaluated. These are listed below:

- . freight, equipment and pipe hauling;
- . construction of central processing facilities and pumping stations;
- . base camp expansion;
- . ice road construction and maintenance;
- . gravel and water hauling services;
- . construction materials supply;
- . camp catering;
- . specialty welding;
- . pipeline right-of-way monitoring;
- . line pigging services;
- . real estate development services;
- . oilfield supply;
- . wirelining and dewaxing services;
- . industrial cleaning supply;
- . pipeline instrumentation services;
- . machine shop services; and
- . construction and operation of accommodation facilities.

It is important to recognize that this is, however, only a representative list and many more opportunities will exist for the astute Northern entrepreneur. The best way to become involved, in many cases, will be through joint-venture arrangements with southern-based companies. All production phase opportunities placed high in our priority ranking.

#### Recommendations were Addressed to all Groups Involved

The Study Team developed a series of recommendations which should assist interested organizations, companies and individuals in expanding the involvement of Northern companies in oil and gas industry activities.

**In large part, the onus falls on Northern business people themselves to sell their goods and services to the oil and gas companies.** Recommendations for government and oil and gas companies, if implemented, should enhance the ability of Northern business to accomplish this and increase their awareness of opportunities that do, or could, exist. In most cases, however, it is evident that **aggressive businesses which tailor their products and/or services to oil company needs can be successful in achieving sales.**

Northern business people are encouraged to read our private sector recommendations carefully. They may not apply in all cases, but each individual owner/manager should evaluate his business on the basis of the issues raised in this study. Our recommendations range from a more responsive approach to the marketplace, to more aggressive marketing, to improvement of managerial and financial skills.

Recommendations for the oil and gas companies focussed on the need for better communication and information flow between these large corporations and the small businessperson in the North. A number of recommendations were also oriented towards oil company contract tendering and administration procedures. It is recognized, however, that **the major oil companies operating in Northern Canada have generally made good progress in making use of qualified Northern companies in recent years.**

The various levels of government can assist Northern companies in a variety of ways. While on the surface the recommendations in this area may appear to be minor, we consider them to be an integral part of Northern economic development arising from oil industry activity. The Study Team does not believe that low-interest loans, grants, and other financial incentives will, in the medium-term, effectively increase Northern content. The majority of Northern business owners and/or operators take a similar stand on this issue. **However, territorial governments especially should play a more predominant role in assisting Northern businesses through information dissemination, expanded financial assistance for business development and specific skills training in appropriate business sectors.**

The Study Team does recognize the constraints under which Northern businesses are operating. To the extent possible, our recommendations address and attempt to minimize these constraints. **Northern suppliers need to recognize, however, that conditions are unlikely to change drastically and that most of the peculiarities associated with oil company requirements will not change until a production decision is reached.**

Real opportunities do exist for Northern businesses, and these will expand as oil prices and activity levels recover. Those responsible or interested are encouraged to pursue these markets. Some companies, however, are facing both strong competition and limited demand with current oil industry activity levels. In these cases opportunities can only be enhanced as exploration activity levels increase and/or production plans are announced.

In summary, many Northern businesses have already benefitted substantially from oil and gas industry contracts. **It is just as important to retain existing levels of Northern content as it is to expand upon them.** Solid performance is, therefore, essential once the opportunity is provided. This will, inevitably, lead to repeat work. Initial contracts are more difficult to secure, but the opportunities do exist and can expand as and when production activity occurs.

## RESUME

Cette étude a été mandatée par le FREE et entreprise par Canadian Resourcecon Ltd. (1983) et Novacorp Consulting Inc. de mai à novembre 1985.

Les objectifs de l'étude visaient l'augmentation de la participation de la population du Nord

Le travail, pendant la durée de ce projet, a principalement consisté à donner:

- une bonne appréciation des ressources et des moyens commerciaux du Nord canadien (y compris ceux du Yukon et de la partie ouest des Territoires du Nord-Ouest);
- une évaluation du genre de biens et de services dont les compagnies d'exploitation du pétrole et du gaz du Nord canadien ont besoin aujourd'hui et demain;
- l'identification des zones où les entreprises du Nord peuvent pénétrer ou accroître leur pénétration, dans le Nord, des marchés de l'industrie pétrolière et gazière; et
- l'élaboration de recommandations particulières qui pourraient aider à la fois les entreprises du Nord et les compagnies pétrolières à augmenter la participation de la population du Nord, de façon importante et acceptable pour tous.

Notre méthode pour aborder le problème a surtout porté sur les possibilités pratiques

Au cours de l'étude, on a surtout cherché à obtenir une première appréciation des caractéristiques et des contraintes des fournisseurs du Nord, ainsi qu'à connaître les exigences des principales compagnies d'exploitation du gas et du pétrole du Nord canadien. Un très grand nombre d'entrevues personnelles ont été organisées, afin de s'assurer que, des deux côtés, problèmes et possibilités étaient identifiés et bien compris. L'activité pétrolière et les analyses des achats ont permis à l'équipe de travail d'établir un lien entre les moyens et ressources du Nord et les besoins des compagnies pétrolières.

On a reconnu, dès le début, que des changements importants de modes d'approvisionnement actuels ne viendraient sans doute pas de cette estimation. L'étude a donc plutôt porté sur l'identification de l'augmentation des possibilités, pour les fournisseurs du Nord, d'augmenter leurs ventes aux marchés pétroliers ou d'en créer de nouvelles. Ces deux possibilités combinées pourraient influencer énormément sur les économies du Nord. Prises à part, elles représentent une possibilité évidente, pour les compagnies pétrolières, d'augmenter la participation de la population du Nord, en respectant leurs normes de qualité supérieure et de prix équitable

#### Un grand nombre de facteurs uniques touchent l'expansion des entreprises dans le Nord canadien

Notre recherche a montré qu'un grand nombre de facteurs et de questions ont une certaine portée sur la mesure dans laquelle on peut réaliser l'approvisionnement, dans le Nord, des compagnies gazières et pétrolières. Malgré les contraintes que ces facteurs représentent vis-à-vis de l'expansion des entreprises, il s'agit également d'un défi pour les chefs d'entreprises du Nord, qui abordent le problème avec un enthousiasme et des compétences que l'on ne trouve pas dans le Sud.

Les facteurs suivants font plus particulièrement partie des points importants visant à accroître l'engagement des entreprises du Nord dans l'industrie pétrolière et gazière:

- En général, les fournisseurs du Nord sont de petits fournisseurs, tandis que les besoins de l'industrie pétrolière sont importants;
- malgré leurs grandes compétences techniques en général, bien des entreprises du Nord doivent améliorer leurs compétences en gestion;
- les compagnies du Nord ont souvent du mal à garantir des niveaux convenables d'obligations;
- les efforts de commercialisation des fournisseurs varient beaucoup et la réussite de leurs efforts a tendance à mettre en parallèle la puissance et la rentabilité du programme de commercialisation d'une entreprise;

- les demandes et les procédures d'achat des compagnies pétrolières doivent être bien comprises des fournisseurs éventuels, mais ce n'est pas assez souvent le cas dans le Nord canadien;
- un grand nombre de compagnies du Nord ont réduit leur production à cause de l'économie du Nord, ce qui a provoqué un surplus de capacité qui, dans certains cas, peut trouver des débouchés dans l'industrie pétrolière;
- une variété de programmes d'aide existent déjà dans le Nord canadien et les fournisseurs du Nord peuvent en tirer plus d'avantage qu'actuellement;
- les conceptions sur le sens de population " du Nord " varient beaucoup, ce qui provoque de grandes contraintes pour certaines entreprises, par rapport à d'autres, en fonction de leur situation géographique;
- comme les règlements des revendications territoriales des autochtones se font dans le Nord canadien, la capitalisation, pour les tentatives commerciales, offrira des possibilités à certaines, et une plus grande concurrence à d'autres;
- les contrats des compagnies pétrolières sont souvent trop petits ou de trop courte durée pour supporter un gros investissement, ou encore trop importants pour pouvoir être honorés par la main-d'oeuvre, les installations et le matériel existants;
- les achats, pendant la phase d'exploration, n'ont pas de limite définie dans le temps, tandis que bien des possibilités, dans la phase de production, sont des opérations à long terme, à l'exception de celles qui sont liées à la construction; et
- la disponibilité de la dette et des capitaux propres pour le lancement de nouvelles entreprises et l'expansion commerciale est limitée.

Il est indispensable de faire une appréciation de ces facteurs et de ces questions pour la réussite de l'expansion des entreprises liée à l'industrie pétrolière du Nord canadien.

#### La réussite, aujourd'hui, servira de guide pour demain

L'industrie pétrolière et gazière a fait augmenter, petit-à-petit et au fil des ans, la population du Nord. Les compagnies du Nord semblent généralement avoir réussi à obtenir des contrats pour une ou plusieurs des raisons suivantes:



- promotion soigneuse, dynamique et efficace;
- mise à disposition des installations, du matériel et de la main-d'oeuvre employés auparavant à l'usage d'autres marchés;
- investissement financier, avec risques, dans du matériel d'approvisionnement destiné à l'industrie pétrolière;
- emplacements de bureaux ou de bases de ravitaillement proches des zones d'exploration; et
- bonne et sérieuse exécution des anciens contrats d'approvisionnement reçus du secteur industriel.

Les entreprises du Nord, qui veulent créer ou développer leurs ventes au marché industriel pétrolier et gazier, devraient reconnaître le succès de ces facteurs.

Les possibilités identifiées ont été à la fois à court terme et à long terme

L'équipe de travail ne s'est pas mise à établir une liste exhaustive des possibilités offertes aux fournisseurs du Nord, mais plutôt une liste type, qui orienterait et stimulerait les entreprises du Nord, comprenant des perspectives d'expansion commerciale, de diversification des entreprises et de développement de nouvelles entreprises.

Ces perspectives se divisaient en deux: 1) celles qui étaient associées aux activités d'exploration et 2) celles qui l'étaient aux activités de production, phénomène d'autant plus important que la nature et la durée de ces possibilités varient considérablement dans chaque cas et que, de plus, le rythme et l'importance des nouvelles activités de production du Nord canadien sont incertains.

La phase d'exploration comprend des possibilités qui sont, soit immédiates, pour certaines, soit à court terme, pour d'autres, soit à moyen terme, pour d'autres encore. Elles vont des services de ménage/gardiennage, pour les camps de base, à la fabrication de métaux et au remontage de moteurs électriques. Celles qui permettraient aux entreprises existantes d'étendre leurs activités à l'approvisionnement des marchés industriels du pétrole offrent un moindre risque. Un plus grand risque consistera à la création d'entreprises, ce qui exige, par conséquent, une recherche et une planification plus soignées. On a

identifié et évalué douze possibilités particulières dans la phase d'exploration:

- services de ménage et de gardiennage;
  - transport et réparation des combinaisons de survie;
  - fabrication de métaux;
  - réparation et remontage de moteurs;
  - location d'outils de forage;
  - entretien et réparation de matériel de navigation et de communications;
  - fourniture de trépons;
  - centre de dépannage du matériel de sécurité;
  - centre d'entreposage et de distribution d'éthylène glycol;
  - centre d'entreposage et de distribution de matériel d'isolation;
  - garage pour l'entretien de véhicules et de matériel légers;
- et
- services sismiques.

Les perspectives d'évolution, pour les fournisseurs, pendant la phase de production sont très différentes de possibilités, en phase d'exploration. Elles sont certainement à plus longue échéance et directement liées à une décision touchant la production. Celles qui ont trait à la construction d'installations de production dureront moins longtemps, alors que les possibilités visant la rentabilité offrent des perspectives commerciales sûres et à plus long terme. On a identifié et évalué, au total, dix-sept possibilités pendant la phase de production:

- transport, remorquage de matériel et de canalisations;
- construction d'installations centrales de traitement et de stations de pompage;
- expansion des camps de base;
- construction et entretien des routes de glace;

- services de transport du gravier et de l'eau;
  - fourniture de matériaux de construction;
  - approvisionnement alimentaire des camps;
  - soudage de spécialité;
  - surveillance des tracés de pipelines;
  - services de ramonage des canalisations;
  - services d'exploitation immobilière;
  - approvisionnement des champs pétroliers;
  - services de câblages métallique et de déparaffinage;
  - services de nettoyage industriel;
  - services d'appareillage pour canalisations;
  - atelier de mécanique;
- et
- construction et exploitation d'installations pour le soutien logistique.

Il est important de reconnaître qu'il ne s'agit cependant que d'une liste type et que le chef d'entreprise avisé du Nord trouvera bien d'autres possibilités. Le meilleur moyen de s'engager, dans bien des cas, sera par le biais d'accords pour monter des entreprises en coparticipation avec des compagnies installées dans le Sud. Toutes les possibilités, dans la phase de production, se sont très bien classées dans l'ordre de nos priorités.

Des recommandations ont été adressées à tous les groupes concernés

L'équipe de travail a élaboré une série de recommandations qui devraient aider les organisations, les compagnies et les particuliers intéressés à accroître l'engagement des compagnies du Nord dans des activités pétrolières et gazières:

Il incombe, en grande partie, aux hommes d'affaires du Nord eux-mêmes de vendre leurs biens et leur services aux compagnies gazières et pétrolières.

Les recommandations faites au gouvernement et aux compagnies pétrolières et gazières, si on leur donne suite, devraient augmenter le pouvoir des entreprises du Nord à les réaliser et accroître leur prise de conscience des possibilités qui existent réellement ou qui pourraient se présenter. Dans la plupart des cas, cependant, il est clair que les entreprises dynamiques, qui façonnent leurs produits ou leurs services selon les besoins des compagnies pétrolières, peuvent réussir à réaliser des ventes.

Nous encourageons les hommes d'affaires du Nord à lire attentivement nos recommandations pour le secteur privé. Il se peut qu'elles ne s'appliquent pas à tous les cas, mais chaque propriétaire/gérant particulier devrait faire l'évaluation de son entreprise en s'inspirant des questions soulevées dans cette étude. Nos recommandations vont d'une méthode d'approche du marché plus sensible à une commercialisation plus dynamique et à une amélioration des compétences en gestion et en finances.

Les recommandations faites aux compagnies pétrolières et gazières ont surtout porté sur le besoin de mieux faire circuler l'information et d'améliorer les communications entre ces grandes sociétés et le petit homme d'affaires du Nord. Un certain nombre de recommandations concernaient également la soumission et les procédures de gestion de contrats des compagnies pétrolières. On reconnaît, cependant, que les principales compagnies pétrolières en fonctionnement dans le Nord canadien ont généralement fait, ces dernières années, de grands progrès, en utilisant les compagnies qualifiées du Nord.

Les différents paliers du gouvernement peuvent aider les entreprises du Nord de diverses façons. Bien qu'en apparence les recommandations, dans ce domaine, puissent paraître mineures, nous les considérons comme faisant entièrement partie du développement économique du Nord issu des activités de l'industrie pétrolière. L'équipe de travail ne croit pas que les prêts, garanties à faible taux d'intérêt et autres encouragements financiers augmenteront efficacement, à moyen terme, la population du Nord, point de vue que partagent la majorité des propriétaires et des responsables des entreprises du Nord. Cependant, les gouvernements territoriaux, en particulier, devraient jouer un rôle plus important d'aide aux entreprises

du Nord, par la diffusion des informations, l'accroissement d'une aide financière destinée au développement des entreprises et la formation d'aptitudes particulières dans les secteurs commerciaux appropriés.

L'équipe de travail est consciente des contraintes sous lesquelles les entreprises du Nord travaillent. Nos recommandations reconnaissent et essaient, dans la mesure du possible, de les minimiser. Les fournisseurs du Nord doivent admettre, cependant, que les conditions risquent peu de changer de façon importante et que la plupart des particularités liées aux demandes des compagnies pétrolières ne changeront pas, avant qu'une décision soit prise en ce qui concerne la production. Les entreprises du Nord ont de réelles possibilités à leur disposition, qui augmenteront même avec la reprise du prix du pétrole et le relèvement des niveaux d'activité. Nous incitons les personnes responsables ou intéressées à suivre ces marchés. Certaines compagnies, cependant, doivent faire face, à la fois à une forte concurrence avec les niveaux actuels de l'activité industrielle du pétrole, et à une restriction de la demande. Dans ces deux cas, les possibilités ne peuvent qu'augmenter avec l'accroissement des niveaux des opérations d'exploration ou avec l'annonce de plans de production.

Pour résumer, un grand nombre d'entreprises du Nord ont déjà considérablement tiré profit des contrats de l'industrie pétrolière et gazière. Il est tout aussi important de maintenir les niveaux actuels de population dans le Nord que de se développer grâce à eux. Un bon rendement est, par conséquent, indispensable, dès que la possibilité se présente, ce qui, inévitablement, conduira à refaire le travail une deuxième fois. Les premiers contrats sont plus difficiles à assurer, mais les possibilités existent vraiment et peuvent augmenter dès qu'ont lieu les opérations de production.

## 1.0 INTRODUCTION

The western Northwest Territories (NWT) and Yukon has been an area of interest to the oil and gas industry for decades owing to its potential for recovery of hydrocarbon resources. The first oil well was drilled in 1920 at Norman Wells and production began from this field during World War II. Esso has recently completed its expansion project at Norman Wells and 4,000 cubic metres/day ( $m^3/d$ ) of oil now flow south through a new pipeline to Alberta.

Since the mid 1960's, oil and gas companies have invested millions of dollars annually on exploration activity in the Mackenzie Delta/Beaufort Sea area. Numerous oil and gas discoveries have been made, but the necessary level of oil reserves to support development has eluded the oil and gas operators to date. Still, oil reserves in the Mackenzie Delta/Beaufort Sea are very near the threshold level required and oil industry personnel are optimistic that a decision to produce will be made in the next year or two.

The Government of Canada has urged oil and gas companies operating in frontier lands to expand their purchases of goods and services from regional suppliers. The Canada Oil and Gas Lands Administration (COGLA) requires companies to submit their plans for increasing the Canadian and regional content of frontier expenditures. Partly through its own initiatives and partly through COGLA's encouragement, significant progress has been made over the years by the oil and gas industry in expanding its use of Northern suppliers. Southern Canada is still the main source of goods and services for the industry but the portion supplied by Northern businesses has steadily increased.

### 1.1 FUNDING AND PURPOSE OF THIS STUDY

The Environmental Studies Revolving Fund (ESRF) is financed by oil and gas companies operating in the Canada Lands. It was established in March, 1982 to undertake environmental, economic and social studies needed to assist decision-making on issues related to oil and gas activity in the Canada Lands.

This study was financed under ESRF and is concerned with providing Northern residents and businesses with a larger share of income generated by exploration and development activities of the oil and gas industry in Northern Canada. Such income generation can occur in two ways:

- directly, through employment of Northern residents with oil and gas companies and their principal contractors; or
- indirectly, in the form of wages, salaries and profits earned by employees and owners of Northern businesses providing goods and services to oil and gas companies.

This document is concerned with identifying methods to increase Northern income through expanded involvement by Northern companies. The objectives of this study are to identify constraints facing Northern companies, to determine opportunities for these companies to increase sales to the oil and gas industry and to recommend specific actions required to enhance these opportunities for Northern businesses.

## 1.2 STUDY AREA

Northern businesses, as defined by the Federal Government, include all of those in either Yukon or the Northwest Territories. The study area for this analysis, however, has been narrowed to the western portion of Northern Canada, including portions of both Yukon and the Northwest Territories. The Arctic Islands and Eastern Arctic are not included in this study. Approximate areas of concern are shown in Figure 1.

## 1.3 STUDY TEAM APPROACH

It was recognized prior to beginning work on the study that a traditional supply/demand analysis would not produce the practical and realistic conclusions required in this report. This is primarily true since the Northern economy is limited in its supply capabilities and pockets of economic activity are widely

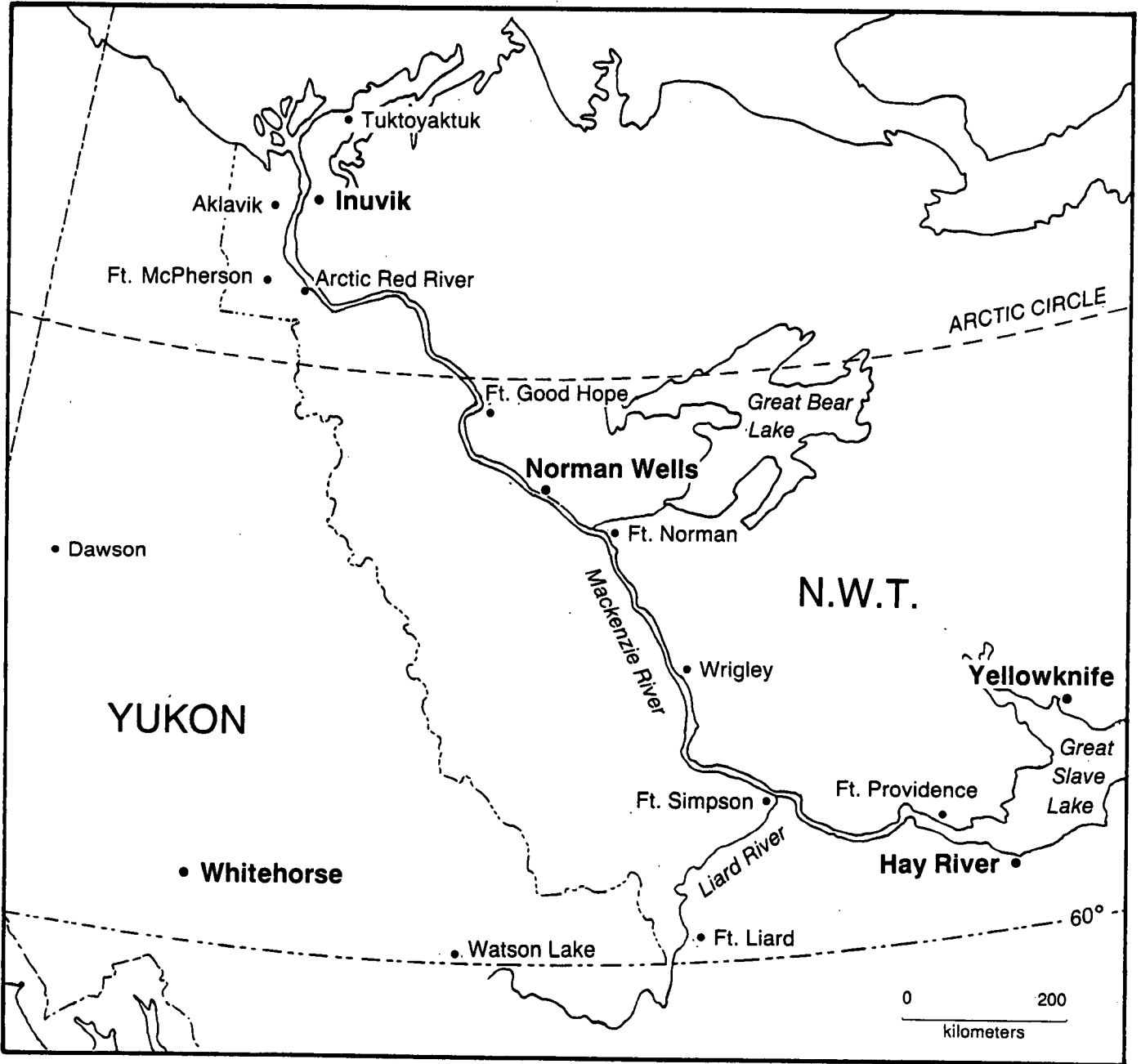


Fig. 1 STUDY REGION



dispersed. In addition, many constraints and issues exist in Northern Canada which directly affect the capability and willingness of companies to alter corporate direction or to commit corporate resources.

The Study Team planned from the outset to place emphasis on face-to-face interviews with northern businesses, oil and gas company representatives and government officials. This plan was supported by the Steering Committee for the study. Such an approach enabled the Study Team members to appreciate problems and concerns of both the Northern suppliers and the oil and gas industry purchasers. It provided the insight necessary to realize both the resources and limitations of Northern business based on a carefully selected sample of companies which were interviewed in depth.

The approach of the Study Team, of course, was not limited to original research in Northern Canada. Considerable time and effort was spent assembling, consolidating and analyzing purchasing information from the major oil and gas companies operating in the north. Purchasing requirements associated with exploration and those associated with production were also analyzed, profiled and compared. This enabled the Study Team to develop conclusions and recommendations which will help Northern businesses prepare for changing requirements over time.

Since an extensive amount of data and information has been previously assembled on Yukon and the Northwest Territories, relevant material from these sources was collected, reviewed and extracted. This procedure was used to profile businesses in the communities of concern, although interviews, by necessity, had to focus on selected firms within the largest communities. Previous studies also provided insight into opportunity areas identified by others and an appreciation of the extent to which suggestions and recommendations developed in the past have been implemented.

## 1.4 ORGANIZATION OF REPORT

This Final Report was prepared in a manner which would facilitate the reader's understanding of the opportunities identified, how they were derived and the various business information, purchasing data, constraints and issues which led to our conclusions.

Following this introductory chapter, this Final Report includes eight additional chapters, the contents of each which is described below.

### Chapter 2 - Oil and Gas Exploration/Production Activity in the Study Region

This chapter places the study in perspective by outlining the exploration and production activity which has occurred in the study area over the past few decades. It sets the stage for the analysis of current opportunities and for conclusions developed concerning the future involvement of Northern suppliers.

### Chapter 3 - Oil and Gas Company Purchasing Profiles

Chapter 3 provides important purchasing information regarding oil and gas company operations in Northern Canada. It includes profile information of both exploration and production activity purchases. This chapter, in effect, describes the oil and gas industry market for Northern suppliers since it is these purchasing demands which companies must satisfy to achieve the sales they desire.

### Chapter 4 - Oil and Gas Industry Supply Characteristics

Based on the study team's research, the successes and failures experienced by Northern business in selling to the hydrocarbon industry are discussed in this chapter. Marketing efforts undertaken are examined and related to successes achieved to-date and constraints faced by individual companies in penetrating the oil and gas industry. Chapter 4 provides valuable information which is used to develop conclusions concerning opportunities now and in the future.

### Chapter 5 - Assessment of Supply Issues and Factors

Since a wide variety of factors, issues and constraints affect the capability for Northern firms to penetrate hydrocarbon industry markets, the most relevant ones are identified and discussed in Chapter 5. Many of these are common to all companies while others are specific to individual industry sectors or to the oil and gas companies themselves. An appreciation of each is, however, required for increased Northern content to be achieved.

### Chapter 6 - Northern Supply Opportunity Priority List

This chapter defines our rationale for prioritizing a long list of opportunities (Appendix "C") and provides a time-phased prioritized list of opportunities which the study team feels are realistic, practical and worthwhile. Specific requirements associated with each opportunity are described as appropriate.

### Chapter 7 - Recommendations

This last chapter of the report provides a number of recommendations. Recommendations are categorized according to those that should be implemented by the oil and gas companies, by Northern supply businesses and by government.

All relevant and important findings, analysis results, conclusions and recommendations are reported in this document. An Executive Summary of the most important findings and conclusions is provided at the front of this Final Report.

## 2.0 OIL AND GAS EXPLORATION/PRODUCTION ACTIVITY IN THE STUDY REGION

It is important for the reader to interpret this report based on a perspective of historical oil and gas industry activity in the study area and on an appreciation of possible future industry developments in the North. This chapter provides such a perspective and discusses future possibilities, although it stops short of forecasting levels of activity in the years ahead since the latter exercise is outside the scope of this study.

### 2.1 HISTORICAL ACTIVITY

Geological interest and investigation in the Mackenzie Valley dates from the late 1800's. The first oil well in the Northwest Territories was drilled by Imperial Oil at Norman Wells in 1920. The Norman Wells oil field was put into production during World War II when the Canol pipeline was built linking Norman Wells to a Whitehorse refinery. Output from the Whitehorse refinery supplied military installations in Alaska. The pipeline was shut down with the end of WW II and Imperial Oil built a refinery at Norman Wells. By 1980, about 50 oil wells were producing some 500 m<sup>3</sup>/d in the area, with a total of more than 3.2 million m<sup>3</sup> of oil produced. The Norman Wells oil field and refinery services markets in the Mackenzie Valley and the northwestern Arctic mainland.

The development of natural gas production and transmission systems in northeast British Columbia led to natural gas exploration in adjacent areas of Yukon and the Northwest Territories. The first discovery in Yukon was in 1960 at Eagle Plains. The Pointed Mountain gas field was discovered in 1966, and a gas plant, gathering facilities and a pipeline connection to the Westcoast Transmission system followed in 1972.

In the Mackenzie Delta/Beaufort Sea onshore area, collection of seismic data began in the early 1960's. Seismic activity was extended to the offshore in the early 1970's. The first onshore well was drilled on Richards Island 1965. Oil

discoveries were made at Atkinson Point in 1970 and at Mayogiak in 1971. Two major natural gas fields were discovered at Parson's Lake and Taglu. To date, nearly 200 wells have been drilled in the Mackenzie Delta/Beaufort Sea region, with about 60 of these being drilled in the offshore area.

The three major companies operating on their own and on behalf of their partners in the Mackenzie Delta/Beaufort Sea area are Esso, Gulf and Dome. Esso's offshore leases extend from the onshore area to about the 20 metre water depth contour, while Gulf operates on acreage adjacent to Esso in water depths from 20 to 45 metres. Dome operates in the deeper water beyond Gulf's leases. The different water depths for the three operators result in major differences in the offshore drilling technology utilized by each. Gulf has carried out all operations under its subsidiary, Beaudril.

Offshore drilling in the Beaufort began in 1973 with the initial well being drilled from an artificial island constructed in three meters of water. Since then, over 25 artificial islands have been constructed in summer with dredged material, or in the winter with gravel trucked over the landfast ice. The largest single island was Issungnak, constructed in 20 metres of water over two summer seasons. This development required in excess of five million cubic metres of sand.

Because artificial islands in deeper water require such large amounts of dredged materials, several new concepts have been introduced to dramatically reduce fill requirements. Esso is currently utilizing an eight-sided steel caisson to retain the sand fill. Gulf is operating the Molikpaq, a mobile caisson consisting of a shallow water drilling unit which is floated to location and towed onto a subsurface berm. Dome operates a steel semi-submersible drilling caisson (SSDC) which was fabricated from a segment of a VLCC oil tanker and which can be ballasted onto a berm built to within nine metres of the ocean surface.

In 1976, two drillships, specially reinforced to operate in the ice of the Beaufort Sea, were brought into the area by Dome Petroleum to commence exploration drilling in deeper waters. These were subsequently supplemented with two more drillships. The ships are capable of operating only three to five months annually

because of the thick, moving ice found in the Beaufort Sea during the rest of the year. To date, these ships have drilled more than 25 wells in water depths ranging up to 70 metres. In 1983, Gulf commenced drilling with the Kulluk, its new conical drilling unit designed for drilling in deep water. The Kulluk, with its ice strengthened design, can operate in ice over one metre thick and can drill into December.

## 2.2 RECENT ACTIVITIES

Table 2-1 presents expenditure information by the oil and gas industry as reported to the Canada Oil and Gas Lands Administration (COGLA) for 1981 through 1984. Figure 2 shows the study region and identifies the major areas of oil and gas activity. Recent activity in each of the main areas is summarized in the following paragraphs.

### 2.2.1 Mackenzie Delta/Beaufort Sea

The three major operators - Esso, Gulf and Dome - have all had active programs. The exploration programs have been successful in delineating a very large natural gas resource base of nearly 283 billion m<sup>3</sup>. While the picture of the oil resource potential is unclear, it is generally agreed that somewhere between 64 million and 160 million m<sup>3</sup> of oil have been discovered to date. Based on exploration results thus far, Esso and Gulf are optimistic that production of either oil or gas, and possibly both, will commence from the Beaufort by the mid-1990's. Dome does not yet have a commercial find in its deep water acreage. Esso and Gulf are focussing their current activities on delineation drilling in order to prove the reserves necessary for production.

The Beaufort Sea Environmental Assessment Panel of the Federal Environmental Assessment Review Office (FEARO) was convened in May, 1981 to assess the potential impact of hydrocarbon development on the environment and people in the Beaufort Sea - Mackenzie Delta region and associated transportation corridors. The Panel reviewed seven volumes of environmental impact information prepared by the three major operators and held community meetings

Table 2-1

Oil and Gas Company Expenditures in the Study Region, 1981-1984

<u>Region</u>	<u>Activity</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>	<u>1981</u>
		( millions of dollars )			
Mackenzie Delta/ Beaufort Sea	Seismic	27.2	28.1	18.3	20.8
	Exploration Drilling	<u>786.4</u>	<u>629.8</u>	<u>600.0</u>	<u>540.0</u>
	Sub-total	813.6	657.9	618.3	560.8
Mainland Territories (Yukon/NWT)	Seismic	48.2	26.3	31.8	3.8
	Development Drilling	72.1	24.9	31.0	3.4
	Exploration Drilling	<u>49.5</u>	<u>12.5</u>	<u>21.0</u>	<u>6.0</u>
	Sub-total	169.8	63.7	83.8	7.2
TOTAL	All Activities	983.4	721.6	702.1	568.0

Source: Canada Oil and Gas Lands Administration, 1984 Annual Report.

Note that the Arctic Islands - Eastern Arctic Offshore and Hudson Bay areas are not part of the study area and expenditures in these areas are not included in this table.

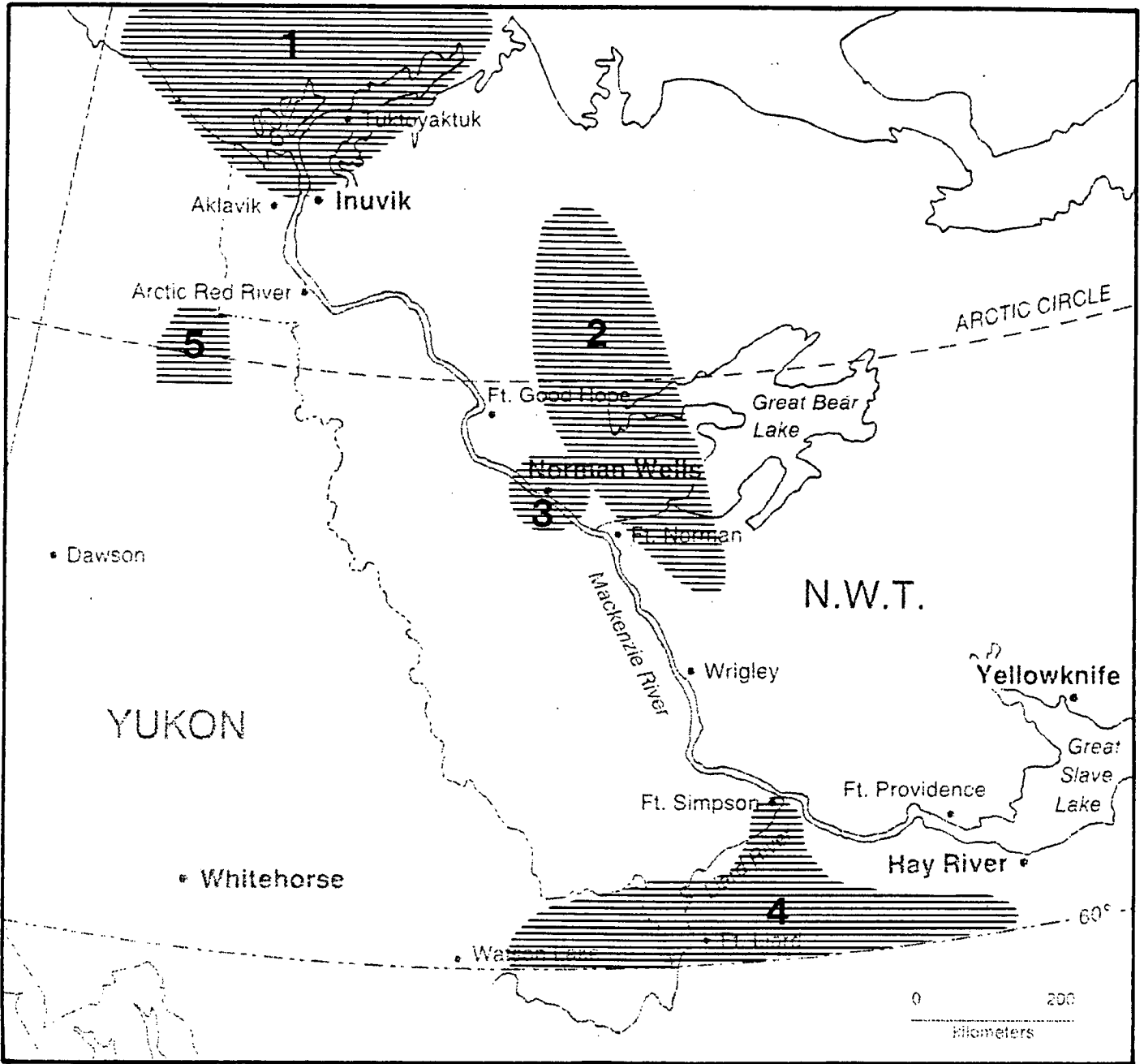


Fig. 2 AREAS OF OIL AND GAS EXPLORATION / PRODUCTION ACTIVITY

- Legend:
- 1. Mackenzie Delta / Beaufort Sea
  - 2. Colville Lake / Great Bear Lake
  - 3. Norman Wells Project
  - 4. Southwest N.W.T./Southeast Yukon
  - 5. Eagle Plain



in 20 Northern communities. The Panel concluded its deliberation and presented its final report in July of 1984. The most significant conclusion stated in this report was that Beaufort Sea oil and gas production and transportation was deemed to be acceptable provided that all activities are carefully controlled, started on a "small scale" and gradually phased in. According to the Panel, under a small scale development scenario, oil production could begin at a rate of about 15,000 m<sup>3</sup>/d. The Panel's endorsement of small-scale development seems to have cleared the way, at least from an environmental and social perspective, for Mackenzie Delta/Beaufort Sea oil and gas production and transportation to proceed.

### 2.2.2 Norman Wells Project

Esso's Norman Wells expansion project and the associated Interprovincial Pipe Lines oil pipeline were commissioned in April, 1985. Esso spent about \$530 million on this project over the period from 1981 to 1985, and Interprovincial Pipelines invested \$366 million in a 820-kilometer, 300 mm diameter pipeline to transport the oil crude from Norman Wells to Zama, Alberta. Esso increased the production of the Norman Wells field from 500 to 4,500 m<sup>3</sup>/d by drilling about 160 new production wells from two existing and six new artificial islands in the Mackenzie River. In addition to the new wells, the project involved construction of a central processing plant and electric generation facility. The processing plant was largely prefabricated in the south and the modules were assembled on site.

### 2.2.3 Mainland Territories

A substantial number of exploration agreements between oil and gas companies and the Federal Government were concluded in 1983 and 1984 for the southern Northwest Territories and along the Norman Wells pipeline route. The agreements call for about \$20 million to be spent on exploration in the southern Mackenzie Valley by a number of companies including Amerada, Chevron, Shell, Sulpetro and Western Decalta during the term of the agreements. It appears that expenditures on seismic and exploration drilling will exceed the planned amount by a wide margin.

Petro-Canada has also become a major player in the Mainland Territories, with an exploration program in the Norman Wells - Great Bear Lake area. The Petro-Canada exploration agreements call for an expenditure of up to \$112 million on several seismic programs and as many as 13 exploration wells during the 1983-1988 period.

#### 2.2.4 Polar Gas Project

With respect to natural gas, the on-land drilling programs in the Mackenzie Delta in the early 1970's successfully delineated large natural gas reserves, in the order of 283 billion m<sup>3</sup> (10 Tcf). Sufficient reserves have been discovered for a major development; however, market conditions will have to improve significantly before any development takes place.

Polar Gas is a consortium of TransCanada PipeLines, Petro-Canada, Ontario Energy Corporation, Panarctic Oils and Tenneco Energy. This group has filed an application to the National Energy Board and Indian Affairs and Northern Development to build a natural gas pipeline from the Mackenzie Delta to Alberta. The proposed pipeline would be 914 mm (36 inch) in diameter, 2,145 km long, transport about 22 million m<sup>3</sup>/d, and cost about \$3.3 billion to construct. The current schedule is for construction to commence in 1988 with completion in 1991. Polar Gas does not have a natural gas market, natural gas supply arrangements or project financing in place; consequently, the Polar Gas Project is a long way from a go-ahead decision.

### 2.3 FUTURE SCENARIOS

Predicting the future pattern of oil and gas development in the study region is difficult. No official predictions exist and the best information comes from statements of guarded optimism by oil company personnel, government officials and politicians about future production possibilities. However, for the analysis in this study, a frame of reference vis-a-vis future development is necessary in order to discuss expansion of business opportunities.

Uncertainty about the future course of oil and gas industry expenditures comes from a number of sources. The Petroleum Incentives Program (PIP) grants have been an important source of funding to Northern operators. PIP grants are being phased out as part of the Western Accord (i.e., grants will be terminated as of March 28, 1986 with "grandfathering" arrangements of up to three years for existing exploration agreements respecting Crown lands). The Federal government has recently announced an "exploration tax credit" program to replace PIP grants. Although exploration drilling has resulted in numerous oil and gas discoveries, production threshold levels of oil reserves have not been reached. The industry's reaction to the new program is important if exploration drilling is to continue and production threshold levels of oil reserves are to be discovered. On the other hand, natural gas reserves are sufficient to support development but soft U.S. markets and pipeline financing issues continue to delay natural gas development in the Arctic.

The future price of crude oil is a source of major uncertainty regarding the timing of oil production from the Beaufort. Crude oil prices are currently in the \$25 U.S. per barrel range; OPEC has controlled crude price levels since 1982 by reducing production (most notably Saudi Arabia). If OPEC is not able to maintain production level discipline, a surplus of crude oil could emerge driving prices to \$20 U.S. per barrel or less. Prices will need to continue in the \$25 U.S. per barrel range for Beaufort production to occur.

For purposes of this analysis, two scenarios are offered and are described briefly in the following paragraphs.

### 2.3.1 Status Quo

This scenario represents a pessimistic view of the future for Mackenzie Delta/Beaufort Sea oil and gas industry activity. Under the status quo situation, exploration drilling would continue but threshold reserve levels will elude the operators. Without a production project, however, enthusiasm for exploration will fade and oil and gas company expenditures in the north will begin to decline. Additional Northern business opportunities will be limited under this scenario.

### 2.3.2 Oil Production

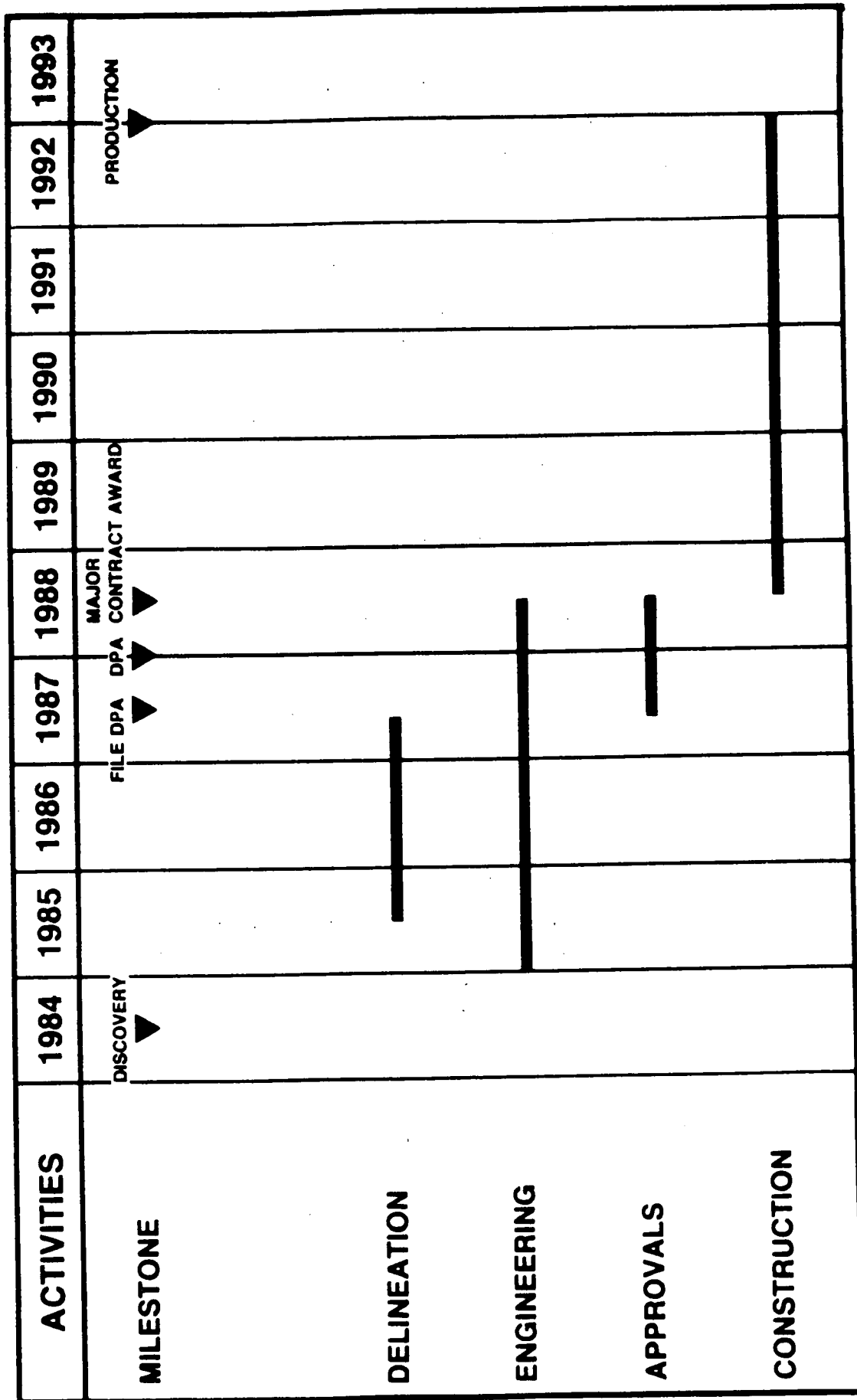
Both Esso and Gulf are close to having the necessary reserves for production. Esso has delineation wells planned for the 1985/86 winter season that they hope will confirm sufficient reserves. The company could begin oil production at a relatively modest scale by extending the 300 mm Norman Wells pipeline to the Beaufort. Initially, production would be about 4,000 m<sup>3</sup>/d, increasing to 7,150 m<sup>3</sup>/d as Norman Wells production declines. Esso's other option is for a larger pipeline 16 inch (400 mm) from the Beaufort to Zama, Alberta with a capacity of about 16,000 m<sup>3</sup>/d.

Gulf bases its optimism for early production on the Amauligak discovery. The discovery well tested 825 m<sup>3</sup>/d from one zone with a calculated production capability of 2,160 m<sup>3</sup>/d. This makes it the largest discovery to date in the Beaufort. Gulf will drill at least two delineation wells on the Amauligak structure during the 1985/86 winter season with the hope of proving a commercial development. The company's preference is for a 500 mm (20 inch) pipeline capable of moving about 24,000 m<sup>3</sup>/d.

The main components of an offshore development project in the Beaufort Sea would be a production platform for the production facilities, with satellite drilling islands, as required, to access the reservoir together with inter-island flowlines and trunklines to transport oil and/or gas to the main pipeline terminals onshore. The production platform would support the processing and ancillary facilities, including oil, gas and water treatment facilities; personnel accommodations; and electric power generators. The production facilities would likely be constructed in modules in Southern Canada and moved onto production platforms that are already in place, or integrated into barges or production structures and transported as a complete unit to the production site.

Figure 3 shows a typical schedule for an offshore production development. The development would take about 7 or 8 years from initial discovery or funds commitment to production start up. This schedule would include delineation drilling and regulatory approvals which could take up to three years. Design and

# BEAUFORT DEVELOPMENT MILESTONE SCHEDULE



from D.R. Motyka. 1985.

Fig. 3

construction of structures, facilities and trunklines and drilling of production wells is expected to require a further four years before production start-up.

Under the assumption that an oil production development of 16,000 to 24,000 m<sup>3</sup>/d goes ahead, major opportunities would be available to Northern businesses. Total expenditures for the 4,000 m<sup>3</sup>/d Norman Wells project were in excess of \$900 million, including \$550 million for the field development and plant facility and \$366 million for the pipeline. A Beaufort oil development would cost more per m<sup>3</sup> of capacity, owing to the greater length of the pipeline and higher cost of wells in the offshore. Expenditure for the seven year development period would probably be in the order of \$1 billion per year. In addition, a production project would likely induce a continuation of exploration activity. To Northern businesses, an oil production decision means that oil and gas industry expenditures will continue at current levels and perhaps increase. As the oil and gas industry switches from exploration activity to development activities, new business opportunities will be provided, along with a more stable business environment.

### 2.3.3 Natural Gas Production

Natural gas reserves are sufficient for a gas pipeline project; the problem is to find a market that will support the cost of such a large undertaking (estimated at \$4 billion in 1985\$). The best estimate is that the North American natural gas surplus will disappear by 1990, paving the way for a gas pipeline project to begin construction in the early 1990's, with first deliveries in the late 1990's. Polar Gas, which would build a pipeline down the Mackenzie Valley, is the most likely project to proceed. The market for natural gas is the key to when a gas pipeline project will proceed.

### **3.0 OIL AND GAS COMPANY PURCHASING PROFILES**

Chapter 2.0 indicates that large expenditures have been made by the oil and gas industry in Northern Canada in recent years. In order to identify specific potential business opportunities related to these expenditures, however, it is first necessary to develop detailed profiles of the types of goods and services required by operators in the region. This chapter provides demand profiles for both the exploration and production phases of activity. The exploration phase includes onshore and offshore seismic work and exploration drilling, while the production phase includes engineering, design, construction and operation of development wells, gathering systems, primary processing plants and pipelines.

#### **3.1 INFORMATION SOURCES**

As the first step in constructing demand profiles, members of the ESRF's Social Issues North Program Study Committee and northern benefits people were contacted in each of the major companies operating in the study area - Esso, Gulf, Dome, Petro-Canada, and IPL. The purpose of the study was explained to those not already familiar with it, along with the type of data that was being sought. In response to these requests, the consultants were provided with recent copies of the companies' annual Canada benefit reports to COGLA. These reports were then studied to determine the adequacy of the data contained therein as a basis for constructing the desired profiles. Generally speaking, these reports were not sufficiently detailed to form the basis for such profiles, so it was necessary to obtain supplemental information from a variety of sources including: COGLA staff, contractors to the major operators, industry associations, and a drilling consultant.

A more detailed discussion of data sources and data quality is provided in the following sections dealing with each of the specific activities considered herein.

## 3.2 EXPLORATION PHASE

Oil and gas exploration consists of two major activities: seismic surveys which are undertaken to identify potential reservoir areas, and exploration drilling to establish whether these areas actually contain oil or gas. This section describes these activities and provides profiles of expenditures for typical northern seismic and drilling programs. Due to the marked difference between onshore and offshore seismic and drilling, these activities are discussed separately.

### 3.2.1 Onshore Seismic Surveys

#### (a) Activity Description

Seismic surveys are undertaken to define the character of subsurface strata for the purpose of identifying potential oil and gas reservoir areas for exploration drilling programs. These surveys involve creating a shock wave at the surface and recording the length of time it takes to reflect from subsurface layers back to a series of recorders placed at intervals along a straight line. The time intervals between creation and detection of the reflected shock waves are then analyzed to provide an indication of the depth and shape of the subsurface strata.

Following an initial survey and marking of the seismic line, it is cleared of trees and other vegetation by a number of bulldozers and a slashing crew. This portion of the work is usually carried out in the late fall, in advance of the actual seismic work. In remote areas it may be necessary to construct winter access roads or airstrips, adding substantially to both the cost of the program and the opportunities for northern content.

The actual seismic work takes place in the winter months (usually between January and April) when the ground surface is frozen in order to facilitate surface travel and minimize damage to the soil and vegetation. While some programs may last several months, the drilling and recording operations are often completed in only a week or two on some of the shorter lines.



The typical seismic crew consists of about 50 persons overall, including surveyors, geophysicists, shot hole drillers, explosives handlers and assistants. The operation consists of surveying the shot hole and geophone locations, drilling the shot hole, placing the explosive charge in the hole, and setting out the cables and geophones. Once the equipment is in place, the recording apparatus is activated and the explosive charge is detonated. The equipment is then moved along to the next location. Usually, the drilling crew will work a few days ahead of the recording group, but often stay in the same camp. Following completion of the recording, any debris or garbage along the line is cleaned up, usually by the same crew that did the slashing.

Equipment for the seismic survey includes drilling and recording equipment mounted on 4-wheel drive trucks or tracked vehicles, water, fuel and supply trucks, crew trucks, and a camp that is moved along by truck or bulldozer to keep pace with the crew. Typical equipment requirements of an overall seismic operation would include the following:

Line clearing:

- 2 to 8 bulldozers
- support trucks (fuel, water, and supplies)
- camp

Drilling and recording:

- 3 to 6 drills mounted on 2 to 3 ton, 4-wheel drive trucks or tracked vehicles
- 4 line trucks (3/4 to 3 ton)
- 1 shooting truck and 1 recorder truck (1 to 3 ton)
- camp
- 1 bulldozer
- crew trucks
- support trucks

(b) Seismic Profile

Table 3-1 provides a breakdown of typical seismic expenditures, as compiled by Petro-Canada. This profile is representative of a winter seismic program on flat terrain, as opposed to a summer helidrill seismic operation in mountainous

**Table 3-1**  
**Seismic Activity Profile**

<u>Expenditure Item</u>	<u>Total Cost*</u> (000\$)	<u>% Total</u>	<u>NWT**</u>
<b>GEOPHYSICAL REQUIREMENTS (Recording)</b>			
	1,200	20.0	20
DRILLING	800	13.3	25
LINE CLEARING	1,000	16.7	30
ACCOMMODATION FACILITIES	200	3.3	10
<b>THIRD PARTY GOODS AND SERVICES</b>			
	2,400	40.0	42
Drilling bits	600	10.0	10
Air support	550	9.2	70
Fuel and lubricants	400	6.7	90
Foodstuffs	250	4.2	20
Freight transport	250	4.2	20
Dynamite and caps	185	3.1	20
Supplies	40	0.7	20
Expediting Services	40	0.7	90
Transportation (misc)	60	1.0	20
Communication	5	0.1	20
Parts and repair services	5	0.1	50
Recording paper	5	0.1	5
Magnetic tapes	5	0.1	20
Lathe and flagging	5	0.1	20
DATA PROCESSING	400	6.7	0
<b>TOTAL</b>	<b>6,000***</b>	<b>100.0</b>	<b>29</b>

Source: Petro-Canada, 1983 Canada Benefits Report to COGLA.

\* 1982 dollars

\*\* Projected.

\*\*\* Total cost based on 640 kilometres of seismic work.

terrain. The latter would involve a much higher air support component, and correspondingly lower proportions in other categories than in the profile shown in Table 3-1. Purchases of third-party goods, of which an estimated 42 percent could be sourced regionally, are disaggregated in the table. The composition of other major expenditure categories is defined below.

Geophysical Requirements - includes the cost of hiring a geophysical contractor to undertake the actual field collection of seismic data (recording) and supervise the overall operation. This normally includes supervising drilling, line clearing, camp and catering contractors as well as using a surveying company and a substantial amount of support equipment. Salaries, depreciation on equipment and instruments, parts and service, office overhead and taxes would be included in this category. Recording of the seismic data would usually account for at least half of the total cost of this category.

Drilling - covers the drilling and loading of seismic holes with dynamite by a drilling contractor who provides both the required personnel and drilling equipment.

Line Clearing - involves clearing of the seismic lines with a bulldozer and a slashing crew. Normally, the line clearing contractor would be responsible for accommodating his own crew. Access road construction is often undertaken by the same contractor. Line clearing is already carried out largely by Northern business.

Accommodation Facilities - for all other contractors involved with drilling, recording, surveying, and air support, etc. The amortized purchase of the camp is included in this cost category. It might be feasible for Northern businesses to provide complete camp facilities for seismic programs lasting several months. Petro-Canada has, in fact, negotiated several camp lease-back arrangements with Native development corporations. In the case of shorter seismic programs, however, it would be difficult to amortize the camp cost.

Data Processing - is carried out almost exclusively in southern Canada using specialized computer analysis. Consequently, there is little real prospect for Northern supply of this category.

A listing of typical requirements of seismic operations is provided in Appendix A, Table A-1. While no indication is available of the relative share of total expenditures on each item, the list does give a better indication of some of the specific requirements of a seismic program.

(c) Northern Content

Total Northern onshore seismic expenditures were in the order of \$50 million during the 1983-84 season. Except for the specialized recording equipment and geophysical expertise, seismic is an activity that lends itself to a high degree of Northern content. While regional content of Northern seismic expenditures averaged less than 20 percent during the 1983-84 season, as shown in Table 3-2, three operations reported Northern contents of more than 40 percent, illustrating the potential to more than double the present Northern share.

It should be recognized that much of this potential increase in Northern content will be in the form of direct employment opportunities rather than in supply and service contracts to northern businesses. An opportunity, however, has been identified to develop a company which provides seismic work on a contract basis. An upper limit to actual Northern content in this area will be determined by the total Canadian content percentage of the seismic program. Seismic programs typically are reported to have Canadian content of 75 to 85 percent, on a value-added basis.

### 3.2.2 Offshore Seismic

Offshore seismic surveys are conducted from specially-designed ships during the open water season. These vessels contain living quarters for the crew and specialized equipment to create the shock waves, record the reflected waves, and process and analyze the recorded information. The self-contained nature of

**Table 3-2**  
**Regional Content of Seismic Programs**

<u>Operator</u>	<u>Area</u>	<u>1983-84 Expenditures</u>		
		<u>Total</u> (000\$)	<u>Regional</u> (000\$)	(%)
Forward Resources	Tedji Lake	4,734.1	386.5	8.2
	Rond Lake	6,280.3	310.2	4.9
	Dahadinni	5,077.6	164.0	3.2
Northcor	All areas	21,000.0	3,100.0	14.7
Petro-Canada	All areas	9,505.0	3,042.0	32.0
Gulf	Inuvik-Reindeer	3,149.3	1,275.5	40.5
Western Decalta/Esso	Fort Norman/Wrigley	1,500.0	462.5	30.8
Texaco	Carcajou/Norman Wells	1,487.0	700.0	47.1
NSM Resources	Little Bear/Fort Norman	1,005.0	391.0	38.9
Shell	Aklavik Lands	498.0	318.0	63.9
<b>TOTAL</b>		<b>54,336.3</b>	<b>10,149.7</b>	<b>18.7</b>

Source: Canada Benefits reports to COGLA.

seismic ship operation, combined with the requirement for highly-trained personnel, does not lend itself to Northern business supply nearly as much as onshore seismic activity.

There are, however, a number of opportunities for Northern content. These include:

- vessels for crew changes and supplies,
- marine base support functions (groceries, fuel, and vessel supplies and maintenance),
- tugs, barges and smaller vessels for recording and surveying shallow waters.

### 3.2.3 Onshore Exploration Drilling

#### (a) Activity Description

This section describes the major expenditure categories making up an onshore drilling program and, based on an analysis of Canada Benefits reports and other data, provides an estimate of the distribution of costs among these categories, on average. Onshore exploration drilling is a highly site-specific activity in terms of well depth, geology, site accessibility, etc. The large variability in these factors makes it difficult to construct a single profile that is representative of all onshore exploration programs north of 60°.

#### Construction

Prior to moving the drill rig to the designated site it may first be necessary to construct an access road, while the land around the well site must be cleared, graded and levelled to prepare the site for the rig and associated equipment and buildings. After the drilling is complete, the site is cleaned up and restored, usually by the same contractor. This type of construction work requires a couple of bulldozers, a grader, front-end loader, and dump trucks. Construction typically accounts for 10 to 15 percent of the cost of onshore drilling, depending largely on the amount of access road required, and is already carried out mainly by Northern contractors.

## Transportation

Drilling requires large tonnages of drilling equipment and operating materials to be moved on-site. Due to the lack of road access in Northern Canada and the sheer distances involved, barge and aircraft are used to a much greater extent than in the south.

Trucking for a typical well requires in the order of 100 to 120 loads, according to Amoco's 1982 Canada Benefits report. Initially, the dismantled drill rig, camp, and ancillary equipment are trucked on-site along with drill pipe, drill casing, mud materials, etc. Transportation of the rig and drilling equipment is done on heavy duty oilfield trucks, specially equipped for oilfield use. The hauling of mud and other drilling supplies, along with camp supplies and large quantities of water and fuel, continues throughout the drilling operation.

Total surface transportation costs (including barging) typically account for at least 10 percent of drilling costs. Reported regional content of surface transport for drilling program ranges from a low of zero to a high of 80 percent, with the latter figure reported by Petro-Canada in 1984. However, since one of Petro-Canada's rigs is kept in the North all year, while other operators move their equipment up from Alberta, 80 percent is not considered to be a realistic regional content target for the surface transportation component of drilling in the North as a whole.

Aircraft are used extensively in remote regions for both crew change and the supply of parts and smaller supplies. Aircraft costs vary widely as a percentage of the total drilling cost, from as little as two or three percent in the southern territories, to more than 25 percent in remote areas. On average, aircraft costs will probably account for 5 to 10 percent of total onshore drilling expenditures in the north, of which a substantial portion will be charter work. One projected drilling program plan indicates the need for several specific types of charter aircraft, including DC3, Twin Otter, and Bell 204 helicopter.

### Drilling Rig

The cost of hiring a drilling contractor to carry out the basic drilling and supervision of the overall program is usually the largest single component of Northern exploration drilling, accounting for about 20 percent of total costs. Actual rig time may cost only half of this amount, but by the time rigging up and down, rig moving, and standby costs are added, the cost is much higher. The camp cost is sometimes included in this category, but generally it is restricted to the cost of labour and supervision of drilling, rig maintenance, a capital charge for the rig, and corporate overheads and profits. Drilling supplies (mud, bits, casing, fuel, etc.) and specialized drilling operations (logging, testing, fishing) are usually reported under separate headings.

The relative shares of drilling rig cost components are estimated as shown below, based on CAODC data for an 1600 metre rig in southern Canada.

	<u>% of total</u>
Direct labour	29.0
Rig Manager Exp.	5.0
Admin. & Field Expense	10.0
Communications	0.5
Insurance	1.5
Maintenance	19.0
Drill Pipes & Collar	7.0
Water (trucking)	5.0
Rig Amortization*	23.0
	<u>100.0</u>

\* Estimated by Canadian Resourcecon (1983) Limited.

Aside from direct labour, water trucking would probably have the highest potential for Northern supply, along with a portion of maintenance and miscellaneous field expenses.

Repairs and maintenance expenses for a typical western Canada well would be distributed as follows:



	<u>\$/day</u>	<u>% Total</u>
Company Labour	75	8
Oil, Grease & Running Supplies	150	17
Hand Tools	15	2
Drilling Lines	25	3
Drawworks	50	5
Mud Pump	50	6
Engines	80	9
Light Plant	50	6
BOP's	50	6
Mud System	100	11
Boiler & Heating System	25	3
Power Tongs	30	3
Handling Tools	50	5
Drill Pipe & Collars	40	4
Welding	35	4
Miscellaneous	<u>75</u>	<u>8</u>
TOTAL	<u>900</u>	100%

Source: Manadrill Drilling Management Inc.

Of these items, grease and running supplies, hand tools, drilling lines, power tongs, and welding would have a high potential for Northern content.

Like seismic activity, onshore exploration drilling is carried in a limited period of the year (usually between January and April) when the surface is frozen, which facilitates surface travel and minimizes surface disturbance. This limited drilling season provides a poor equipment utilization factor, while the level of Northern drilling activity may fluctuate considerably from year to year. Most onshore rig operators therefore will move their equipment south for the rest of the year for baseload operation if work is available there. At present, onshore exploration drilling in the study region is largely carried out by rigs based in southern Canada. The limited Northern drilling season, uncertain level of work, the high cost of rigs (\$2 million plus) and the specialized skills required all combine to make it difficult to operate a rig out of the North.

### Drilling Services

In addition to the drilling contractor, specialists are required to carry out activities including: coring, mud logging, wireline logging, testing, cementing, and fishing. These drilling services, which usually account for five to ten percent of total well costs in the north, do not lend themselves to local supply by virtue of their specialist nature.

### Other Services

Included in this category are the camp (representing three percent of the total cost), catering (three percent), and communciations (one percent), along with smaller items such as welding, and first aid, all of which would be only a fraction of one percent of the total cost. Items in this category already have a high regional content.

### Consumables

This category includes a number of major items required by the drilling operation on an on-going basis including: mud/drilling fluid (four percent), drill bits (three percent), cement (three percent), casing (five percent), and fuel and lubrication oils (five percent).

Fuel and lubrication oils for onshore drilling are sourced almost entirely from Northern distributors, but other items in this category continue to come largely from the south by virtue of their specialized nature. Some mud components, cement and drill bits, however, are supplied by Northern businesses.

#### (b) Onshore Exploration Drilling Profile

Table 3-3 provides profiles for onshore exploration wells in three different regions of the Yukon and Northwest Territories. Transportation and fuel costs are seen to increase markedly in the case of Great Bear Lake, due to its remoteness from the drilling industry in Alberta. The NWT - Alberta border well

Table 3-3

Onshore Exploration Drilling Profiles, Yukon and Northwest Territories

<u>Area</u>	<u>NWT Alberta Border</u>	<u>Central Yukon Territory</u>	<u>Great Bear Lake</u>
Well Depth ( metres )	1,500	1,800	1,600
	( % of total well cost )		
1. Construction - Equipment, camps	14	9	10
2. Transportation - Rig and vessel mobilization			
- Ground support (trucking)	10	18	29
- Air support			7
- Support vessels			2
3. Supervision and support base	13	8	10
4. Drilling			
- Drilling rig	17	14	7
- Camp catering	5	6	2
- Drill bits	3	3	1
- Cementing	4	1	1
- Logging & evaluation	2	3	2
- Testing	3	1	1
- Drilling fluids	4	2	2
- Casing	2	2	1
- Downhole tools & rentals	3	6	4
- Support equipment	4	3	3
- Communications, weather forecast	2	2	1
5. Fuel			
- For rig, transport units & support vessels	5	6	17
TOTAL	100	100	100

Source: Petroleum Services Association of Canada, Well Cost Study, July 1985.

profile corresponds most closely to average expenditure patterns reported to COGLA by companies operating in the north, since much of the exploration activity is concentrated in the southern NWT.

A listing of goods and services typically required for onshore drilling has been compiled by Petro-Canada, as shown in Table A-2 of Appendix A.

(c) Northern Content of Onshore Drilling

Total Northern onshore drilling expenditures (excluding Panarctic) exceeded \$65 million during the 1983-84 exploration season. Canadian content of Northern onshore drilling programs is usually estimated to be in the vicinity of 80 to 90 percent. The reported regional content of these drilling programs averaged only about 11.5 percent, but Northcor reported a Northern content of more than 40 percent (point-of-purchase basis), while Petro-Canada reported about 28 percent (value-added basis), indicating the potential for sizable increases in Northern content. However, the very high Northern content reported by Northcorp is unlikely to be repeated, as it resulted from unusually high access road construction expenditures through difficult terrain. This road construction was carried out mainly by Northern contractors.

Table 3-4 shows the projected 1985 regional content percentages for expenditure items in Petro-Canada's drilling program, providing some indication of items which are likely candidates for local supply.

3.2.4 Offshore Exploration Drilling

(a) Activity Description

Exploration drilling expenditures in the Mackenzie Delta - Beaufort Sea area, most of which have been related to offshore wells, have accounted for the dominant share of oil and gas industry expenditures north of 60°. Offshore exploration drilling is quite similar to its onshore counterpart in terms of the actual drilling and drilling services operations. Because it is carried out

Table 3-4

Projected Regional Content of Petro-Canada's Mackenzie Valley Drilling Program

Listing of Program Expenditure Items	Forecast - 1985		
	Expenditures (\$000)	Canadian Content (%)	Regional Content (%)
<b>EQUIPMENT</b>			
Drilling Rig	1,720	91	5
Aircraft	3,604	100	15
Trucking	1,044	100	80
Barges	150	100	81
Drilling Equipment	120	76	0
Drill Equipment (Rental)	480	90	14
<b>CONSUMABLES</b>			
Mud/Supplies & Chemicals	165	76	12
Drill Bits/Reamers	150	40	0
Wellhead Equipment	0	75	0
Cement & Additives	195	93	8
Casing	751	73	0
Fuel/Lubricants	1,150	100	95
Miscellaneous (Consumables)	300	98	58
<b>SERVICES</b>			
Coring	75	90	0
Wireline Logging	420	72	0
Mud Logging	64	100	0
Testing: Prod/Drillstem	300	92	0
Special Drilling Services	600	99	3
Communications	150	100	27
Catering	400	100	100
<b>LOGISTICS/SUPPORT BASE</b>	465	95	37
<b>OTHER</b>	3,232	100	25
<b>TOTAL</b>	15,534	95.1	28.3

Source: Petro-Canada, 1984 Annual Report of Canadian Benefits to COGLA, Canada Land Programs. Estimate based on the planned drilling of 3 exploration wells.

offshore, however, it requires the use of either special floating drill vessels, or artificial islands as foundations from which to drill. Each of these alternatives requires specialized, capital-intensive equipment which is not feasible to construct in Northern Canada. As a result the potential for Northern supply to offshore exploration activity is more limited than for onshore drilling and seismic programs, although maintenance and repair opportunities will continue to exist with offshore activity.

Offshore drilling also differs in terms of its logistical support requirements. Vessels required for the transportation of supplies from coastal supply bases are a major cost component of offshore drilling programs, as is the operation of the bases themselves.

Artificial Islands are constructed in the shallower waters of the Beaufort Sea (generally less than twenty metres depth), usually with very large capacity dredges during the summer season. To date most of these dredges have been brought over from Holland because dredges of sufficient capacity do not exist in Canada. A few islands, however, have been constructed in winter by trucking gravel over the ice.

Several types of artificial islands have been constructed in the Beaufort Sea, each being different in the means used to resist wave and ice erosion. These include:

- sandbagged perimeters,
- sacrificial beaches,
- various types of steel or concrete caissons set on a dredged base, ballasted with water, and filled with sand.

Artificial islands are essentially self-contained, including a camp for the rig crew, fuel, drilling and mud supplies, as well as the drilling rig and associated equipment.

Floating Drill Vessels are used in deeper offshore waters where artificial island construction is not feasible. This method of drilling is used primarily by Dome, which uses four ice-reinforced drill ships, and Gulf, which has a single conical drilling unit. In both cases, the capital cost of the drill vessels forms a large part of the total drilling program cost. In a projected breakdown of the cost of drilling a west Beaufort Sea well, for example, capital charges for specialized drilling and support vessels amounted to more than 60 percent of the total cost.

Having directly outlined the major types of offshore drilling systems, the major types of goods and services required as inputs to offshore exploration drilling may now be examined in more detail.

(b) Commodity Profile

It is difficult to construct a single profile for offshore drilling in the Beaufort Sea because of the significant differences among the three principal operators in terms of the physical conditions under which they operate and the drilling systems which they employ. Furthermore, each of the three major operators presents their expenditure data in somewhat different formats which do not lend themselves to aggregation in a single profile.

Table 3-5 provides a breakdown of offshore drilling expenditures by the three major operators in the Beaufort Sea - Mackenzie Delta area during 1984, as compiled by COGLA from individual Canada benefits reported by each company. The offshore expenditure profile in Table 3-5 is of somewhat limited value, as it is more aggregated than desirable and is based on inconsistent disaggregations by each of the three operators. Supplementary information was therefore obtained from several sources, including the Petroleum Services Association of Canada (PSAC), individual Canada Benefits reports, and an offshore drilling consultant. This table illustrates the capital-intensive nature of offshore drilling, as two-thirds of total expenditures fall under the "equipment" category. Each of the sub-categories of equipment includes operating expenditures for many different types of goods and services as well as capital charges. However, as noted earlier, expenditures for the latter do predominate, particularly in deeper water

Table 3-5

## OFFSHORE EXPLORATION DRILLING EXPENDITURES IN 1984

COMPANY EXPENDITURE CATEGORY	ESSO RESOURCES		GULF CANADA		DOME PETROLEUM		ALL OPERATORS	
	M\$	% TOTAL	M\$	% TOTAL	M\$	% TOTAL	M\$	% TOTAL
<b>EQUIPMENT</b>								
Drilling rigs - offshore	9.0	4.5	123.5	50.1	117.5	37.8	250.0	32.9
- onshore	0.9	0.4					0.9	0.1
Vessels	33.7	16.7	33.7	13.7	91.7	29.5	159.0	20.9
Helicopters	3.7	1.8					3.7	0.5
Aircraft	4.6	2.3					4.6	0.6
Total Air support	8.3	4.1	6.4	2.6			14.7	1.9
Calsson	29.6	14.7					29.6	3.9
Calsson rig and camp	8.5	4.2					8.5	1.1
Other	5.6	2.8	13.6	5.5			19.2	2.5
Subtotal	95.6	47.4	177.3	71.9	209.1	67.2	482.0	63.5
<b>CONSUMABLES</b>								
Mud, Fluids and cement	2.8	1.4	3.7	1.5	9.1	2.9	15.6	2.1
Cement and additives			0.9	0.3	1.4	0.4	2.2	0.3
Drill bits and reamers	0.5	0.2	0.2	0.1	0.2	0.1	0.8	0.1
Wellhead equipment	0.3	0.1	0.5	0.2	0.4	0.1	1.2	0.2
Fuel & Lubes	5.8	2.9	20.4	8.3	13.1	4.2	39.3	5.2
Casing	3.4	1.7	3.4	1.4	4.4	1.4	11.2	1.5
Misc.			1.2	0.5	0.1	.0	1.3	0.2
Subtotal	12.8	6.3	30.2	12.3	28.7	9.2	71.8	9.5
<b>SERVICES</b>								
Coring	0.6	0.3			0.1	.0	0.7	0.1
Coring & Geotechnical	0.2	0.1					0.2	.0
Wireline Logging	2.1	1.0	1.7	0.7	4.1	1.3	7.9	1.0
Site Geologists, technicians	0.4	0.2					0.4	0.1
Testing	6.8	3.4	3.3	1.3	4.0	1.3	14.0	1.8
Ice management				0.0	5.4	1.7	5.4	0.7
Dredging	25.2	12.5					25.2	3.3
Meteorological	0.2	0.1			0.0	0.0	0.2	.0
Positioning	2.1	1.0			1.7	0.6	3.8	0.5
Cementing	2.1	1.0	0.2	0.1	0.6	0.2	2.9	0.4
Mud logging	0.2	0.1			1.5	0.5	1.7	0.2
Communications	2.5	1.2			1.1	0.4	3.6	0.5
Diving			1.0	0.4	1.4	0.4	2.4	0.3
Other			11.4	4.6	1.9	0.6	13.3	1.7
Subtotal	42.4	21.0	17.5	7.1	21.9	7.0	81.8	10.8
<b>SPECIAL SERVICES</b>								
Well Auxiliary equipment	0.6	0.3					0.6	0.1
Well control equipment	0.6	0.3					0.6	0.1
Drilling Stab. Equip.	1.8	0.9					1.8	0.2
Fishing tools & remed.	0.2	0.1					0.2	.0
Seismic surveys	1.8	0.9					1.8	0.2
Mud Eng. & Centrifuge	1.5	0.7					1.5	0.2
Insurance	3.0	1.5					3.0	0.4
Subtotal	9.5	4.7	1.0	0.4	1.0	0.3	11.5	1.5
<b>LOGISTICS AND SUPPORT</b>								
Catering					3.7	1.2	3.7	0.5
Camps	6.9	3.4					6.9	0.9
Onshore facilities	6.6	3.3					6.6	0.9
Barging & Trucking	9.9	4.9					9.9	1.3
Stores facility operations	3.2	1.6					3.2	0.4
Mats., Maint. & support	3.9	1.9					3.9	0.5
Esso pers. & O.H.	5.5	2.7					5.5	0.7
Misc.	5.5	2.7			46.6	15.0	52.1	6.9
Subtotal	41.5	20.6	20.4	8.3	50.3	16.2	112.2	14.8
<b>TOTAL</b>	<b>201.8</b>	<b>100.0</b>	<b>246.5</b>	<b>100.0</b>	<b>311.0</b>	<b>100.0</b>	<b>759.3</b>	<b>100.0</b>

Source: Annual Canada Benefits Reports to COGLA. Geophysical and seismic, engineering and consulting, and research and development expenditures are excluded.



offshore, where specialized drillships and caissons are used. This feature of offshore drilling obviously restricts the opportunities for Northern content due to the large capital investment required relative to the lack of an assured long-term demand.

The PSAC has recently published a drilling cost breakdown for an artificial island in the Beaufort Sea area which is detailed in Table 3-6. This example would be most comparable to Esso Resources' drilling operations in the shallow areas of the Beaufort Sea. While this profile is generally considered to be adequate, several items require further disaggregation and explanation.

Artificial Island Construction - Construction of islands is shown to account for more than half of the total well cost. Dredging and offshore marine equipment are estimated to make up almost ninety percent of the expenditures in this category. It is expected that dredging will continue to be provided mainly by foreign-built dredges. However, the provision of groceries, fuel, and other supplies to dredges is already carried out to some extent by Northern businesses. Support vessel operation is probably the largest component of artificial island construction with a high potential for Northern content. Other opportunities include site construction, sandbagging, aircraft support, diving, and the operation and maintenance of camps and communications equipment.

Transportation - As in the case of onshore exploration drilling, transportation is reported to account for a substantial portion of the offshore well cost (eight percent). Total transportation costs are, in fact, much larger since mobilization of offshore marine equipment (dredges), support vessel use, and air and ground support accounted for under the artificial island construction category. Esso's 1984 report to COGLA shows the following shares for various transportation modes:

Vessels	17%
Air support	4%
Barging and trucking	5%
Total	<u>26%</u>

**Table 3-6**  
**Offshore Exploration Drilling Profile, Beaufort Sea**

Drilling Method: Artificial Island      No. of Drilling Days: 180      T.D.: 4000 m

<u>Particulars</u>	<u>Drilling (\$)</u>	<u>Percent of Sub Total</u>
1. Construction		
- Equipment, Camps	1,340,200	2
- Artificial Island	28,807,200	51
2. Transportation		
- Rig and Vessel Mobilization and Demobilization	---	
- Ground Support	1,119,300	2
- Air Support	1,335,800	2
- Support Vessels	2,278,300	4
3. Supervision and Support base	3,693,700	7
4. Drilling		
- Drilling Rig	4,334,000	8
- Camp Catering	1,220,400	2
- Drill Bits	52,000	0
- Cementing	1,386,400	2
- Logging & Evaluation	905,100	2
- Testing	2,513,500	5
- Drilling Fluids	669,400	1
- Casing	411,700	1
- Downhole Tools	1,090,600	2
- Support Equipment	2,390,700	4
- Rentals	1,046,300	2
- Wellhead Equipment	55,200	0
- Rig Positioning, Location Survey	---	
- Communications, Weather Forecast	624,000	1
5. Fuel		
- Rig, Transport Units & Support Vessels	833,800	2
<b>TOTAL</b>	<b>\$56,107,600</b>	<b>100</b>

Source: Petroleum Services Association of Canada, Well Cost Study, July 1985.

The preceding vessel share of total expenditures is roughly in line with the average reported by Dome and Gulf. It is therefore evident that vessels represent one of the largest single cost components of offshore drilling programs. Various types of support vessels are required for offshore drilling, including fuel tankers, supply freighters, icebreakers, drydocks, crane barges, camp barges, river and ocean tugs, cargo barges and crew boats. While many of these vessels are too expensive to be provided by local businesses, a number of tugs and barges, crew boats, and smaller supply vessels are already owned and operated by Northerners. One of the most notable examples is Northern Transportation Company Limited which is the principal barge operator on the Mackenzie River. Northern operators are expected to make further inroads into the support vessel business in the area relating to offshore barging as well as crew and tug boat operation over the short-term. With oil and gas production in the North, more regularized vessel demand will exist which might, eventually, allow Northerners to provide some of the larger support vessels.

It should be noted that fuel accounts for a substantial portion of vessel operation costs (about twenty percent). Total fuel use related to Beaufort offshore exploration activity is currently in the vicinity of fifty million litres annually. The majority of this fuel is sourced by tanker from southern Canada due to the limited capacity of the Norman Wells refinery.

Aside from fuel, a large number of goods and services are required for vessel operation and maintenance. A number of these are listed below:

- Vessel maintenance and repair (welding, riveting, painting, and engine repairs),
- Vessel equipment (pumps, motors, winches, generators, etc.),
- Engine room equipment (lubes, glycol, hoses, filters, etc.),
- Supplies for galley and quarters (food, cleaning supplies, etc.),
- Deck equipment (life rafts, anchors and chain, safety and survival equipment),
- Bridge equipment (communications and navigation).

A more detailed listing of goods and services related to marine equipment is provided in Table A-3 of Appendix A. Most of these items are candidates for Northern supply since many require only modest levels of investment. The most notable exception is drydocking facilities for larger vessels, which are presently provided by Dome Petroleum.

Air support, river barging and trucking are already provided, to a fair extent, by Northern firms. Again, however, production would increase Northern content through a more assured level of demand.

Support Bases provide a variety of functions required to supply and service the logistical requirements of offshore drilling. These support bases are largely self-contained entities whose functions include:

- warehousing of oilfield supplies and parts
- equipment repair and maintenance
- catering and accommodation
- medical treatment
- communications
- air services and aircraft support
- administrative and office services
- meteorological monitoring
- provision of utilities (waste, waste disposal, electric power)
- support equipment (tugs and barges, trucks, cranes, etc.)

The uncertain levels of offshore drilling activity, coupled with the lack of existing infrastructure in the region, have necessitated that oil companies provide these functions in-house. Conversely in Southern Canadian exploration programs, many of these functions are normally be sourced from third-parties. Table A-3 of Appendix A provides a detailed listing of the many types of goods and services needed for base operations. Some of these items, such as catering, base maintenance, and various types of supplies are already provided by Northern businesses on a contract basis.

The possibility of sharing a number of shorebased services which support offshore exploration activities has been discussed among the three principal operators. Shared services could be supplied by a third-party Northern business. Such

sharing could lead to increased efficiency by avoiding the unnecessary duplication of facilities and services. Examples of proposed shared services include:

- fire fighting equipment and services
- emergency medical support
- search and rescue
- pollution abatement services
- weather forecasting
- ice reconnaissance
- harbour monitoring
- road maintenance
- bank facilities
- materials management systems
- storage areas
- support vessels
- an offshore industry information centre

Resistance towards major sharing efforts is, however, quite strong. While opportunities exist to expand Northern content of base operation during the exploration phase of offshore drilling, it is generally agreed that the regularized demand generated by oil or gas production would enable Northern businesses to participate in a much larger way. Functions on the preceding lists could be contracted in their entirety from third parties, rather than the oil and gas companies continuing to maintain in-house control over them and purchasing selected inputs, as is the case at present. Expanded possibilities for Northern business involvement in support bases during the production phase are discussed in Section 3.3.5 of this chapter.

Drilling - The actual offshore drilling operation is not very different from onshore activity, as discussed earlier. The major difference (aside from the requirement for marine equipment and specialized drilling structures) is that offshore drilling from artificial islands can be carried out year-round once the island has been constructed. Onshore drilling, on the other hand, is generally confined to the winter and early spring months. In addition, offshore drilling tends to be concentrated in a much smaller geographic area than onshore drilling which is dispersed throughout the Mackenzie Valley and western NWT. Both of these factors (i.e., the more sustained activity level and concentration of activity might be viewed as providing greater opportunities for Northern business participation than in the case of onshore drilling.

To date, however, offshore operators have chosen to maintain direct control over offshore drilling by using their own experienced crews, rather than contracting it out to third parties. The use of in-house drilling expertise is based on a number of factors, including the desire to minimize the risk of a blowout and avoid the resulting environmental damage.

Aside from these general observations, the components of offshore drilling and the opportunities these present for Northern participation are similar to those discussed previously for onshore drilling.

Fuel - As previously noted, the proportion of total represented by fuel is considerably larger than that shown in the PSAC profile, as a portion of total fuel costs is hidden under "support vessels". Based on Table 3-5 and discussions with oil companies, it is estimated that total fuel and lubricating oil costs would normally constitute at least five percent of total offshore drilling expenditure. The potential for increased Northern content is constrained by limited refinery capacity at Norman Wells, at least in the short-term. Over the longer term, with the advent of production, a topping plant could produce diesel fuel locally, as is done in the Prudhoe Bay area.

A more detailed listing of the types of goods and services used in Northern Offshore Drilling is provided in Table A-3 of Appendix A. While no indication of the relative cost of each item is available, this table does give a good breakdown of the more aggregated categories shown in previous tables.

(c) Northern Content of Offshore Drilling

Offshore exploration activities in the Beaufort/Mackenzie Delta region resulted in expenditures totalling \$795 million in 1984. Of this amount, about eight percent was disbursed to Northern businesses, compared to nine percent in 1983. These percentages would be considerably smaller if southern-based Northern businesses were excluded. The lack of a standardized definition of "Northern business" among Canada Benefits reports of the three principal offshore operators, however, makes it difficult to determine Northern content on a consistent

basis. Dome is the only one of the three operators to distinguish "Northern-based southern companies" from "Northern" companies. If payments to companies in the former category are excluded from northern business content, the Northern content of Dome's offshore program would be reduced by almost half for the 1983 and 1984 reporting periods.

### 3.3 PRODUCTION PHASE

When economic circumstances do eventually justify the large-scale exploitation of oil and gas reserves in Northern Canada, purchasing patterns may be altered changing the following characteristics:

- types of goods and services purchased,
- total purchase volumes,
- the regularity and predictability of purchases.

Production of oil or gas will require several activities not undertaken during the exploration phase. These include well completions and servicing, field facilities and oil and gas pipelines.

The construction of facilities will increase total annual expenditures during the development of production facilities, but on-going operating expenditures are not expected to increase greatly above present exploration expenditures levels. The mix of goods and services purchased will also change somewhat due to well completion activities as well as construction and operation of facilities.

The most important change in purchasing patterns brought about by production will be a more predictable and on-going demand for goods and services. Without such an assured level of demand, Northern businesses are generally unable or unwilling to invest capital in plant or equipment for which demand exists only on a year-to-year basis. With production-oriented demand, however, Northern business will be able to justify investments in training, facilities and equipment to provide a much broader range of goods and services than at present.

To date, Northern production experience in Canada has been limited to the on-shore development at Norman Wells. Based on the Norman Wells experience and on projections of offshore facility requirements, the following section provides an indication of the types of goods and services that will be required during the production phase of Northern oil and gas development, along with an assessment of opportunities for Northern supply.

### 3.3.1 Well Drilling and Completions

Production will not only be associated with the same basic drilling operations undertaken during the exploration phase, but will also generate well completion activity and well servicing activity over the lifetime of the completed wells.

Figure 4 provides a useful breakdown of all the inputs that are required to bring an oil well into production. It gives an indication of the sequence of operations, the types of oilfield industries that are required, the relative cost of each input, as well as the capital investment in each business.

#### Completions

In order to bring a well into production, a number of additional operations must be carried out after the cased hole is drilled. These operations are listed below:

- installation of production tubing and packers,
- perforation of the production casing and tubing to permit the flow of oil or gas up the tubing to the surface,
- chemical or physical stimulation of the producing formation to increase the flow of oil or gas (usually by injecting acid or silica sand into a formation), and
- installation of pumping and wellhead equipment (downhole pump, sucker rods, pumpjack, motor, and valves).

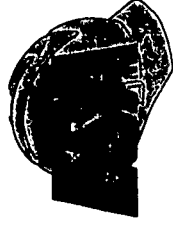
Well completion operations are usually carried out by a service rig which is smaller and less expensive than a drilling rig. Highly-skilled specialists are



Fig. 4

# DEVELOPMENT COSTS OF A TYPICAL CENTRAL ALBERTA OILWELL

A small Canadian independent oil and gas producer drilling a 2000 Metre Glauconitic oilwell, wants to put the well on production. This outline shows the various contractors involved and for what purpose **BEFORE** any oil can be sold from that well.



Prepared by the Energy Services Association  
Red Deer, Alberta

February, 1981 Revised May 1983

**X-Y-Z RESOURCES**  
Geologist manages management of seismic data received from a recent offsetting oil well. He suggests that this trap would extend over to some adjacent land that is available at an up coming land sale and urges management to purchase the land. He also suggests that mineral rights then drill an exploratory well to evaluate.

<p><b>WESTERN LAND SERVICES CALGARY</b> Contracted to bid on land at land sale \$2,000 4 Man-days</p>	<p><b>WESTERN LAND SERVICES</b> (Capital Investment) Contracted to obtain lease from surface land owner \$20,000 \$1,100 3 Man-days</p>	<p><b>SNELL &amp; OS Lund SURVEYS</b> (Capital Investment) Contracted to survey lease and access road \$26,000 \$1,000 5 Man-days</p>	<p><b>KIDD CONSTRUCTION</b> (Capital Investment) Contracted to build lease and access road \$350,000 \$12,000 10 Man-days</p>	<p><b>ROLL'N DRILLING</b> (Capital Investment) Contracted to drill 6,000 foot well \$2,034,000 \$75,000 252 Man-days</p>	<p><b>HECK'S TRUCKING &amp; OILFIELD HAULING LTD.</b> (Capital Investment) Contracted to move drilling rig and related equipment to lease \$800,000 \$10,000 20 Man-days</p>	<p><b>BOB McMURRAY DRILLING CONSULTANT</b> (Capital Investment) Contracted to engineer drilling operations \$25,000 \$7,500 25 Man-days</p>	<p><b>2-SINK TRUCKING</b> (Capital Investment) Contracted to haul water for drilling operations \$100,000 \$6,000 18 Man-days</p>	<p><b>NORTHWEST PIPE &amp; SUPPLY</b> Contracted to supply surface casing \$4,000 3 Man-days</p>	<p><b>ARTHUR'S LIGHT OILFIELD HAULING</b> (Capital Investment) Contracted to haul surface casing to location \$150,000 \$400 1 Man-day</p>	<p><b>MORELLI'S POWER TONG SERVICE</b> (Capital Investment) Contracted to make up and run casing \$70,000 \$600 1 Man-day</p>	<p><b>NORTHERN GEOPHYSICAL</b> (Capital Investment) Contracted to shoot seismic over area to determine best target location \$750,000 \$35,000 70 Man-days</p>	<p><b>CANADIAN FRACMASTER</b> (Capital Investment) Contracted to cement casing \$450,000 \$4,000 3 Man-days</p>	<p><b>PROTEC MUD SERVICE LTD.</b> (Capital Investment) Contracted to supply drilling gels and required chemicals \$18,000 \$15,000 6 Man-days</p>	<p><b>R ROBINSON TRUCKING LTD.</b> (Capital Investment) Contracted to hauling drilling gels and chemicals \$70,000 \$1,500 2.7 Man-days</p>	<p><b>COMPUTALOG</b> (Capital Investment) Contracted to run required open hole electrical logs \$500,000 \$20,000 3 Man-days</p>	<p><b>LYNES UNITED TESTERS</b> (Capital Investment) Contracted to run required drill stem tests \$140,000 \$20,000 2 Man-days</p>	<p><b>VIKING OILFIELD SUPPLY LTD.</b> Contracted to supply production casing \$50,000 \$50,000 1 Man-day</p>	<p><b>GALLANT'S OILFIELD HAULING LTD.</b> (Capital Investment) Contracted to haul casing to location \$80,000 \$1,700 2 Man-days</p>	<p><b>BARBAN POWER TONG SERVICE</b> (Capital Investment) Contracted to make up and run production casing \$70,000 \$1,700 2 Man-days</p>	<p><b>SLURRY CEMENTERS LTD.</b> (Capital Investment) Contracted to cement casing \$450,000 \$10,000 4 Man-days</p>	<p><b>WEL-CAN WELDING</b> Cut off casing \$150 0.3 Man-day</p>	<p><b>DERALD STONE EQUIPMENT LTD.</b> (Capital Investment) Contracted to move drilling rig &amp; equipment off lease \$800,000 \$10,000 20 Man-days</p>	<p><b>GYORKI CONSTRUCTION LTD.</b> (Capital Investment) Contracted to squeeze pits and re-store lease \$350,000 \$12,000 8 Man-days</p>	<p><b>VIKING OILFIELD SUPPLY LTD.</b> Contracted to supply wellhead and production tubing \$25,000 \$25,000 1 Man-day</p>	<p><b>FRENETTE'S TRUCKING LTD.</b> (Capital Investment) Contracted to haul service rig and tubing to location \$250,000 \$1,500 2 Man-day</p>	<p><b>PONCHO OILFIELD SERVICES</b> (Capital Investment) Complete well, swab test Run bottom hole pump and rods \$800,000 \$39,000 52 Man-days</p>	<p><b>DEINES PERFORMING SERVICES LTD.</b> (Capital Investment) Contracted to run cement bond and gamma ray corr. log as well as perforate well \$250,000 \$8,000 3 Man-days</p>	<p><b>CANADIAN OILFIELD STIMULATION SERVICES LTD.</b> (Capital Investment) Contracted to do mud clean-up, acid and acid-frac stimulation job \$225,000 \$8,000 3 Man-days</p>	<p><b>ANDY'S TRUCKING LTD.</b> (Capital Investment) Contracted to move service rig &amp; equipment off location &amp; back to Red Deer base \$250,000 \$1,500 2 Man-days</p>	<p><b>R. GERVAIS OILFIELD CONSULTANT</b> (Capital Investment) Contracted to put well on production \$20,000 \$6,000 20 Man-days</p>	<p><b>NORTHWEST PIPE &amp; SUPPLY</b> Contracted to supply 627 treater &amp; 2 - 500 bbl tank \$51,000 25 Man-days</p>	<p><b>LARSEN &amp; D'AMICO MFG. LTD.</b> Contracted to supply separator with gas run \$15,000 17 Man-days</p>	<p><b>ARTHUR'S LIGHT OILFIELD HAULING</b> (Capital Investment) Contracted to haul treater, 300 bbl. tank &amp; separator to lease \$80,000 \$4,000 2 Man-days</p>	<p><b>BIRD OILFIELD MANUFACTURING</b> Supply a 114 Pump Jack and Base \$30,000 10 Man-days</p>	<p><b>FRENETTE'S TRUCKING LTD.</b> (Capital Investment) Contracted to haul Pump Jack &amp; Base \$60,000 \$1,000 2 Man-days</p>	<p><b>CRANEMASTER EQUIPMENT</b> Contracted to set up Pump Jack \$250,000 \$500 1 Man-day</p>	<p><b>VIKING OILFIELD SUPPLY LTD.</b> Contracted to supply fittings, valves and piping \$15,000 \$15,000 2 Man-day</p>	<p><b>WALKING EAGLE ENTERPRISES</b> (Capital Investment) Contracted to build fire walls etc. around tanks \$150,000 \$2,000 4 Man-days</p>	<p><b>TRI-ALTA</b> Contracted to put in power to lease \$6000 9 Man-days</p>	<p><b>HUGHES CONSTRUCTION LTD.</b> (Capital Investment) Contracted to supply labour needed to tie in well &amp; battery \$115,000 \$9,000 40 Man-days</p>	<p><b>WHIRLWIND INDUSTRIES LTD.</b> (Capital Investment) Contracted to sand blast and paint tank and other equipment \$55,000 \$6,000 10 Man-days</p>	<p><b>ACE FENCING LTD.</b> Contracted to supply material and fence in the location \$7,500 \$4,000 9 Man-days</p>	<p><b>D. BRANSON PUMPER SERVICE LTD.</b> (Capital Investment) Contracted to check and supply information daily \$100,000 \$3,000 12 Man-days</p>	<p>17m<sup>3</sup> of oil per day Being sold to Pipe line terminal at Eckville or Rimbey</p>
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Capital Investment \$9,965,500 ★ Contract Price \$536,150 ★ 692 Man-days

Total Compensation Paid to Employees \$197,700

required to perform these and other operations associated with well completion. A separate breakdown of completion costs is not available for Northern Canada, but the PSAC well cost study does provide such data for three wells in Northern Alberta. The completion costs for a 2100 metre sour oil well in the Rainbow Lake area of Northwestern Alberta are shown in Table 3-7.

Completions in Northern Canada will have a somewhat higher transport component than is reflected by costs in Table 3-7, due to the remoteness of the region. It should be noted that components of oil well completion are compiled on an installed cost basis, which includes services as well as materials. Nevertheless, it is evident that completions are very materials-intensive, as casing, tubing, wellhead and pumping equipment account for more than 60 percent of the total cost. The potential for Northern value-added, therefore, will be less than during the drilling phase, which is more service-intensive.

On the other hand, an on-going schedule of well completions should increase opportunities for Northern participation. Shehtah Drilling Ltd., a joint venture of the Dene and Metis business development corporations and Esso Resources, operated one drilling rig and one service rig at the Norman Wells project. This is only one example of valuable experience that has been acquired in the past on Northern energy projects which could be applied in the future.

### 3.3.2 Well Servicing and Workover

Over the lifetime of a producing well, periodic servicing and workovers may be required to maintain or increase production. Well servicing involves swabbing, dewaxing, repairing or replacing sucker rod pumps, sucker rods, production tubing and packers. These operations are carried out by a service rig, while larger workover rigs are employed to make more extensive repairs to a well including sand cleanout, sand control measures, plug-back, casing repair, directional and deeper drilling, and fishing to remove undesirable objects from the well bore.

**Table 3-7**  
**Oil Well Completion Profile**

<u>Item</u>	<u>Cost</u> <u>(000\$)</u>	<u>% of</u> <u>Total</u>
Road and site preparation	1.0	0.3
Rig and misc. transport	17.0	5.4
Logging (open hole & cased)	5.9	1.9
Cementing and cementing services	26.0	8.2
Casing and attachments	67.1	21.2
Tubing and attachments	31.6	10.0
Wellhead	32.0	10.1
Other equipment and services	12.4	3.9
Engineering supervision & admin.	9.7	3.1
Service rig	38.0	12.0
Stimulating & perforating	12.3	3.9
Pumping equipment	62.8	19.9
<b>TOTAL</b>	<b>315.8</b>	<b>100.0</b>

Source: Petroleum Services Association of Canada, Well Cost Study, July, 1985. Based on Rainbow Lake, Alberta sour oil well.

Most of the production wells drilled in the North will be of the directional type, where sucker rod pumps cannot be used for artificial lift. Instead, gas lift would be employed, which has a requirement for the supply and periodic replacement of gas lift valves.

Oil in the Mackenzie Delta/Beaufort region reportedly contains very little paraffin and sulphur, so dewaxing and corrosion-related workovers of offshore wells will be less frequent. Oil wells in the Norman Wells field, however, do require regular dewaxing.

Sand-related workovers of offshore wells are expected to be required about once every two years and take about one to two weeks per well. Well bore stimulation (acidizing and fracturing), while performed occasionally in offshore wells, is more common with onshore production activity.

In comparison to well completions, well servicing and workover activities are more service-intensive with a much higher potential for Northern value-added per dollar of expenditure. These activities are also sustained over a much longer time frame since the lifetime of a producing oil well is typically in the order of 25 years.

Well servicing workovers are seen as a significant opportunity for Northern business when production does eventually come on-stream. This has been recognized before as evidenced by the following statement from the Canadian Association of Oil Well Drilling Contractors in 1978:

"As production develops from exploration on the Mackenzie Delta, the Arctic Islands and off the Atlantic Coast, it will follow inevitably that places like Inuvik, Resolute and Frobisher Bay will become operating bases for service rig companies" (CAODC, 1978).

#### Northwestern Alberta Oilfield Development

In order to identify potential oil well servicing and supply opportunities for Northern businesses during production, we profiled a mature oilfield development

in the Rainbow Lake - Zama - High Level area of Northwestern Alberta. This area is comparable to the study region in the following respects:

- Remoteness - It is too far away from existing oil service centres to be easily supplied by these locations, thus encouraging self-sufficiency in oilfield goods and services.
- Scale - Oil production from this region is approximately 25,000 cubic metres per day. While this scale is much larger than that anticipated for initial Beaufort production, it could be approached by the end of the century, given the development scenarios discussed in Chapter 2.

As a combined result of the remoteness of the region and its scale of oil production, virtually all types of oilfield goods and services required are available within the immediate area of Rainbow Lake, Zama and High Level. The greatest concentration of oilfield companies occurs in High Level due to its more developed infrastructure and its central position in the region.

The telephone directory for the High Level area indicates that it is well represented by firms providing the following goods and services:

- surveying
- oilfield construction and roadbuilding
- truck transport (muds, chemicals, water, drilling rigs, tanks, etc.)
- air transport
- camp rentals
- welding and related supplies
- well drilling and servicing
- power tongs
- perforating
- stimulation
- testing
- logging
- safety and consulting
- oilfield tools
- wellhead equipment
- wireline and hot oil service (dewaxing)
- electrical and mechanical installation and maintenance
- cementing
- inspection of drill pipe and collars, pipe straightening
- equipment rentals, including:

- 400 and 210 barrel tanks
- pumps, compressors and generators
- BOP's
- boilers
- drill pipe and collars
- vehicle and construction equipment rental
- incinerators
- safety equipment

A production decision in the study region will not automatically mean that all of the preceding goods and services can immediately, or even eventually, be supplied locally. It has taken almost 20 years for oilfield supply and service industry in Northwestern Alberta to develop to its present level of self-sufficiency. The industry in that part of the province is supported by extensive on-going exploration drilling and seismic work, as well as by producing wells with a combined capacity of about six times that of Norman Wells. If Beaufort production were to occur at roughly the same scale as Norman Wells, the initial development of the oil field supply and service industry in the North would be much more modest than in the High Level area. For example, only two drilling rigs were required to drill the 164 wells at the Norman Wells field over a three-year period, and only two service rigs were assigned to complete the wells and carry out ongoing well servicing. Therefore, while a diversity of supply opportunities may exist over the long-term, short to medium-term production related opportunities can be expected to be less extensive in number.

Nevertheless, many of the items on the preceding list will provide fairly immediate opportunities for Northern businesses when production does occur. Equipment rental businesses, in particular, are reported to be lucrative by oil company sources in Northwestern Alberta. Northern business involvement in specialized operations such as logging, testing, perforating and stimulation could probably best be achieved through joint ventures with established southern companies. This would facilitate the transfer of technology and assist in raising the required capital. As the Northern supply and service industry matures, Northern businesses will be able to fulfil more of the oil industry's needs without assistance from southern-based companies.

### 3.3.3 Gathering Systems and Processing Plants

Production of oil and gas will also require the construction of small-diameter pipelines to collect the product, and a plant to carry out some form of primary processing prior to transport via pipeline to southern Canada. As gathering system inputs will be fairly similar to those of pipelines, discussion of their purchasing requirements is covered under the heading of pipelines, in the next section.

Processing of natural gas or oil is carried out to remove impurities or byproducts that are undesirable in pipelines due to their corrosion, erosion or flow constraining characteristics. In the case of natural gas, processing is carried out to remove excess water, carbon dioxide, hydrogen sulphide and liquid hydrocarbons, while oil is processed to remove water, sand, and gases. Processing plants also include pumping and compression facilities which are required to re-inject water and gases into the reservoir in order to maintain reservoir pressure and dispose of produced water.

Processing plants are capital-intensive facilities requiring large proportions of specialized inputs which are generally not available in Northern Canada. These inputs include the following:

- pipe and fittings,
- tanks and treaters,
- power boilers,
- structural steel,
- valves,
- pumps and compressors,
- motors,
- electrical equipment, and
- instrumentation.

For the Norman Wells processing plant, a series of 64 modules were pre-fabricated in Edmonton prior to assembly on-site. This pattern will likely be repeated should processing plants be constructed in Northern Canada in the future.

Substantial opportunities for Northern business participation in plant construction will still exist, however, as demonstrated by the recent experience at Norman Wells, where a Northern content totalled 18 percent of the total project cost. Table 3-8 provides a profile of inputs to an oil processing plant in Alberta, as a detailed breakdown of inputs to the Norman Wells plant was not available.

### 3.3.4 Norman Wells

Development and operation of the Norman Wells project gives a good appreciation of the scope of work associated with a production scenario. Characteristics of the Norman Wells project are discussed below under project development and project operation categories.

#### Project Development

Construction of the Norman Wells Esso Resources crude oil project with an output of 4,000 cubic metres per day was begun in 1982 and completed in 1985. This project involved a number of major components as listed below:

- the construction of six artificial drilling islands in the Mackenzie River,
- the drilling and completion of 164 development wells,
- a pipeline gathering system,
- a central processing plant,
- utility and communications infrastructure, including a new electrical power generation system, fuel gas processing facilities, domestic water supply, and a satellite communications system.

The total project cost was about \$530 million. Disbursements to Northern businesses to the end of May 1985 (when the project officially opened) totalled about \$97.5 million, or more than 18 percent of the overall project cost.

Esso Resources breaks down these Northern business disbursements into four major categories in its 1984 socio-economic annual report for the project as shown below.



<u>Item</u>	<u>Million \$</u>	<u>% Total</u>
Consulting	0.8	0.9
Construction	61.2	66.2
Equipment, materials and supplies	21.7	23.4
Leasing	<u>8.8</u>	<u>9.5</u>
TOTAL	92.5	100.0

Work undertaken by Northern firms under each category is useful as we examine possibilities for production related participation in the future. Examples of Northern supply successes achieved in Norman Wells are provided below:

#### Consulting

- conducting socio-economic surveys
- producing a project film
- typesetting, printing and distributing the "Esso North" newsletter
- providing travel services

#### Construction Services

- preparing and maintaining leases, roads and docks
- constructing rock rings for production islands in the Mackenzie River
- installing the infield pipelines and central processing plant's control building
- piling
- painting
- transporting:
  - modules for the central processing plant
  - freight and personnel
- electrical, mechanical and insulation work
- well drilling and servicing
- installing and operating camps and offices, including such support services as:
  - laundry
  - refuse management
  - secretarial
  - security
- hotel services
- advertising

#### Materials and Equipment

- supplying and assembling heavy equipment and vehicles
- construction materials

**Table 3-8**  
**Oil Processing Plant Profile**

<u>Component</u>	<u>% of Total Cost</u>
<b>MATERIALS</b>	
Site Materials (gravel)	1.0
Pipe	9.3
Fittings and fab. pipe	1.9
Tanks	6.1
Boilers (process)	0.5
Steel - piles and structural	1.5
Structural steel and buildings	1.8
Fencing	1.1
Heating and ventilating	1.1
Valves	8.2
Pumps and Compressors	11.0
Treaters	4.6
Vessels (process)	2.2
Flare stack	1.4
Engines and motors	0.8
Electric equip. - misc.	1.2
Panels - control, alarm	1.6
Insulation	1.3
Pipe coating	0.6
Paint, coating, insulation	1.2
Instruments - electric, pneumatic	1.4
Safety equipment	0.7
Power line	1.0
Communications equipment	0.7
Subtotal	62.1
<b>SERVICES</b>	
Land - rentals, fees, claims	1.5
Fees, permits	0.3
Camp	2.1
Equipment rentals	0.5
Location Preparation/cleanup	0.9
Transportation	1.0
Engineering and drafting	2.9
Inspection and expediting	2.0
Quality control	1.2
Surveying	1.5
Dirtwork	1.4

...continued

**Table 3-8 (continued)**  
**Oil Processing Plant Profile**

Installation:		
	- civil	2.1
	- mechanical	4.6
	- electrical	2.8
	- equipment	0.4
Environmental		0.3
Install pipeline		7.2
Road construction		4.3
Testing equipment		0.9
Subtotal, services		<u>37.9</u>
<b>TOTAL</b>		<b>100.0</b>

Source: Canadian Resourcecon (1983) Ltd.

Note: Includes gathering system.

- office supplies
- lumber
- electrical supplies
- automotive supplies

Leasing

- equipment, vehicles and an office building

Altogether, 212 businesses received contracts in excess of \$1,000 each in connection with the project by the end of 1984. The regional distribution of Northern business disbursements was as follows:

Norman Wells	41%
Hay River	19%
Yellowknife	19%
Inuvik	15%
Yukon	4%
Other	2%

Project Operation

Annual operating expenditures for the Norman Wells project are expected to be in the order of \$30 million. While much of this amount will be in the form of direct wages and salaries, there will be opportunities for local firms to supply a variety of goods and services.

Esso has contracted out many of the operating and maintenance tasks normally performed in-house in southern Canada including those listed below:

- marine operations and maintenance,
- welding,
- pipefitting, and
- general oilfield maintenance.

A list of operating inputs to the project, purchased from Northern businesses during the first nine months of 1985, is provided below. The total value of these goods and services, which are ranked in descending order of value, was approximately \$4.5 million.

- Camp rental
- Heavy equipment & vehicle parts, service and rental
- Welding supplies & service
- Building supplies and construction
- Apartment rental
- General & civil contractors
- Plumbing, gas fitting, heating contractors
- Marine contractors
- Oilfield services
- Office rental
- Trucking, rock haul and purchase, road construction
- Telephone and telex
- Air charters (passenger and freight)
- Janitorial services & laundry
- Moving, transportation, freight
- Painting supplies & services
- Electrical contractors
- Licences & permits
- Instrumentation maintenance
- Mechanical & electrical contractors
- Miscellaneous - office supplies, etc.
- Industrial supplies
- Secretarial services
- Film rental - camp
- Glass supplies
- Advertising and public relations

Camp rental is currently the largest operational purchase made from regional businesses, as many Esso workers are residents of other Northern communities and require accommodation when on-shift at Norman Wells. Oilfield services are well down the list in terms of relative value, but this component will probably provide a substantial increase in Northern business expenditures within a few years, as oil well servicing and workovers are required.

In addition to the foregoing items, a number of other business possibilities have been suggested for the Norman Wells project as identified below:

- oilfield equipment supplies (gas lift valves, production tubing, valves),
- electric motor rewinding,
- wireline operation,
- machine shop services, and
- radio repair service.

A more detailed listing of potential Northern business opportunities associated with the ongoing operation of Norman Wells has been compiled by Esso, as shown in Table A-4 of Appendix A. It should be noted that a few of these opportunities actually relate to construction rather than on-going O & M.

### 3.3.5 Offshore Production

Offshore production will require some special facilities in addition to those described earlier. Specifically, these will include the following:

- production islands or structures,
- additional and expanded support bases, and/or
- deep water port facilities.

Each of these specialized components of offshore oil and gas production is discussed in the following paragraphs.

#### Production Islands

A variety of production platforms have been proposed for the Beaufort Sea area, but in the near-term some form of dredged island will probably be used in the shallow offshore. Production islands need to be somewhat larger than exploratory islands and provided with a more permanent form of slope protection. This protection could be provided by rock and gravel, concrete or steel caissons. Northern business involvement in island construction would likely be limited to support vessel operation and the provision of rock. Dredging, which is a major component of island construction, will continue to be provided by outside operators, while caissons will likely be prefabricated offsite. The construction of permanent structures for accommodation and materials storage on production islands will, however, provide expanded opportunities for Northern participation.

#### Support Bases

With the development of offshore oil and gas production systems, additional and expanded base facilities will be required. Northern businesses may not only

participate in the construction of these base facilities, but could also play an increasingly important role in their operation. Rather than each company continuing to provide all of its logistical requirements in-house, these functions may be obtained from a third party who supplies several companies. Such an arrangement is common in the North Sea where "base operators" provide a variety of goods and services to offshore operators such as those listed below:

- office accommodation,
- transportation,
- equipment,
- stevedoring labour,
- yard and bulk material storage,
- customs documentation,
- material control,
- wharfage, and
- communications facilities

Similarly, in the Prudhoe Bay oilfield of Alaska there is also a sharing of facilities and services. These include a power plant and other utilities; docks; airstrips; fuel, water and personnel transport; and catering services. While the sharing of some of these functions may be acceptable to offshore operators, they will likely continue to operate their own maintenance facilities to provide emergency repairs and warehousing for critical parts in order to avoid costly downtime. Scheduled maintenance services and warehousing for items used on a scheduled basis, however, could be provided by a third party. Operators would likely continue to provide their own accommodation and office facilities.

#### Deep Water Port Facilities

In order to efficiently handle the large volumes of freight associated with the construction of field facilities and the on-going operating requirements of offshore oil and gas production, a deep-water harbour could eventually be required in the Beaufort region. Several sites have been identified, including King Point in Yukon. This multi-user facility, which would initially consist of a dredged

harbour, air strip and dock, is expected to eventually grow to include a variety of facilities and services as listed below:

- Port - dock, harbour, mooring basin, warehousing, staging area, etc.
- Airport - all weather runway, hangar, air terminal, helicopter strip, maintenance facilities, etc.
- Communications - meteorological, ice forecasting, community, navigation, search and rescue, etc.
- Fuel - marine, aviation, community.
- Fabrication - materials, shop, trades.
- Administration - offices and operation centre.
- Community - accommodation, amenities.
- Site Services - water, heat, light, etc.

It is estimated that the first phase of the water port project would cost up to \$100 million. Northern businesses would be in a position to supply a substantial proportion of construction services for this development, based on their recent experience with the Norman Wells project and the resources that are available in Yukon and the NWT. Operation of a deep water port would also provide business opportunities, both in terms of port operation and oilfield supply and service industries to businesses in the adjacent area.

### 3.3.6 Pipeline/Development and Operation

From the discussion in Chapter 2, it is apparent that when large-scale oil and gas development does proceed in Northern Canada, very large capital expenditures will be made on pipeline construction, providing major opportunities for Northern business participation.

#### Pipeline Development

Pipeline construction involves a number of major work components, as listed and described briefly below:



Support facility construction - including permanent access roads, snow roads, station pads, stockpile and camp sites, airstrips and wharves for supply vessels.

Right-of-way clearing and grading - including tree cover removal by bulldozers and slashing crews and then right-of-way grading to enable access to vehicles and equipment.

Pipeline installation - including ditching, bending and line-up, pipe welding, wrapping and lowering, backfilling, and testing. This is the major component of pipeline construction and is carried out by specialist mainline contractors.

Right-of-way clean-up - removing any construction debris and restoring and revegetating the right-of-way.

Compressor/pump and metering station construction - these stations will be largely prefabricated in modules, but will still require substantial on-site construction services such as those listed below:

- site survey and preparation
- construction of the foundation
- installation of:
  - valves, fittings and piping
  - heat exchangers, fluid separators, cooling towers
  - station buildings
  - gas turbines
  - electric motors
  - compressor or pump units
  - transformer substations (for electric motor supply)
  - electrical equipment
  - controls and instrumentation
  - computer and communication facilities
  - tie-in and connection of piping and equipment
  - power connection, tie-in with main line pipe

The recently-constructed Norman Wells pipeline provides a useful model for Northern pipeline commodity requirements. However, only a rough breakdown, based on pre-project cost projections, was available for the project's construction and operating phases. A number of other Northern pipeline proposals were therefore consulted as sources for this information. The Polar Gas application provides one of the most detailed pipeline cost breakdowns, as summarized in Table 3-9.

**Table 3-9**  
**Polar Gas Pipeline Profile\***

<u>Component</u>	<u>Cost</u> <u>1984 \$ '000</u>	<u>% of</u> <u>Total</u>
<u>Pipeline Materials</u>		
Right-of-way Cost	5,203	.18
Pipe	723,980	25.43
Int. Coatings	12,814	.45
Ext. Coatings	67,455	2.37
Valves & Fittings	45,940	1.61
Misc.	<u>131,210</u>	4.61
Sub-total	986,602	34.66
<u>Pipeline Installation</u>		
Equipment	272,780	9.58
Fuel	69,912	2.46
Expendables	12,405	0.44
Tools	11,213	0.39
Labour	466,090	16.37
O.H. & Profit	125,466	4.41
Catering	<u>37,576</u>	1.32
Sub-total	995,442	34.97
Pipeline Total	1,982,044	69.63
<u>Station Material</u>		
Compressor Assembly	31,750	1.12
Refrig./Htg. Assembly	27,855	0.98
Meter Assemblies	3,110	0.11
Misc.	1,265	0.04
Buildings	45,321	1.59
Utilities	<u>1,000</u>	0.04
Sub-total	110,301	3.87

...continued

Table 3-9 ( continued )

<u>Component</u>	<u>Cost 1984 \$'000</u>	<u>% of Total</u>
<u>Station Construction</u>		
Equipment	9,565	0.34
Fuel	1,270	0.04
Expendables	7,975	0.28
Tools	2,410	0.08
Labour	71,730	2.52
O.H. & Profit	27,815	0.98
Catering	9,605	0.34
Sub-total	130,370	4.58
Station Total	240,671	8.45
<u>Logistics Equipment</u>		
Camps & Buildings	3,115	0.11
Equipment	22,267	0.78
Miscellaneous	6,800	0.24
Sub-total	32,182	1.13
<u>Logistics Operation</u>		
Fuel	5,114	0.18
Tools	1,080	0.04
Labour	21,015	0.74
Catering	1,609	0.06
Sub-total	28,818	1.01
<u>Transportation</u>	214,978	7.55
Logistics Total	275,978	9.70

...continued

Table 3-9 ( continued )

<u>Component</u>	<u>Cost 1984 \$ '000</u>	<u>% of Total</u>
<u>OTHER FACILITIES</u>		
<u>Materials and Equipment</u>		
Buildings	7,267	0.26
Maintenance Equipment	25,668	0.90
Aircraft	11,200	0.39
Communication costs	21,208	0.75
Sub-total	65,343	2.30
<u>Construction</u>		
Equipment	839	0.03
Fuel	120	---
Expendables	719	0.03
Tools	180	0.01
Labour	6,053	0.21
O.H. & Profit	2,337	0.08
Catering	779	0.03
Sub-total	11,027	0.39
<u>Engineering</u>	177,176	6.22
<u>Inspection</u>	94,316	3.31
GRAND TOTAL	2,846,500	100.00
<u>Items Common to Several Categories</u>		
Equipment (Construction & Logistics)	305,451	10.73
Fuel	76,416	2.68
Expendables	21,099	0.74
Tools	14,883	0.52
Labour	564,888	19.85
O.H. & Profit	155,618	5.47
Catering	49,569	1.74
Buildings	52,588	1.85

\*This profile is for a 914 mm diameter, buried natural gas pipeline running 2,120 km from the Mackenzie Delta to Edson, Alberta.

Source: Polar Gas, Polar Gas Application, Canadian Content Assessment, Volume X, Appendix B, 1985.

Materials for the pipeline, compressor stations, and other facilities are seen to account for more than 40 percent of the total project cost shown in Table 3-9. Virtually all of these materials will likely be sourced from suppliers in southern Canada. Similarly, most of the pipeline installation, which accounts for another 35 percent of the project, will likely be handled by major construction firms from the south. Significant opportunities for Northern business participation will, however, exist in several areas as follows:

- access road and wharf construction;
- right-of-way clearing, grading, and cleanup;
- station construction: site work, building construction, piping pre-fabrication;
- truck, barge, and air transport;
- camps and catering;
- manufacture of concrete weights, timber pipe skids and other wood products;
- supply of consumables (fuel, industrial gases); and
- equipment leasing and maintenance.

A more detailed listing of potential Northern business opportunities as identified by Polar Gas is provided in Table A-5 of Appendix A.

#### The IPL Project: Norman Wells to Zama, Alberta Oil Pipeline

The Norman Wells pipeline project provides a relevant case study for Northern participation in terms of the policies and programs used to encourage regional business content, the amount of Northern content actually achieved, and the types of goods and services sourced from Northern suppliers.

Prior to the start of construction in 1982, IPL identified a number of work packages suitable for Northern involvement and set a target value of \$61.5 million for contracts with Northern companies. Most of these work packages would traditionally have been included in the main pipeline but, in order to maximize Northern business participation, IPL separated these items from the mainline contracts and tendered or negotiated them directly with Northern companies. Examples of such work packages are listed later in this section.

In identifying opportunities for Northern business participation, IPL noted that mainline construction would be of short duration and require specialized skills and equipment for which no market would exist following completion of the pipeline. Emphasis was therefore placed on local firms providing construction services that would utilize existing business capabilities or new capabilities for which other business opportunities would exist following pipeline construction.

IPL implemented a number of programs in order to maximize Northern participation. These programs are summarized below.

- Preference was given to Northerners bidding on certain components of the project through protected regional bids and/or negotiations.
- A community consultation program was undertaken to provide as much advance information as possible on potential business opportunities.
- Special assistance was provided to Northern firms wishing to participate in the project, including:
  - assistance regarding interpretation and preparation of tenders and purchase documents,
  - assistance on the community level to native and other groups,
  - waiver of bid and performance bonding requirements for most contracts,
  - encouragement of the formation of joint ventures or consortia to facilitate maximum Northern participation,
  - prompt payment to firms and advancement of progress payments to those experiencing temporary cash flow difficulties, and
  - assistance in the financial management of firms experiencing difficulty in accounting techniques.

In total, 330 Northern companies were awarded 1,584 contracts with a total value of \$68.4 million. This amounts to more than 18 percent of the total project cost of \$366 million. Coincidentally, this Northern content percentage is

the same as was achieved on Esso's Norman Wells project. Approximately \$40 million of the preceding figure was awarded directly by IPL to Northern firms, while the remaining \$28 million indirectly accrued to Northern companies through subcontracts to mainline pipeline contractors and subcontractors.

NWT firms in the immediate project area obtained about 42 percent of the contract value which accrued to Northern firms. The following construction services were negotiated directly between IPL and firms in the immediate project area:

- catering and accommodation services
- rough lumber supply
- camp and stockpile site security services
- expediting services
- right-of-way clearing, restoration, and revegetation
- facility site development and clearing
- mobile home construction
- sand-bag filling & stockpiling and transport
- concrete weight manufacture and transport
- warning sign manufacture
- pump-station and facility fencing/painting services
- pile-driving services
- utilidor construction services
- kilometre-post marker manufacture
- general maintenance services
- helicopter services
- charter air services
- water taxi services
- right-of-way wildlife monitoring
- electrical/mechanical services

In addition, project area firms provided the following services to mainline contractors:

- camp catering services
- fuel supply/transport
- gravel haul
- helicopter services
- accommodation services
- hardware and building supplies
- welding services
- general transport/freight services
- electrical/mechanical services

- concrete/civil works
- site development

Other Northern firms outside the immediate project area supplied about half of the total Northern content to the project. These firms were able to supply some higher-order services not available in the smaller project area communities. Construction services supplied to IPL by these businesses included the following:

- right-of-way clearing
- freight expediting
- accommodation services
- aerial wildlife surveys
- helicopter services
- vehicle leases
- fuel supplies/transport
- safety supplies
- socio-economic consulting services
- camp and stockpile site development
- concrete weight manufacture/transport
- warehouse/office construction
- staff residence supply/installation
- lumber supply/transport
- charter and scheduled air services
- barge dock supply/installation
- fuel tank supply/installation
- office lease
- equipment barging/transport
- equipment lease
- firefighting kits
- personal survival kits
- inspectors tools
- audio-video productions
- legal survey services
- concrete/civil works
- electrical/mechanical services

NWT firms outside the immediate project area also were involved in activities related to mainline construction as follows:

- general transport/freight services
- fuel supply/transport
- propane supply
- accommodation services
- consulting services



- legal services
- hardware and building supplies
- equipment and parts supply
- vehicle lease
- vehicle repairs/parts supply
- heavy equipment leases
- safety and first-aid supplies
- charter and scheduled air services
- equipment barging services
- pump-station
  - earthworks
  - concrete works
  - mechanical, electrical, civil works

Northern content of the IPL pipeline has been classified into five general categories, as shown below. Of these, construction services of the types shown in the foregoing lists represented the major Northern input to the project, followed by material and supplies.

Northern Business Content of Norman Wells to Zama Pipeline

	<u>(\$M)</u>	<u>% Total</u>
Administrative	1.15	1.7
Contract Services	39.12	57.2
Equipment & Leases	5.56	8.1
Material & Supplies	14.93	21.8
Transport Services	7.65	11.2
TOTAL	<u>68.42</u>	<u>100.0</u>

A complete listing of the types of goods and services included under each heading is provided in Table A-6 of Appendix A.

Pipeline Operation

The Norman Wells pipeline will cost about \$7.5 million per annum to operate and maintain, of which the largest component will be accounted for by wages, salaries and fringe benefits. Based on information supplied by IPL, it appears that disbursements to Northern businesses will run at about \$2 million annually.

An earlier estimate of operation and maintenance expenditures was broken down as follows:

	<u>% Total</u>
Property taxes	12
Salaries & Wages	20
Power and fuel	10
O&M supplies and services	22
Helicopter for remote maintenance	6
Aircraft for line patrol	1
Insurance	6
Communications	3
Business, vehicle and other licences	-
Contingency	20

Source: IPL, Norman Wells to Zama Pipe Line,  
Discussion Material for the National  
Energy Board, May 1982.

Operational and maintenance supplies and services will constitute the largest source of Northern business revenue during the operational phase, followed by fuel, helicopter and aircraft charter, insurance and communication. Included under the heading of operational and maintenance supplies and services would be such items as welding supplies and service, vehicle repair, and industrial supplies. Overall, it is estimated that almost 90 percent of these expenditures will accrue to NWT companies. This is a much higher percentage than the Northern content achieved during the construction phase (18 percent).

#### 4.0 OIL AND GAS INDUSTRY SUPPLY CHARACTERISTICS

An important part of this study included face-to-face interviews which were carried out with Northern suppliers, oil and gas industry representatives and government officials. These interviews provided valuable information concerning the successes and/or failures experienced by Northern businesses during their attempts to penetrate the oil and gas industry market. Furthermore, it provided the Study Team with an understanding of concerns and problems experienced by oil companies when dealing with Northern businesses.

To effectively determine realistic opportunities for increased Northern content and to recommend action which will enhance the ability of Northern companies to capitalize on these opportunities, it was considered important to research the successes and problems experienced in the past. This chapter reports on the past performance of Northern suppliers vis-a-vis the oil and gas industry, the extent to which purchases have been made from these Northern suppliers and the relationships between Northern suppliers and the oil and gas industry.

Conclusions are described which relate to recent supply experience and these conclusions are applied directly during the analysis of future opportunities in Northern Canada.

##### 4.1 NORTHERN BUSINESS CHARACTERISTICS BY SECTOR

Interviews focussed, in part, on the success, problems and constraints experienced by Northern businesses during their dealings with the oil and gas industry. Results of our findings on these subjects are summarized by principal industry sector in the following paragraphs. A detailed inventory of the types of business resources available in major communities of the study area is provided in Appendix B. Figure 5 shows the major surface transportation linking communities within the study region as accessibility to areas of oil and gas activity is an important consideration in assessing Northern business supply capability.

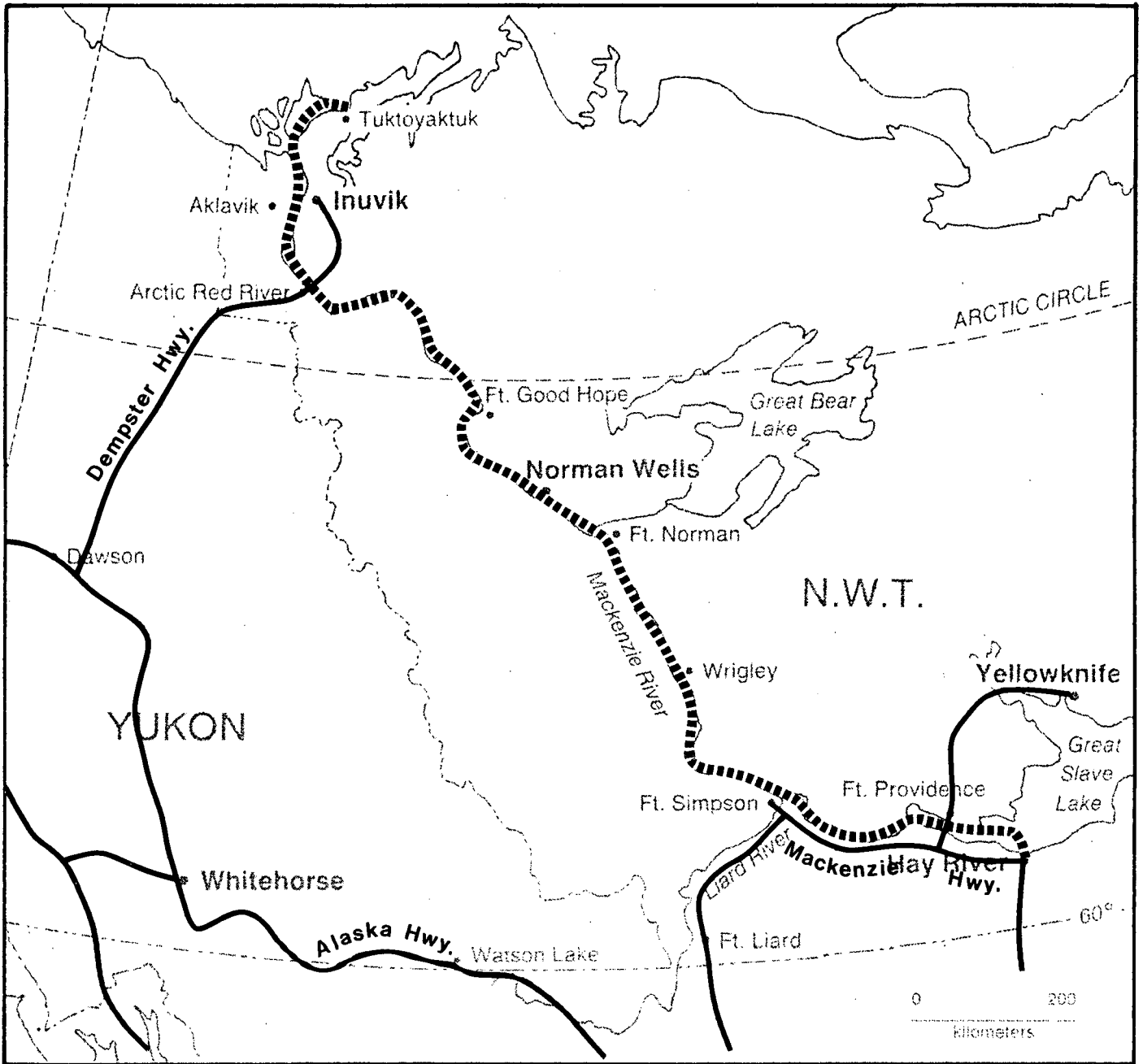


Fig. 5 TRANSPORTATION ROUTES

Legend:  Highway  
 Barge Route

#### 4.1.1 Construction/General Contractors

A total of nine construction and general contracting firms were interviewed during the study. These interviews were undertaken in Yellowknife, Whitehorse, Hay River, Inuvik, and Tuktoyaktuk. As indicated in Appendix B, the general contractors that operate within the study region, provide a comprehensive range of services to oil companies. Their success, however, is attributed to three main criteria: their location relative to oil company activities, their size (i.e., available equipment, manpower, and bonding levels, etc.) and their overall marketing efforts. A number of characteristics became evident during the course of the Study Team's research. These are summarized below:

- The large general contractor companies (i.e., those that obtain gross revenues of \$10.0 to \$20.0 million annually and have bonding levels of a minimum of \$3.0 to \$5.0 million) prefer that contracts are not broken down into smaller bid packages. Smaller contractors firms, in contrast, prefer that bid packages are kept within their current bonding levels.
- General contractors have either been very successful in obtaining work, or have completely missed out on opportunities. The key to success lies initially in the ability of a company to obtain the first contract. Successful companies report that five to ten percent of their revenues annually are from oil companies. Companies involved in the Norman Wells expansion project obtained contracts that contributed 25 to 30 percent of gross revenues. The most successful contractors interviewed were those operating from Tuktoyaktuk where revenues were based almost entirely on oil company contracts.
- Contract values ranged from a low of \$50,000 for office remodeling work to a \$5.0 million contract for supplying a pumping station building package at Norman Wells. The majority of general contractor contracts fall within the \$250,000 to \$1.0 million range.

- General contractors prefer to work directly for oil companies rather than for their drilling contractors since most oil companies pay their receivables within 30 days. This is not as critical for the larger companies as it is for the small contractors.
- In Yukon, a number of contractors who worked on some exploration programs experienced major difficulties in obtaining full payment for their services; this has led to some reluctance by some companies to pursue additional oil industry work.
- Almost all contractors indicated that oil companies do not perceive them as having sufficient capability to perform large contracts for oil-related projects.
- The most frequent statement by contractors was to "just give us a chance to bid". Many of the contractors interviewed were often not aware that tender calls had been requested, even though they were registered with the oil companies in their business directories.
- Smaller contractors experience more difficulty in determining who are the appropriate contacts in the oil company head offices than do the larger companies. Many of the larger contractors visit Calgary for business development purposes, and/or maintain offices there.
- General contractors tend to prefer open bidding, although they are also quick to point out that the oil companies should be allowed to conduct their businesses in their own manner and without government direction.
- After bidding unsuccessfully on tenders, a number of contractors indicated that there was no debriefing provided by the oil companies, although most contractors did not specifically request a

debriefing. These contractors are keen to maintain their relative competitiveness within the business and are therefore always interested to know how they are positioned when compared to other bids and contractors. For the most part, contractors located in Tuktoyaktuk and Inuvik received debriefings more regularly than contractors located in other areas of the study region, although the major operators indicated that they will comply with debriefings if requested by the companies concerned.

- Almost all contractors indicated that more time is required to complete tender documents. In part, this is due to Northern contractors being less familiar with oil company tender documents than their competitors to the south.
  
- The major oil companies are perceived by Northern general contractors as being fair businessmen to work with, and while expectation levels may have been too high initially (i.e., prior to the start of the Norman Wells expansion project), most companies are looking forward to increased opportunities associated with further oil and gas development and production in Northern Canada.

#### 4.1.2 Supply Companies

Supply companies interviewed represented five major types of equipment and product lines. These companies retailed heavy equipment and parts, building materials, welding gases, industrial cleaning supplies, and work clothes and garments. A total of eight supply businesses were interviewed in Whitehorse, Hay River, Inuvik and Ft. McPherson during the course of the study. Many of these businesses retail directly to the oil companies and to general contractors who are working on contracts for oil companies. In this latter situation, it is difficult to measure indirect sales since suppliers are often unaware of the end user. The provision of building supplies is a typical example of indirect sales to the oil companies.

The major results of interviews with supply companies are provided in the following paragraphs.

- Northern supply companies find it difficult to compete with southern suppliers who have well-established supply channels to the North.
- Most Northern suppliers feel that they can be very competitive with freight costs, particularly on the Dempster Highway, but often feel that their costs are not treated on an equal F.O.B. basis to the final destination point. Suppliers in Whitehorse indicate that they can compete with southern suppliers on a time basis for all freight movements that are hauled by truck from southern destinations.
- A location in Tuktoyaktuk or Inuvik is considered to be a major requirement in supplying equipment and materials to the oil companies.
- The more aggressive companies have established operations in the Beaufort area or intend to do so in the future.
- It was mentioned that purchasing arrangements that originate from buyers in Tuktoyaktuk tend to be more personable than those that are handled from Calgary. The former are usually preceded by an inquiry telephone call to confirm availability and then are followed by a purchase order. Orders from Calgary are usually received via Telex without any advance notice. This more personable approach from buyers in Tuktoyaktuk is explained, in large part, by the fact that Northern suppliers that deal with oil companies have either been to the Beaufort on marketing trips or, through repeat business, are known on a first name basis.



- There have been a few instances where suppliers have received requests for price quotes, have been told their prices are competitive, but have not received any purchase orders.
- Supply companies established in the Beaufort area have developed excellent working relations with the oil companies that are located in Tuktoyaktuk. Products purchased from these businesses by oil companies represent between 35 to 50 percent of total gross revenues.
- Companies located in other areas indicated that between one to twelve percent of sales directly relate to oil company purchases. Building supply outlets indicated direct sales of less than one percent of gross revenues, although indirect sales could represent a significantly higher percentage.

#### 4.1.3 Service Companies

Ten service businesses were interviewed during our research. These interviews took place in Whitehorse, Yellowknife, Tuktoyaktuk, Aklavik, Norman Wells, and Hay River. Companies interviewed represented a wide range of businesses and included janitorial services, surveying companies, welding services (including underwater construction and welding), painting businesses, drilling services, water hauling, and environmental services. A number of characteristics were identified that were common to most businesses. These are described below.

- All companies stated that location and aggressive marketing are the key elements in successfully obtaining contracts with the oil companies. A few companies indicated an interest in locating in Inuvik or Tuktoyaktuk during the development and production phases.
- Businesses located in Tuktoyaktuk, Norman Wells, and Aklavik reported that 75 to 100 percent of their revenues were directly related to oil company contracts.

- Businesses in Whitehorse, Yellowknife, and Hay River obtained contracts with oil companies that represented from zero to 30 percent of business revenues.
- Average contract values obtained by service businesses were approximately \$60,000.
- Businesses located close to the areas of oil exploration and production indicated few problems in working for oil companies. Businesses further away tended to experience typical problems such as an unawareness of contracts and minimal debriefings.
- All companies indicated a strong desire to obtain work with the oil companies.
- The two week on/off work schedule of oil company employees was identified as a problem for many businesses. In most cases, this was often due to poor communication and debriefing between the two cross-shift employees (particularly in the area of contract administration); the result was often a misunderstanding of what was actually agreed on between the various parties.

In addition to these common elements, a number of characteristics were identified that were specific to only a few businesses. These are described in the balance of this section.

- Whitehorse and Yellowknife companies feel that they can be highly competitive and quick to mobilize to meet the needs of the oil companies. Improved air service between Whitehorse and Inuvik would significantly enhance the situation of companies established in the former community.
- Some Whitehorse companies feel that the oil companies in the Beaufort region neither perceive them as being "Northern" nor having the capabilities that are suited to their requirements.

- A few companies that are not centrally located to the areas of oil development activity experienced very short tender call periods. These tenders were often received via telex.
- It was suggested that diving services in Yellowknife and surveying services in Whitehorse have not been utilized as much as possible. These companies have significant Northern experience, the capability to access personnel and equipment from Alberta and British Columbia, have bid preparation experience on tenders for oil company contracts, and, whenever possible, have participated in Northern oil industry trade shows to promote their services.
- A few companies have missed the opportunity to bid on contracts, often without explanation, although they have worked in the past for the oil companies and performed all services in accordance with their contracts. This is due in part to the fact that oil companies have felt it necessary to spread the work around rather than focus on a select number of companies.
- Some companies experienced initial payment problems, often as a result of not understanding the invoicing procedures of the oil companies. These problems tended to be resolved with time as companies became more familiar with the process.

#### 4.1.4 Supply & Service Companies

A total of fourteen supply and service companies were interviewed. These interviews took place in Whitehorse, Yellowknife, Inuvik, Tuktoyaktuk, and Norman Wells. Major types of businesses represented in this industry sector included radio and communications equipment supply and service, mechanical/electrical supplies and contracting services, food wholesale and catering, and retail sales and servicing of liferafts and safety equipment. This group comprised over 60 percent of all businesses interviewed. Businesses involved in the radio and communications field represented approximately 20 percent of all

businesses interviewed. General characteristics of supply and service companies are presented in the following paragraphs. Characteristics that are specific to the radio/communications and mechanical/electrical businesses are described separately.

- Companies located in Tuktoyaktuk, and also in Norman Wells during the expansion project, have a clear advantage over other Northern companies.
- Aggressive marketing and numerous business trips to Calgary and Tuktoyaktuk are required in order to establish contracts with the oil companies. Even after these efforts, some companies have not been entirely successful in obtaining work.
- Supply and service companies either rely for major portions of their gross revenue on the oil companies (and are usually located in Inuvik and Tuktoyaktuk), or have not been successful in acquiring major contacts.
- Supply and service companies often experience delays in payment when working as subcontractors for general contractors who are established in Southern Canada.
- Southern companies provide considerable competition to Northern supply and service businesses. With profit margins today as low as 5 to 7 percent in the North, compared to 20 to 25 percent five years ago, and with an abundant labour force in the south, Northern companies are facing severe competition under marginally profitable conditions.
- One major problem experienced appears to be a lack of awareness concerning what work is available from the oil companies.

Specific characteristics of businesses involved in the supply and service of radio and communication equipment are presented below.

- Unless located in Inuvik where contracts from oil companies can account for a considerable proportion of revenues, these businesses do not rely on work from the oil industry. Business from the oil industry represents between zero to 5 percent of revenues for those companies located elsewhere in the study area.
- Average contract value was estimated to be \$150,000.
- Oil companies prefer equipment purchases and/or leases for short periods of time (usually one year contracts) since they are often uncertain as to their future exploration programs. Northern businesses cannot generally afford the investment required in new equipment under these short-term contractual arrangements.
- Oil companies often purchase directly from southern suppliers which result in follow-up servicing contracts.
- All of these businesses sell to the trucking companies operating in the North and therefore indirectly benefit from oil and gas industry activity.
- Lead time is critical in order to arrange debt financing. Businesses interviewed felt that additional lead time is required in order to prepare bids in a satisfactory manner.
- Some of the oil companies hire their own radio/communications technicians. This tends to minimize local involvement in service repair work.

Most of the interviews concentrated on the mechanical/electrical subtrades since this was considered to be the most significant type of supply and service business that has participated, or potentially could participate, in contracts with oil companies. Principal findings concerning these businesses are summarized below.

- During the Norman Wells expansion project, contracts were broken down into sizes that were manageable by Northern companies.
- A number of contractors experienced significant participation in the Norman Wells project. Contracts obtained during this period accounted for over 50 percent of gross revenues for many businesses. This proportion has now dropped substantially and has resulted in financial problems for some firms.
- Some employees of these contractors initially experienced difficulties with the high safety standards that were established by the oil companies.
- Supply and service companies in general, and mechanical/electrical contractors in particular, often experience difficulties in arranging bank financing and claim that the financial institutions are not familiar with Northern conditions. Additional lead time in preparing contract bids is likely to lessen this constraint.
- Contract sizes range in value from \$100,000 to upwards of \$1.0 million.
- Northern companies typically have smaller inventories than southern suppliers and are therefore not as price-competitive. Also Alberta-based suppliers can consolidate shipments from warehouses in Calgary and Edmonton more easily than Northern suppliers and thereby can obtain lower freight rates to transport goods to the North.

- All companies experience strong competition from businesses in southern Canada.
- A number of companies have not achieved sales despite the investment of time and money in marketing their businesses to the oil industry, which could indicate that promotional efforts have not been appropriate.
- Much of the electric motor rewind work is undertaken in the south although establishments that can undertake most types of repair and maintenance service are located in Whitehorse and Yellowknife. These Northern companies do not appear to have aggressively promoted this market however.

#### 4.1.5 Transportation Companies

These companies provide a wide range of comprehensive and integrated services to oil companies operating in the North. For the purpose of this study, the transportation businesses that were interviewed were separated into trucking companies and air service companies. A description of the involvement of these types of businesses is provided separately in the paragraphs below.

##### Trucking Companies

Eight trucking companies were interviewed during field research in Whitehorse, Inuvik, Yellowknife, and Norman Wells. These companies provide contract hauling for general merchandise and heavy equipment, scheduled freight services, LTL trucking, and freight forwarding services. In addition, a number of general contractors who were interviewed also provide general hauling services, primarily for gravel materials and heavy equipment. These companies, however, were discussed earlier in Section 4.1.1. of this Chapter. A summary of trucking company research findings is provided below.

- Most trucking companies have hauled either directly or indirectly (i.e., for contractors) for oil companies in the study region.
- It is generally agreed that for new businesses entering the market, the initial contracts are the most difficult to obtain while ongoing marketing success is easier once the initial contracts have been secured.
- Esso operates its own trucks for much of its equipment and freight so that contracts with this company are limited.
- Established companies that haul for oil companies indicate that a good working relationship has been built up and that no major problems are experienced. Many companies are prepared to expand their fleets and services to meet increases in demand as they develop.
- Currently, oil companies operating in the Beaufort are well-serviced by existing companies and a major increase in activity will be required before any new carriers can viably enter the market. One company, however, is already investigating this opportunity.
- Most companies indicated that sufficient bidding time was provided for preparing tenders for contract hauling services.
- A number of trucking companies are affiliated with national and international carriers which results in strong competition for locally owned, Northern-based companies.
- A number of companies indicated that contract hauling prices have declined in southern Canada, to the point that their trucking operations and services to the North are only marginally justifiable. These companies, however, do not provide scheduled services to Beaufort destinations.



- Supply lines from Alberta and the United States to the North for shipping oil field supplies are well established. Oil companies in Alberta tend to support this cost-effective supply route. The market for new entries appears to be limited at present, as well as dictated by the availability of trucking licences.
- Trucking companies working for oil companies indicate either a considerable proportion of revenue is oil-related (i.e., 50% to 90%) and maintain offices in the area of activity, or obtain limited revenues (i.e., less than 5 percent of gross revenues) and are located away from the centres of activity.
- Whitehorse is perceived as an important resupply and interlining point for freight which originates from southern Canada and is destined for Inuvik and Tuktoyaktuk. Trucking companies located in Whitehorse will also be able to provide direct services to the North for goods and equipment that are fabricated in the region.

#### Air Service Companies

Companies offering air transportation services to the oil companies can provide a variety of fixed wing and rotary wing charter services (including heavy lift aircraft), and scheduled air services. Seven air service companies were interviewed. Results of their involvement with oil companies are discussed below.

- The more established and larger businesses have excellent working relationships with oil companies, are dependent on the levels of oil and gas activity undertaken by the industry, obtain between 20 to 35 percent of their revenues from the oil companies and have equipment available to meet demand increases.
- Air service companies located in the study region have considerable Arctic experience and an oversupply of available equipment. This is especially the case with helicopter charter services.

- Smaller businesses find it difficult to break into the market, even though the oil companies have indicated that work is available. Expectation levels in the past appeared to be higher than actual performance. Revenues of these companies arising from oil-related work is generally less than one percent. Some of these companies have been approached by the oil industry to supply short-term contracts that often require equipment purchases. This under-capitalization and short-term contract work has prevented many companies from successfully penetrating the market.
- A few of the smaller companies have received 'crisis' requests when regular operators were not available for use.
- Scheduled services from Whitehorse to Inuvik are used regularly by oil companies to transport workers and freight.
- Specialized heavy lift aircraft operations in Yellowknife are utilized extensively by oil companies. This is the only Northern-based company that provides this type of service in the Northwest Territories.
- Most air service companies indicate that they are concerned about the use of private aircraft owned and operated by the oil companies to transport personnel and freight when local aircraft are available.
- Possible Federal de-regulation of the airline industry in the North was indicated as a potentially damaging development by some established operators.

#### 4.2 MANY NORTHERN COMPANIES HAVE MARKETED SUCCESSFULLY

We have found from our research that the oil and gas industry in Northern Canada has proven of significant value to Northern-based companies. This is evidence of the success that has been achieved by the industry in expanding the Northern content of its exploration expenditures over the years.

The success achieved by individual companies in the North is based on a variety of factors, many of which are specific to the product or service sold or the company itself. In general, however, we have identified a number of common threads which appear to tie in directly with those companies that have gained substantially from oil industry activity. These are described briefly as follows:

- companies which promote carefully and aggressively tend to achieve success much more quickly than those whose promotion is ineffective or non-existent;
- Northern firms which have developed the plant, equipment and manpower to service other markets, such as the mining industry, have frequently been able to market excess capacity and skills successfully to the oil industry;
- Northern suppliers who took a financial risk in purchasing equipment which was expected to be required by the oil industry, have generally been rewarded with oil company business due to the availability of this equipment locally;
- companies located close to the centres of oil industry exploration in the Beaufort Sea and Mackenzie Delta have often received contracts as a result of their proximity and capabilities; and
- Northern suppliers from throughout the study area who have performed well and fairly on initial contracts have frequently received additional purchase orders and supply contracts.

These are general observations that do not necessarily apply to all Northern companies which have undertaken work for the oil industry. Nevertheless, they do provide valuable guidance to the Northern private sector firm which is seeking to secure its initial contract with the industry or to expand on success already achieved.

## 5.0 ASSESSMENT OF SUPPLY ISSUES AND FACTORS

A large number of factors and issues have a bearing on the extent to which oil and gas companies buy from Northern firms and the extent to which Northern firms are capable of meeting the supply requirements of the industry. These need to be understood before an analysis of business opportunities can be completed. In addition, an appreciation of Northern trade characteristics and constraints will assist individual businesses with their efforts to penetrate the oil and gas industry market.

This chapter discusses a number of diverse factors which, in one way or another, directly affect the extent to which Northern businesses can supply goods and services to the oil and gas industry. Our approach to and evaluation of these parameters formed an integral part of the opportunity analysis.

### 5.1 IMPORTANT ISSUES AND FACTORS ARE MANY AND VARIED

Doing business in Northern Canada is different than in southern Canada and forces different constraints on business operators. Doing business with oil and gas companies relative to traditional customers such as the Territorial governments is also different, especially in the Beaufort Sea. The "one year at a time" type of planning during the exploration phase and the seasonal demand peaks is a difficult environment in which to operate.

Northern businesses in the Northwest Territories and Yukon which wish to sell to the oil and gas industry face many constraints and complexities which relate to the two main influences identified above (i.e., the way/nature of working in the north and the particular requirements of the oil and gas industry). Issues, constraints and characteristics of importance to this study, which are described in the balance of this chapter are as follows:

- production and supply constraints of Northern firms;
- Northern business management and operational characteristics;

- bonding levels in Northern Canada;
- Northern business marketing characteristics;
- oil and gas industry purchasing characteristics;
- available excess capacity in Northern businesses;
- available business assistance programs and incentives;
- philosophy towards Northern content by area;
- effects of Native land claims settlements;
- contract size and length;
- exploration phase requirements vs. production phase requirements;  
and
- available financial resources in Northern Canada.

Many other factors exist which directly and indirectly affect the capability of small Northern firms to penetrate the hydrocarbon industry market. Many relate to some businesses or business sectors and not to others. These factors are therefore addressed individually under opportunity discussions in Chapter 6 and Chapter 7.

## 5.2 NORTHERN FIRMS OFTEN FACE SUPPLY CONSTRAINTS

In relative terms, the economy of the study area is small and the requirements of the oil and gas industry are large. As business developed to service and supply goods to the local or regional economic base in Northern Canada, specific types of companies evolved which, generally, were limited in size in response to market demand levels in the North. Often oil company requirements differ from either the type or the magnitude of supply capability in Northern Canada.

Certainly, for supply opportunities to be capitalized on, Northern companies will need to meet specific requirements for the type, quality and volume of product and/or services required. This may require that Northern companies expand, improve quality or diversify.

### 5.3 NORTHERN BUSINESSES SOMETIMES LACK QUALIFIED PERSONNEL

Most companies in Northern Canada are small and many are run by individual owners/operators. Because of this, many firms can supply traditional markets in an effective and capable manner. The same firms, however, often find themselves short of the management skills, specialized financial or accounting assistance and/or highly qualified operating staff to effectively compete for oil and gas company business.

Generally, Northern businesses which need to upgrade management, financial and operational skills are not aware of these facts. The requirement for improvement skills were identified by oil company representatives or observed firsthand during interviews study team members held with the small Northern companies.

It is important that Northern firms which want to sell to the hydrocarbon industry should recognize their weaknesses. This does not apply to all companies but most should review their internal capabilities and skills to maximize their probability of success.

### 5.4 APPROPRIATE BONDING LEVELS ARE OFTEN DIFFICULT TO SECURE

Our research has shown that a number of construction and contracting firms in the North have difficulties in securing appropriate levels of performance bonding with traditional projects. As these companies attempt to sell directly to oil and gas companies or their contractors, the bonding issue becomes a constraint on major oil company service contracts. Bonding is not normally an issue for supply contracts.

The difficulty in securing adequate performance bonds has likely resulted from financing constraints in Northern Canada. Traditional capital financing has been more difficult in the North due to costs and constraints associated with doing business in this part of Canada. According to previous work, independent businessmen in the North

"... tend to go into business 'on a shoestring'. As a result of this under-financing, and associated under-accounting, most Yukon companies have experienced difficulty in obtaining performance bonds. This problem stems mainly from their inability to produce regular audited financial statements which display an adequate liquidity situation to meet the normal demands of the bonding companies" (White, 1978).

Northern companies need to recognize bonding as a constraint, or concern, particularly as they seek major service contracts with the oil and gas industry. Often the constraint can be overcome by the use of security deposits to replace the bond but this often leads to additional debt against personal guarantees beyond the normal limits of the company. The best solution is for individual businesses to improve their capitalization through appropriate debt and equity proportions. Adequate capitalization and corporate performance will result in improved bondability which will improve the marketability of the company as well. Clearly, this process is easier to recommend than to achieve, but we consider it important for business owners to recognize limitations on bonding where they exist and the impact this could have on oil and gas industry sales. In addition, until Northern land claims settlements are concluded, it is difficult at best for financial institutions to secure Native company assets such as land which imposes further constraints on obtaining appropriate bonding levels by these firms.

#### 5.5 NORTHERN BUSINESS MARKETING EFFORTS AND EXPECTATIONS VARY

Every company contacted or interviewed in Northern Canada approaches marketing in a slightly different manner. Some firms carry out very little marketing activity while others spend considerable time trying to sell their products and/or services. Similarly, some firms do nothing to secure oil company business while others follow a well-defined, ongoing and aggressive marketing program. **Generally, we have found that success tends to parallel the intensity and effectiveness of a company's marketing program, although there are exceptions.**



Different companies in Northern Canada also indicated substantially different expectations from sales efforts. Some, for example, believe that phone calls to and registration with the oil and gas companies should lead to supply contracts. Other Northern firms believe that company representatives must be continually travelling to Inuvik, Tuktoyaktuk, Calgary and Edmonton and that the firm must take an aggressive and forward-looking approach to marketing to conclude supply contracts.

Some types of goods and services need to be marketed more aggressively and with more expense than other goods and services. Each particular company must determine the type and level of promotion it will undertake. **It is evident from our research, however, that, from an overall perspective, Northern businesses should spend more effort and resources in marketing to the oil and gas companies.** These efforts should also be carefully designed and tailored. Such general observations will not apply to all Northern companies, but reassessment of marketing practices by most of these firms could lead to various individual successes.

#### 5.6 OIL AND GAS PURCHASING ACTIVITIES SHOULD BE FAMILIAR TO EVERYONE

Most Northern suppliers the study team interviewed were generally familiar with oil and gas industry purchasing activities. Still, our suspicion is that many Northern companies are neither fully aware of the procedures followed by the industry nor of the actions they should take themselves. This will apply mostly to Northern firms which have not yet undertaken serious marketing efforts aimed at the oil and gas industry. **It is critical for Northern suppliers to know the requirements and purchasing procedures of the oil companies in order to be able to conclude sales contracts. Such a market driven approach to sales is too often not in evidence in Northern Canada.**

While each oil and gas company follows slightly different purchasing procedures, the overall approach of each of the three major companies is similar. Important characteristics of this approach are as follows:

- many of the purchasing decisions in each company are made from the oil company base camps in Tuktoyaktuk;
- some purchasing decisions, primarily those of major impact and those involving southern (i.e., Southern Canada or the United States) suppliers, are made in oil company offices in Alberta;
- all major oil companies have lists of acceptable Northern suppliers and a firm must be on this list to be invited to bid on a supply contract (. . . not all listed firms will be asked to bid on each contract);
- major oil companies generally hold information meetings annually in key Northern communities to advise local businesses of the anticipated supply requirements and their purchasing procedures for the upcoming season;
- advertisements for bid requests and pre-tender qualifications are placed in Northern media for some, but not all, contracts;
- oil company newsletters provide regular updates of company plans and business opportunities;
- in some cases (Esso) an annual list of specific business opportunities has been prepared in advance of each year's activities to facilitate Northern business participation;
- bidders lists are drawn up internally by the oil companies and there are no guarantees that any individual company will be asked to bid on any specific supply contract;
- some oil companies conduct "debriefing sessions" for unsuccessful bidders but generally this is done 'on request' only.

The Northern business community needs to be aware of these procedures and must take the individual initiatives and marketing efforts necessary to be asked to bid and to succeed in the bidding process. Factors that directly affect the purchasing decision by the oil and gas industry are varied. However, a number of important requirements should be recognized by Northern suppliers if they are to be successful. These are listed below:

- the bidder must be capable of supplying the extent of product or service required within the time-frame stipulated;
- the bidder must provide high-quality products and/or services;
- the bidder should have a successful track record;
- the bidder must be competitive in price with other potential suppliers; and
- the bidder should have the financial resources necessary, including bondability where appropriate, to complete the work.

Price, quality and reliability are all key factors. Experience with oil company contracts must be earned but, once earned, can lead to substantial business in the future if initial performance is good.

#### 5.7 SOME NORTHERN COMPANIES HAVE MARKETABLE EXCESS CAPACITY

Companies based in Northern Canada possess a variety of skills and plant capabilities. In some cases, company sales have declined over the past five years as a result of the economic slowdown. For the limited number of Northern-based companies involved in production or assembly operations and for those which rely on capital equipment to undertake their work (e.g., drilling companies, trucking firms, etc.), a reduction in sales volume has resulted in significant unused plant and equipment capacity.

Excess capacity cannot, necessarily, be used to supply oil and gas industry needs. However, in specific situations, available skills and capacity may be marketed to the oil and gas industry in Northern Canada. Indeed, this represents an opportunity for some companies since it is extremely difficult in many cases to

justify the new capital investment necessary to establish new plant and equipment capacity without longer term commitments by the marketplace.

In summary, Northern businesses should examine their capabilities without major investment to determine where existing skills as well as existing plant and equipment capacity can be used to supply the oil and gas industry. Opportunities exist, particularly with companies which relied heavily on purchases by the mining industry prior to its decline. Capitalizing on existing assets and skills could produce acceptable returns which may not be possible with new capital projects.

#### 5.8 NORTHERN COMPANIES SHOULD TAKE ADVANTAGE OF ASSISTANCE PROGRAMS TO THE EXTENT REQUIRED OR DESIRED

Government-sponsored assistance programs exist which can, in some cases, support the efforts of Northern businesses in selling to the oil and gas industry. Northern suppliers and potential Northern suppliers should be aware of these programs and make use of them as appropriate. A number of examples of government assistance that could prove beneficial are listed below:

Federal Business Development Bank - Provides research assistance, seminars, booklets and professional consulting help, all at a nominal cost, to small businesses. Capital financing is also available through FBDB, although rates are equal to or higher than normal commercial rates.

Manpower Training Programs - The Federal Government sponsors a variety of manpower training programs that can be and have been taken advantage of by Northern businesses. Recently, cutbacks in a number of these programs have been announced, however. Generally, these programs involve cost sharing between the Federal Government and the company for employees who attend specific training courses.

Apprenticeship Training Programs - Industry and the Federal Government jointly fund apprenticeship training programs which are administered by the territorial governments. Several trade schools in both Alberta and British Columbia are eligible for placing apprentices for their classroom training. A number of firms interviewed during this study had taken advantage of these programs.

Financial Assistance Programs - A variety of Federal and Territorial government supported financial assistance programs are available to businesses in Northern Canada. Some of this type of assistance is funneled directly to qualifying companies such as through low interest, federal government-guaranteed Business Improvement Loans. Other major areas of assistance are generated by Economic Development Agreements between the Federal Government and each Territorial Government which, in turn, are redeemable for specific industry sector purposes through subsidiary agreements to the basic EDA.

Native Assistance Programs - A number of government programs are available which provide support to Native businesses in the Northwest Territories and Yukon. Examples include Special ARDA (through DRIE), programs under the Department of Indian and Inuit Affairs and the Eskimo Loan Fund.

This report is not intended to provide a comprehensive listing and description of training and financial assistance programs available. However, the areas in which assistance is available should be recognized by Northern business so that advantage can be taken of available programs when appropriate.

According to most companies interviewed, only limited use is being made of government assistance programs. Many firms indicated that government assistance was not required and seldom, if ever, used. Most of these businesses had successfully bid on oil and gas company contracts. It is evident, therefore, that Northern suppliers can succeed and have succeeded in penetrating the hydrocarbon industry market without relying heavily on financial assistance by the government. Training programs, however, continue to be reasonably popular and assistance in this area can be expected to increase the capability of Northern suppliers to take advantage of opportunities in the Beaufort Sea and elsewhere.

## 5.9 PHILOSOPHIES ON NORTHERN CONTENT

From the beginning of this study it was clear that there was no standardized or universally-accepted definition of what constitutes a "Northern business".

Northern business definitions may vary not only in terms of what geographical area is considered "Northern", but also according to the following:

- head office location;
- location of owner;
- percentage of sales in North;
- percentage of capital investments in North;
- percentage of employees from North; and
- length of time operating in North.

#### 5.9.1 Definition of "Northern" Region

This study clearly defines Northern businesses as those located above the 60th parallel. As our research was carried out, however, it became apparent that different philosophies exist in the North concerning the geographical areas on which one should focus.

Being close to offshore oil and gas company activity in the Beaufort Sea, the communities of Inuvik and Tuktoyaktuk are frequently considered as the "true" Northern supply areas. Most local people and most local companies strongly believe that oil companies should give priority to Inuvik and Tuktoyaktuk in directing their purchasing expenditures. In fact, the Canada Benefits section of one company's 1982 Beaufort exploration applications states that:

"In awarding contracts, the company will give first consideration to qualified local businesses from the immediate area; then to other businesses in the Yukon and Northwest Territories; then to the rest of Canada; providing the practice remains cost effective and results in acceptable quality."

This emphasis is typical of all major oil industry operators in the Beaufort Sea/Mackenzie Delta region.

Smaller communities in the Northwest Territories north of Norman Wells have supplied oil and gas industry needs to a limited extent. While companies located in these communities are also considered "more Northern", only a few exist and most are limited in economic scope and can provide only limited goods or services.

Many companies became established in Norman Wells during the expansion of the oil field there. With production taking place, supply and service requirements changed. Now many of the original companies are out of business and new operations have been established to provide production-oriented goods and services. This change in types of purchases made between the explanation phase and the production phase is an important factor to recognize as and when production system development takes place in the Beaufort Sea.

Communities in Yukon and the Northwest Territories, other than those referenced above (with the exception of Old Crow), are considered by some residents to have a strong Southern influence. This view of other Yukon and NWT communities, although far from universal, has arisen due to their distance from and their difficult access to primary customers located in the Mackenzie Delta/Beaufort Sea. It appears that proximity and accessibility has enabled the most northerly communities in the study area to benefit most significantly from oil and gas company expenditures in Northern Canada. These "project" communities will continue to rely heavily on oil and gas industry activity but it should be recognized that other, more distant, Northern communities have resources which could be utilized within the industry.

Despite achievements to-date and the concentration of oil industry expenditures, the Government of Yukon, the Government of the Northwest Territories and more southern communities within both territories are extremely interested in capitalizing on these market opportunities further. We feel that there are opportunities for expansion of oil industry sales, especially in those communities which are further from the activity areas themselves but which do fall within the Study Area. This is especially true for businesses located in Whitehorse and Yellowknife. Due to the economic size of each of these cities, a wider variety of businesses exists in each centre and businesses are frequently larger than in smaller Northern communities. Consequently, opportunities do exist to effectively substitute Northern suppliers for southern suppliers to the oil and gas industry. This would produce net benefits to Northern Canada and not detract from or increase competition to Northern companies already selling to the industry.

It is important for both oil and gas companies as well as for Northern suppliers to recognize differences in definition of Northern supply areas. More southern, but still "Northern", companies appear to be faced with a variety of opportunities while "truly Northern" companies in Inuvik, Tuktoyaktuk and surrounding small communities can realize significant expansion but only by bringing in skills, manpower and/or investment from further south. The latter will lead to real economic growth in the "true north" communities in parallel with population and employment growth.

In summary, opportunities exist in many areas but are different. In the "true Northern" communities, increased oil and gas company sales will eventually lead to (and indeed require) population and economic base expansion. That can only take place by more southern residents moving north and by more southern-based companies investing in the North. In contrast, opportunities in the more southerly communities in Yukon and the Northwest Territories (such as Whitehorse and Yellowknife) can be capitalized on using, for the most part, the existing economic base and manpower. Such involvement would lead to economic growth in these areas through increased employment and local production.

#### 5.9.2 Other Criteria for Northern Content

Of the three major offshore operators, only Dome distinguishes between Northern companies and Northern-based southern companies in its annual Canada Benefits report. The other companies generally consider a business to be "Northern" as long as it has a Northern base of operations and is owned or managed by a Northerner.

The criteria for defining a "Northern Business" have been discussed at length in other documents without any real consensus. In terms of maximizing value-added benefits to Northern Canada, however, the most important criterion is that a business employs a high percentage of Northern residents.



For this reason, strict and narrow definitions of "Northern Business" based on ownership or head office location should probably be avoided. If, for example, only those businesses that were wholly-owned by long-term Northern residents were considered to be "Northern" for regional content calculations, the incentive for joint-ventures between Northern residents and established southern specialist firms would be lessened. Without the expertise and capital resources of southern firms, Northern businesses would not be in a position to supply certain goods and services on their own. Consequently, the work might be done directly by the southern firms, with little or no Northern content. In such cases, the imposition of a strict definition of "Northern Business" would obviously work to the detriment of Northern content.

We would suggest that, as long as a business has a permanent presence in the North, has some Northern ownership or management component, and utilizes Northern employees to the maximum extent possible, it makes a positive contribution to the regional economy and should qualify as a "Northern Business".

#### 5.10 NATIVE LAND CLAIMS SETTLEMENTS DO AND WILL IMPACT ON THE OPPORTUNITIES AVAILABLE

All Native groups in Northern Canada have conducted or are in the process of conducting land claim settlements with the Government of Canada. Most businesses in the North are aware of these activities and the influence that they are having and are likely to have on pursuing sales opportunities with the oil and gas industry.

At the present time, most Native groups and bands in Northern Canada have not concluded land claims settlements. Capital is not, therefore, readily available for band or Native operated enterprises through the bands themselves. Since Native groups often face severe constraints in securing financing from traditional sources, it is evident that land claims settlements could, and likely will, lead to an expansion of Native corporations. This has already occurred in Inuvik and Tuktoyaktuk as a result of the COPE settlement and the establishment of the Inuvialuit Development Corporation.

As land claims settlement money becomes available, opportunities will be created for Native corporations since capitalization will be possible in specific situations. Native groups and individuals should pursue existing opportunities but they should also monitor settlement progress and be prepared to capitalize on oil and gas company opportunities as and when settlements lead to capital availability for specific purposes.

Since land claims money will lead to increased competition in some sectors, it would be wise for all Northern businesses to monitor progress as well. All companies must recognize the realities of the environment within which they are operating and be prepared to act and react appropriately as circumstances change and settlements are concluded.

#### 5.11 NORTHERN INVOLVEMENT CAN BE CONSTRAINED BY CONTRACT SIZE AND LENGTH

There are three basic characteristics of oil and gas company purchases that often prevent Northern supplier involvement:

- contract volumes are too large to be met with existing manpower, plant and/or equipment;
- contract size is too small to support the investment required to meet the purchase requirements; and
- contracts are short-term or one-time in nature which prevents investments which require a payback over several years.

While some solutions do exist to the above problems, these characteristics are representative of exploration activity by the oil and gas industry and will not change. Purchasing requirements are established and if they are too large for Northern supply, goods or services will be sourced directly from the south. Similarly, if contract volumes are too small to support new investment by Northern firms, the oil industry will buy from southern suppliers which sell to other markets as well. Finally, the short-term nature of contracts was expressed

as a common constraint. The nature of oil and gas company exploration programs, however, is such that commitments are only made on a year-to-year basis. The industry cannot, therefore, guarantee multi-year contracts when it is not certain that the supplies or services will be required. While this will change as the production phase approaches, it represents a significant constraint at the present time.

Northern suppliers need to recognize these constraints and function, to the extent possible, within them. Two or more suppliers could joint venture or consolidate resources to bid on contracts too large for either firm by itself. Similarly, Northern companies can try to find additional markets or customers for specific products or services which require investment, but which are only purchased one year at a time by the oil and gas industry. In summary, it is important for Northern suppliers to understand and adapt to the environment in which they are selling. Oil company peculiarities are unlikely to change until a production decision is made and suppliers must recognize that dealing with these customers requires a different strategy than dealing with traditional customers.

#### 5.12 PRODUCTION PHASE REQUIREMENTS DIFFER SIGNIFICANTLY FROM EXPLORATION PHASE REQUIREMENTS

Once a production decision is made, Northern suppliers will be faced with a different set of opportunities which have significantly different characteristics. The differences between exploration and production supply requirements are discussed in detail in Chapter 3.0. It is important for the reader to recognize basic differences at this stage since these differences can impose hardships or generate opportunities, depending on the extent to which they are understood.

Once a production decision is reached, a major phase of construction and development will follow. During this five or six-year period, businesses will find opportunities relating to supply base development, island construction and pipeline development. Once construction is complete, however, many of these opportunities will disappear and Northern suppliers need to recognize this fact before becoming involved.

Following development, the production phase will lead to major long-term opportunities for Northern firms. These opportunities will be, for the most part, in different areas than current exploration phase opportunities. They will also be ongoing for a 20 to 30-year period, enabling capital investments to be supported by multi-year contracts. The Northern business community should monitor and be prepared to capitalize on these opportunities on a timely basis. Supply and service contracts will be signed once they are required. Timing will prove crucial once this phase becomes imminent. Suppliers in Northern Canada need to recognize the ongoing nature of oil and gas industry activity but also the need to be responsive to changes in supply requirements and to be customer or market oriented with their sales approach.

### 5.13 AVAILABLE CAPITAL FINANCING IS LIMITED

It is evident that many Northern companies experience difficulty in raising capital through both equity contributions and through debt financing. While this is a universal problem associated with small business, it appears to be more of a constraint to Northern companies than to those located elsewhere in the country.

The shortage in availability of financial resources needs to be recognized by Northern businesses, governments and financial institutions alike. It is a constraining factor that cannot be easily removed. However, some progress is taking place as is evidenced by the recently announced "Venture Capital Program" by the Government of the Northwest Territories. This program encourages private sector investment, as equity, in Northern businesses through a grant arrangement.

Over time, financial institutions operating in Northern Canada should be encouraged to ease their lending requirements. Location of traditional venture capital companies in the North should also be encouraged. This may require some form of government support. Finally, Northern owned financial institutions could be developed with a view to financing Northern businesses. Capital for such an institution could be possible through an organization with the required assets such as the Inuvialuit Development Corporation.

## **6.0 NORTHERN SUPPLY OPPORTUNITY PRIORITY LIST**

Present and projected oil and gas industry purchasing requirements were analyzed and compared with Northern business supply capabilities, as discussed in foregoing chapters, in order to develop a preliminary list of opportunities and opportunity areas (see Appendix C). This preliminary list was discussed with the Steering Committee, expanded and analyzed further to develop a priority list of opportunities that can be pursued.

This chapter provides background information concerning the preliminary opportunity list, describes the prioritization process, and provides a priority list of business prospects that should be brought to the attention of the Northern business community. Encouragement should be provided for Northern businesses to investigate appropriate possibilities in more depth. It should be stressed that these evaluations fall significantly short of detailed feasibility analyses and, before business or financial commitments are made, opportunities need to be investigated in substantially more detail.

### **6.1 A REVIEW OF OIL INDUSTRY ACTIVITY AREAS PROVIDES A FOCUS FOR OPPORTUNITY IDENTIFICATION**

Chapter 3 of this report identified and discussed types of purchases made by the oil and gas industry. The discussion was oriented towards industry activity that occurs during the two principal phases of oil and gas development, namely exploration and production.

An understanding of principal oil and gas industry activities is essential when identifying opportunities in Northern Canada. While some types of goods and services are common to numerous activities, others represent specific requirements of specialized industry activities. Frequently, many of these purchasing requirements cannot realistically be met by Northern suppliers for the following reasons:

- products or services are highly specialized and/or associated with technologically-advanced production systems which are not available in Northern Canada;
- suppliers must have ready access to non-oil and gas industry markets as well in order to maintain the necessary inventory funds that are needed to adequately meet the requirements of the oil industry.
- production requires access to resources unavailable in Northern Canada such as large labour markets, specific raw materials and/or direct international transportation links to other countries.

While a variety of resources are available in Northern Canada, it is important for governments, suppliers and oil companies to appreciate supply opportunities as well as supply limitations. Limited market size, high labour and transportation costs, weather and the relatively small economic base associated with general business in the North makes Northern supply of many goods and services impractical.

During this study, the Study Team recognized the need to focus on practical opportunity areas and to avoid detailed analysis of supply areas which are impractical or unlikely for obvious reasons. To provide such a focus, oil and gas industry activities were analyzed so that opportunities with a good probability for northern supply could be identified.

Figures 6 and 7 summarize the principal types of oil and gas industry activities that are now, or could potentially, be carried out in Northern Canada. These are segregated into exploration phase activities (Figure 6) and production phase activities (Figure 7) as was done in Chapter 3. Additional breakdowns of sub-activities, which relate to purchasing categories referenced in Chapter 3, are also included in the figures.

FIGURE 6

CURRENT (EXPLORATION PHASE) HYDROCARBON INDUSTRY ACTIVITIES  
IN NORTHERN CANADA

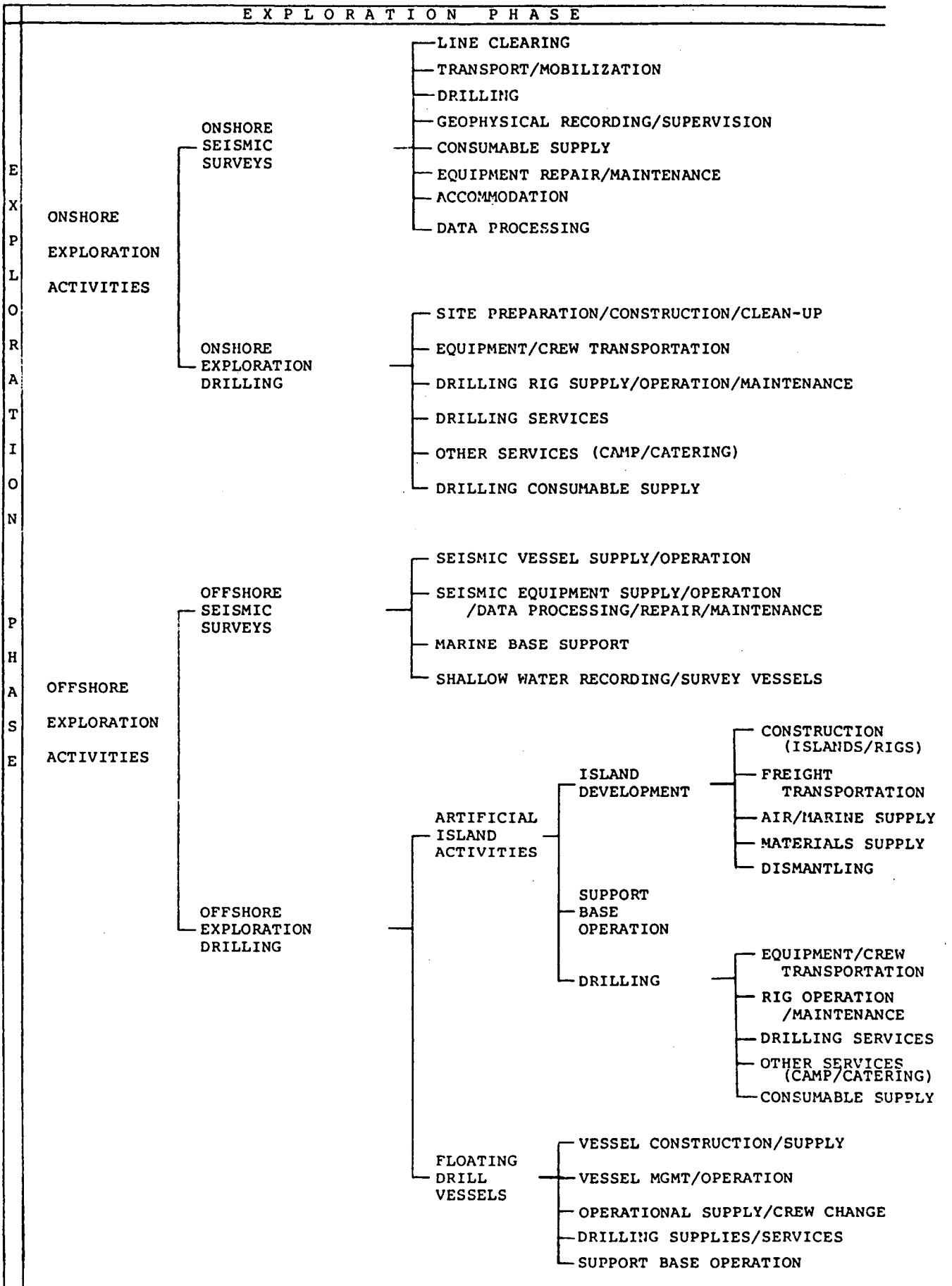
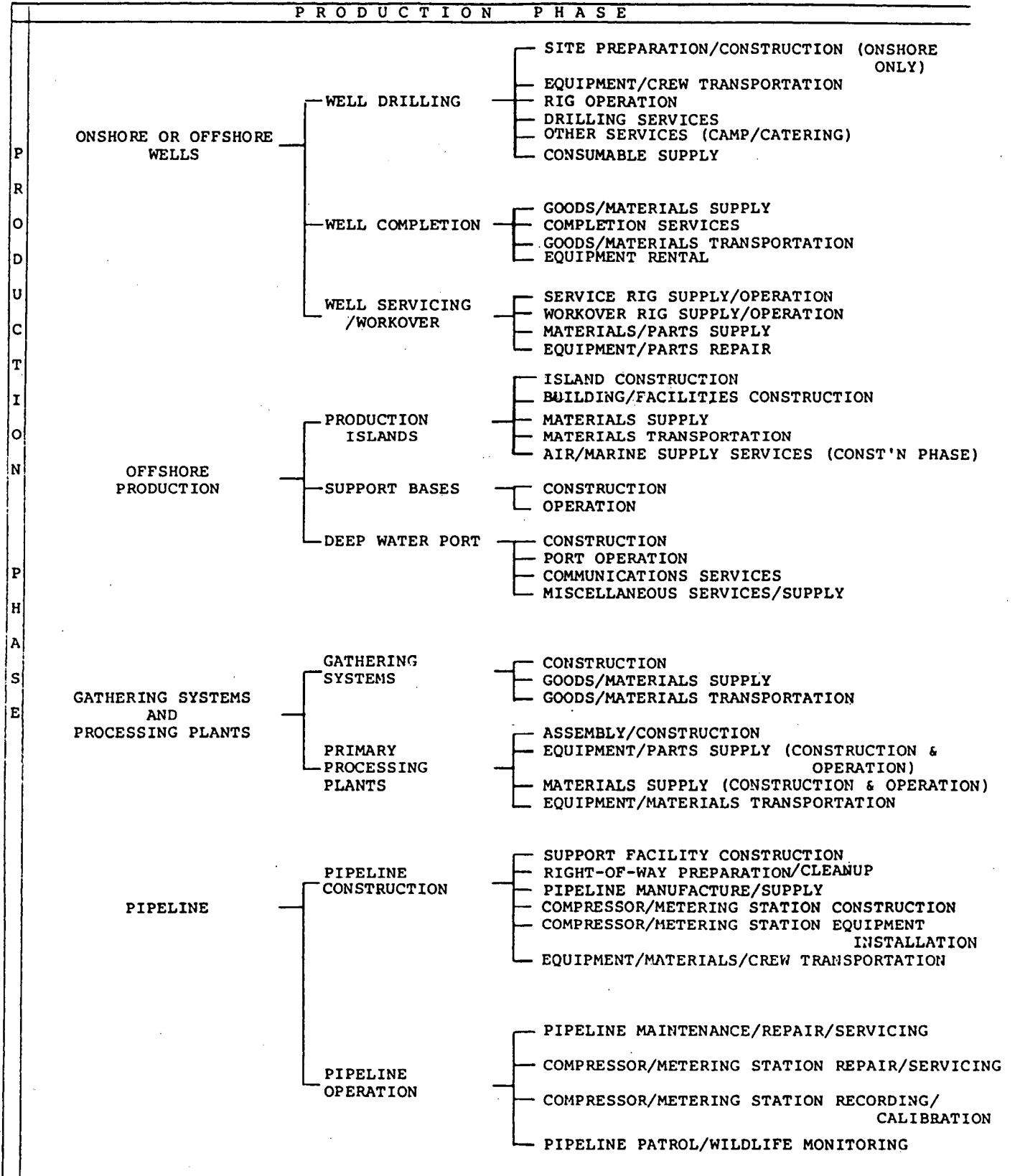


FIGURE 7

POTENTIAL (PRODUCTION PHASE) HYDROCARBON INDUSTRY ACTIVITIES  
IN NORTHERN CANADA





All activity areas identified in Figure 6 and Figure 7 are oriented, at least in part, to goods and services contracts external to the oil and gas companies themselves. Excluded, therefore, are direct oil and gas industry employment opportunities.

An assessment of each industry activity was carried out to develop a priority list of areas where Northern supply opportunities may exist. This assessment was based on our understanding of oil and gas industry requirements, on business resources within the study area and on constraints affecting small business development in Yukon-Western Northwest Territories.

## 6.2 OPPORTUNITY EVALUATION AND PRIORIZATION CRITERIA

In order to evaluate and prioritize opportunities described in Appendix C, a list of criteria were prepared and a series of business concerns that needed to be addressed were identified, at least at a cursory level, in this report. These considerations are described in the following paragraphs.

### 6.2.1 Criteria Focussed on Identifying Viable Businesses which would Generate Valuable Economic Benefits

While all business opportunities included on our recommended list are practical and potentially viable, a number of evaluative criteria were established for comparative purposes. These criteria enabled us to identify business prospects which effectively take advantage of Northern resources and those that could generate the most significant economic benefit to Northern Canada. Criteria used during our assessment of Northern supplier opportunities are listed below:

- the extent to which human, physical and business resources currently exist to capitalize on the opportunity;
- the likelihood that one or more oil companies would react positively to Northern supply of the goods and/or services involved;
- the existence of non-oil and gas industry markets which could supplement the often uncertain requirements of the oil industry;

- the extent of financial investment required and the likelihood that capital funding could be secured;
- the number of jobs and extent of other Northern benefits which could be generated by the business opportunity;
- the level of competition from southern Canada likely to be faced by Northern businesses which plan to market the goods and/or services involved;
- the level of demand represented by the oil and gas industry relative to threshold levels required to generate a 'breakeven' position based on investment levels required;
- the nature of oil and gas industry demand in terms of variations from year-to-year and variations within a given year;
- the requirement for technical and managerial skills relative to their availability in Northern Canada;
- the availability of raw materials and infrastructure such as transportation, utilities, technical back-up and financial resources; and
- the suitability of the opportunity to joint-ventures between southern and Northern companies or between two or more Northern companies themselves.

It should be recognized that these criteria were also applied intuitively during the identification process which resulted in the list described in Appendix C. Thus, most of the business prospects identified are considered to have a reasonable prospect of success.

The criteria described above were not applied in a rigorous and quantitative manner to the opportunities. Rather, each opportunity was assessed in a qualitative and judgemental manner, making use of all information collected as well as our familiarity with Northern business development and oil company purchasing requirements. As stated earlier, quantitative analysis therefore should be carried out, especially for new business ventures, and should be combined with market and financial projections prior to financial commitments being made.

### 6.2.2 Areas of Business Concerns were Standardized for Each Opportunity

These opportunity evaluations ensured, not only that the above criteria were taken into account, but that specific areas of business concern were addressed in each case. These areas are identified and discussed briefly below.

- Market/Utilization - An assessment of the market or markets to which the goods and services can be sold and an appreciation of the level of demand and type of utilization expected by principal customers.
- Competition - An assessment of the principal competition for the proposed venture and other competitive factors which could affect overall viability.
- Location - An assessment of the most practical location or locations for the opportunity in Northern Canada and the sensitivity of success relative to locational factors.
- Conditions/Requirements - Specific developments or other conditions which need to occur before the opportunity can be considered realistic and exhibit a good probability of success.
- Likelihood/Timing - A qualitative assessment of the likelihood that the venture will be successful and an appreciation of the timing required until implementation should be pursued.
- Miscellaneous - Assessment and/or identification of other factors that could affect the practicality, success and viability of the proposed business opportunity.

Again, each of these areas of concern was addressed in a qualitative manner. However, our findings, based on these assessments, do serve to identify the critical factors which will likely impact on probabilities for success or failure for each opportunity.

### 6.3 SHORT-LISTED OPPORTUNITIES ARE VARIED AND EXPAND CONSIDERABLY DURING PRODUCTION

Following an assessment of each opportunity described in Appendix C, summaries of opportunity priorities and timing were prepared. These summaries are provided on Tables 6-1 and 6-2. Table 6-1 includes exploration phase opportunities while Table 6-2 summarizes production phase opportunities. Further details on individual opportunity assessments are included in the individual opportunity reports in Appendix C. These reports should be reviewed carefully by those interested in pursuing one or more of the prospects included.

A review of Table 6-1 shows that only a few exploration phase opportunities are considered "immediate", while a considerable number could be capitalized on over the next few years. This reflects the importance of careful planning and investigation when business diversification or new business development is being considered. Expansion-related opportunities, on the other hand, tend to represent shorter-term possibilities requiring some initiative and marketing investment, but comparably low investment and risk levels. It is notable that the two exploration phase opportunities considered as "immediate" are related to expansion of existing businesses in Northern Canada.

It should be stressed again that the opportunities listed during current exploration activity are representative only. A variety of other business development prospects certainly exist and are awaiting specific companies to undertake the initiative, research and sales efforts required.

Table 6-2 is strikingly different from Table 6-1 with respect to opportunity timing and priorities. The production phase opportunities are shown to occur in a period from three to five years from now. This timing will, of course, be sensitive to when a production decision is actually made and the extent of production activity which will be undertaken. Some business prospects will occur earlier since they are associated with construction, while operational opportunities will only come into play once production actually begins.

Table 6-1

Northern Supplier Development Opportunities  
Short-Listed and Priority Business Prospects  
Exploration Phase

OPPORTUNITY DESCRIPTION	TYPE OF DEVELOPMENT	TIMING AND PRIORITY			COMMENTS
		IMMEDIATE	1-3 YRS.	3-5 YRS.	
(1) Housekeeping/Janitorial Services	- Industrial Services (EXPANSION)	Priority 1	Priority 2	ongoing	- Expansion possibilities during production phase.
(2) Transport & Survival Suit Services	- Industrial Servicing (EXPANSION)	-----	Priority 2	ongoing	- Set-up required. Production phase demand growth.
(3) Metal Fabrication	- Industrial Manufacturing/Supply (EXPANSION)	Priority 2	Priority 1	ongoing	- Limited but potentially lucrative supplementary market.
(4) Motor Repair and Rewinding	- Industrial Servicing (EXPANSION)	-----	Priority 2	ongoing	- Good prospects for one Northern supplier. Strong southern competition.
(5) Drilling Tool Rental	- Industrial Supply (NEW BUSINESS)	-----	Priority 2	ongoing	- Prospects increase with production decision. Strong southern competition.
(6) Navigation & Communications Equipment Servicing	- Industrial Servicing (DIVERSIFICATION)	-----	Priority 2	Priority 1	- Highly specialized and adaptable skills required. Limited scope.
(7) Drill Bit Dealership	- Industrial Supply (NEW BUSINESS)	-----	Priority 3	ongoing	- Possible but difficult due to variety of stock required.
(8) Safety Equipment Service Centre	- Industrial Servicing (NEW BUSINESS)	-----	Priority 2	Priority 1	- Increasingly viable with program expansion. Joint venture candidate.
(9) Glycol Warehousing and Distribution Centre	- Industrial Supply (NEW BUSINESS)	-----	Low	Low	- Oil company demand levels not sufficient alone.
(10) Insulation Warehousing and Distribution Centre	- Industrial Supply (NEW BUSINESS)	-----	Low	Priority 3	- Better demand as production approaches.
(11) Light Vehicle/Equipment Maintenance Garage	- Industrial Servicing (NEW BUSINESS)	-----	Priority 1	ongoing	- Tuktoyaktuk only. Small at first but growth through reputation.
(12) Seismic Services	- Industrial Servicing (NEW BUSINESS)	-----	Priority 1	ongoing	- Labour intensive. Contract services that are labour intensive.

Priority levels shown on Table 6-2 are consistently higher than those shown opposite exploration phase opportunities. This is a solid indication of our belief that many production phase business development efforts can prove viable if entrepreneurial action is timely and effective. All of the production-oriented opportunities require that appropriate initiatives be undertaken by the private sector to take advantage of the market demand increases associated with a production decision.

Table 6-2

Northern Supplier Development Opportunities  
Short-Listed and Priority Business Prospects  
Production Phase

	OPPORTUNITY DESCRIPTION	TYPE OF DEVELOPMENT	TIMING AND PRIORITY			COMMENTS
			IMMEDIATE	1-3 YRS.	3-5 YRS.	
(1)	Freight, Equipment and Pipe Hauling	- Transportation (EXPANSION)	----	----	Priority 1	- Significant demand growth during construction.
(2)	Construction of Central Processing Facilities and Pumping Stations	- Construction/General Contracting (EXPANSION)	----	----	Priority 1	- Specific type of facilities to be decided. Joint ventures worthwhile.
(3)	Base Camp Expansion	- Construction/General Contracting (EXPANSION)	----	----	Priority 1	- General contracting and sub-trade opportunities.
(4)	Ice Road Construction and Maintenance	- Construction/General Contracting (EXPANSION)	----	----	Priority 1	- Skills already well established and equipment available.
(5)	Gravel and Water Hauling Services	- Transportation (EXPANSION)	----	----	Priority 1	- Construction phase opportunity. Skills and equipment available.
(6)	Construction Materials Supply	- Industrial Supply (EXPANSION)	----	----	Priority 1	- Construction phase opportunity. Spin-off opportunities available.
(7)	Camp Catering	- Industrial Servicing (EXPANSION)	----	----	Priority 1	- Construction and operation phase (long-term) opportunity.
(8)	Specialty Welding	- Industrial Servicing (EXPANSION)	----	----	Priority 1	- Construction and operational phase (long-term) opportunity.
(9)	Pipeline Right-of-Way Monitoring	- Industrial Servicing (DIVERSIFICATION)	----	----	Priority 1	- Excellent opportunity to employ experienced outdoors people.

... continued

Table 6-2 (continued)

Northern Supplier Development Opportunities  
Short-Listed and Priority Business Prospects  
Production Phase

OPPORTUNITY DESCRIPTION	TYPE OF DEVELOPMENT	TIMING AND PRIORITY			COMMENTS
		IMMEDIATE	1-3 YRS.	3-5 YRS.	
(10) Line Piggng Services	- Industrial Servicing (DIVERSIFICATION)	----	----	Priority 2	- Good opportunity with appropriate skills and equipment. Periodic demand.
(11) Real Estate Development Services	- Industrial Servicing (NEW BUSINESS)	----	----	Priority 2	- Tuktoyaktuk/Inuvik location. Depends on business/population base increases.
(12) Oilfield Supply Company	- Industrial Supply & Servicing (NEW BUSINESS)	----	----	Priority 2	- Nature of sales will depend on activity. Joint venture likely.
(13) Wirelining and Dewaxing Services	- Industrial Servicing (NEW BUSINESS)	----	----	Priority 2	- Specialized skills and equipment required. Demand could be irregular. Joint venture worthwhile.
(14) Industrial Cleaning Supplier	- Industrial Supply (NEW BUSINESS)	----	----	Priority 2	- Demand uncertain. Competition could be strong.
(15) Pipeline Instrumentation Servicing	- Industrial Servicing (NEW BUSINESS)	----	----	Priority 1	- Training required in advance. Excellent opportunity. Oil companies need to hire external service for viability.
(16) Machine Shop Services	- Industrial Servicing (NEW BUSINESS)	----	----	Priority 2	- Thread cutting focus. Strong resistance expected from Alberta competition.
(17) Construction and Operation of Accommodation Facilities	- Construction/Industrial Servicing (NEW BUSINESS)	----	----	Priority 1	- Good labour intensive opportunity. Oil companies would need to limit their involvement. Consortium possible.



## 7.0 RECOMMENDATIONS

The extent of Northern business participation in the exploration and development of Canada's oil and gas industry will depend in large part on the degree to which Northern business initiatives, oil company responsiveness, and government action, can be coordinated and consolidated into an industry plan for Northern Canada. This chapter identifies a series of recommendations that address this objective. Recommendations are provided for the oil companies that are now operating in the North; for businesses that have obtained, or could obtain, contracts with oil companies; and for Federal, Yukon and Northwest Territories Governments.

**It should be acknowledged at the outset that some of the recommendations in this chapter have already been implemented by one or more oil companies, businesses or governments. In these cases, what is being recommended is a more widespread adoption of these policies.**

Our research has indicated that there has been considerable participation by Northern companies in the exploration and development of oil and gas reserves within the study area. This participation is likely to increase in the future under favourable market, economic and world oil price conditions. It is also evident that many Northern businesses are capable, both technically and financially, of providing increased levels of supplies and services to the oil companies, and have a vested, long-standing interest in the North. These businesses not only represent an independent entrepreneurial spirit that is characteristic of many Northern companies, but are currently willing to participate to the greatest extent possible in the development of the North.

**By far the major constraint to Northern business involvement is a lack of awareness concerning the needs of the oil companies. However, many Northern firms have also not marketed themselves effectively. The major oil companies, on the other hand, have undertaken considerable effort to inform the business community of their programs and anticipated requirements. In the course of**

discussions with Northern businesses, however, it became evident that information and communication between the oil companies and businesses in the North has not been entirely effective. In our recommendations concerning the oil companies, a number of initiatives that should effectively address this problem are presented.

**Many Northern businesses have not been nearly as aggressive as they should in pursuing opportunities with the oil companies.** In part, this results from a belief that, with the existence of a Northern business sector that operates within an isolated economy, a major portion of business will be secured automatically. In contrast to the south, where there are highly competitive and aggressive market conditions, Northern businesses are now beginning to realize that opportunities related to the oil and gas industry can be easily lost unless aggressive marketing and flexible business practices are adopted. The majority of our recommendations concerning the Northern business sector, therefore, focus on ways to enhance and solidify their market position.

It should be recognized that oil and gas industry activities in Northern Canada are not the easiest to supply by Northern companies. Many firms have found it difficult to respond with the short time periods allowed or to make the investment necessary given the year-to-year uncertainty of the oil company markets during exploration. While increased advance notice on contracts and forward planning by the industry can be encouraged, these constraints are unlikely to change during the short-term and the exploration phase.

The Yukon and NWT governments can also play an important role in expanding the participation of Northern businesses in the oil industry. This role should be one of facilitation and information dissemination while continuing involvement in the provision of loans and financial support of business development efforts. In the past, Northern businesses have tended to view government and government programs with some degree of skepticism. Consequently, the role of government must be specific and results-oriented so that Northern businesses can clearly see the benefits of any direct initiatives which are undertaken. Recommendations concerning the role of government in assisting Northern businesses are also provided for consideration.

In the following sections of this chapter, recommendations for each of the three major groups have been identified, namely the oil companies, Northern business and government. A summary chart for each is also provided to indicate priorities and phasing for each recommendation.

## 7.1 RECOMMENDATIONS FOR NORTHERN BUSINESS SECTOR

The degree to which Northern businesses obtain further work with the oil companies will depend largely upon whether local businesses can undertake individual initiatives and present a unified front that indicates their interest and willingness to bid competitively and more aggressively on oil company contracts. This will also require that Northern businesses adopt a more cooperative spirit with their local business partners and the oil companies, and at the same time, be prepared to joint venture with groups and/or companies which are generally viewed as competition. Many of the recommendations provided in the following section should be undertaken individually on a business-by-business basis. A considerable number, however, require joint efforts that often go against the grain of the Northern business attitude of individualism. This spirit of cooperation is considered essential if Northern businesses are interested in pursuing the larger types of contracts that will result from production in the Beaufort and in other areas of the study region that are less advanced in their oil development programs. Many of our recommendations reflect this aspect of cooperation combined with more aggressive and tailored marketing.

- The Northern business community should coordinate and undertake, on a territorial basis, marketing efforts including an annual trade mission, information seminars on oil company activities and, perhaps, territorial information packages directed towards the oil and gas companies. These efforts should focus on existing territorial supplier resources and should be coordinated through organizations such as territorial and municipal chambers of commerce. They would increase the profile of Northern businesses, promote an understanding of business resources and supplement individual efforts of companies promoting to this industry. Smaller communi-

ties within the study area should consider similar and parallel efforts to promote local businesses by joint private sector efforts.

- Northern based trade associations should advertise in local newspapers and industry journals indicating their expertise, abilities and equipment availability. Individual companies should also consider selective advertising. These advertisements should stress Northern capability to meet specific needs of the oil and gas industry and would supplement other coordinated efforts aimed at increasing the profile of Northern suppliers.
- Northern businesses should expand their examination of joint-venture arrangements, both within the study region, and in southern Canada. Businesses are encouraged to begin this process in the short-term so that arrangements can be effectively and quickly concluded when suitable opportunities arise. Joint venture arrangements with southern specialized companies will be critical for major participation during the development and production phases.
- In cooperation with the Yukon and NWT Business Services Offices, Northern businesses should ensure their inclusion in the existing business directories published by the territorial governments.
- Northern businesses should undertake, on an individual basis, ongoing and steady marketing efforts. It should be recognized that the first oil company contract is usually the most difficult to obtain and will likely require more sales effort than subsequent contracts. Specific actions should include preparing company profiles, past experience, visits to Tuktoyaktuk and Calgary, and ongoing telephone calls to oil company purchasing representatives. Company profiles should include short descriptions of goods and/or services provided, price lists (if appropriate), photographs of plant and equipment, and past experience.

- Northern companies should adopt a more positive and constructive attitude towards the oil companies. They should recognize the importance of long-term business relationships with the industry. In turn, oil companies will be receptive to more aggressive and well-organized marketing efforts carried out by Northern businesses and organizations.
  
- Northern businesses need to take a longer-term perspective when bidding on oil company contracts, thereby establishing the opportunity for future work. In some cases, Northern firms have overpriced to maximize short term profits; this has been detrimental to securing follow-up work. Northern companies should also recognize that southern companies can be under-bid, but that profitability levels will need to be lower where contracts are price-sensitive. Oil companies will continue to be price-sensitive under most circumstances and especially in the short term as oil prices remain low. During the production/development stage, the industry will likely focus on the most cost-effective measures.
  
- Private businesses in Northern Canada should reinvest business profits to the extent practical with a view to long-term viability and capabilities. Reinvestment will increase the capability of many firms and enhance the likelihood that appropriate bonding can be secured.
  
- Northern businesses that are interested in supplying equipment and/or services to oil companies should become more aware of the needs of the oil companies and the ways in which they conduct business. This can and should be accomplished in parallel with the enhanced marketing efforts recommended above.
  
- Northern businesses should be aware that after-sales service is a major requirement of oil companies and that the establishment of a good reputation enhances the likelihood of repeat business. This is

especially true of "wet leases" (where the owner supplies, operates and maintains the equipment) in which there are a number of examples where appropriate levels of service have not been provided. On the other hand, a number of examples are also evident where excellent after-sales service has been provided by small companies. This has, as a result, increased individual opportunities to bid on and secure further work.

- Northern businesses should actively upgrade their management, bookkeeping and marketing skills. Government assistance will likely be vital in this area, but Northern entrepreneurs must also take appropriate initiatives.
  
- Companies in southern Yukon and southern NWT should consider pursuing oil and gas work in Northern Alberta and B.C. as a means to broaden their bases of activity and to gain additional experience and a longer season of activity.

A summary of our recommendations concerning Northern businesses and their attempts to obtain contracts with the oil companies are provided in Table 7-1.

## 7.2 RECOMMENDATIONS FOR OIL COMPANY CONSIDERATION

Recommendations directed towards oil and gas companies operating in Northern Canada are described below. They are grouped into those which address communication problems between the industry and Northern suppliers and those which deal with oil company contract tendering and administration.

### 7.2.1 Oil Company Communication and Information Dissemination

Many Northern businesses throughout the study area experience a genuine lack of awareness concerning the purchase and contract requirements of the oil companies. This problem is based, in part, on the large geographic area of the study region and the distance which separates many communities from the centres of

Table 7-1  
Northern Business Sector Recommendations

RECOMMENDATION	PRIORITY AND IMPLEMENTATION SCHEDULE			IMPLEMENTATION ASSUMPTIONS AND REQUIREMENTS
	Immediate	Medium Term	Long Term	
	(within 12 months)	(1-3 years)	(3-5 years)	
Co-ordinated Efforts by Yukon, NWT and municipal Chambers of Commerce	(1)	ongoing	ongoing	Efforts should increase in intensity immediately following an oil company development/production decision.
Business Advertising	(1)	ongoing	ongoing	Advertising campaigns will enhance the profile of Northern businesses and business sectors.
Northern Business Joint-Ventures		(1)	ongoing	Joint-ventures are fast becoming an economic requirement for effective bidding on oil and gas contracts. Northern businesses must re-evaluate their traditional methods of operation.
Northern Business Directories		(2)	ongoing	Should be coordinated by the Yukon and NWT Chambers of Commerce as part of their overall business development efforts. Important not to duplicate existing information.
Long-term and Tailored Marketing Efforts		(1)	ongoing	Northern businesses must be convinced of opportunities if long-term marketing is carried out. Increased time and resources need to be committed.
Northern Business Attitudes	(1)	ongoing	ongoing	Some companies are perceived to be "complainers" and have not concentrated on proper marketing to oil companies.

...continued

Table 7-1 (continued)

Northern Business Sector Recommendations

RECOMMENDATION	PRIORITY AND IMPLEMENTATION SCHEDULE			IMPLEMENTATION ASSUMPTIONS AND REQUIREMENTS
	Immediate	Medium Term	Long Term	
	(within 12 months)	(1-3 years)	(3-5 years)	
Northern Business Pricing and Business Philosophy	(1)	ongoing	ongoing	Many Northern businesses are operating from a short horizon which will (or has) adversely affected the degree to which they can obtain contracts.
Reinvestment of Business Profits	(1)	(2)	ongoing	Effective reinvestment in appropriate situations will increase viability and competitiveness.
Awareness of Oil Company Purchase Requirements and Procedures	(1)	ongoing	ongoing	Oil company purchasing officers must respond to legitimate business enquiries.
Recognition and Provision of After-Sales Services	(1)	ongoing	ongoing	Poor after-sales service directly impacts on future success levels. Companies providing high levels of service to oil companies are well positioned to obtain further sales contracts and purchase orders.
Management, Financial, Marketing Skills Upgrading	(1)	(2)	ongoing	Increased business skills will complement the operational and technical skills already in place.
Contracts in Northern Alberta and B.C.	(1)	ongoing	ongoing	Businesses located in Southern Yukon and NWT are well positioned to pursue oil and gas work in this region and to broaden their existing experience.

(1) Indicates First Priority.  
 (2) Indicates Second Priority.



oil exploration and production activity. In an attempt to address these concerns, a number of recommendations have been developed with the objective of decreasing these communication and information dissemination barriers. These are described in the following paragraphs:

- The major oil companies operating in Norman Wells and in the Beaufort region should provide a public document that identifies key industry contacts that are involved in purchasing goods and services. Some companies already provide this but some identify public relations officers and community coordinators only. This should be expanded to identify base superintendents, purchasing people and expeditors. Distribution of this information can take place through the use of company publications and local chambers of commerce in Northern Canada.
- Northern businesses that register with the oil companies should be notified of their registration and provided with a list of names and telephone numbers of purchasing personnel. Oil companies should urge Northern businesses to register and advertise the importance of this registration in the local newspapers throughout the study region.
- Oil companies operating in the North should continue to maintain their Northern Business Coordination Offices.
- A local oil company representative should be established in Yellowknife and Whitehorse, on a trial basis for approximately six months, following a production decision in the Beaufort region. These field representatives should have a technical background in oil company activities, as opposed to a public relations background, and have the ability to conduct business opportunity seminars in the secondary areas of the study region. The usefulness and success of these field representatives should be assessed by the oil companies after the first six months of operation, and only

continued if strong business support is evident in each community. Oil companies would benefit through an appreciation of resources available and by securing the most highly-qualified Northern suppliers. The field representative offices would be most valuable during the initial part of the development stage and, perhaps, during the initial stage of production.

- The oil companies should continue with their community/business information meetings. Oil companies should ensure that operational staff are realistic in stating what opportunities are likely for Northern businesses so that expectation levels are not raised unnecessarily.
  
- Oil companies should consider the type of input that can realistically be provided to a semi-annual or quarterly report which describes, to the extent possible, planned industry activity and major contracts over the upcoming three to six months. This report should be distributed to paid subscribers for their use and information. It should list all planned purchases by the oil companies. This would not only provide available information, but also demonstrate to the Northern business community that the oil companies are making the effort required to increase awareness of purchase requirements and procedures in the North.

A summary of recommendations concerning oil company liaison with the Northern business community and information dissemination is provided in Table 7-2.

#### 7.2.2 Oil Company Contract Tendering and Administration

The second area of concern for Northern businesses deals with the day-to-day operation of the oil companies in contract tendering and administration. Many Northern businesses are not familiar with the highly complex environment that the oil companies operate within and the frequent need for complicated

**Table 7-2**  
**Oil Company Recommendations - Business Liaison and Information Dissemination**

<u>RECOMMENDATION</u>	<u>PRIORITY AND IMPLEMENTATION SCHEDULE</u>			<u>IMPLEMENTATION ASSUMPTIONS AND REQUIREMENTS</u>
	<u>Immediate</u>	<u>Medium Term</u>	<u>Long Term</u>	
	<u>(within 12 months)</u>	<u>(1-3 years)</u>	<u>(3-5 years)</u>	
Oil Company Contact List	(1)	ongoing	ongoing	Oil companies should differentiate between public relations and purchasing offices for northern business, as well as full-time vs. two-week rotational portions.
Northern Business Registration	(1)	ongoing	ongoing	Advertise importance of Northern business registration and purchasing contacts.
Northern Business Coordination Offices	(1)	ongoing	ongoing	Maintain the offices which now exist.
Yellowknife & Whitehorse Representative		(1)*		Trial basis initially with max. one-year operation after production decision announced.
Community/Business Information Meetings	(1)	ongoing	ongoing	Meetings should focus on "how to work with oil companies" and on known projects rather than likely opportunities.
Semi-annual or Quarterly Reports		(1)	ongoing	Establish a quarterly or semi-annual activity report and mail-out subscription list. Should be distributed to paid subscribers.

(1) Indicates First Priority.  
 (2) Indicates Second Priority.  
 (\*) Once production decision is made.

contracts and tender processes. To assist Northern businesses with these problems, a number of recommendations are made for oil company consideration in the following paragraphs.

- Oil companies should continue with their policy to "Buy Northern" to the extent that Northern suppliers can be competitive with southern businesses and can provide equal or better service.
  
- Where possible, oil companies should attempt to provide a minimum one-month tender period for all contracts requiring construction services. A minimum three-week tender period for supply and service contracts should be provided where practical. **It needs to be recognized that the nature of oil and gas exploration activity precludes long tender periods, but the industry should attempt to extend these periods wherever possible.**
  
- Oil companies should indicate to Northern businesses that the operations at Tuktoyaktuk are the focal point for most purchasing /contract decisions for Gulf/Beudrill and Esso, whereas the Calgary offices of Dome now make all purchasing decisions regarding Beaufort Sea activity. Major construction projects and supply/service contracts should be announced and advertised on a regular basis, either in a supplementary issue of the APOA Review (Arctic Petroleum Operators' Association) or in a special newspaper (i.e., styled after the Journal of Commerce). This information bulletin could form part of the Quarterly Project Report document that was previously recommended. Wider distribution of bids within Northern Canada is recommended, especially in situations where known expertise exists in the North. In some cases it may be appropriate for oil companies to invite protected regional bids or to negotiate to facilitate the involvement of smaller firms and smaller communities in Northern Canada.
  
- Oil companies should be encouraged to simplify bidding documents and, where possible and practical, to break contracts up into sizes

that are manageable by local Northern companies. It is recognized, however, that breaking contracts into smaller contracts is generally not practical.

- Oil companies should ensure that bid evaluation practices compare northern and southern supply bids on an equal basis and that all specified price bids are based on final F.O.B. destination. In most cases this is practiced at the present time.
- Oil companies should continue their practice of prompt payment to creditors and, to the extent possible, guarantee payment within sixty days so that Northern businesses can obtain bank financing on current receivables.
- Oil companies should encourage general contractors to make use of local Northern subtrades in their bid documents for construction service contracts. Consideration should be given to identifying Northern contractors who are registered with the oil company involved. This would place the onus on Northern firms to register with the oil companies. We understand that a similar practice was undertaken during the Norman Wells project and would ensure that southern contractors who are interested in bidding contracts are aware of Northern expertise.

Table 7-3 presents a summary of our recommendations concerning improvements to the contract tendering and administration process by oil companies operating in the study region.

### 7.3 RECOMMENDATIONS FOR GOVERNMENT

The services of the Yukon and Northwest Territorial Governments and the many varied programs administered by the Federal Government will continue to be of assistance to the development and expansion of Northern businesses. All levels of government have recognized the importance of the oil industry and its contribution in diversifying the economy of the North. At the territorial level,

Table 7-3  
Oil Company Recommendations - Contract Tendering and Administration

RECOMMENDATION	PRIORITY AND IMPLEMENTATION SCHEDULE			IMPLEMENTATION ASSUMPTIONS AND REQUIREMENTS
	Immediate	Medium Term	Long Term	
	<u>(1-3 years) (3-5 years)</u>			
"Buy Northern" Policies	(1) <u>(within 12 months)</u>	ongoing	ongoing	Assumes that oil companies will accept lowest bid, that guarantees of service and performance levels are satisfactorily in place by Northern bidder and that "best value" as defined in CMOP is provided.
Minimum Tender Periods	(2)	ongoing	ongoing	Assumes sufficient advance planning by oil companies.
Tuktoyaktuk and Calgary are Focal Points for Purchasing Decisions	(1)	ongoing	ongoing	Oil companies will continue to decentralize operations as much as possible and provide more purchasing people into the field. Wider bid distribution in the North would be advantageous.
Simplified Bidding Documents and Reduced Contract Sizes	(2)	ongoing	ongoing	Northern businesses should be aware that southern companies bid on similar contract documents and that simpler contracts are not always possible.
Equal F.O.B. Bid	(1)	ongoing	ongoing	Assumes that all southern bids reflect market freight and transportation charges.

... continued

**Table 7-3 (continued)**  
**Oil Company Recommendations - Contract Tendering and Administration**

<u>RECOMMENDATION</u>	<u>PRIORITY AND IMPLEMENTATION SCHEDULE</u>			<u>IMPLEMENTATION ASSUMPTIONS AND REQUIREMENTS</u>
	<u>Immediate</u>	<u>Medium Term</u>	<u>Long Term</u>	
Invoice Payment Period	(2) (within 12 months)	(1-3 years)	(3-5 years)	Northern businesses must be fully aware of oil company invoicing procedures in order to obtain prompt payment.
Northern Subcontractors Identified	(2)	(1)	ongoing	Oil companies should encourage the use of considerable Northern expertise. Identification of registered Northern subtrades should be considered if preferential treatment of some can be avoided.

- (1) Indicates First Priority.
- (2) Indicates Second Priority.

the Governments of Yukon and the Northwest Territories have taken steps to assist local business by establishing services that provide advice and financial assistance to companies that are pursuing contracts within the oilfield sector. Some programs, however, notably in the area of training, have not been utilized to the extent possible, largely as a result of a short advance planning period (due to the uncertainty and complexity of the oil industry), as well as the in-house training provided directly by the oil companies.

The demand for government programs and services is likely to increase considerably as when oil exploration and development actively expands within the study region. As a result, it will be necessary for governments to establish policies that identify their roles and the degree of involvement in assisting Northern businesses. The following recommendations concerning this level of involvement and the role of government as a facilitator are provided for consideration:

- The Territorial Governments should sponsor a series of financial management workshops that include advice on general management practices, accounting procedures, bonding, and marketing strategies. These workshops should target specific business sectors and should supplement existing programs already in place, such as those offered by the Federal Business Development Bank.
- Assistance services, business development guidelines and the data base available through the Federal Business Development Bank should be advertised and promoted more widely, and Northern businesses should be encouraged to make use of the varied, economical services available.
- Both territorial governments should assist business associations with their promotional efforts towards the oil industry. This could be accomplished, in part, through financial assistance and, in part, through continued publication of business directories.



- Territorial governments should continue to support and co-sponsor community workshops in conjunction with the oil companies operating in the North. These workshops should focus on the provision of information to local companies on subjects such as "how to do business with the oil industry" and "invoicing and procurement policies". It is important that representatives of the oil companies and government discuss in advance what opportunities are realistic and which communities have services that are appropriate to specific needs of the industry. In this way workshops can be effectively oriented and planned. Care should be taken to avoid raising local expectations beyond realistic levels.
  
- Territorial and municipal governments should continue to support and participate in future Beaufort Industry Group conferences and oil industry trade shows. Follow-up information seminars should take place in the secondary business community areas.
  
- The Territorial Governments need to follow-up with companies that they have specifically helped to establish. Current economic initiatives tend to focus on development, whereas some monitoring of these new businesses is required to ensure that effective services and/or products are provided and proper management practices are carried out.
  
- The Government of Yukon should examine the practicality and feasibility of establishing a funding program for assisting Northern business in its marketing efforts to the oil companies. The Government of Northwest Territories should consider expansion of the "Trade Show Assistance Program" already in place. These programs, likely modelled after the Federal Government Program for Export Market Development (PEMD), would assist those businesses established in communities away from the centres of oil activity to undertake marketing and business development trips to the Beaufort region and Alberta, to participate in trade shows, to

attend marketing seminars and to develop brochures. The private sector could be required to repay territorial government contributions as and when promotional efforts prove successful. The only similar program now in place is one aimed at trade show participation under the auspices of GNWT. Its \$30,000 annual budget is restrictive relative to the benefits that could be derived by this type of assistance, and should also be altered to fund companies serving the local territorial market as well as manufacturers of exported products.

- The Yukon and Northwest Territorial Governments should research and establish a list of professional expertise and services available under the CASE and CESO programs that could be of interest to Northern businesses which are pursuing the oil and gas industry market. The availability of these services should be advertised so that Northern businesses can either approach these programs directly, or indirectly through the help of the territorial governments.
  
- The governments of Yukon and the Northwest Territories should consider the establishment of Native entrepreneurial training programs which would provide direct experience to selected Native people. The territorial governments and the oil companies would need to co-operate on selecting individuals from Native Development Corporations, Native organizations and Native businesses to work directly in the industry for a period of up to six months. The knowledge and awareness so gained would prove valuable to suppliers which bid on and undertake work within the oil and gas industry.
  
- Once a development/production decision is made in the study area, territorial government-supported full-time positions should be considered for Beaufort Sea coordinators in Inuvik, Yellowknife and/or Whitehorse. Such a position in Inuvik would have the

highest priority. Candidates selected to fill these positions should have a solid background in and understanding of oil industry development and purchasing requirements.

- The territorial governments, particularly the GNWT, should encourage and sponsor social business occasions that encourage more interaction between the oil companies and the business community. This should be implemented jointly with local trade associations. These functions would attempt to change the perception of local businesses and residents that the oil companies operate in isolation from the local communities and are inaccessible to the general business community.
- The Government of the Northwest Territories should undertake steps to improve the delivery of financial assistance programs. Specifically, GNWT should consider raising the approval limit of regional loan boards which is currently set at \$50,000. Increased regional authority would enable a faster response time for applications since approval from Yellowknife would only be required at higher levels. This increased authority will be especially important once a production decision is reached, since Northern businesses will need to respond quickly to the opportunities which arise. Steps to implement this recommendation should proceed well before a production decision is made.
- An evaluation of the practicality of previous training programs utilized and established for the Norman Wells project and pipeline should be undertaken jointly by the Federal and Territorial governments so that programs can be planned and offered that are directly relevant to the needs of the oil and gas industry. It is critical that these programs are established well in advance of specific employment trade skill requirements.

- Government should establish a standard reporting procedure for the oil and gas companies concerning levels of annual expenditure by business sector by Northern community and consolidated by territory. These reports should be submitted annually. They should not include standard reporting by purchase category since accounting and purchase type variations amongst the oil companies would require significant effort for limited value. Standard reporting by business sector and by community would facilitate the tailoring of training, promotional and coordination initiatives by territorial and municipal governments and business associations.
  
- Government should commission a careful study of the economic impact arising from oil and gas industry expenditures in Northern Canada. This evaluation would enable the specific community impact to be determined, allow the actual economic benefit remaining in the North after leakages to be understood, identify supply sectors generating the greatest economic benefits for the dollars expended and provide a solid base for monitoring future industry expenditures in the North and the benefits so derived.
  
- The Government of Yukon and the Government of the Northwest Territories should plan, fund and implement an information dissemination program which relates directly to the opportunities and recommendations described in this report. This process should be oriented towards making Northern businesses aware of opportunities and action required. It could include community meetings involving presentation of appropriate conclusions and the preparation and printing of a brochure including relevant contacts, planned government action, support services and training programs as well as specific opportunities and recommendations for distribution to Northern businesses.

Table 7-4 summarizes the principal recommendations for consideration by the Territorial and Federal levels of Government.

**Table 7-4**  
**Government Recommendations and Assistance for Northern Businesses**

<u>RECOMMENDATION</u>	<u>PRIORITY AND IMPLEMENTATION SCHEDULE</u>			<u>IMPLEMENTATION ASSUMPTIONS AND REQUIREMENTS</u>
	<u>Immediate</u>	<u>Medium Term</u>	<u>Long Term</u>	
	<u>(within 12 months)</u>	<u>(1-3 years)</u>	<u>(3-5 years)</u>	
Financial Management Workshops	(1)	ongoing	ongoing	Initial discussions with a number of businesses and the local chambers of commerce should be undertaken in order to confirm local interest.
FBDB Services Promotion	(2)	(1)	ongoing	Ongoing improvement and expansion of FBDB services is underway.
Assistance to Business Associations		(2)	ongoing	Success of business association efforts will depend on the degree to which business sectors are prepared to co-ordinate their marketing efforts.
Community Workshop Sponsorship		(1)	ongoing	Oil company and government representatives will need to discuss in advance likely business opportunities and available services before undertaking community information meetings.
BIG Conference Support	(1)	ongoing	ongoing	BIG conferences should focus on Northern businesses in Yukon and NWT jointly.
Follow-up Monitoring and Business Services to New Companies	(2)	(1)	ongoing	Budgets for increased time for follow-up and travelling to secondary market areas will need to be approved.
Business Marketing Program		(1)	ongoing	Expansion of financial resource commitments is required for business development travel, trade shows, marketing seminars and brochures.

... continued

Table 7-4 (continued)  
 Government Recommendations and Assistance for Northern Businesses

RECOMMENDATION	PRIORITY AND IMPLEMENTATION SCHEDULE			IMPLEMENTATION ASSUMPTIONS AND REQUIREMENTS
	Immediate (within 12 months)	Medium Term (1-3 years)	Long Term (3-5 years)	
Professional Expertise and Services List		(1)	ongoing	CASE and CESO services should include general business management expertise as well as specialist advice regarding the oil and gas industry.
Native Entrepreneurial Training Programs		(1)	ongoing	Co-operation by the oil industry will be required to provide direct experience within the companies.
Beaufort Sea Co-ordinators		(1)	ongoing	Will depend on development/production decision. Suitable technical background essential.
Oil Company/Community Business and Social Events	(2)	(1)	ongoing	Oil company/community events will facilitate more awareness of oil exploration/development activities and provide opportunities for local businesses to become familiar with industry representatives.
Improve Delivery of Financial Assistance Programs		(1)	(1)	Increased regional loan board approval limits in the NWT would be beneficial. Especially important once a production decision is reached.

... continued

Table 7-4 (continued)  
 Government Recommendations and Assistance for Northern Businesses

RECOMMENDATION	PRIORITY AND IMPLEMENTATION SCHEDULE			IMPLEMENTATION ASSUMPTIONS AND REQUIREMENTS
	Immediate	Medium Term	Long Term	
	(within 12 months)	(1-3 years)	(3-5 years)	
Training Program Evaluation and Development	(1)	ongoing	ongoing	Will assist in training programs suited to Beaufort Sea development. Community/business feedback is important. Establishment in advance of production is critical.
Standard Reporting Procedure by Sector and Community	(2)	(1)	ongoing	Information can be consolidated and used by territorial governments and municipal groups to tailor assistance programs.
Promotion of Recommendations, Opportunities and Information	(1)			Community workshops and summary brochure distribution aimed at Northern businesses will provide direction which will encourage action.

- (1) Indicates First Priority.
- (2) Indicates Second Priority.

**APPENDIX A**  
**DETAILED LIST OF GOODS AND SERVICES**  
**REQUIRED FOR**  
**OIL AND NATURAL GAS EXPLORATION AND PRODUCTION ACTIVITIES**



Table A-1

**Typical Requirements of Seismic Operations**

PERSONNEL

Cable Truck Drivers	Mechanics' Helpers
Camp Attendants	Monitors
Clerks/Supplymen	Observers
Cooks	Recording Helpers
Cooks' Helpers	Shooters
Drillers	Shooters Helpers
Drill Helpers	Strip Camp Operators
Drill Pushes	Surveyors
Expeditors	Surveyors' Helpers
Junior Observers	Water Truck Drivers
Mechanics	Vibroseis Operators
	Vibroseis Mechanics

MATERIALS

Acetylene	Fuel/Lubricants
Building Supplies	Hole Pluggers
Communication Equipment	Lumber
Drill Mud	Medical Supplies
Drilling Bits	Pumps - water
Equipment/Clothing	• Various Tools and Hardware
Explosives	Welding Accessories
Food Stuff	

SERVICES

Air Freight	Gravity Surveys
Aircraft Support	Instrumentation Repair
Barging	Local Employment Officer
Cable/Geophone Repair	Maintenance
Camp Maintenance	Seismic Survey
Camp Rental	Slashing
Caterers	Surveyors
Cats	Trucking
Communications	Vehicles
Drills	Welding
Expediting	

Source: Petro-Canada, 1983 Canada Benefits Report to COGLA.

Table A-2

**Typical Requirements of an Onshore Drilling Program**

PERSONNEL: Drilling Rig Crew

Derrick Persons  
Drillers  
Floor Persons  
Motor Persons  
Roustabouts  
Warehouse Support Staff

MATERIALS

Acetylene	Generators (Rental)
Air Compressors	Insulation
Bearings	Line Heaters (Rental)
Bit Subs	Line Pipe
Bits (Coring and Drilling)	Lubricants
Boxes and Crates	Lumber
Building Supplies	Medical Supplies
Cable	Meters
Casing	Methanol
Cement Retainers	Mud Chemicals
Cement (Drilling)	Paint/Equipment
Centralizers	Piling
Centrifugal Pumps	Pipe and Hose Fittings
Coating (Pipe Vessels & Tanks)	Propane
Communication Equipment	Pumps (General)
Crane (Rental)	Quick Connection Coupling
Detectors (Gas)	Rotary Pumps
Drill Collars	Safety Equipment & Clothing
Drill Pipe	Separators (Rental)
Electrical Panel (Rental)	Shackles
Fencing	Shock Subs (Rental)
Fire Extinguishers	Signs
First Aid Kits	Space Heaters (Rental)
Fishing Equipment (Overshots and Grapples, etc.)	Stablizers (Rental)
Flanges	Steel Plate
Float Equipment	Storage Tanks (fuel, water)
Framed Buildings	Temperature Indicators
Fuel - Gasoline, Propane	Tools
Fuel - Diesel & Aviation	Valves
Gauges (Pressure)	Welding Accessories
	Work Clothing

... continued

Table A-2 ( continued )

SERVICES

Air Drilling	Fishing (Drill stem)
Aviation	Ice Bridge Construction
Barging	Inspection Services
Blowout Specialists	Lease Surveys
Casing Jacks	Lease and Road Construction
Catering	Maintenance
Cementing	- Cats
Core Analysis	- Graders
Construction Support	- Forklifts
Coring	Local Employment Officer
Construction Consultant	Pressure Testing
Cranes	Filing
Drill Stem Testing	Printing Services
Directional Drilling	Rig Jackers
Drilling Consultants	Rig Move
Drilling Rig	Trucking (Water and General)
Electric Logging	Welding and Fabrication
First Aid	Well Logging

Source: Petro-Canada, 1983 Canada Benefits Report to COGLA.

Table A-3

Typical Goods and Services Used in Northern Offshore Drilling

CONSTRUCTION

Civil Engineering

1. CAMP CONSTRUCTION

o Labour

- carpenters
- equipment operators
- electricians
- plumbers

o Equipment

- trucks
- earthmoving equipment
- ratholers
- sewage and water system
- fire alarm system
- low-boys, high-boys
- lumber and general
- building supplies
- compressors

2. ROAD AND AIRSTRIP CONSTRUCTION AND MAINTENANCE

- o Earthmoving equipment and parts
- o Sand and gravel
- o Surveyors and equipment
- o Trucks and parts
- o Blasting equipment
- o Culverts
- o Automotive and mechanical tools and accessories
- o Gravel and fill material

3. ISLAND CONSTRUCTION AND MAINTENANCE

- o Crushing plants
- o Blasted and crushed rock gabions
- o Trucks
- o Sand bags
- o Plastic mesh
- o Surveyors
- o Divers
- o Dredges

4. DOCK CONSTRUCTION

- o Sheet pile
- o Steel pipe and piles
- o Angle irons
- o Steel braces and posts
- o Concrete
- o Pile drivers
- o Cranes
- o Earthmoving equipment
- o Marine fenders (old large tires, etc.)

5. GENERAL

- o Herman Nelson heaters
- o Compressors and air tools and equipment
- o Portable generators
- o Steam plant
- o Electrical contractors and equipment
- o Mechanical contractors and equipment
- o Jack hammer
- o Rig mats
- o Small hardware
- o Fuel and lubes
- o Portable pumps
- o Portable lighting
- o Portable compressors

... continued

Table A-3 ( continued )

MARINE EQUIPMENT

Marine Systems

1. VESSELS

- o Crewboats
- o Tugs
- o Supply vessels
- o Barges
- o Runabouts

2. MARINE SUPPORT

o Vessel maintenance

- welding equipment and welders
- oxygen, acetylene
- welding, supplies
- steel plant, angle iron
- machinery equipment and machine shops
- marine paint
- tank cleaning

o Equipment

- spare parts: hoses, pumps, valves fittings, filters
- small engines
- portable generators
- boilers
- heaters
- winches
- hydraulic equipment
- small outboard motors
- portable pumps
- portable compressors

3. ONBOARD EQUIPMENT

o Engine Room equipment

- water evaporators
- fuel and lubes
- glycol
- solvents
- hoses, filters, gaskets
- electrical equipment

- fire alarm system and extinguishers
- air conditioning equipment
- boilers
- cleaning materials
- hand and small power tools

o Galley and Quarters

- food supplies
- kitchen equipment
- linen and towels
- magazine, newspapers, literature
- cleaning materials
- VCR's and VCR tapes

o Deck equipment

- life rafts and life vests and jackets
- life raft supply and maintenance
- anchors and chain
- winches
- rope and cable
- shackles and swivels
- safety equipment
- fire hoses and extinguishers
- mooring lines and buoys
- blocks
- survival suits

o Bridge equipment

- maps and charts
- communication equipment
- navigation equipment
- video display terminals
- ship communications systems
- maintenance of above systems

DREDGING GROUP

1. STEEL WORK

- o welding equipment
- o Machining
- o Remetalling
- o Drydock equipment
- o Tank cleaning
- o Sheet metal

... continued

Table A-3 ( continued )

- o Sand blasting
- o Sand blasting materials inventory
- o Tank linings

2. METAL PROTECTION

- o Marine paint
- o Sandblasting equipment
- o Painting contractors
- o Scaffolding

3. GENERAL MECHANICAL MAINTENANCE

- o Diesel, engine repairs and parts
- o Winches, cable, wire ropes
- o Pumps, hoses, hydraulic fittings, filters
- o Small engines

4. MARINE EQUIPMENT AND SUPPLIES

Same as marine systems

DRILLING OPERATIONS

Drilling Equipment

1. CONSUMABLES

- o Cement and cement chemicals
- o Barites and mud chemicals
- o Wellhead equipment

2. DRILLING HARDWARE

- o Drill bits and nozzels
- o Drill pipe and collars
- o Spinning chain
- o Shale shaker
- o Mud lines
- o Mud pumps
- o Tongs
- o Kelly
- o BOP stack
- o Slips

- o Draw works
- o Hoses and pipes
- o Rotary table
- o Swivel
- o Mesh screen
- o Drill pipe dope

SUPPORT SERVICES

1. HOTEL AND OFFICES

o Accommodation and dining facilities

- air conditioning
- equipment
- furniture
- janitorial services and equipment
- fire alarm system and extinguishers

o Recreational facilities

- billiard equipment
- newspapers and magazines
- sporting goods
- televisions and video equipment
- stereo and radio equipment

o Office supplies

- calculators and accessories
- copiers, accessories, including maintenance
- desks
- typewriters
- maps
- printing services
- file cabinets
- business forms
- drafting supplies

o Communications Facilities

- radio transmitters and receivers
- battery packs
- communication equipment maintenance

... continued

Table A-3 ( continued )

- o Medical Supplies
- 2. UTILITIES AND BUILDING MAINTENANCE
  - o Water delivery and treatment
    - pipes and hoses
    - water trucks
  - o Sewage treatment and disposal
    - honey wagons
    - septic tanks and chemicals
  - o Electrical
    - electrical contractors
    - lighting supplies
    - other electrical supplies
    - motor rewind
  - o Heating equipment
    - oil furnaces and burners
    - Herman Nelson heaters
    - camp heating (glycol system)
    - Propane
  - o Fire fighting system
    - hoses and fittings
    - pumps
    - extinguisher and extinguisher refills
  - o Building
    - roofing material
    - lumber
    - aluminum siding
    - doors and windows
    - weather strip
    - plumbing supplies
- 3. YARD STORAGE AND MAINTENANCE
  - o Storage equipment
    - fuel tanks
    - mud tanks
    - bulk tanks
    - construction equipment
    - cranes and parts
    - fences
    - lumber
    - shelving
    - strapping
    - cargo containers
  - o Yard maintenance
    - loaders and parts
    - truck and parts
    - dozers and parts
    - backhoes and parts
    - gravel supplies
    - culverts
    - welding equipment
- 4. MATERIAL CONTROL
  - o Warehouse
    - central warehouse supplies (rope, soap, and dope)
    - marine warehouse supplies (marine engine repair and maintenance)
    - drill systems warehouse supplies (downhole equipment, drill bits, casing and tubing)
  - o Fuel management
    - quality control equipment
    - aircraft refuelling equipment
    - marine refuelling equipment
    - fuel tanks, meters and pumping systems

... continued

Table A-3 ( continued )

- o Trucking and barging support
  - tugs and barges (cargo and fuel)
  - trucking (local and long distance)
  - expediting (Inuvik, Hay River, etc.)

- o Materials handling and control equipment/ systems/personnel

- o Computer operations
  - computer equipment
  - computer maintenance
  - computer forms, etc.

5. SURVEY AND POSITIONING

- survey buoys
- anchors
- transmitter stations
- parts and maintenance

6. AIR SERVICES AND AIRCRAFT SUPPORT

- scheduled air services
- fixed wing charter
- helicopter charter
- fuel
- ground transportation (buses, taxis, etc.)
- expediting
- aircraft loading/unloading
- accommodations and food
- in-flight catering
- hanger services
- parking facilities
- de-icing equipment

7. SAFETY SUPPLIES

- safety awards
- clothing
- arctic gear
- survival rations and equipment

8. SUPPORT TO OTHER GROUPS

- o Manpower
  - electricians
  - welders
  - equipment operators
  - mechanics
  - machinists and fitters
  - plumbers
  - carpenters
  - bear monitors
  - harbour and environmental monitors

- o Equipment
  - yard maintenance equipment
  - trucks
  - lathes and mills
  - chain saws
  - batteries
  - compressor and air accessories
  - cranes
  - ladders and scaffolding
  - small hardware supplies

PETROLEUM ENGINEERING

Well Completions

1. EQUIPMENT

- o Tubing string - Nipple profiles
- o Well safety devices
- o Circulation valves
- o Temperature/pressure gauges
- o Perforating equipment
- o Plugs
- o Filter units/filters
- o Pumps and hoses
- o Christmas trees equipment for wellhead/control systems
- o Packers/hangers

... continued



Table A-3 ( continued )

2. CHEMICALS

- o Acids (HCl, HF)
- o Completion fluids
  - brine mixtures
  - CACl, CaBr, ZnBr
- o Chemical additives
- o Other chemicals

ENVIRONMENTAL RESEARCH

1. OILSPILL RESEARCH

- o Transportation
  - aircraft
  - helicopters
  - snowmobiles
  - tracked vehicles
  - small and medium size support boats
  
- o Labour and technical support
  - environmental consultants
  - chemical analyses
  - sampling and packaging
  - bear monitors
  - divers
  
- o Equipment
  - small expendable equipment, rope, plastic valves, pipes
  - videotape equipment
  - aerial photography equipment
  - shoreline protection booms
  - fireproof booms
  - oil burners
  - sorbents
  - incendiary devices
  - skimmers
  - rubber boats

2. REMOTE SENSING RESEARCH

- o Surveillance equipment
  - radar equipment
  - specialized or modified radar system
  - low light photography equipment
  - video and video equipment
  - electronic processing equipment
  - specialized computer display facilities
  
- o Tracking
  - ice reinforced buoys
  - current meters
  - meteorological equipment

Source: Dome Petroleum Ltd.

**Table A-4**

**Production Phase  
Northern Business Opportunities  
Norman Wells Project**

Services

Welding

- o Provide welding support to ongoing operations. B-Pressure Welder is required.
- o Welders required on an ongoing basis.

Electrical

- o Supply small amounts of construction and manpower to handle extra electrical maintenance work loads.
- o Electricians required on an as required basis.

Insulation

- o Supply an Insulator to support the ongoing operation.

Instrumentation

- o Provide an Instrumentation Mechanic on an as required basis to support existing operations.

Table A-4 (continued)

Mechanical

- o Supply Millwrights and Pipefitters on an as required basis to support the existing operation.

Marina and Boat Operation

- o Supply a Dredger to dredge Production Operations Marina.
- o Supply two-man crew to operate Esso Resources' boats during the summer months on an as required basis.

Pipeline

- o Replace 1000' of 2" gas line feeding the Production Warehouse.

Hot Oiler

- o Supply a Hot Oiler on an as required basis to support the ongoing Field Well Production Program.

Steamer

- o Supply a steamer on an as required basis particularly during the winter months to support the ongoing operation.

Table A-4 (continued)

Carpentry and Plumbing

- o Experienced carpenters for general maintenance on houses, i.e. painting, windows, exterior building repairs.
- o Other miscellaneous carpentry and plumbing.

Berm Sealant Application

- o Supply and apply Berm Sealant on tank farm berms as per supplied specifications.

Vehicle Servicing

- o Supply monthly service to approximately 50 vehicles, i.e. oil change, grease, safety check.

Facility Shutdowns

- o Provide men, equipment, and tools for turnaround work (blanking, steel inspection, PSV's, etc.) at Battery #3, C.P.F. and Island Facilities.

Helicopter Support

- o Provide helicopter service from mainland to all Production Island facilities during spring break-up and fall freeze-up.

Table A-4 (continued)

Wireline Support

- o Provide two men to operate Esso Resources wireline equipment on a 12-hour, 365 day a year basis.

Janitorial, Camp and Catering

- o Provide janitorial services at the Production Operations Maintenance offices, C.P.F., Production Warehouse, O.M. & S., Firehall and Refinery.
- o Window and camp cleaning for Esso Resources 200-person camp.
- o Catering for 200-person camp - contract for renewal 85 06 - maybe renewed.
- o Catering for 20-person camp at Redstone River for approximately one month.
- o Camp cook and attendant for seismic camp at Wrigley for 40 days.
- o Food and camp supplies for seismic camp at Wrigley.

Table A-4 (continued)

Miscellaneous Manpower

- o PORTCO-provide a three-person crew to fill drums with petroleum products. Approximately three to four months work.
- o Supply manpower to clear flaw pit areas of all vegetation.
- o Supply equipment and men to repair and up-grade vacant leases.
- o Expeditor for seismic activity in Wrigley area for 40 days.
- o Recording helpers for seismic activity in Wrigley area 10 x 20 days.
- o Person to operate incinerator and bobcat 6-12 hours per week.

Rock and Shale

- o Cover Esso's Camp I utilidor with shale.
- o Backfill two mainland drilling sumps, one Goose Island sump and one Bear Island sump.
- o Place rock scour protection around 12 bunkers on Goose Island.
- o Repair BIT 3 surface with shale.
- o Upgrade Bear Island Pumpjack bases with shale.
- o Upgrade six roads and leases on Bear Island with rock and shale.
- o Minor rock repairs on two artificial islands.

Environmental

- o Analysis of water, soil, and sediment samples from the Norman Wells area Environmental Baseline Gathering Program (Arctic Labs doing some analysis now).
- o Consultant services for another waterfowl survey if required by government.
- o Reclamation services if Esso cannot successfully reclaim areas disturbed by our activities.

Miscellaneous

- o Seeding of sump on two mainland and one Bear Island sumps.
- o Fuel supply - approximately 20,000 gallons.
- o Minimal air charter.

Table A-4 (continued)

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Equipment

Trucks and Heavy Equipment

- o Supply tank trucks on an as required basis to haul water and chemicals to support the Field Well Production program.
- o Supply a five-ton Picker truck on an as required basis to support the Field Wireline Operation.
- o Supply a truck to haul sewage from Battery III on a scheduled basis.
- o Supply equipment to haul water and sewage from Production Warehouse on a scheduled basis.
- o Equipment and men to maintain all roads throughout the Esso lease.
- o Gravel and shale hauling.
- o Van service.
- o A general requirement for equipment on an as needed basis; i.e., rental of pick-up trucks, cats, vacuum trucks, cranes, tractors, trailers.
- o Equipment and men to excavate new sump on Bear Island.
- o Purchase of oil spill response equipment such as additional booms, ropes, skimmers. Current plan is to purchase such materials from southern firms.

Source: Esso Resources Canada Ltd.



Table A-5

Potential Northern Business Inputs to Polar Gas Pipeline

MATERIALS

FORM LUMBER

FABRICATED BOARD

- Plywood
- Particle Board
- Wafer Board

PIPE

- Water
- Sewer
- Conduit
- Culvert

CHAIN

ROPE

- Wire
- Sisal
- Nylon

EXPLOSIVES

INDUSTRIAL GASES

- Oxygen
- Acetylene
- Argon
- Carbon Dioxide
- Propane
- Nitrogen

WELDING ROD OR WIRE

CEMENT

FILTER CLOTH

FENCING

- Chain Link
- Plastic

COATING

- Paint
- Rock Shield/Netlon

MATERIALS ( cont'd )

SANDBAGS

TARPAULINS

PETROLEUM, OIL & LUBRICANTS

- Gasoline
- Diesel
- Oil
- Lubricants

TIRES, BATTERIES & ACCESSORIES

- Tires
- Batteries
- Accessories

PARTS

CLOTHING

FOOD SUPPLIES

CONTRACTS

SERVICES

ENGINEERING

- Surveying
- Aerial
- Field

- Inspection
- Radiographic
- Ultrasonic

CONSTRUCTION

- Road and Site Preparation
- Camp Construction
- Hauling - Misc. Supplies
- & Materials
- Clearing
- Fencing
- Painting
- Revegetation
- Sandbag Filling

... continued

Table A-5 ( cont'd )

CONTRACTS

SERVICES ( cont 'd )

MANUFACTURING OR PROCESSING

TIMBER

- Chips
- Cribbing
- Piling

LUMBER

- Skids
- Swamp Mats

EARTH BORROW

- Pit Run
- Processed
  - Sand
  - Select
  - Aggregate
  - Rock Riprap

CONCRETE WEIGHTS

SANDBAGS

OTHER

Office

- Stenographic

Camp Maintenance

- Security
- Janitorial
- Building Trades
- Catering

Expediting

Transportation

- Aircraft
- Vehicle
- Boat
- Barge

Fuel Storage

CONTRACTS ( cont 'd )

EQUIPMENT LEASING

Construction

- Bulldozers
- Graders
- Loaders
- Scrapers
- Backhoes
- Cranes
- Air Equipment
- Drills
- Pumps
- Generators
- Concrete Mixers

Vehicles

- Flatbeds
- Dump
- Pickups
- Buses
- Tankwagons
- Trailers
- Tracked

Camp Units

- Sleeping
- Dining
- Warehouse
- Office

Tools

Office

- Business Machines
- Furniture

Aircraft

- Fixed Wing
- Helicopter

Warehousing

Source: Polar Gas, Northern Business Opportunities.

Table A-6

**Norman Wells-Zama Oil Pipeline  
Northern Business Content Classification**

1. ADMINISTRATIVE

- o accommodation and food services
- o business licence/permits
- o community hall rental
- o consulting services (general)
- o legal services
- o license plate/permit charges
- o media services (general)
- o office rental/lease
- o real estate appraisal fees
- o secretarial services
- o security training program
- o supervisors orientation program
- o telephone charges
- o translation services
- o travel agency services
- o video media productions
- o youth trapper training program

2. CONTRACT SERVICES

- o access road construction and maintenance
- o aerial marker manufacture
- o aerial wildlife surveys
- o barge dock installation and removal
- o boat repairs
- o brush clearing manpower
- o camp catering services
- o camp expediting services
- o camp security services
- o concrete weight manufacture and transport
- o construction services (general)
- o construction services (general)
- o electrical services (general)
- o equipment mobilization

...continued

Table A-6 ( cont'd )

- o fuel tank design and installation services
- o geo-tech helicopter support
- o geo-tech manpower
- o ice-bridge construction
- o insulation services
- o line survey manpower
- o maintenace services (general)
- o marine surveillance services
- o mechanical services (general)
- o M/L helicopter support
- o office renovations
- o O & M facility installation
- o O & M facility fencing and painting
- o pile-driving services
- o P/L route location services
- o P/L warning sign manufacture and installation
- o plumbing services (general)
- o P/S building supply
- o P/S civil works
- o P/S concrete works
- o P/S earthworks
- o P/S electrical services
- o P/S mechanical services
- o radio repair services
- o river crossing sign manufacture
- o remote valve installation
- o R/W clearing
- o R/W restoration
- o R/W revegetation
- o R/W wildlife monitoring
- o sand bag fill and stockpile
- o site development (P/S, construction camps, etc.)
- o skid lumber manufacture
- o socio-economic consulting services
- o staff housing construction and maintenance
- o tire repair services
- o trailer installation
- o trenching services
- o utilidor construction services
- o vehicle body work
- o vehicle maintenance
- o water taxi services
- o welding services (general)
- o wire disposal manpower

... continued

Table A-6 ( cont'd )

3. EQUIPMENT & LEASES

- o air compressor rental
- o audio-visual equipment rental
- o boat rental/lease
- o electrical equipment lease
- o equipment purchase
- o equipment rental/lease (general)
- o heavy equipment rental/lease
- o line survey equipment lease
- o pump rental/lease
- o skidoo and sled rental/lease
- o staff housing lease
- o telecommunications equipment (general)
- o vehicle rental/lease
- o warehouse rental/lease

4. MATERIALS & SUPPLIES

- o arctic clothing supply
- o craft items and supplies
- o electrical supplies (general)
- o fabricated steel supply
- o facility supply (general)
- o fire-fighting kits
- o first-aid supplies
- o fuel and lubricant supplies (general)
- o glass supplies
- o gravel and soil materials (general)
- o grocery items
- o hardware supplies (general)
- o household furnishings
- o lumber supplies (general)
- o office furniture
- o office supplies (general)
- o O & M facility supply
- o parts supply (general)
- o personal and survival kits
- o photographic supplies (general)
- o pipe supply (general)
- o propane supply
- o propane tank supply
- o tire supply
- o tools (general)

... continued

Table A-6 ( cont'd )

- o trapper supplies
- o water supply
- o welding supplies (general)

5. TRANSPORT SERVICES

- o ambulance services
- o barge transport services (general)
- o bus/taxi services
- o camp tow-out services
- o charter air services
- o courier services
- o freight transport (trucking-general)
- o fuel transport (general)
- o gravel haul
- o helicopter services (general)
- o pilot car services

Source: Interprovincial Pipe Line (NW) Ltd.

## **APPENDIX B**

### **NORTHERN CANADA BUSINESS PROFILE**

A key element of this study was to determine business resources available within the study area relative to the needs of oil and gas companies operating in Northern Canada. It is important not only to recognize the resources that Northern companies can offer, but also to identify their shortcomings relative to oil and gas company purchasing requirements. Appendix B provides a detailed profile of the types of business resources available by community within the study region.

In compiling such a business profile, it was first necessary to carefully define an approach for collecting and consolidating information to ensure that:

- i) the right type of information was collected in terms of identifying supply characteristics relevant to the petroleum industry;
- ii) the information was consolidated into a format that would facilitate comparison with oil and gas industry purchasing categories.

The approach used for the information collection and consolidation is described below.

#### **B.1 APPROACH TO COLLECTING AND CONSOLIDATING NORTHERN BUSINESS INFORMATION**

A number of factors were of primary importance and a number of information sources were used to develop the profile of Northern businesses.

##### **B.1.1 Geographic Location**

The location of private businesses in Northern Canada often has a direct influence on the company's ability to service or supply oil and gas company

activity. Due to distance and transportation costs, accessibility to development areas enhances the chances for success.

It is important to the governments of the Northwest Territories and Yukon that businesses located within their respective boundaries capitalize on oil and gas industry opportunities. Geographic categorization of Northern businesses not only ensures that an appropriate level of research takes place within each jurisdiction, but also provides opportunities for both territorial governments to assist with business development to the extent and in the manner they feel is appropriate.

Original research during this study focussed on the larger population centres in both Yukon and the Northwest Territories for reasons described in the next section. Original research was also carried out in smaller communities with direct access to oil and gas company activity. Other smaller or more remote population centres in Yukon and the Northwest Territories were researched through careful review of available statistical data and previous studies. Table B-1 summarizes the information collection approach utilized for each community within the study area. The communities themselves represent the geographic categorization for this project.

Figure 7 identifies the major transportation links in the study region. The Yukon communities, with the completion of the Dempster Highway, have a road connection to the Mackenzie Delta and, hence, could provide services and supplies to the oil and gas industry.

#### B.1.2 Community Economic Size

It is evident that the oil and gas companies require a wide variety of goods and services. Some of the smaller communities in Northern Canada, however, are characterized by limited economic bases and therefore have few, if any, businesses which can provide the goods and services required. Alternatively, companies that do the type of work required are often limited in size and cannot, sometimes, effectively bid on oil and gas industry work.



Table B-1

Business Research Method by Community

	<u>Community</u>	<u>Personal Interviews</u>	<u>Available Material Review</u>
<b>Northwest Territories</b>	- Aklavik		x
	- Fort Franklin		x
	- Fort Good Hope		x
	- Fort Liard		x
	- Fort McPherson		x
	- Fort Norman		x
	- Fort Simpson		x
	- Hay River	x	x
	- Inuvik	x	x
	- Norman Wells	x	x
	- Tuktoyaktuk	x	x
	- Wrigley		x
- Yellowknife	x	x	
<b>Yukon</b>	- Carmacks		x
	- Dawson City		x
	- Haines Junction		x
	- Mayo		x
	- Old Crow		x
	- Pelly Crossing		x
	- Ross River		x
	- Watson Lake		x
- Whitehorse	x	x	

The Study Team's research concerning Northern business resources focussed on communities with reasonable or good access to the oil and gas industry market and on communities with the economic base to effectively provide a variety of the goods and services required. Personal interview research was, therefore, carried out in smaller communities such as Inuvik, Tuktoyaktuk and Norman Wells due to their proximity to oil industry markets; smaller communities such as Hay River due to their accessibility to oil industry markets, and larger communities such as Yellowknife and Whitehorse due to their relatively large economic size and the variety of companies located there that could sell to the oil industry.

As described earlier, research of smaller communities where personal interviews were not carried out was completed through a review of available information and previous reports.

#### B.1.3 Information Sources

To supplement its original research, the Study Team researched and analyzed a variety of available information. Included in this source list were the following:

- Northwest Territories Construction Association;
- Beaufort Fact Book;
- Northwest Territories Business Directory;
- Yukon Business Directory (1985/1986);
- Yukon and Northwest Business Directory;
- Yukon Data Book (1984/1985);
- Oil company business directories;
- Business Statistics from the Government of Yukon's data base; and
- a variety of studies carried out previously in Yukon and the Northwest Territories

Consolidated results of this research and information assembly constitute the majority of this chapter.

#### B.1.4 Major Industry Sectors

As a profile of businesses in Northern Canada was developed, it became evident that only certain industrial sectors could, realistically, sell goods and/or services to the oil and gas industry. For purposes of our work, it was important to focus on these sectors and to recognize that other types of businesses such as hotels, restaurants, retail stores, household service companies and the like have limited potential to provide for the major industrial needs of the oil and gas industry. However, it should be recognized that these types of businesses can, and often do, realize indirect benefits from hydrocarbon industry activity in Northern Canada.

For this study, five industrial sectors have been identified which relate to direct oil and gas industry purchasing requirements and which are used to describe Northern businesses by community. These industry sectors are described below:

Construction/General Contractors - Companies which provide overall construction management and/or general contracting services, including provision of materials and hiring and supervision of sub-trades.

Supply Companies - Those firms involved almost entirely in the manufacture, assembly, distribution and/or retailing/wholesaling distribution of goods, materials or products which are used by the oil and gas industry.

Service Companies - Those firms which provide or could provide professional and specialized services to the oil and gas industry. Services cover a wide range from laundry service to catering to vessel repairs to electrical contracting.

Supply and Service Companies - Companies that provide goods and services which are, or could be, purchased by the oil and gas industry. Generally the goods and services supplied by an individual company are closely related (e.g., electrical repair service and electrical parts sales; radio equipment and radio equipment repair services).

Transportation Companies - Firms which are involved directly or indirectly in the transportation of freight and/or passengers within and to/from Northern Canada. This includes carriers (e.g., aircraft operators, trucking companies, etc.) as well as agents and forwarders used by these carriers.

Throughout the balance of this chapter, a discussion of the business resources in Northern Canada in relation to the above industry sectors. This business profile is described by population centre beginning with Yukon communities, followed by Northwest Territory communities.

## B.2 WHITEHORSE BUSINESS CHARACTERISTICS

The City of Whitehorse is the capital of Yukon and headquarters for both Territorial and Federal Government Services. With an estimated population of 16,000 residents, the economic base is centred on mining, transportation services, government, and tourism. The city's history and growth has been closely tied to mining and transportation. In the late 1890's and early 1900's, it acted as an important staging point for gold exploration activities in the Dawson area. Later, it developed as, and still continues to be, a transportation and service centre for the mining industry. Today, with the opening of the Dempster Highway and with direct links to the Beaufort region, its transportation role is being further expanded into the oil and gas sector. This highway connection will permit companies in Whitehorse to expand into new markets, previously serviced by the Mackenzie Valley corridor.

The business community in Whitehorse is well-established and diverse. Much of the current business sector is closely associated with mining activities. Some of the services and products sold to this sector are similar to some requirements of the oil and gas companies, as detailed in Chapter 3.

Within the City of Whitehorse, there are numerous businesses that supply goods and services which are indirect requirements of oil and gas industry activity (e.g., accommodation and food services.) However, for the purposes of this study, research has been focussed on those businesses that can potentially sell goods and services which are directly required by oil companies from an operation and development standpoint. Table B-2 presents research findings concerning those businesses in Whitehorse which meet these criteria. A description of each business sector follows the table.

**Table B-2**

**Whitehorse Community Business Profile**

<u>Business Sector</u>	<u>Number of Registered Companies</u>	<u>Employment Range Per Sector</u>		
		<u>Full Time</u>	<u>Part Time</u>	<u>Seasonal</u>
Construction/General Contractors	18	1-75(3)	1-10(5)	5-15(9)
Supply Companies	28	1-34(7)	1-3(2)	1-15(4)
Service Companies	37	1-12(4)	1-14(2)	2-50(9)
Supply & Service	22	1-18(6)	1-2(2)	1-50(2)
Transportation	37	1-112(12)	1-3(3)	1-12(5)

Note: ( ) indicates average number of employees.

**B.2.1 Construction/General Contractors**

Within the City of Whitehorse, there are approximately sixty companies that can be classified as general contractor businesses and which provide a full range of construction services. Many of these companies, however, are small in size and undertake contracts that primarily involve residential construction/rennovation and local excavation services. Of the total number of components in this sector, it is estimated that 30 percent have the range of services that are appropriate to the oil industry. This group of companies have been in business for an average of eleven years in the region while two firms surveyed had been established for over twenty-five years. Construction services provided within this sector include:

- site work;
- excavating;
- road building;
- industrial construction;
- heavy equipment hauling, and;
- heavy equipment leasing.

Most of these companies provide trucking and hauling services in addition to general construction services.

General contracting companies in Whitehorse have considerable experience in the mining sector and have developed expertise that could be marketed to the oil and gas industry. It is estimated that twenty percent of these companies have worked on oil and gas exploration projects, primarily in conjunction with the Eagle Plains/EXCO project. Government projects administered by YTG account for over 50 percent of revenues for most contractors.

#### B.2.2 Supply Companies

There are an estimated 28 companies in Whitehorse that fall within the classification of potential supply businesses that can market to the oil and gas industry. Many of these companies provide products that are directly related to the building industry and which are purchased by general contractors. Types of products available include the following:

- building supplies;
- wholesale industrial & household chemicals;
- welding supplies;
- electrical wiring products;
- plumbing, heating & air conditioning systems;
- prefabricated housing, industrial camps, and building systems;
- safety equipment;
- janitorial supplies;
- water tanks;
- equipment and machinery related to mining;
- wholesale food; and
- office equipment and machinery.

There is a wide range of products available from Whitehorse companies that are purchased by oil companies. These companies are well established and have been in business for an average of sixteen years. Twenty-five percent have been in operation for over twenty-five years. Supply companies tend to employ an average of seven people on a full-time basis. One-third hire seasonal employees during the summer peak period. A number of businesses sell directly to the oil companies in Tuktoyaktuk.

The more successful supply sector companies in Whitehorse have either an established agent or a warehouse in the Beaufort area and combine their marketing effort with business promotion trips to the north. Some of these businesses sell highly specialized products such as welding gases, janitorial supplies, office equipment, and heavy construction equipment.

### B.2.3 Service Companies

There are an estimated thirty-seven service companies in Whitehorse that could provide services to oil companies. Many of these businesses have developed in conjunction with the requirements of the mining industry. Typical services provided by companies include the following:

- hydrographic and legal surveys;
- seismic surveys;
- geotechnical analysis, scientific & technical services;
- engineering services;
- camp construction;
- expediting;
- drilling;
- catering;
- line cutting;
- surveying;
- janitorial services;
- water supply & services; and
- welding.

Service sector companies in Whitehorse have been established for an average of eleven years and provide services to the mining industry and public sector. Thirty percent of these companies provide engineering/surveying/environmental services. Twenty percent provide drilling services, and a number of these companies are developing experience directly related to the oil industry. In fact, one company in Whitehorse has pursued the oil industry for work for a number of years and has recently obtained a number of drilling contracts.

Service companies surveyed in Whitehorse employ an average of four full-time employees. Seventy percent hire seasonal workers during the summer period. Most of these employees are local residents.

#### B.2.4 Supply & Service Companies

Supply and service companies provide a wide range of products and services to the construction industry and to the public sector. Approximately twenty-two companies in Whitehorse and classified as supply and service companies for the purposes of this report. They cover the following types of businesses:

- construction machinery sales, and service;
- mining machinery, equipment, supplies, and service;
- industrial, machinery and repairs;
- electrical, plumbing, heating supplies and service; and
- underwater repair, welding, and supplies.

These businesses generally operate as general construction trades and have retail and/or wholesale outlets. Most companies have been in business for at least eleven years and employ six full-time staff. A number of the larger companies have participated in oil and gas industry development related work, notably in Norman Wells and in the Eagle Plains area. However, these businesses tend to act in a subtrade capacity and therefore do not work directly for oil companies. The high cost of undertaking business away from Whitehorse and the limited size of these companies have constrained the degree to which many supply and service companies in the City have participated in the oil exploration/development sector.

#### B.2.5 Transportation Companies

Transportation companies in the City of Whitehorse provide the necessary link for local businesses to provide goods and services to the oil industry. In addition, these companies offer direct and interlinking trucking services as well as air services from points in southern Canada to destinations throughout Yukon,



Alaska, and the Northwest Territories. The transportation sector in Whitehorse is diverse and can cater to most of the needs of oil companies. General services include the following types of businesses:

- fixed wing scheduled and charter services;
- rotary wing charters;
- helicopter services for slinging and erection of oil rigs;
- heavy equipment hauling;
- general trucking;
- freight forwarding; and
- storage facilities.

There are a total of thirty-seven transportation-related companies in Whitehorse, many of which have generated business, directly or indirectly, from oil and gas development activities within Yukon and elsewhere in the north. These businesses have been in operation for an average of eleven years. Over twenty-five percent have been offering transportation services to the north for fifteen years or more. Businesses employ an average of six people on a full-time basis and two companies employ in excess of 100 staff.

Within the transportation business sector, trucking companies account for the largest number of firms. Many are associated with national carriers which operate their own company tractors and employ drivers and mechanics on a full-time basis. The more locally-based (i.e., locally-owned) companies tend to operate with driver-owned tractors. A number of these companies also provide truck hauling as part of a general contracting service. This combined service is characteristic of many general contractor/trucking businesses in the north.

Transportation businesses in Whitehorse are well-positioned to obtain contracts related to oil and gas development in the north. Freight movements along the Dempster will continue to increase as freight rates become more competitive with Mackenzie River barging. Furthermore, if Whitehorse is promoted as a "bedroom community" for oil company employees who are working in the Beaufort region, increased air services to Inuvik and Tuktoyaktuk will eventually

occur. This will create spin-off opportunities for a number of other businesses in the City.

### B.3 BUSINESS CHARACTERISTICS OF SECONDARY YUKON POPULATION AREAS

Within Yukon, there are a number of secondary population areas that have established businesses that are capable of providing goods and services to oil and gas companies. A brief description of these communities and their business characteristics is provided in the following sections.

#### B.3.1 Dawson City Business Profile

Dawson City has developed as a service centre for the central and Northern Yukon over the years. A variety of small businesses which cater primarily to both the mining and tourism sectors are now located in the community. Dawson's full-time population is estimated at approximately 1,000 residents. This figure varies widely during the summer months when tourism plays the major role in the local economy.

Table B-3 presents the major businesses that offer goods and services to the oil industry. This is followed by a brief description of each business sector.

**Table B-3**

#### **Dawson City Community Business Profile**

<u>Business Sector</u>	<u>Number of Registered Companies</u>
Construction/General Contractors	3
Supply Companies	3
Service Companies	8
Transportation	7

Note: Employment figures not available.

### Construction/General Contractors

In Dawson City there are three general contractors that provide general construction and highway maintenance services to the local area. Two of these companies are involved in heavy equipment leasing from time to time (i.e., loaders, cats, tractors, graders, lowboys, etc.). All three companies provide general hauling and trucking services. The YTG tends to be the major source of revenue for these contractors, with mining operators contributing a second major source of revenue. In the past, these companies have not participated in any oil-related activities, either in Eagle Plains or in the Beaufort region. The potential for these companies to participate in the future will most likely be limited to equipment leasing and joint-ventures with other Yukon companies in Whitehorse.

### Supply Companies

Three supply companies which could potentially service oil companies are located in Dawson City. Two of these companies are involved in heavy construction equipment and rentals. One of these companies is also located in Whitehorse and serves the Beaufort region from their office. The third company is involved in sawmilling and wood exports. Some of these products are currently destined for the Alaska market. Shipments to Beaufort, however, have been limited in the past. The market for these wood products, as and when oil production develops in the north, is considered to be significant.

### Service Companies

There are eight companies that provide limited services directed towards the needs of local industries and the general public. These businesses include welding, machinery repair, electrical contracting, plumbing, and expediting services. The market for these companies is entirely local. Since most of the companies represented in this sector employ less than five employees, their size tends to restrict the degree to which they can participate in contracts outside of their principal market areas.

Transportation Companies

Transportation companies in Dawson City provide scheduled and charter air services, general freight hauling, and trucking services. There are currently three aircraft companies operating in Dawson City and four trucking companies. With the exception of scheduled air services to the Beaufort region, local air services cater primarily to the mining and tourism sectors. Trucking companies are involved in gravel hauling and general freight movements locally. The limited size of these companies restricts these businesses primarily to the local market.

B.3.2 Watson Lake Business Profile

The community of Watson Lake was established as an accommodation and construction supply centre during the construction of the Alaska Highway. Today its economy is still based on highway-oriented services, although timber production and government services are now important aspects of the local economy. The community population is estimated at 1,200 full-time residents.

A number of businesses in Watson Lake offer services that are purchased by oil companies. However, many of these businesses rely directly on the requirements of the highways construction and maintenance sector, as well as mining and incidental construction activities in the region. A profile of these business sectors is presented in Table B-4.

**Table B-4**

**Watson Lake Community Business Profile**

<u>Business Sector</u>	<u>Number of Registered Companies</u>	<u>Employment Range Per Sector</u>		
		<u>Full Time</u>	<u>Part Time</u>	<u>Seasonal</u>
Construction/General				
Contractors	7	2-6(3)	4	2-10(6)
Supply Companies	5	2-4(3)	n/a	n/a
Service Companies	7	n/a	n/a	n/a
Supply & Service	2	2	3	---
Transportation	9	1-15(4)	n/a	n/a

### Construction/General Contractors

There are seven construction/general contractor businesses in Watson lake. These companies offer a variety of services, most of which are oriented towards earth works, highways construction, and general residential/commercial services. Company sizes are small with an average of three full-time employees. All companies hire seasonal workers during the peak construction period. These companies have been established for an average of eleven years. Unlike other communities in Yukon and the Northwest Territories, there have been no new businesses establishing in Watson Lake during the last nine years, indicating a relatively depressed market condition. These general contractors rely extensively on Yukon Government contracts for significant portions of their business revenues.

### Supply Companies

Six supply companies in Watson Lake provide products that are either purchased by local contractors or the public, or exported out of the region. Types of products within this business sector are as follows:

- industrial machinery and parts;
- plumbing, heating and air conditioning supplies;
- welding gas;
- building supplies;
- barite (for drilling mud) and mud containers; and
- timber products.

These companies have been established for an average of nine years. With the exception of timber products and barite, which is produced locally, the market for the supply companies is confined to the Watson lake area. In addition, the size of latter businesses also restricts the degree to which these companies can effectively compete for contracts with oil companies. The demand for timber products and barite, however, will continue as activities in the Beaufort expand in the future. This will provide a substantial demand for these products and a

market that can be further developed under competitive pricing by these producers.

### Service Companies

Service businesses in Watson Lake provide a limited range of services to oil companies. These services include the following types of companies:

- expediting;
- drilling services;
- janitorial services; and
- welding and general machine shop repairs.

While a limited amount of information is available on this business sector, most of the seven companies that are classified as service businesses are small in size and are limited to the demands of the local market. It is not likely that these companies will experience opportunities in the future unless gas exploration and production activities are resumed in the southeast portion (i.e., the Kotaneelee field) of Yukon.

### Supply & Service Companies

There are only two supply and service companies in Watson Lake that could potentially contract with oil companies and/or their general contractors. These include a mechanical contractor and retail outlet, and an electrical contractor and supply establishment. Both businesses have been in operation for over eight years and each hires two full-time staff. These companies, due to their small size, and local market focus, have not pursued the oil companies for contracts. Furthermore, it is unlikely that these companies have the resources, both capital, equipment, and manpower to effectively compete with similar businesses who are located closer to the activities of the oil sector. Business initiatives directed to the oil companies by the local general contractors would clearly assist the supply and service companies in Watson Lake in providing sub-contracting services.

### Transportation Companies

Nine companies that can be classified as transportation businesses are established in Watson Lake. They provide the following types of services:

- scheduled air services and fixed wing charters;
- rotary wing air charter;
- freight trucking and freight forwarding;
- water hauling; and
- gravel and rock hauling.

Three of these companies are involved in providing air services and each has an average of twenty-one years of business experience. Contracts with the YTG comprise a major portion of business revenues for these companies.

Six trucking companies currently operate in Hay River. They have an average of nine years of business experience in the area. With the exception of one national freight carrier which has an office in town, these trucking companies are involved for the most part in gravel and aggregate hauling for highways contracts, transporting firewood and logs, and general freight hauling within the region.

### B.4 YELLOWKNIFE BUSINESS CHARACTERISTICS

The City of Yellowknife has an estimated population of 10,500 residents, a trading area of approximately 29,500 people, and serves the Northwest Territories as an important administrative and service centre. Its early development centred on the exploration and production of gold in the 1930's. Today, the City has a diverse and relatively strong economic base with mining, transportation, communications, government administration, oil and gas activity, and tourism contributing as major components of the regional economy. The City has also weathered the affects of the national recession and has not experienced an appreciable downturn in recent years. In fact, some sectors such as the construction industry experienced a major increase in business activity

levels during major development projects including the Norman Wells oilfield expansion project. In summary, the oil and gas industry is important to the Yellowknife economy but it does not dominate economic activity to the extent that occurs in other Northern communities.

A considerable number of businesses located in Yellowknife offer goods and services that are pertinent to the needs of the oil and gas industry. Many of these companies were originally established in order to service the mining industry, and as the oil industry developed, diversified their products and services to penetrate this market. The City is also characterized by a number of well-established and long-standing businesses. These companies are typically involved in the transportation and construction industries.

Table B-5 presents a general profile of the types of businesses within the municipality of Yellowknife that offer products and services purchased by oil and gas companies in their exploration and drilling programs. A summary description is also provided of each business sector in the following paragraphs.

**Table B-5**  
**Yellowknife Community Business Profile**

<u>Business Sector</u>	Number of Registered Companies	<u>Employment Range Per Sector</u>		
		<u>Full Time</u>	<u>Part Time</u>	<u>Seasonal</u>
Construction/General				
Contractors	10	1-35(9)	1-8(4)	1-100(32)
Supply Companies	11	1-19(5)	1-5(2)	1-5(3)
Service Companies	41	1-45(6)	1-10(2)	1-16(5)
Supply & Service	8	2-20(7)	3-7(5)	1-5(2)
Transportation	14	3-150(25)	1-7(3)	1-80(12)

#### B.4.1 Construction/General Contractors

There are ten construction/general contractor companies in Yellowknife that provide services which relate to the oil and gas industry requirements. These range from general housing and structural steel building construction to heavy



industrial development and in-house design/build services. This business sector is well established, with 55 percent of the companies operating in the area for over 10 years. Only thirty percent of these businesses have been established for 5 years or less.

Company sizes vary considerably from one to 35 fulltime employees and reflects the diversity and varying capabilities within this business sector to work on oil industry related projects. Most companies hire seasonal workers during the peak construction period from May to October, with much of this labour being provided in the Territories. Companies, however, regularly supplement their work crews by hiring in the south as well.

The construction/general contractors in Yellowknife obtain contracts from a wide variety of sources. Generally the Federal and Northwest Territory Governments provide the largest number of contracts and account for between 25 and 75 percent of local business revenues. The larger companies tend to have a broader customer base and rely less on government-related work. Some of these companies obtained contracts in Norman Wells that accounted for upwards of 25 percent of gross business revenues. Smaller contractors had limited involvement in this expansion project.

The other major source of contractor revenue is the mining industry which can account for approximately 30 to 40 percent of gross revenues for the larger companies. Many of the skills acquired through this work are directly transferable to the oil and gas industry. Smaller contractors have significant expertise in all aspects of Northern construction, particularly in the residential and commercial areas.

#### B.4.2 Supply Companies

Companies under this category which were surveyed in Yellowknife included businesses as supplying the following types of products:

- building supplies;
- hydraulic hoses and fittings;
- vehicle parts and accessories;
- industrial parts and equipment;
- prefabricated homes and metal buildings;
- welding supplies;
- safety equipment;
- janitorial supplies; and
- meat products.

At present, there are twelve supply companies in Yellowknife that sell products purchased by the oil and gas companies from time to time. Fifty-five percent of these companies are considered long-time resident businesses and have been operating in Yellowknife for over 14 years. The balance of these supply companies (45 percent) have been established for five years or less. Most of these companies employ seven or fewer full-time people while 20 percent employ more than ten people on a full-time basis. Since the demand for products sold by these companies is fairly constant, they tend to hire few part-time and seasonal workers. Also, products are generally purchased by a variety of buyers, (i.e., contractors, government, mining companies, and the general public) so that reliance on one industry has not developed. Indirectly, these businesses benefit from oil and gas exploration and development activity by providing equipment and materials to those companies (i.e., contractors) who are working on projects in that industry. However, revenues generated from these types of sales generally represent a small component of total revenues. Normally, Yellowknife-based supply businesses that provide goods to the oil industry sell to contractors instead of directly to the oil companies themselves.

#### B.4.3 Service Companies

The service company sector in Yellowknife represents a considerable number of diverse and well-established businesses that can provide services to oil companies and their general contractors. The following list typifies this extensive range of services:

- contract administration, project management, & construction management;
- oilfield equipment maintenance;
- pile driving, drilling, and blasting;
- expediting;
- geological consulting;
- surveying and mapping;
- contract line clearing;
- camp clean-up;
- janitorial services;
- security services;
- electrical, mechanical, and plumbing;
- commercial and industrial painting;
- commercial diving;
- welding;
- motor rewind services;
- financial management and accounting;
- socio-economic and environmental consulting; and
- engineering services.

There are approximately 41 service companies in Yellowknife that can offer business services to the oil and gas industry. These businesses have been established, on average, for over ten years and employ approximately six people year round. Approximately 50 percent of these businesses also employ part-time and seasonal staff. Many of these companies provide sub contracted services such as painting, welding and electrical work to general contractors who have had previous contracts with the oil companies during the Norman Wells expansion project. These businesses have worked both directly and indirectly with the mining industry in the past and therefore are familiar with the conditions expected in similar work with the oil and gas industry. Many of these services are marketable within both industries.

#### B.4.4 Supply & Services Companies

There are eight supply and service companies in Yellowknife that sell equipment, products and services typically purchased by the oil and gas industry. These businesses tend to be similar in nature to the supply companies described above and include the following:

- construction equipment sales, rental, and servicing;
- industrial cleaning supplies and janitorial services;
- mechanical/plumbing/electrical sales, repairs, and installations;
- land/marine radio equipment installation, supplies, and repair; and
- oilfield equipment and services.

Supply and service businesses in Yellowknife have been established, on average, for over ten years, and employ seven people on average on a full-time basis. Half of these firms hire part-time workers and only one-quarter increase their staff level on a seasonal basis. Businesses that provide specialized products such as industrial cleaning fluids or navigation equipment, tend to deal directly with oil company purchasing agents. Services that involve the installation of materials (e.g., electrical systems) are usually subcontracted to a general contractor in the case of the Norman Wells expansion project. The GNWT is the largest source of revenue for local supply and service businesses in Yellowknife and can account for between 50 and 80 percent of total revenues generated by individual companies.

#### B.4.5 Transportation Companies

Transportation companies located in Yellowknife represent the most established aspect of local businesses that can provide services to the oil industry. Fourteen companies have been classified as transportation businesses for the purpose of this report. The range of services provided by these firms are summarized below:

- air charter, fixed and rotary wing;
- contract trucking, scheduled services, and less than truckload (LTL) trucking;
- freight forwarding;
- heavy equipment rentals;
- ice road construction; and
- camp and oil rig moves.

The transportation businesses in Yellowknife have contributed in a major way to the overall development of the region. The companies are long-established businesses and have been in operation for an average of seventeen years. Seventy percent of these businesses employ between 3 and 15 people while 30 percent employ between 30 and 150 people on a full-time basis. Companies that provide trucking services tend to hire additional staff during the peak construction period.

Businesses in the transportation sector have considerable expertise related to the requirements of the oil and gas industry. Many companies, particularly the smaller aircraft charter businesses, rely extensively on the mining sector for work. They are also well-positioned to obtain oil and gas related work. Trucking companies that have worked in the mining industry have significant expertise in goods movement and logistics planning. The capability also exists in Yellowknife to transport most oilfield equipment, materials, and supplies throughout the North. Many of these trucking companies are also providing general contracting services.

#### B.5 HAY RIVER BUSINESS CHARACTERISTICS

Hay River is the southernmost port on the Mackenzie River system and acts as an important transportation, communication and service centre to Northern communities, particularly those located along the Arctic Coast. The town continues to play an important role as a staging point for supplies and services during the development of the Mackenzie Valley corridor. This role has been further strengthened with improved highway connections from Alberta and from points south of Hay River.

The town has a population of approximately 3,300 residents and an estimated trading area of 10,000 people. During the late 1960's and early 1970's, Hay River experienced an economic "boom" due to oil and gas exploration activity and the anticipated construction of the Mackenzie Valley pipeline. However, economic activity in the region declined in the latter part of the 1970's once it became apparent that the pipeline would not be built in the near future. Population figures also dropped during this period.

A considerable resource base of companies exist in Hay River that have either served the oil industry in the past or could do so in the future. Table B-6 identifies the types of businesses in Hay River which could potentially sell to the oil and gas industry in Northern Canada.

**Table B-6**

**Hay River Community Business Profile**

<u>Business Sector</u>	<u>Number of Registered Companies</u>	<u>Employment Range Per Sector</u>		
		<u>Full Time</u>	<u>Part Time</u>	<u>Seasonal</u>
Construction/General				
Contractors	7	2-20	0-10	0-12
Supply Companies	4	2-20	1	---
Service Companies	15	1-20	1-4	1-15
Supply & Service	5	1-29	2	---
Transportation	9	1-29	1-5	1-250

**B.5.1 Construction/General Contractors**

There are seven companies located in Hay River that are classified as construction/general contractor businesses for this study. Typically these firms provide a wide range of contract services including road building, general contracting, excavating, and building construction. The size of these companies varies considerably with between two and 20 full-time employees in each. Business size depends on the types of services offered by each company. Most hire between 15 and 85 labourers on a seasonal basis during the summer months. Companies surveyed indicated a preference to hire locally and that an adequate

supply of workers was available in the south if labour skills could not be found within Hay River area itself.

Construction/general contracting companies consider themselves to be Northern-based and are well-established within the economy. A few companies which have been established in Hay River during the last three years have been based on the expansion at Norman Wells. However, the average residency is twelve years. A few companies have been established for over 30 years in the region. The well-established companies have significant resources and equipment and can participate in projects requiring bonding levels between \$3.0 and 5.0 million.

The Federal Government and GWNT are the principal clients of the construction/general contracting firms in Hay River and account for approximately 60 to 70 percent of all individual business revenues. Over the past few years, some of the larger companies obtained contracts from the oil and gas companies in the Norman Wells project that accounted for 25 to 30 percent of their gross revenue during that period. Further details of these characteristics are provided in Chapter five of this report.

#### B.5.2 Supply Companies

Hay River companies that wholesale and retail products, but do not offer service departments, include those which see building supplies, petrochemical products, industrial equipment, and construction machinery. Within Hay River, there are four companies that have been categorized under the supply sector. These businesses tend to be either single proprietor-owned with one or two employees, or are medium-sized and employ between 10 and 20 staff. The supply businesses are well established companies in the community and have been operating for an average of 15 years per business.

Supply businesses in Hay River rely extensively on the construction industry for approximately 70 percent of all business revenues generated. These revenues are based on Federal Government contracts, the GNWT (including NWT Housing), and general contractors who are either in Hay River or are currently undertaking projects in the region. Most supply-oriented businesses have little direct involvement with the oil and gas industry itself.

### B.5.3 Service Companies

The service companies in Hay River represent the largest group of businesses that provide, or potentially can provide, services to the oil and gas industry. At present there are fourteen businesses that offer a wide range of services that include:

- welding;
- millwright field services;
- electrical and mechanical;
- installations;
- plumbing;
- surveying;
- expediting, and;
- seismic services.

During the past five years, there has been a considerable increase in the number of service industries locating in Hay River. These new companies represent approximately 50 percent of all service-oriented businesses in the community. The established companies tend to be larger in size and have been in existence for a minimum of ten years. Most service businesses are diverse in nature and therefore tend to have a wide customer base including private corporations, the GNWT, the Federal Government and a number of general contractors. They generally do not rely directly on the oil and gas companies for business.

### B.5.4 Supply & Service Companies

There are a total of five companies in Hay River that see products and services which could potentially be purchased by the oil and gas industry. The following types of businesses are included in this sector:

- marine electronics;
- truck and heavy equipment supply and services, and;
- marine equipment supply and servicing.



These companies are considered to be well-established Northern businesses and have generally been in operation for over ten years and employ between ten and thirty full-time staff. Their markets are dominated by the construction industry and the marine transportation industry. With the exception of heavy machinery sales or leases, these companies normally do not enter into direct contracts with the oil and gas industry. However, those businesses that have supplied equipment to construction contractors in the area have benefitted indirectly from oil and gas company expenditures. One company, for example, reported that over 75 percent of all revenue was generated last year through oil and gas-related projects, notably in the Norman Wells development.

#### B.5.5 Transportation Companies

The nine transportation companies in Hay River represent the most established businesses in the community. These firms have been in business for an average of 17 years and offer a complete range of services including: air, road, and marine transportation; freight forwarding; gravel and water hauling; and equipment leasing. They are well-positioned to service the oil and gas industry since air charter and trucking companies have developed considerable experience in operating within the arctic environment and are serving the mining industry which has provided experience with logistics support in the field. Both the trucking and marine-oriented transportation companies located in Hay River have had experience in servicing the oil and gas industry. In the case of fixed wing and rotary wing charter businesses, only limited penetration of the oil and gas industry market has been achieved.

In the past, Hay River transportation companies have been involved in three principal areas as follows:

- goods movement by truck to Hay River and barging on down the Mackenzie River;
- fixed wing and rotary wing charters related to mining, forestry and tourism; and
- logistics support for oil drilling contractors.

While the future demand for transportation services will continue in Hay River, increased activity along the Dempster Highway could result in a lower level of transportation demand on the Mackenzie River and therefore lower levels of trans-shipment activity in Hay River. Local companies should therefore focus their marketing efforts on the requirements of the oil and gas industry and their operational efforts on increased efficiency.

## B.6 NORMAN WELLS BUSINESS CHARACTERISTICS

The community of Norman Wells recently experienced a major increase in economic activity associated with the construction of the IPL pipeline and the oilfield expansion project. Unlike other communities within the Mackenzie Valley corridor, Norman Wells was established as a result of oil exploration and development in the 1920's. Its population level has therefore been directly linked to oil and gas industry activity levels. Today, it is estimated that the community has a population level of approximately 450 permanent residents.

Businesses first became established in Norman Wells to service oil and gas industry development. In fact, during the last few years, many new businesses from Alberta, British Columbia, and Yukon set up in the community in order to obtain contracts related to the industry expansion. Table B-7 identifies the types of businesses located in Norman Wells that service the oil and gas industry. In the following paragraphs, a general description of each business sector is provided.

**Table B-7**

### **Norman Wells Community Business Profile**

<u>Business Sector</u>	<u>Number of Registered Companies</u>	<u>Employment Range Per Sector</u>		
		<u>Full Time</u>	<u>Part Time</u>	<u>Seasonal</u>
Construction/General				
Contractors	2	10-12	---	10-50
Supply Companies	1	2	1	1
Service Companies	13	2-15	1-4	1-65
Supply & Service	5	2-16	0-3	0-10
Transportation	5	2-16	0-3	0-10

### B.6.1 Construction/General Contractors

There are two construction/general contractor companies located in Norman Wells. Their activities tend to be oriented primarily to the oilfield construction market. Both offer services in oilfield support, rock and gravel trucking, and general construction work. Each has been in operation for over twelve years in the area, employs ten full-time staff, and during peak construction periods, hires on as many as 50 seasonal employees from the surrounding region and Southern Canada. Most contracts for these two companies are tied either directly or indirectly to oil production. Site work and heavy equipment rentals form a significant portion of their business revenues.

### B.6.2 Supply Companies

At present, there is only one business in Norman Wells that provides a retail supply outlet that caters to oil companies and their construction materials needs. This business has been in operation for approximately two years and retails welding supplies, hardware, tools, and fleet products. The primary market is the Norman Wells area, with secondary markets in Fort Franklin, Fort Norman and Fort Good Hope. This company supplies contractors, local service businesses, and public needs with a variety of products that are incidental to the construction sector. Direct purchases by oil and resource companies that are operating within the region tend to be limited.

### B.6.3 Service Businesses

There are currently thirteen service-oriented businesses in Norman Wells that provide contract services to oil companies in the region. Types of services include the following:

- welding;
- pipefitting;
- catering;
- mechanical and electrical installations;

- drilling and service rig maintenance;
- industrial painting;
- janitorial services; and
- project supervision.

Over 75 percent of these businesses located in the community during the last five years, indicating considerable interest by southern-based companies to establish during the time of Esso's expansion plan. These companies tend to employ an average of seven employees and hire additional workers during the summer and early fall peak periods. Many of these employees are hired from the south and are housed in camps provided by the business. This is particularly the case with welding, mechanical and electrical contractors who are working on projects with crews that are in excess of 10 men. With the completion of the Esso project, it is likely that a number of companies will leave Norman Wells to seek opportunities in other areas where oil-related development will require support services.

#### B.6.4 Supply & Service Companies

Supply and service companies in Norman Wells include those businesses that retail products purchase directly or indirectly by the oil and gas industry sector, and those that provide contract services. Typically, these businesses undertake camp facility construction and maintenance, electrical products supply and servicing; and building supply sales and general contracting. By their very nature, the five companies that are classified under the supply and service sector tend to be quite diverse in the range of services that they provide. Most are well established and were in business prior to the Esso expansion project. On average, they employ eight full-time employees and two part-time staff. Seasonal hiring tends to vary. Some companies hire upwards of ten additional workers in the summer, while others have limited seasonal requirements.

### B.6.5 Transportation Companies

There are currently eight transportation companies servicing the Norman Wells area. These companies provide a wide range of services that are required by the oil and gas industry as follows:

- heavy equipment and fuel hauling;
- equipment leasing, general LTL freighting from Alberta; and
- helicopter and fixed wing aircraft chartering.

The majority of these transportation companies have been established in Norman Wells for ten years or more and are considered by local residents to be Northern enterprises. Two helicopter charter companies, however, have been established more recently.

Transportation firms in Norman Wells provide the infrastructure that is necessary to sustain the community's role as an oil producing region. The well-established companies support approximately fourteen employees each and thereby contribute significantly to the social and economic well-being of the community. It is likely that a reduction in the number of transportation businesses will result now that peak economic activity related to the oilfield expansion has occurred.

### B.7 INUVIK BUSINESS CHARACTERISTICS

The Town of Inuvik is the NWT's first modern town and is the largest Canadian community north of the Arctic Circle. Built in the 1950's, it became the administrative hub of the Western Arctic following the relocation of various government functions from Aklavik. Over the next decade, Inuvik continued to grow as the region experienced a rapid growth increase in oil and gas exploration activity. This was followed by a recessionary period during the late 1970's as a result of the Berger Inquiry and the ten-year moratorium that was placed on the Mackenzie Valley pipeline.

Today, Inuvik plays an important role as a government, transportation, communication, military and commercial centre in the Mackenzie Delta. With the resurgence of oil exploration activity in the Beaufort Sea, business activity levels have shown noticeable increases in recent years. Many new companies have located in Inuvik, and are branch offices of southern-based companies.

Businesses in Inuvik rely extensively on the oil and gas companies for their existence. As a result, there are a number of firms providing specialized services that are oriented more to the needs of the oil companies than to other industries. This is in contrast to other communities in the North that have a wider client base to draw from for business. Businesses in Inuvik therefore tend to be small, one-owner companies and, in many cases, business owners operate a number of other business interests, which concentrate on markets external to the oil industry itself.

Table B-8 provides a summary of the Inuvik business community that currently sells, or could sell, goods, equipment, and services to the oil companies operating in the region. In the following paragraphs, a description of the characteristics of each business sector is given.

**Table B-8**

**Inuvik Community Business Profile**

<u>Business Sector</u>	<u>Number of Registered Companies</u>	<u>Employment Range Per Sector</u>		
		<u>Full Time</u>	<u>Part Time</u>	<u>Seasonal</u>
Construction/General				
Contractors	9	1-4(3)	1-15(3)	1-28(12)
Supply Companies	12	1-12(5)	1-3(2)	1
Service Companies	20	1-12(5)	1-10(4)	1-8(3)
Supply & Service	13	1-12(6)	1-4(2)	2-20(7)
Transportation	14	1-26(7)	1-50(10)	1-6(3)

### B.7.1 Construction/General Contractors

There are nine businesses in Inuvik that we have classified in the construction/general contracting category. These companies have been in business for an average of nine years and offer the following services:

- residential contracting;
- general construction and management;
- gravel hauling;
- mouse and rat hole drilling; and
- ice road building and maintenance.

Most of these companies are small and, with the exception of one much larger business, employ three full-time people on the average. Companies in this sector generally hire extra workers during their busy periods which occur in the summer or the winter. Many of these seasonal workers are hired from southern Canada.

General contractors in Inuvik are well-positioned to obtain work related to oil and gas industry development in the Beaufort region. In fact, most contractors have worked directly or indirectly for the oil companies in the past and attribute major portions of their revenue directly to this sector. Local contractors are constrained more by financial capability than by experience.

Competition for work in the North, however, is severe. Large contractors in B.C. and Alberta provide the major competition to Northern businesses, both in Inuvik and elsewhere in the Territories. Local contractors are clearly in a good position to joint-venture on projects within the region and indicate a willingness to do so. With the exception of private residential and commercial developments, Territorial Government work comprises the balance of revenues for local contractors.

### B.7.2 Supply Companies

The supply companies established in Inuvik provide a wide range of materials and equipment that are leased or purchased by the oil and gas companies. Twelve companies in Inuvik have been classified as supply businesses for this study. Types of products handled include the following:

- chemical/cleaning supplies;
- first aid equipment;
- industrial hardware;
- shop equipment and air compressors;
- hoses and hydraulic fittings;
- structural steel and fuel tanks;
- oilfield supplies;
- explosives;
- welding supplies;
- prefabricated homes; and
- construction equipment.

These supply companies have been established, on average, for seven years. However, the majority (60%) of supply businesses in Inuvik have been in operation for five years or less, indicating that an increase in new companies occurred during the same time that oil exploration activity increased. A number of these recently established businesses are distributorships or branch offices of companies based in southern Canada. The balance of the supply companies (i.e., 40%) have been established in Inuvik for about ten years.

Supply businesses employ an average of five people on a full-time basis. Fifty percent of the businesses hire part-time workers, whereas only fifteen percent hire seasonal employees. This tends to indicate a relatively constant requirement for products and equipment throughout the year, although some seasonal demand is evident.



### B.7.3 Service Companies

Service companies in Inuvik provide a wide range of business services, both directly and indirectly, to the oil and gas companies operating in the Beaufort region. Many of the service companies established in Inuvik are diverse in the scope of services offered even though the actual size of the businesses is small. Some of the typical services of these companies are listed below:

- security services;
- janitorial work;
- laundering services;
- camp maintenance;
- catering;
- expediting;
- employment and manpower provisioning;
- pressure welding;
- industrial equipment leasing;
- electrical contracting and repairs;
- water delivery;
- plumbing and mechanical installations and repairs;
- geophysical services; and
- social and economic consulting.

At present, there are approximately 24 companies that provide business services related to the needs of the oil companies. Fifty percent of these companies have been established in Inuvik since 1980. Only 30 percent have been in operation for over ten years. Service businesses in Inuvik employ five full-time people on average and half of these hire an average of four part-time employees each year while only 25 percent hire seasonally. The service companies in Inuvik fulfil important day-to-day operational requirements of the oil companies. Many rely extensively on the oil and gas industry for their principal source of revenue. Other important markets include the private sector, GNWT, and the Town of Inuvik.

#### B.7.4 Supply & Service Companies

There are ten businesses in Inuvik that retail and/or wholesale products and equipment and which have service departments directly related to the requirements of the oil companies in the Beaufort. These companies are generally characterized by the following types of products and services:

- electrical contracting and sales;
- heavy equipment sales/leasing and services;
- truck sales/leasing, and services;
- ship chandlery and marine supplies;
- sales and service of lifecrafts and safety equipment;
- food wholesale and catering;
- painting and paint sales;
- contract expediting; and
- communications equipment sales, installation and servicing.

Supply and service businesses in Inuvik tend to be well-established and have been in operation for an average of ten years. Unlike the service sector, a large increase in the number of supply and service businesses has not occurred in recent years. New businesses in the supply and service category represent only 20 percent of the total establishments. Businesses employ an average of six full-time staff, while half hire both part-time and seasonal employees in addition to their full-time staff.

Supply and service businesses in the region rely to a major extent on the purchase and service requirements of the oil and gas companies. However, these companies, in addition to obtaining revenue from the general public, also supply equipment and service to local contractors who are often engaged in projects that are not oil industry-related. A number of the supply and service businesses in Inuvik are also branch offices of national and international companies. In general, these businesses are well-positioned to obtain further contracts with the oil companies when additional construction and production levels occur.

### B.7.5 Transportation Companies

The transportation companies located in Inuvik provide a vital link to the community and businesses in both northern and southern Canada. Nowhere is this reliance more evident than Inuvik where approximately twenty businesses are currently established in this sector. Types of services provided by transportation businesses are summarized below:

- scheduled air services and fixed wing air charter;
- rotary wing charter services;
- tug and barge freighting;
- contract trucking and LTL trucking services;
- freight forwarding services; and
- oil field supply trucking and equipment hauling.

Like other transportation businesses in the North, these companies are the most established in the community and have been in existence for an average of eleven years. A significant number, however, are associated with companies in either Alberta or Yukon. Of the business sectors serving the oil and gas industry, the transportation companies tend to be the largest, and have an average of seven full-time employees. While part-time employees are not hired by all of the transportation businesses, most hire seasonally as business picks up during the summer months.

Companies that operate air charter businesses tend to be either quite small (i.e., 1-5 employees) and often constrained by the availability of equipment as well as trained pilots, or are in the 10-25 employee range. The larger companies are in an excellent position to obtain additional contract services in the future.

A number of trucking companies have NWT operating authority, but operate from the south. They generally operate branch offices in Inuvik and possess their own trailers, but contract to drivers who also operate from the south.

## B.8 TUKTOYAKTUK BUSINESS CHARACTERISTICS

The Hamlet of Tuktoyaktuk plays a central role in the present activities of those oil companies that are engaged in off-shore exploration activity in the Beaufort Sea and on-shore activity in the Mackenzie Delta. Traditionally the area was home to the Inuvialuit as a whale-hunting base. Its past function was further developed in the 1930's and, with the construction of the DEW Line twenty years later, the economy of Tuktoyaktuk became more firmly established as a transportation and government centre.

The community has undergone a major shift in focus in more recent years, away from the traditional pursuits of hunting, trapping, whaling, and sealing, to activities that are centred on the oil and gas industry. It has also seen the establishment of a number of new companies whose business is directly related to the requirements of oil companies. The creation of base camps by the industry, away from the hamlet, has avoided major social impact on the community and has separated and isolated the two groups. This separation has, to some degree, constrained local businesses (including those in Inuvik) from effectively promoting business opportunities. With the exception of those businesses that provide either retail services to the public and transportation, restaurant, or accommodation facilities, most businesses in Tuktoyaktuk generate the majority of their revenue directly from the oil companies. These businesses and their employment characteristics are listed in Table B-9. A brief description of each business sector follows.

**Table B-9**

### **Tuktoyaktuk Community Business Profile**

<u>Business Sector</u>	<u>Number of Registered Companies</u>	<u>Employment Range Per Sector</u>		
		<u>Full Time</u>	<u>Part Time</u>	<u>Seasonal</u>
Construction/General				
Contractors	3	13-20	4	50
Supply Companies		n/a	n/a	n/a
Service Companies	5	3-40	2	10-140
Supply & Service	3*	22	---	10
Transportation	6	1-13	---	1-50

\* Employment information pertains to one company.

### B.8.1 Construction/General Contractors

There are three companies located in Tuktoyaktuk that are categorized as construction/general contractor businesses. Information on two of these companies indicates that they have been in business from between 9 to 20 years, employ 13 to 20 people on a full-time basis and, during the peak construction period, employ an additional 50 workers. Most of these seasonal labourers are required from southern Canada. These three companies provide the following services:

- general contracting;
- heavy equipment rental;
- industrial tank cleaning;
- marine construction; and
- road construction and earthworks.

Contractors in Tuktoyaktuk depend on the oil companies and the GNWT for their primary source of revenue. As one company representative pointed out, business is 100 percent either directly or indirectly related to the activities of the oil companies. All three businesses are highly motivated to obtain further work with the oil companies. However, they indicate they are constrained by oil company perceptions that they are not able to perform on the larger contracts. Recent performances by one company, in particular, are beginning to change this situation. Each company also has a considerable opportunity to obtain further work in the future through joint venture arrangements with general contracting companies from cities such as Yellowknife, Whitehorse, Calgary, Edmonton, and Vancouver).

### B.8.2 Supply Companies

Information concerning the number and characteristics of supply companies based in Tuktoyaktuk was limited. During the course of the study, two businesses that can be classified as a supply companies were identified. These included a business that supplies oxygen and acetylene products, mostly for welding requirements, and a retail food store that also supplies food to the oil company camps.

### B.8.3 Service Companies

Five service businesses were identified in Tuktoyaktuk. These companies provide services to the oil companies that include the following:

- polar bear monitoring;
- electrical contracting;
- ship repair and drydock facilities; and,
- water trucking and sewer services.

One service company has been established for over ten years, while the remainder have been in operation for six years or less. Since the type of services offered by these companies is so varied, generalized comments regarding their employment characteristics cannot be made. All companies, however, do hire seasonal employees and this seasonal hiring can be in winter for such services as polar bear monitoring, or in the summer months, as in this case for three of the companies. The service companies in Tuktoyaktuk rely extensively on the purchasing and service requirements of the oil and gas companies and will, in all likelihood, continue to obtain further contracts during the development and production phases of the Beaufort program.

### B.8.4 Supply & Service Companies

Limited information was available concerning supply and service companies located in Tuktoyaktuk. Three such businesses were identified, however, during the course of the study. They include a company that provides communication and medical services and equipment, and a retail food store and catering company, and an electrical supply and contracting company. All three companies rely on the oil companies, either directly or indirectly for a considerable portion of their business revenues. They are also positioned in the market to take advantage of additional opportunities as demand increases for their services. Competitive pricing from the south could, however, affect the degree to which these opportunities are realized.

### B.8.5 Transportation Companies

Six transportation companies have been in operation in Tuktoyaktuk for a period of between four and twenty years. They represent, in part, the lifeline of the oil and gas companies and associated businesses in the community in terms of obtaining goods and equipment from the south. Types of services that these companies provide are summarized below:

- gravel hauling;
- road construction and maintenance;
- boat chartering;
- supply vessels and barges;
- freight services; and
- helicopter charter services.

Many of these companies operate from head offices in southern locations such as Calgary and Edmonton. However, most have been servicing the needs of the Beaufort region for a considerable number of years and are therefore considered to be Northern. Increased activities related to the Beaufort development will see major opportunities for these and other transport-related companies.

### B.9 BUSINESS CHARACTERISTICS OF SECONDARY N.W.T. POPULATION CENTRES

Within the Northwest Territories, there are a number of smaller communities where local companies have experience in providing services to the oil and gas industry. These types of services have been grouped into the following categories:

- general contracting;
- camp maintenance, security, and construction;

- expediting;
- pipeline right-of-way clearing;
- site preparation;
- sandbagging and concrete weight fabrication and installation;
- heavy equipment leasing;
- gravel hauling; and
- general labour pools.

Many of these companies are Native businesses and were established during the period of the Norman Wells field expansion. Specific community characteristics are described briefly in the following paragraphs.

#### B.9.1 Fort Norman

The community of Fort Norman has a population of 340 full-time residents. The economy is based on a number of traditional pursuits including hunting, fishing, and trapping. During the recent Norman Wells expansion project, two Native companies were established to take advantage of the development. These two companies along with one other are described below:

Tulita Development Ltd. was established in 1983 by Ft. Norman Dene Council and has been involved in a number of contracts with IPL and joint ventures with Ft. Norman Contracting Ltd. The firm also provided labour for pipeline clearing contracts.

Fort Norman Development Ltd. was established in 1984 and has had no involvement in oil and gas contracts to date. However, the firm has an expressed interest in future work in that industry.

Fort Norman Contracting provides expertise in road construction, general contracting, and heavy equipment.

These three businesses are well positioned to obtain additional pipeline-related work if a pipeline is built from the Beaufort region to Norman Wells.



### B.9.2 Fort Franklin

Fort Franklin is a Dene community with a population of approximately 625 residents. Its economy is centred on traditional activities that include hunting, fishing, and trapping. During the Norman Wells expansion project, the Fort Franklin Development Corporation was established (approximately three years ago) in order to provide refuse management and camp security services. This contract, which has since been completed, employed 20 people. The Fort Franklin Development Corporation also joint-ventured with Tulita Development Ltd. on the pipeline right-of-way clearing. Today the company is active locally and undertakes general contracting work.

### B.9.3 Fort Good Hope

Fort Good Hope became established as a major fur trading post in the lower Mackenzie Valley. Today, its residents continue their traditional activities of hunting, fishing, and trapping and, occasionally, work on seismic programs. In the past, residents were also involved in the construction phase of Norman Wells, and recent plans for exploration to the west of Fort Good Hope could provide new opportunities.

The Native companies in Fort Good Hope provide services incidental to the oil companies. These companies are described briefly below:

The Fort Good Hope Community Council has not been involved in oil and gas projects to date but have had recent discussions with B.P. Resources Canada Ltd. regarding their drilling activities.

Fee-Yee Consulting Ltd. provided environmental monitoring of the islands during construction at Norman Wells.

Fort Good Hope Hunters and Trappers Association has provided slashing and right-of-way monitoring for B.P. Resources.

Arctic Circle Enterprises provides municipal services as well as road and air strip construction capabilities.

#### B.9.4 Fort Simpson

The settlement of Fort Simpson was established in the early 1800's and is regarded as the oldest continuously-occupied trading post on the Mackenzie River. The community is located at the junction of the Liard and Mackenzie River and, in the past, acted as an important transportation centre. The village has an estimated population of 1000 residents and a diverse economy. During the 1960's, it became a base for oil exploration activities and an administrative centre.

Within the community, there is a considerable amount of expertise that is directly relevant to the oil and gas industry. Much of this is related to pipeline construction.

Fort Simpson companies that can provide services to oil companies are presented by business sector in Table B-10.

Research conducted during this study indicates that a number of general contractors in Fort Simpson could undertake pipeline clearing and right-of-way preparation contracts in the future. Many of these companies have already proven experience in this field. While the supply and service companies tend to be limited in number, there is a well established transportation sector that has specialized in helicopter charter services. These businesses are well-positioned to obtain contracts in oilfield exploratory and development activities in the future. Equipment to transport oilfield machinery and heavy equipment is limited in the community.

#### B.9.5 Wrigley

The community of Wrigley is one of the more remote settlements of the Ft. Smith region that participated in the Norman Wells expansion project. It is a

Table B-10

Fort Simpson Business Profile

<u>Business Sector</u>	<u>Company</u>	<u>Year Estab- lished in Fort Simpson</u>	<u>Ownership</u>	<u>Services/Products/Comments</u>
Construction/ General Contractors	Rod's Contracting	1979	N/A	- General contractor with pipeline clearing and preparation and highway maintenance capabilities.
	Nagha Enterprises Ltd.	1981	Fort Simpson Dene Council	- Native company established to undertake road maintenance and pipeline development related work.
	Rowe's Construction	N/A	Hay River with full-time camp in Fort Simpson	- Road maintenance contracts via Fort Simpson camp.
	Burrill & Sons Ltd.	1975	N/A	- Six full-time employees specializing in all aspects of general construction, earth-works and site preparation.
Supply & Service	Kiwi Electric Ltd.	1979	Local	- Commercial, residential and industrial contracting and retail sales.
	Igloo Building Supplies	N/A	Hay River	- Complete product line of building supplies associated with company by the same name in Hay River.
Transportation	J&L Holdings (Byers Transport)	1980	Local	- Contract trucking and medium distance hauling within the region.
	Simpson Air (1981) Ltd.	1981	Local	- Charter services and surveys.
	Totem Air Ltd.	1970	Local	- Chartered helicopter services.
	Okanagan Helicopters Ltd.	N/A	B.C.	- Chartered helicopter services.
	Lakeland Helicopters Ltd.	N/A	N/A	- Chartered helicopter services.

community that is comprised almost entirely of Dene people and has an estimated population of 150 residents. Hunting, trapping, and fishing are the primary activities within the area.

There is one business entity in Wrigley that can provide, or has provided, services to the oil sector. This corporation is described below:

Wrigley Development Corporation was established in 1982 for the purpose of undertaking pipeline right-of-way clearing directly for IPL. The company joint-ventured with Stan Dean and Sons from Hay River and provided the labour to clear approximately 100 miles of right-of-way. For this project 20-30 local people were hired.

Following the completion of this contract, the corporation has been temporarily inactive. However, the Band has a continued interest in further work of this nature and can provide a variety of skilled labourers and heavy equipment operators for pipeline-related activities.

#### B.9.6 Fort Liard

The Fort Liard community has an estimated population of 400 residents. Approximately 95 percent of this population is comprised of Dene people. The settlement began in the 1800's as a Northwest Company trading post and today is still active in the traditional activities of hunting, trapping, and fishing. Fort Liard had only limited involvement in development of the nearby Pointed Mountain gas field, largely because of the lack of road access to the field at the time of development. More recent activity in oil and gas exploration and development, however, has allowed the community to participate in this sector.

There is currently only one company in Fort Liard that has undertaken work for the oil development sector. This company is described below:

Beaver Enterprises - established by the Ft. Liard Band as a Band Development Corporation in 1977. This diversified company can undertake a variety of general construction-type contracts, particularly with respect to pipeline slashing, site preparation, camp construction, pipeline weight manufacturing, and well maintenance. The company has a supply of cats, loaders, graders, and trucks available for contract work and/or lease. The company has participated in a number of pipeline related contracts with IPL and currently is involved in winter road maintenance and construction.

#### B.9.7 Aklavik

The community of Aklavik was originally the centre of trapping, trading and transportation in the Mackenzie Delta. However, flooding and erosion problems in the 1950's resulted in the establishment of Inuvik and the relocation of some residents to the new settlement. The community relies heavily on traditional pursuits. However there are three businesses that can provide services to the oil companies in the Mackenzie Delta/Beaufort Sea area. These businesses are briefly described below:

D. Storr & Sons - involved in heavy equipment leasing and operating. Have experience in ice road clearing, gravel hauling, and general earthworks.

Beaufort Environmental Support Services - provides environmental services directed towards oil spills, boat leasing, logistics support, and consulting. Have been in operation since 1972 and have worked for the three major oil companies based in Tuktoyaktuk.

Fabric North - began in 1982 to manufacture sandbags which are used to protect dredged sand islands in the Beaufort Sea. Several local women have been employed in this venture.

B.9.8 Fort McPherson

The settlement of Fort McPherson has an estimated population of 720 residents. Its economy is based on trapping, highway services, and the production of canvas products. In the case of this latter activity, one specific company provides products to the oil companies in Tuktoyaktuk. This company is described below:

Fort McPherson Canvas Project - established in 1970 to manufacture a variety of garments, bags, and tents. Currently employs 18 full-time employees. Provides products to all three of the oil companies in the region. At present, this company is considered to be the only business in Fort McPherson that can provide services to the oil companies.

Aside from this company, local taxi/expediting services have been used by the oil industry to assist with employee rotation, while the Fort McPherson Band operates a construction company.

## APPENDIX C

### PRELIMINARY LIST OF NORTHERN BUSINESS OPPORTUNITIES

#### C.1 EXPLORATION PHASE ACTIVITIES

Oil and gas industry activity in the study area, excluding the Norman Wells project, is exploratory in nature. Specific activities associated with exploration differ significantly from production-related activities. In the following paragraphs onshore exploration activities and offshore exploration activities by the oil and gas industry are discussed separately since characteristics vary depending on the location of exploration work.

##### C.1.1 Onshore Exploration Activities

Of the primary oil and gas activities associated with onshore oil and gas industry exploration, several represent good opportunity areas for Northern supply. A summary of findings which relate to onshore exploration activities is provided in Table C-1.

It is evident from Table C-1 that many of the activities related to onshore exploration have been, or can be, supplied by Northern companies. Generally, the more specialized equipment and services, along with goods and services which must access both northern and southern markets to be viable, will be sourced in southern Canada.

##### C.1.2 Offshore Exploration Activities

Offshore exploration activities in the Beaufort Sea are more dissimilar, more complex and include a wider variety of requirements than do onshore exploration activities. However, Northern suppliers have succeeded in concluding numerous offshore contracts and several important opportunity areas exist for ongoing and new supply from the North. A summary of our findings which relate to offshore exploration activities is provided in Table C-2.

Table C-1

**Northern Supply Opportunity Areas Associated with On-Shore Exploration**

<u>Primary Activities</u>	<u>Sub-Activities</u>	<u>Northern Supply Potential</u>
On-shore Seismic Surveys	Line Clearing	Excellent area for Northern supply, which already occurs.
	Drilling	Northern supply potential exists and has only been partially realized.
	Geophysical Recording/ Supervision	Expertise generally in the south, but could be located in Northern Canada with sufficient training and demand.
	Equipment Repair/ Maintenance	Possibility for Northern supply, but usually undertaken by equipment supplier.
	Accommodation	Northern supply potential, but contractors often supply their own camps.
	Data Processing	Highly specialized activity - no potential for companies in Northern Canada.
	On-Shore Exploration Drilling	Site Preparation/ Construction/ Clean-up
Equipment/Crew Transportation		Possible Northern supply, which has also been provided by Northern firms.
Drilling Rig Supply/ Operation/ Maintenance		Mostly southern, but Northern supply possible if rigs work in south off-season.
Drilling Services		Generally specialized and provided from Southern Canada ... limited sub-trades (S.T.) potential.
Other Services		Good potential for Northern content which has already been realized in camp/catering supply.
Drilling Consumable Supply		A significant proportion can or does come from Northern suppliers, while the balance offers little potential.



Table C-2 demonstrates the much wider variety of goods and services required by the oil companies carrying out off-shore exploration work. Much of this variety results from the differences in exploration methods due to depth of water in which the companies operate.

Components of offshore exploration activity may be classified into three general categories in terms of their present and ultimate potential for Northern participation as follows:

- those which have no or very limited potential for Northern content;
- those that are now well supplied by Northern businesses so that little expansion is possible without expanded exploration programs, and;
- those that could be supplied by Northern businesses where some, but only limited, market penetration has already occurred.

There are numerous opportunities for Northern companies to supplement their existing sales with sales to the oil and gas industry. Most of these opportunities would involve the displacement of some southern Canadian suppliers. For business sectors which have already succeeded in obtaining oil company contracts, only limited expansion opportunities exist unless exploration activity increases and/or a production decision is made.

These initial conclusions are important since they enabled us to focus our opportunity evaluation in areas where it appears practical and realistic for Northern content to be increased, taking into account both the industry's requirements and the resources available in Northern Canada.

## C.2 PRODUCTION PHASE ACTIVITIES

Norman Wells provides a good example of the types of industry activity that are associated with oil and/or gas production. Once a production decision is reached,

Table C-2

Northern Supply Opportunity Areas Associated With Offshore Exploration

<u>PRIMARY ACTIVITIES</u>	<u>SUB-ACTIVITIES</u>	<u>NORTHERN SUPPLY POTENTIAL</u>
Offshore Seismic Surveys	Seismic Vessel Supply/Operation	All seismic vessels are from the south or are foreign ... Zero potential.
	Seismic Equipment Supply/Operation /Data Processing/Repair/ Maintenance	Limited business prospect . . . self-contained skills on-board and 'high-tech' supply from southern or foreign suppliers. Employment possibilities.
	Vessel Operational Supply/Crew Change	Good Northern supply area for appropriate supply and transportation services.
	Marine Base Support	Potential Northern content in base camp supply and maintenance.
	Shallow Water Recording/Survey Vessels	Good prospect for Northern content via tug, barge and other vessel supply/operation
Offshore Exploration Drilling	<u>Artificial Island Activities</u>	
	Island Development - Construction	Some Northern supply potential depending on construction method.
	- Transportation	Potential for heavy equipment and high volume hauling by ice road or water.
	- Air/Marine Supply	Northern content possible for crew/consumable supply during construction.
	- Materials Supply	Limited business potential for large quantities required on an infrequent basis.
	- Dismantling	Excellent business prospect and good employment opportunity.

... continued

Table C-2 ( continued )

<u>PRIMARY ACTIVITIES</u>	<u>SUB-ACTIVITIES</u>	<u>NORTHERN SUPPLY POTENTIAL</u>
Offshore Exploration Activities	<u>Artificial Island Activities</u> ( cont'd )	
	Support Base Operation	Good potential for Northern camp supply and maintenance.
	Drilling - Equip./Crew Transport	Northern supply potential for equipment, crew and consumable transport to/from islands.
	- Rig Operation/Maint.	Potential to supply some parts and goods, but staff either employed by company or contracted from the south.
	- Drilling Services	Generally specialized and provided from southern Canada . . . limited S.T. potential.
	- Other Services	Good Northern supply potential, much of which has already been realized.
	- Consumable Supply	Good achievement to-date, but little additional potential without expansion of exploration program expansion.
	<u>Floating Drill Vessels</u>	
	Vessel Construction/Supply	Southern Canada or foreign supply . . . Zero potential.
	Vessel Management/Operation	Sometimes contracted, but no Northern business potential . . . possible employment opportunities.
	Operational Supply/Crew Change	Usually oil company controlled, but some potential exists with appropriate equipment and services.
	Support Base Operation	Good potential for specific supplies and services from Northern Canada.

construction and development will generate an entire new set of activities which will be followed by operational aspects of the production phase. Principal activities associated with oil and/or industry development and production are discussed in the following sections.

#### C.2.1 Production Well Activities

When a production decision is reached, an entirely new set of industry requirements will occur which will generate new and different opportunities for Northern businesses. This section discusses possible opportunity areas associated with the drilling and operation of oil/gas production wells, whether these be in onshore or offshore areas. Particular opportunity areas associated with offshore production facilities are discussed in Section C.2.2.

Production well activities will depend on the location and nature of the production system. However, our research has indicated that some basic activities will be representative of this phase. A summary of findings which relate to production well activities is provided in Table C-3.

Table C-3 demonstrates that a significant number of oil and gas industry opportunities exist with production well development and operation. More business opportunities tend to be associated with development activities than with operational activities. Since oil and gas companies tend to control most of the operational aspects of production, many of the Northern opportunities during that phase will be employment-oriented. However, well servicing/workover and other oilfield maintenance services will provide substantial ongoing business opportunities once production begins.

#### C.2.2 Offshore Production Activities

It is possible that an initial production decision will be associated with an offshore find. Should this be the case, opportunities will be generated specifically associated with the development and operation of offshore facilities. While the production well activities described in the previous section will be similar

Table C-3

Northern Supply Opportunity Areas Associated with Production Wells

<u>Primary Activities</u>	<u>Sub-Activities</u>	<u>Northern Supply Potential</u>
Well Drilling	Site Preparation/ Construction (Onshore Only)	Good potential for Northern supply of labor and equipment.
	Equipment/Crew Transportation	Possible Northern supply where not provided by individual contractors.
	Rig Operation	Rig supply and operation will likely be southern, but some Northern content is possible, based on experience at Norman Wells.
	Drilling Services	Generally specialized with southern sourcing, but longer-term Northern content possible through joint-ventures with established southern companies.
	Other Services	Good potential for Northern supply of camp catering.
	Consumable Supply	Northern supply likely for many of these consumables.
	Equipment Rental	Good opportunity for local businesses to supply a variety of tools and equipment.
Well Completion	Goods/Materials Supply	Limited potential with initial production but could expand.
	Completion Services	Some potential for Northern supply based on previous experience.
	Goods/Material Transportation	Good potential depending on material sourcing arrangements.
	Equipment Rental	Good opportunity for local businesses to supply a variety of tools and equipment.
Well Servicing/ Workover	Service Rig Supply/Operation	Good potential for long-term Northern business supply.
	Workover Rig Supply/Operation	Reasonable potential especially with southern joint-venture arrangement.
	Materials/Parts Supply	Good potential for Northern oilfield supply store.
	Equipment/ Parts Repair	Good potential with acquisition of required skills in the North.

whether onshore or offshore production occurs, opportunity areas which relate specifically to offshore production activities are summarized in Table C-4.

Offshore production activities that offer potential for Northern business involvement tend to be oriented towards construction and transportation as well as support base operation. Many other purchasing requirements will be sourced from the south, sourced independently by the oil and gas companies, or are related to employment opportunities instead of small business opportunities. Deep water port development, although uncertain, would generate ongoing business opportunities relating to such supply areas as fuel, fabrication services and accommodation. Nevertheless, it is evident that offshore production will provide additional opportunities beyond those which would occur should onshore production take place instead.

### C.2.3 Gathering Systems and Processing Plants

Production within the study area will require the development and operation of oil/gas collection systems and processing plants. The latter could include local fuel production as well as crude oil and gas treatment prior to pipelining.

The gathering systems and processing plants, for purposes of this study, are considered to be separate activity areas associated with oil and/or gas production. A summary of our findings which relate to this phase of production activity is provided in Table C-5.

Opportunities associated with gathering system development are shown in Table C-5. Operation of the gathering system will be carried out primarily by oil and gas company or pipeline company personnel. The supply of equipment and parts to these plants can be expected to be sourced almost exclusively from southern Canadian and United States companies, while much of the construction value-added will take place in Alberta and British Columbia where the plants will likely be prefabricated in modular fashion. However, with the benefit of experience gained during construction of the Norman Wells project, Northern firms should be able to participate in the on-site assembly of these modules, as well as in

Table C-4

Northern Supply Opportunity Areas Associated with Offshore Production

<u>Primary Activities</u>	<u>Sub-Activities</u>	<u>Northern Supply Potential</u>
Production Islands	Construction	Reasonable Northern business potential and good employment prospects.
	Materials Supply	Limited since sourcing of large quantities will likely take place by oil companies or general contractors.
	Materials Transportation	Good potential for heavy equipment and high volume hauling.
	Air/Marine Supply Services (construction phase)	Northern content possible for crew/consumable supply during construction.
Support Bases	Construction	Good possibility for some Northern material supply and significant Northern services supply.
	Operation	Good potential for Northern base supply and maintenance.
Deep Water Port	Construction	Limited potential for Northern supply ... sub-trades only.
	Port Operation	Will likely be new Northern company but likely staffed by both Northerners and southerners.
	Communications Services	Likely government-run but offers employment opportunities and business prospects re. maintenance.
	Miscellaneous Supply/Services	Good Northern prospects such as fuel supply, fabrication, accommodation, etc.

Table C-5

**Northern Supply Opportunity Areas Associated with Gathering Systems and Processing Plants**

<u>Primary Activities</u>	<u>Sub-Activities</u>	<u>Northern Supply Potential</u>
Gathering Pipelines	Construction	Good opportunity for Northern contractors during the construction phase.
	Goods/Materials Supply	Limited possibilities for Northern supply such as gravel and equipment.
	Goods/Materials Transportation	Good potential depending on material sourcing arrangements.
Primary Processing Plants	Assembly/Construction	Plant will be prefabricated in modules in Alberta, but some opportunities available in site work and on-site assembly of modules.
	Equipment/Parts Supply	Limited supply of construction equipment, while most will be sourced in the south.
	Materials Supply	Reasonable potential for construction materials supply, with limited operational materials supply prospects.
	Equipment/Materials Transportation	Good potential during operational phase, but dependent on sourcing arrangements during construction.



initial site preparation work. In addition, materials supply and transportation offers reasonable prospects for Northern companies.

#### C.2.4 Pipeline Construction and Operation

With a production decision, it is likely that a pipeline will be constructed to transport Northern oil or gas (initially, oil is more likely) to the south. This pipeline would connect with the existing line at Norman Wells or be an entirely new transportation system from the North to Alberta.

Construction and operation of this pipeline, regardless of its configuration, will be a major undertaking by the industry. As such it will necessitate large expenditures and will generate opportunities for Northern business to become involved. Our findings which relate to the potential opportunities for Northern businesses associated with pipeline construction and operation are summarized in Table C-6.

It is evident from Table C-6 that a variety of pipeline-related opportunities are likely to exist for Northern businesses. Technologically-advanced equipment will be sourced outside Northern Canada, but assembly, construction and operational aspects of the pipeline could be supplied or serviced by Northern firms. In all likelihood, mainline pipeline construction will be carried out by a union contractor and small businesses will need to recognize this fact and the constraints it imposes.

### C.3 SHORT-TERM OPPORTUNITIES RESULT FROM EXPLORATION ACTIVITY IN NORTHERN CANADA

A production decision is likely some time away, although some industry representatives report it is imminent. As a result, and for purposes of this study, all short-term opportunities identified are exploration activity related.

The differences between exploration and production activities which represent or could lead to Northern business opportunities were delineated in Chapter 3 and in

Table C-6  
Northern Supply Opportunity Areas from Pipeline Development and Operation

<u>PRIMARY ACTIVITIES</u>	<u>SUB-ACTIVITIES</u>	<u>NORTHERN SUPPLY POTENTIAL</u>	
Pipeline Development	Support Facility Construction	Good opportunity for construction contractors and materials suppliers.	
	Right-of-way Preparation	Good opportunity for Northern crews and contractors.	
	Pipeline Manufacture/Supply	Likely southern supply, although Northern contractor opportunities exist for assembly/welding.	
	Pipeline Installation	Specialist contractors will likely be employed from the south, but sub-contract opportunities will exist (Note that pipeline contractor will likely be union).	
	Right-of-way Clean-up	Good opportunity for Northern contractors.	
	Compressor/Metering Station Construction	Good opportunity for Northern crews and contractors on site preparation and building erection.	
	Compressor/Metering Station Equipment Installation	Likely controlled by southern supplier of station modules, with Northern sub-contract work possible.	
	Equipment/Materials/Crew Transportation	Good potential for Northern operators.	
	Pipeline Operation	Pipeline Maintenance/Repair/Serviceing	Reasonable long-term opportunities for Northern business with appropriate skills and training.
		Compressor/Metering Station Recording & Calibration	Excellent opportunity for Northern company with trained personnel.
Pipeline Patrol/Wildlife Monitoring		Excellent opportunity for Northern company and/or residents.	

the previous sections of this chapter. This section summarizes Northern business opportunities associated with oil and gas exploration activities that were initially identified during the research phase for this study. Following discussion of many of these opportunities with the Steering Committee and following further analysis of each, some were eliminated and others prioritized. The analyses undertaken and the short-listed opportunities associated with exploration are discussed in Chapter 6.

### C.3.1 Three Types of Exploration Associated Opportunities were Identified

Based on our planned approach to the study, research was oriented towards defining Northern business opportunities in three areas as follows:

- Northern Supplier Expansion Opportunities - These represent opportunities where products or services currently supplied to other others by companies in the study area could be sold to the oil and gas industry or where expanded sales to this industry could be achieved.
- Northern Supplier Diversification Opportunities - These represent opportunities which could be capitalized on by existing companies in the study area. Such companies are already involved in a particular business sector, but could integrate vertically to provide the products or services required (e.g., local assembly of machinery now sold only through a dealership).
- New Supplier Development Opportunities - These represent opportunities for new companies to establish in the study area to provide services and/or products, primarily or in part, to the oil and gas industry market.

This classification system reflects the fact that a variety of business resources and capabilities that can cater to the oil and gas industry already exist in Northern Canada. It also recognizes that some products and services which are now sourced by the industry from southern Canada could be provided through a new operation located within the study area itself.

This classification is intended for convenience in listing oil and gas industry opportunities. In some cases opportunities listed under one category can also exist under another category. The reader should not focus on only one classification, therefore, but should appreciate all of the opportunities listed under all categories.

### C.3.2 Northern Supplier Expansion Opportunities During the Exploration Phase

Many of the exploration phase opportunities identified herein can be capitalized on by existing Northern businesses. In a variety of cases, companies that have already achieved some success in marketing to the oil and gas industry can take advantage of these opportunities.

Table C-7 identifies and summarizes expansion-oriented opportunities which now exist, or could occur, as a result of oil and gas exploration in Northern Canada. This list is preliminary. Opportunities were analyzed and the most practical of these are described in Chapter 6.

The opportunities listed in Table C-7 represent specific oil and gas market segments that could be penetrated by existing businesses in Northern Canada. Our research has shown that the skills and equipment exist to provide the services and products specified. Further, discussions with the oil companies indicate some interest in purchasing these goods and services from a qualified, competitively-priced Northern supplier.

### C.3.3 Northern Supplier Diversification Opportunities During the Exploration Phase

Some opportunities identified could be capitalized on by existing businesses with specific skills and equipment, but would require these companies to diversify, slightly, their traditional product or service lines. Based on our appreciation of business resources available, this diversification is not likely to require significant modification to existing operations.

Table C-7

**Preliminary Northern Supplier Expansion Opportunities  
Exploration Phase**

<u>Opportunity</u>	<u>Industrial Sector</u>	<u>Description</u>
Housekeeping/Janitorial Services	Industrial Servicing	Expansion of existing companies to service the base camps in Tuktoyaktuk which now provide these services internally.
Transport & Survival Suit Services	Industrial Servicing	Expansion of an existing company to carry out survival suit cleaning and repair work.
Metal Fabrication	Ind'l Mnfg./Supply	Expansion of an existing metal working shop to manufacture and supply specialized products to the oil companies.
Motor Repair and Rewinding	Industrial Servicing	Expansion of an existing electrical repair business to offer the certification and equipment required by the oil companies for electrical motor repair and rewinding.

Table C-8 identifies and summarizes two diversification opportunities which face specific existing companies in Northern Canada. Each of these opportunities should be investigated further to determine their viability during oil and gas exploration activity in the North. These opportunities are preliminary in nature and are discussed further in Chapter 6.

The oil company purchase areas identified in Table C-8 are either sourced in southern Canada (i.e., drilling tool rentals) or provided internally (i.e., navigation and communication equipment servicing). Both offer opportunities for Northern supplier sales. Since both of these possibilities would require some degree of diversification, the companies pursuing them could ensure that traditional markets and sales are retained thus minimizing the risk associated with the new component of their business.

It should be noted here that one business opportunity identified under "Northern Supplier Expansion" (i.e., motor repair and rewinding) could also be considered as a diversification opportunity for an existing electrical business which is not yet set up to provide this service. Therefore, a variety of Northern businesses are in a position to take advantage of this prospect although the market can, at the present time, only support one or two suppliers of rewinding services.

#### C.3.4 New Supplier Development Opportunities During the Exploration Phase

During the study several exploration phase opportunities were identified which could represent new business ventures. While a variety of oil company requirements are currently met by existing Northern companies, our research has shown that some purchases could be directed to businesses which supply specific products and/or services currently unavailable in appropriate locations.

Table C-9 identifies and describes new supplier opportunity areas which now exist, or could occur, as a result of oil and gas exploration activity in Northern Canada. This list is preliminary. These opportunities were analyzed and the most practical ones are described in Chapter 6.

**Table C-8**

**Preliminary Northern Supplier Diversification Opportunities  
Exploration Phase**

<u>Opportunity</u>	<u>Industrial Sector</u>	<u>Description</u>
Drilling Tool Rentals	Industrial Supply	Diversification of an existing industrial equipment supplier to stock and rent specialized drilling tools used in the oil and gas industry.
Navigation & Communications Equipment Servicing	Industrial Servicing	Diversification by an existing communications equipment servicing firm to provide qualified, specialized maintenance and repair work for oil company equipment.

Table C-9

**Preliminary New Supplier Development Opportunities  
Exploration Phase**

<u>Opportunity</u>	<u>Industrial Sector</u>	<u>Description</u>
Drill Bit Dealership	Industrial Supply	Establishment of a dealership which would inventory and sell drill bits to oil and gas companies, seismic companies and "ratholers" and provide repair services.
Safety Equipment Service Centre	Industrial Servicing	Establishment of a business to provide safety equipment and fresh air equipment servicing.
Glycol Warehousing and Distribution Centre	Industrial Supply	Establishment of stockpiling and wholesaling centre for glycol in the North. Possible diversification of an existing fuel supply company.
Insulation Warehousing and Distribution Centre	Industrial Supply	Establishment of a warehouse and distribution centre for sales of insulation and insulation related products in the North.
Light Vehicle/Equipment Maintenance Garage	Industrial Servicing	Establishment of a local (Tuktoyaktuk) mechanical repair/maintenance garage to service light trucks, cars, skidoos, three-wheelers, etc.
Seismic Services	Industrial Servicing	Development of a new company to carry out seismic work on a contract basis. This labour intensive operation offers good prospects for joint venture arrangements with southern firms.



As was the case for earlier opportunities, those listed in Table C-9 include oil company requirements which are now supplied internally (e.g., vehicle maintenance) or sourced, for the most part, from southern Canadian suppliers (e.g., drill bits, glycol, insulation, and safety equipment services). In some cases new suppliers would need to be located close to the base camps in Tutktoyaktuk to ensure that a viable new business venture is established.

Some of the new supplier development opportunities listed may be taken advantage of by existing businesses. Under these circumstances, the new markets represented by the oil and gas industry could result in business expansion or diversification.

#### C.4 MOST PRODUCTION RELATED OPPORTUNITIES ARE MEDIUM TO LONG-TERM IN NATURE

As was discussed earlier in this report, a production decision in Northern Canada will lead to new and attractive opportunities for Northern business development. These will be associated with both construction and operational parts of the production phase. The basic difference between these two production-related opportunity areas is that construction or development opportunities will be time-limited, whereas operational opportunities will generally be ongoing for the life of the project (i.e., 20 years or more).

This section of the report summarizes Northern business opportunities associated with oil and gas production activities in the North. Following discussion of many of these opportunities with the Steering Committee and following further analysis of each, some were eliminated and others prioritized. The analyses undertaken and the short-listed opportunities associated with the production phase are discussed in Chapter 6.

It is important to recognize that the opportunities listed in the following pages do not, and cannot, represent an exhaustive listing of all the possibilities wherein Northern companies can participate during production. Those identified are representative of realistic types of goods and services that could be supplied by

Northern firms. A production decision will open up a wide array of supply prospects that could be capitalized on in Yukon and Northwest Territory-based companies. This can be accomplished if their owners and/or managers recognize the opportunities, react positively, and aggressively in a timely manner, and make the investment necessary to provide the goods and services which will be required. Even those business opportunities listed can only be capitalized on if the appropriate initiatives are undertaken by Northern businessmen.

#### C.4.1 Production Phase Opportunity Areas are Classified in a Manner Similar to Exploration Phase Opportunities

As was the case in Section C.4, opportunities for Northern business associated with production fall into three areas as follows:

- Northern supplier expansion opportunities;
- Northern supplier diversification opportunities; and
- New supplier development opportunities.

Specific opportunities which have been identified are listed according to these areas in the following paragraphs.

#### C.4.2 Northern Supplier Expansion Opportunities During the Production Phase

Many types of Northern businesses will be able to expand as oil and gas companies initiate production phase construction and operational plans. A significant amount of new construction will take place, generating demand for a variety of goods, materials and services. Northern-based companies already sell many of these goods and services and could take advantage of this new demand.

Table C-10 identifies and summarizes a number of expansion opportunities which would exist under a production scenario. This list is representative only and many other similar opportunities will also occur. It is also preliminary and the opportunities listed were analyzed further so that the most practical of these

Table C-10

**Preliminary Northern Supplier Expansion Opportunities  
Production Phase**

<u>Opportunity</u>	<u>Industrial Sector</u>	<u>Description</u> <sup>(1)</sup>
Freight, Equipment and Pipe Hauling	Transportation	Expansion of existing marine and road transportation companies to move various products from southern Canada to the North. (c/o)
Construction of Central Processing Facilities and Pumping Stations	Construction/ General Contracting	Expansion of existing contractors in Northern Canada through construction work related to major production facilities. (c)
Base Camp Expansion	Construction/ General Contracting	Expansion of existing contractors through construction of new camps and expansion of present oil company base facilities. (c)
Ice Road Construction and Maintenance	Construction/ General Contracting	Expansion of existing contractors through increased demand for winter ice road construction. (c/o)
Gravel and Water Hauling Services	Transportation	Expansion of existing hauling companies through increased consumption of gravel during construction and water within the activity areas. (c)
Construction Materials Supply	Industrial Supply	Expansion of existing materials supply firms through increased demand from new construction. (c)
Camp Catering	Industrial Servicing	Expansion of existing catering/food supply companies through increased consumption by construction camps, base camps and offshore drilling operations. (c/o)

(1) "C" indicates the opportunity will exist primarily during the construction and development stage. "O" indicates the opportunity will exist primarily during the operational stage of production. "C/O" indicates that the opportunity is expected to exist during both the construction and operational stages.

could be determined. A short-list of expansion related opportunities during the production phase is included in Chapter 6.

The areas for expansion shown in Table C-7 respond to production-related activities of the oil and gas companies that could be supplied by existing Northern businesses. A production phase should provide opportunities for many Northern firms throughout the study area. Skills, equipment and plant capacity exist in Northern Canada to supply a significant proportion of these needs and it is evident that the oil companies themselves are willing to purchase goods and services from Northern companies during the production phase under assumptions of product or service quality and competitive pricing.

#### C.4.3 Northern Supplier Diversification Opportunities During the Production Phase

Many Northern businesses are characterized by skills, equipment and plant capacity which could be applied to production phase requirements by the oil companies. In a variety of cases, these resources would need to be upgraded or modified slightly to enable the firms to effectively supply the goods and/or services required. However, since the basic resources do exist in many cases, Northern companies could, relatively easily, diversify their operations and orient products or services directly towards the production needs of the oil and gas industry.

Table C-11 identifies and summarizes several Northern business diversification opportunities which are expected to arise following a production decision. Since some operational and/or physical modifications will be required to capitalize on these opportunities, timely investment and promotion will prove essential. Companies which monitor oil and gas industry development closely and which are prepared to act in a manner which is responsive to the industry's needs, will significantly enhance their likelihood of success.

Table C-11

Preliminary Northern Supplier Diversification Opportunities  
Production Phase

<u>Opportunity</u>	<u>Industrial Sector</u>	<u>Description</u> <sup>(1)</sup>
Specialty Welding	Industrial Servicing	Diversification of existing welding companies to provide specialized services such as high pressure, non-destructive testing and underwater welding. (c/o)
Pipeline Right-of-Way Monitoring	Industrial Servicing	Diversification of existing businesses with an understanding of the environment (e.g., hunters, trappers, guides, outfitters, etc.) to provide wildlife monitoring as well as physical inspection services. (o)
Line Pigging Services	Industrial Servicing	Diversification of an existing industrial service business to provide periodic cleaning of pipelines. (o)

- (1) "C" indicates the opportunity will exist primarily during the construction and development stage. "O" indicates the opportunity will exist primarily during the operational stage of production. "C/O" indicates that the opportunity is expected to exist during both the construction and operational stages.

Each of the diversification opportunities identified in Table C-11 requires careful evaluation, and should be discussed at length with oil company representatives before investment is committed. However, each is also representative of the type of market opportunity that can be responded to by one or more Northern companies. This is not an exhaustive list of diversification opportunities that will arise during a production scenario. Northern entrepreneurs should carefully evaluate their own resources relative to production phase requirements so that additional business prospects can and should be pursued.

#### C.4.4 New Supplier Development Opportunities During the Production Phase

Many new types of goods and services will be required by the oil companies as production system development and operation takes place. This demand will generate a variety of new business development opportunities in Northern Canada. Opportunities will likely be capitalized on in a variety of ways. Southern-based suppliers can be expected to establish Northern subsidiaries, Northern businesses can be expected to start-up new supply operations, and joint ventures between Northern and southern companies can be expected to be negotiated. Regardless of the format used for new business development, jobs will be created by those firms for Northern residents and benefit the Northern economy significantly.

Table C-12 identifies and describes new supplier opportunities that could exist under a production scenario. The list is preliminary and opportunities are analyzed further and prioritized in Chapter 6.

The specific opportunities identified in Table C-12 represent a sample only of new business ventures which could be established in Northern Canada under a production scenario. They are, however, representative of the type of investment which could be made. The ultimate extent to which new businesses do become established will depend on the type of production program implemented and on the individual initiatives undertaken by both Northern and southern businessmen and companies.

Table C-12 indicates that some new business development opportunities are expected to be related to construction requirements while many others tend to be long-term prospects related to production operations. A review of production-related business expansion opportunities suggests that more construction-related prospects exist for existing companies, due to the resources currently available, than are associated with new business ventures. Again, this is an indication that a new, responsive market-driven approach will need to be taken by Northern businessmen if they hope to take advantage of the many long-term business opportunities which will follow development of production facilities in Northern Canada.

Table C-12

Preliminary Northern Supplier Development Opportunities  
Production Phase

<u>Opportunity</u>	<u>Industrial Sector</u>	<u>Description</u> <sup>(1)</sup>
Real Estate Development Services	Industrial Servicing	A new business providing a full range of real estate services for both residential and commercial sales and development. Could also be an existing property development company. (c/o)
Oilfield Supply Company	Industrial Supply and Servicing	A new oil supply store operation in the North to supply specialty valves, air and oil filters, special fittings, etc. to oil companies and rig operators and to provide maintenance services. Could also be a diversification of an existing company. (o)
Wirelining and Dewaxing Services	Industrial Servicing	A new company providing specialized wirelining and dewaxing services once production wells become operational. (o)
Industrial Cleaning Supplies	Industrial Supply	A new company to inventory and supply a variety of industrial cleaning products to the oil companies. (c/o)
Pipeline Instrumentation Servicing	Industrial Servicing	A new business which will recruit, train and schedule instrumentation mechanics to carry out tune-ups, instrument calibration, etc. and pipeline compressor stations. (o)
Machine Shop Services	Industrial Servicing	A new machine shop operation with lathes, thread forms and gauges to cut specified threads to API specifications. (c/o)

...continued



Table C-12 ( continued )

Construction and  
Operation of Accom-  
modation Facilities

Construction/  
Industrial Servicing

A new business or consortium focussing on accommodation facility planning, design, construction and operation to carry out this work on behalf of the oil companies. (c/o)

- (1) "C" indicates the opportunity will exist primarily during the construction and development stage. "O" indicates the opportunity will exist primarily during the operational stage of production. "C/O" indicates that the opportunity is expected to exist during both the construction and operational stages.

**APPENDIX D**  
**NORTHERN SUPPLIER DEVELOPMENT OPPORTUNITIES**  
**-ASSESSMENTS-**

Phase : Exploration & Production  
Category : Existing Supplier Expansion

OPPORTUNITY: Housekeeping/Janitorial Services

SECTOR: Industrial Servicing

DESCRIPTION: Expansion of existing independent house-keeping/janitorial companies is possible to provide these services to base camps in Tuktoyaktuk. Some camps do make use of these external services while others employ their own housekeeping/janitorial staff.

MARKET/UTILIZATION: Oil company, marine operator and major supplier base camps in Tuktoyaktuk represent the market. Production decision will increase demand.

COMPETITION: Two housekeeping/janitorial service companies currently exist in Tuktoyaktuk. One or both could take advantage of this opportunity. Each will likely compete with the other for contracts.

LOCATION: Tuktoyaktuk.

CONDITIONS/REQUIREMENTS: Agreements from base camp operators must be concluded to make use of an outside house-keeping/janitorial service company where this is not already occurring. Union contracts in some camps may create a major obstacle.

LIKELIHOOD/TIMING: Good possibility. Short-term prospect.

MISCELLANEOUS COMMENTS: Base camp owners/operators need to be convinced of the value of external services.

Phase : Exploration/Production  
Category : Business Diversification

OPPORTUNITY:

Transport and Survival Suit Services

SECTOR:

Industrial Servicing

DESCRIPTION:

Establishment of a cleaning and repair service for transport and survival suits. This could be a diversification opportunity for an existing Native sewing company or cleaning service, or a new business development opportunity.

MARKET/UTILIZATION:

Direct contracts with oil companies operating in the Beaufort region.

COMPETITION:

None at present, but existing business capabilities in the region are well suited to this type of service.

LOCATION:

Inuvik or Tuktoyaktuk is suggested.

CONDITIONS/REQUIREMENTS:

Oil companies will have to be approached in order to determine volume of suits that could be handled and an analysis undertaken of replacement versus repair costs in order to determine the viability of this business.

LIKELIHOOD/TIMING:

Good prospect. Could be established immediately with medium to long-term growth potential through to development/production phases.

MISCELLANEOUS COMMENTS:

Quality and reliable service at reasonable prices are important.

Phase : Exploration  
Category : Existing Supplier Expansion

OPPORTUNITY:

Metal Fabrication

SECTOR:

Industrial Manufacturing/Supply

DESCRIPTION:

Marketing and sales of metal fabrication skills of existing businesses to satisfy intermittent requirements for specialized products by the oil and gas industry.

MARKET/UTILIZATION:

Oil and gas companies represent a market for metal fabrication companies. Products include skids, tanks, bins and the like. Demand is sporadic but represents good opportunities for Northern businesses which also supply other markets.

COMPETITION:

Companies based in Whitehorse, Yellowknife, Inuvik, Tuktoyaktuk, Hay River and southern Canada would likely compete for these contracts. Whitehorse companies have a transportation advantage.

LOCATION:

Existing companies in Northern Canada

CONDITIONS/REQUIREMENTS:

Metal fabrication materials, equipment and skills must be on-hand. Ongoing promotion to the oil companies is required to ensure a bid request is received when the requirements exist.

LIKELIHOOD/TIMING:

Very good opportunity that has already been capitalized on by Northern companies. Short to medium-term sales opportunities that will be sporadic and not continuous.

MISCELLANEOUS COMMENTS:

While metal fabrication skills exist within the oil companies, they will often contract out basic work which is not time-sensitive. Northern companies already have the skills and equipment to capitalize on this opportunity.

Phase : Exploration/Development  
Category : New Supplier Development

OPPORTUNITY: Motor Repair & Rewinding

SECTOR: Industrial Servicing

DESCRIPTION: Establishment of a company to undertake electric motor repairs and rewinding of instrumentation air compressors, machine shop motors, fans, pumps, refrigeration units, etc. Currently most of this work is undertaken in Alberta.

MARKET/UTILIZATION: Repair work for oil rig operators, oil companies, and other local work.

COMPETITION: Companies based in Southern Canada undertake the majority of this work.

LOCATION: Any major centre in Northern Canada with good transportation access to the Beaufort

CONDITIONS/REQUIREMENTS: Two companies that undertake this work are located in Whitehorse and Yellowknife. An opportunity exists for either of these companies to contact the oil companies in Tuktoyaktuk to discuss current and projected volumes of work and to make arrangements for establishing a small repair shop locally or to undertake the work at existing facilities.

LIKELIHOOD/TIMING: Moderate prospect at present with substantial increase in business during production phase.

MISCELLANEOUS COMMENTS: Both shops currently operating would need to investigate training programs for skills upgrading so that work performed meets CSI approved levels. Emphasis should be on explosion-proof electric motor rewinding services. Certification at this level is essential.

Phase : Exploration  
Category : New Supplier Development

OPPORTUNITY: Drilling Tool Rental Business

SECTOR: Industrial Supply

DESCRIPTION: Inventory and rental of specialized drilling tools used in the oil and gas industry such as hole openers, stabbers, etc.

MARKET/UTILIZATION: Oil companies currently rent this equipment from southern-based firms. Current demand levels are likely too low to support a local business of this nature, but a production decision will lead to much higher demand.

COMPETITION: Primarily southern based suppliers.

LOCATION: Tuktoyaktuk or Inuvik preferably, but supply also possible from other communities.

CONDITIONS/REQUIREMENTS: Demand must be sufficient for local depot to be established and, therefore, should be monitored carefully. A joint venture with a southern supplier could be beneficial and minimize the risk.

LIKELIHOOD/TIMING: A potentially lucrative opportunity with increased exploration activity or a production decision.

MISCELLANEOUS COMMENTS: Tools are expensive but are leased out for months at a time. Investment and revenue levels could be substantial.

Phase : Exploration & Production  
Category : Existing Supplier Diversification/New Supplier Development

OPPORTUNITY: Navigation and Communications Equipment Servicing

SECTOR: Industrial Servicing

DESCRIPTION: Establishment of a new business or diversification of an existing communications equipment servicing firm to provide qualified, specialized maintenance and repair work on oil company equipment.

MARKET/UTILIZATION: All navigation and communications equipment currently utilized and maintained by the oil companies including non-directional beacons, shore stations, marine navigation equipment, etc. Oil companies could supplement their internal specialists with a small independent firm of well trained service technicians.

COMPETITION: Internal specialists in oil companies. However, frequently equipment is now sent south for repair since there is too much work for internal specialists. External contract competition is, therefore, southern based.

LOCATION: Tuktoyaktuk or Inuvik most likely.

CONDITIONS/REQUIREMENTS: Technicians must be highly-qualified and well-trained on all types of equipment (i.e., they must be versatile). Feasibility needs to be investigated, but increased oil company activity would likely lead to substantial work since internal staffing would not be expanded with availability of local service.

LIKELIHOOD/TIMING: Good short-term opportunity with continued exploration program levels. Excellent opportunity with increased activity.

MISCELLANEOUS COMMENTS: Pressure on the oil and gas companies to hold internal staffing levels down and to hire local companies enhances this opportunity. Highly-qualified personnel to provide these services is essential.



Phase : Exploration  
Category : New Supplier Development

OPPORTUNITY: Drill Bit Dealership

SECTOR: Industrial Supply

DESCRIPTION: Establishment of a dealership which would inventory and sell drill bits to oil and gas companies, seismic companies and "ratholers". Presently bits are purchased directly from the south. Drill bits are expensive and many are used. This opportunity could be viable if oil and gas companies are not supplied under long-term contracts by southern manufacturers or suppliers.

MARKET/UTILIZATION: All companies involved in drilling operations including oil and gas companies, seismic companies, "ratholers" and mining companies.

COMPETITION: No dealerships currently in the study area.

LOCATION: Tuktoyaktuk/Inuvik would be logical location.

CONDITIONS/REQUIREMENTS: Purchase commitments need to be secured from major customers and current supply arrangements by the oil and gas industry need to be investigated to ensure long-term supply contracts are not in place. Direct supply arrangements by manufacturers should be established.

LIKELIHOOD/TIMING:

- Limited likelihood depending on current supply commitments.
- Timing dependent on length of existing supply contracts.

MISCELLANEOUS COMMENTS: A variety of markets could increase the viability of this opportunity. The large number of different manufacturers and preferences by drilling superintendents could limit viability.

Phase : Exploration  
Category : New Supplier Development

OPPORTUNITY: Safety Equipment Service Centre

SECTOR: Industrial Servicing

DESCRIPTION: Establishment of an operation for safety equipment and fresh air equipment servicing. All oil and gas companies require periodic servicing of this equipment and it was reported that most of this servicing is carried out in Ontario. The possibility exists to stock related parts in the North as well.

MARKET/UTILIZATION: Primarily oil and gas companies but other northern companies may also take advantage of the service.

COMPETITION: No competition in Northern Canada.

LOCATION: Tuktoyaktuk/Inuvik would be logical location.

CONDITIONS/REQUIREMENTS: Original manufacturer warranty conditions associated with equipment servicing need to be carefully checked. Arrangements and/or training in conjunction with the original manufacturer may be required.

LIKELIHOOD/TIMING: Uncertain. Timing will be dependent on arrangements.

MISCELLANEOUS COMMENTS: Discussions with the oil and gas companies are required possibly followed by direct discussions with equipment manufacturers.

Phase : Exploration  
Category : New Supplier Development

OPPORTUNITY: Glycol Warehousing/Distribution Centre

SECTOR: Industrial Supply

DESCRIPTION: Establishment of a stockpiling and wholesaling centre for glycol in the North. Product can be sold directly to oil and gas companies as well as a variety of other customers. It is reported that some oil companies carry two years of inventory. The opportunity exists to set up direct supply arrangements with a manufacturer such as Union Carbide for redistribution in Northern Canada.

MARKET/UTILIZATION: Use of glycol in heating and cooling systems is common and has widespread industrial applications. Virtually all Northern industries use it representing a relatively broad market. Oil and gas companies represent a primary market segment but demand occurs on a seasonal basis.

COMPETITION: It appears that no bulk stockpiling/distribution of glycol exists in the study area, certainly not in the Inuvik/Tuktoyaktuk area.

LOCATION: Tuktoyaktuk/Inuvik appears logical. Could also be established in a larger economic centre with access to the oil and gas industry in the Beaufort such as Whitehorse, Yellowknife or Hay River. Local supply competition should be carefully checked.

...continued

Phase : Exploration ( continued )  
Category : New Supplier Development

CONDITIONS/REQUIREMENTS:

Annual purchase agreements need to be established with the oil and gas companies and with other major consumers. New competition should be investigated carefully. Seasonal demand by oil companies indicates a need for other markets.

LIKELIHOOD/TIMING:

Limited potential. Demand could increase with production.

MISCELLANEOUS COMMENTS:

- Viability is enhanced since the operation would not be totally dependent on oil and gas company markets.
- Existing supply companies could also capitalize on this opportunity.
- Some oil companies purchase from their own petrochemical plants.

Phase : Exploration  
Category : New Supplier Development

OPPORTUNITY:

Insulation Warehousing/Distribution Centre

SECTOR:

Industrial Supply

DESCRIPTION:

Establishment of a warehouse and distribution centre for sales of insulation and insulation related products to oil and gas companies as well as to other commercial and retail customers in Northern Canada.

MARKET/UTILIZATION:

Insulation products are purchased in substantial quantities by oil and gas companies on an annual basis. Additionally, local housing and commercial markets represent an important market that can be tapped. Retail sales are also possible.

COMPETITION:

No competition apparent in Tuktoyaktuk. Most, if not all, materials imported now from southern Canada on an order-by-order basis. Limited supplies available through Inuvik suppliers.

LOCATION:

Tuktoyaktuk/Inuvik appears logical. Could also be established in a larger economic centre with access to the oil and gas industry in the Beaufort such as Whitehorse, Yellowknife or Hay River although local competition in these cases would need to be investigated.

CONDITIONS/REQUIREMENTS:

Demand and competition need to be researched carefully.

LIKELIHOOD/TIMING:

Good potential. Timing is immediate to short-term.

MISCELLANEOUS COMMENTS:

- Viability is enhanced since the operation would not be totally dependent on oil and gas company markets.
- Possibility exists that an existing building material supply company could capitalize on this opportunity instead of a new venture being established.

Phase : Exploration  
Category : New Supplier Development

OPPORTUNITY: Light Vehicle/Equipment Maintenance Garage

SECTOR: Industrial Servicing

DESCRIPTION: Establishment of a local mechanical/repair maintenance garage to service light trucks, cars, skidoos, three wheelers, etc. A variety of mechanical, electrical and bodyshop repairs could be provided.

MARKET/UTILIZATION: Primary markets include the oil companies, government, local businesses and local residents. Oil companies have their own internal mechanics now since a local service of this nature is not available. A few years would be required for slow market penetration but a solid reputation and fair pricing would likely lead to a viable operation.

COMPETITION: No independent competition in Tuktoyaktuk. Market penetration would take time and would parallel service quality and reputation.

LOCATION: Tuktoyaktuk.

CONDITIONS/REQUIREMENTS: Qualified and versatile mechanic skills are necessary. Stocking of basic parts would be required. A solid reputation for fair priced, quality services should lead to good business volume. Ongoing oil and gas industry activity is important.

LIKELIHOOD/TIMING: Excellent opportunity if properly established and effectively run. This is an immediate opportunity which could take a few years to become profitable.

...continued

Phase : Exploration (continued)  
Category : New Supplier Development

MISCELLANEOUS COMMENTS:

Qualified personnel and fair business practices are essential. Initially small (e.g., one man) operation could lead to increases in business volume expansion after initial year or two of operation. After sales service is important. An engine overhaul market with the oil companies also exists and could be tapped by this business venture.

This operation could also stock and sell oil and air filters (and belts) supplied by one manufacturer such as Fram or Purolater. A comprehensive stock would be required but most oil company equipment is now off-warranty and many filters could be sourced from a local distributor for a southern manufacturer.

Phase : Exploration  
Category : New Supplier Development

OPPORTUNITY: Contracted Seismic Survey Company

SECTOR: Industrial Servicing

DESCRIPTION: Establishment of a company which will carry out seismic survey work in the Beaufort Sea/Mackenzie Delta area on a contract basis.

MARKET/UTILIZATION: Primarily government funded seismic work which will need to be carried out under the Northern Accord prior to lands being opened up for further exploration.

COMPETITION: Primary competition from Alberta based seismic companies.

LOCATION: Tuktoyaktuk or Inuvik most likely.

CONDITIONS/REQUIREMENTS: Government commitment to seismic surveys. Investment in equipment is required and reliable labour force will be essential.

LIKELIHOOD/TIMING: Excellent opportunity as government commitments for further exploration and seismic work are established.



Phase : Production  
Category : Business Expansion

OPPORTUNITY:

Freight, Equipment, and Pipe Hauling

SECTOR:

Transportation

DESCRIPTION:

During the development/production phase, there will be an increase in all types of freight, equipment, and pipe hauled from Southern Canada to the North on the Dempster Highway. This will provide an opportunity for existing trucking companies that service the North to expand considerably and allow new companies to establish in the market.

MARKET/UTILIZATION:

Contract and scheduled hauling for the oil companies, rig operators, and supply establishments located in Inuvik and Tuktoyaktuk.

COMPETITION:

Considerable competition from national carriers at present. A number of companies have applied for NWT operating authorities which would significantly increase competition if production does not proceed.

LOCATION:

Inuvik and Tuktoyaktuk via Whitehorse.

CONDITIONS/REQUIREMENTS:

Production decision required.

LIKELIHOOD/TIMING:

Good prospect, but depends on production decision.

MISCELLANEOUS COMMENTS:

Whitehorse will remain an important distribution point for trucking companies that are currently servicing the North. Interlining with existing carriers will also develop if the number of operating authority applications are not approved.

Phase : Production  
Category : Business Expansion

OPPORTUNITY: Construction of Central Processing Facilities, Pumping Stations, etc.

SECTOR: Construction/General Contracting

DESCRIPTION: The types of processing and refining facilities have not been established yet by the oil companies operating in the Beaufort. Should production proceed, however, a good opportunity exists for Northern contractors to participate in these construction activities.

MARKET/UTILIZATION: Direct contracts with the oil companies and pipeline operators.

COMPETITION: Expertise in Southern Canada is considerable in the areas of construction related to refinery and processing facility construction. However, experience gained by NWT businesses in the Norman Wells expansion project is directly relevant to the Beaufort region.

LOCATION: General contractors based in Yellowknife have an excellent opportunity to joint venture with subtrades (i.e., mechanical and electrical contractors) in Whitehorse, Inuvik and Tuktoyaktuk to effectively bid on these projects.

CONDITIONS/REQUIREMENTS: The oil companies must recognize that expertise is available in the North to undertake this work.

LIKELIHOOD/TIMING: Will depend on production decision and amount of processing that will take place in the North.

MISCELLANEOUS COMMENTS: Northern general contractors may wish to explore joint venture arrangements with Alberta or B.C. based contractors in order to convince oil companies of full turn-key construction expertise.

Phase : Production  
Category : Business Expansion

OPPORTUNITY:

Base Camp Expansion

SECTOR:

Construction/General Contracting

DESCRIPTION:

With production, a major expansion could occur at Tuktoyaktuk involving the installation of modular assembly buildings. This will require contracts for general contractors and a number of subtrade specialists including mechanical and electrical subcontractors. Expansion would take place at the existing oil company camps and also could involve the construction of new camps if other oil companies return to the Beaufort.

MARKET/UTILIZATION:

Oil company contracts.

COMPETITION:

Considerable competition in Southern Canada where building supplier/contractor packages can be easily assembled. Competition also in Whitehorse and Yellowknife where a number of companies have experience in camp construction and modular buildings.

LOCATION:

Inuvik and/or Tuktoyaktuk with excellent opportunity to joint venture with contractors and building modular building suppliers (representative agents) from Whitehorse and Yellowknife.

CONDITIONS/REQUIREMENTS:

Base camp expansion will only take place under a development/production scenario. Oil companies must be convinced that local contractors have the expertise in Northern construction and modular building installation.

LIKELIHOOD/TIMING:

Good prospect, but will depend on production decision announcement.

MISCELLANEOUS COMMENTS:

Monitoring of production decision and early joint venture arrangements will be important.

Phase : Production  
Category : Business Expansion

OPPORTUNITY: Ice Road Construction and Maintenance

SECTOR: Construction/General Contracting

DESCRIPTION: Opportunity for a Northern company to expand its services to meet the increase in winter road construction during the production phase.

MARKET/UTILIZATION: Contracts directly with the oil companies.

COMPETITION: There is a considerable amount of winter road construction expertise in Yellowknife and Whitehorse that could effectively compete on this work.

LOCATION: Business expansion is possible in Inuvik and/or Tuktoyaktuk.

CONDITIONS/REQUIREMENTS: Ice road construction will remain at its current level during the exploration phase and only increase substantially if the development/production phase occurs.

LIKELIHOOD/TIMING: Good prospect. Medium to long-term but will depend on Beaufort production decision.

MISCELLANEOUS COMMENTS: Joint venture possibilities between Northern companies.

Phase : Production  
Category : Supplier Expansion

OPPORTUNITY:

Gravel and Water Hauling Services

SECTOR:

Transportation

DESCRIPTION:

Throughout the development/production phases, there will be an increase in demand for gravel for road construction, building bases, etc. and for water both in the Mackenzie Delta/Beaufort Sea area, and along the pipeline route.

MARKET/UTILIZATION:

Market will be with general contractors and with the oil companies.

COMPETITION:

This type of business is considered to be well established in the North with services available in Yellowknife, Whitehorse, Inuvik, and Tuktoyaktuk. Water hauling services are also available in Alberta which will provide direct competition to existing business.

LOCATION:

Primary areas include Yellowknife, Whitehorse, Inuvik and Tuktoyaktuk. Secondary areas include Dawson City, Watson Lake, Hay River, as well as smaller communities located along the Mackenzie River corridor.

CONDITIONS/REQUIREMENTS:

Dependent on production decision.

LIKELIHOOD/TIMING:

Good prospect, short to medium term depending on the timing and length of the construction period.

MISCELLANEOUS COMMENTS:

Because of the considerable amount of equipment available in the North for water and gravel hauling, joint venture and/or equipment leasing between companies may occur. An inventory of Northern equipment currently available would be useful, so that oil companies can utilize Northern businesses to the maximum extent.

Phase : Production  
Category : New Supplier Development and/or Existing Supplier Expansion

OPPORTUNITY: Construction Materials Supply

SECTOR: Industrial Supply

DESCRIPTION: Expansion of an existing business or new business development to provide construction materials such as lumber, insulation, cement products, and building supplies. This venture could be combined with a cement/concrete batching plant for the manufacture of various products required for pipeline construction, production platforms, etc.

MARKET/UTILIZATION: Oil companies/general contractors.

COMPETITION: There are a number of well established companies that currently operate in the North that are based in Hay River, Whitehorse, Yellowknife and Inuvik.

LOCATION: Company should be established in Inuvik.

CONDITIONS/REQUIREMENTS: Production decision will be required. It is important that Northern-based supply companies are allowed to compete on an equal F.O.B. basis with southern supply companies.

LIKELIHOOD/TIMING: Good prospect. Timing will depend on production decision.

MISCELLANEOUS COMMENTS: Northern suppliers have indicated that southern companies, by making use of oil company aircraft, can quote F.O.B. prices at the point of origin rather at the final destination.

Phase : Production  
Category : Business Expansion

OPPORTUNITY:

Camp Catering

SECTOR:

Industrial Servicing

DESCRIPTION:

Major opportunities will occur for catering businesses to supply food services to camps located along the pipeline right-of-way, to expanded base camps at Tuktoyaktuk and to the offshore drilling operations.

MARKET/UTILIZATION:

One-year contracts directly with the oil companies.

COMPETITION:

It is considered that this is a sufficient number of catering companies located throughout the study area to adequately meet the needs of the oil companies during the production phase. Competition from southern Canada is, however, a significant factor.

LOCATION:

Businesses already established successfully operate from Tuktoyaktuk, Norman Wells, Whitehorse, Yellowknife and Inuvik.

CONDITIONS/REQUIREMENTS:

Production decision will be required. Northern companies need to establish competitive freight rates with local carriers.

LIKELIHOOD/TIMING:

Good prospect. Timing of opportunity will be dependent on production decision.

MISCELLANEOUS COMMENTS:

Northern catering companies have already developed considerable expertise in catering contracts with the oil companies.

Phase : Production  
Category : Business Expansion/Diversification

OPPORTUNITY:

Specialty Welding

SECTOR:

Industrial Servicing

DESCRIPTION:

Increased specialty welding (i.e., high pressure, non-destructive, underwater, etc.) will be required during the production phase and will require an expansion of existing businesses to fulfill this need.

MARKET/UTILIZATION:

Oil companies, rig operators, and the pipeline operator will represent the principal market.

COMPETITION:

There is a considerable oversupply of welders and welding shops in Southern Canada (notably Alberta) with qualifications to undertake work in this area. With the completion of the Norman Wells expansion, businesses established for this project are also available for further work.

LOCATION:

Primary areas would include Tuktoyaktuk, Inuvik, and camp operations along the pipeline which could be serviced from Norman Wells, Yellowknife, and Hay River businesses.

CONDITIONS/REQUIREMENTS:

Production phase must be achieved with pipeline construction.

Existing welding shops may have to upgrade staff and/or recruit suitably trained workers from the south.

LIKELIHOOD/TIMING:

Good prospect. Short to medium term during the development phase with limited requirements during production.

MISCELLANEOUS COMMENTS:

It is likely that companies associated with the Norman Wells expansion project (and which relied on this development for their livelihood) will consider establishing in the Beaufort Region during the development stage.



**Phase** : Development/Production  
**Category** : Business Diversification/New Supplier Development

**OPPORTUNITY:**

Pipeline Right-of-Way Monitoring

**SECTOR:**

Industrial Servicing

**DESCRIPTION:**

Establishment of a business to provide pipeline monitoring and to include physical inspections for leaks, erosion control and wildlife monitoring. The pipeline operator could contract this work directly to an organization such as the NWT Hunters and Trappers Association to perform these services.

**MARKET/UTILIZATION:**

Pipeline owner/operator.

**COMPETITION:**

Limited competition at present. The pipeline owner/operator could hire a company or organization during pipeline construction and provide on-the-job training.

**LOCATION:**

Company/organization could be based out of a number of communities close to the proposed pipeline route such as Inuvik, Norman Wells, Fort Norman and Fort Simpson.

**CONDITIONS/REQUIREMENTS:**

The production phase must involve pipeline development for Beaufort oil. An understanding of pipeline technology must be obtained by individuals employed by the business to undertake this service.

**LIKELIHOOD/TIMING:**

Good prospect. Medium to long-term and will depend on a Beaufort production decision.

**MISCELLANEOUS COMMENTS:**

Experience gained in any pipeline monitoring on the Norman Wells to Zama right-of-way could be directly transferrable to the Beaufort line.

Phase : Production  
Category : New Supplier Development/Diversification

OPPORTUNITY: Line Pigging Services

SECTOR: Industrial Servicing

DESCRIPTION: The establishment of an Inuvik or Tuktoyaktuk based company to provide line pigging services (periodic cleaning of connecting lines). This is not considered to be a full-time business opportunity and therefore is likely to be a diversification of an existing company that provides, for example, well clean-up services.

MARKET/UTILIZATION: Direct contracts with oil companies.

COMPETITION: None established in the activity area, although because this is not a highly skilled business that requires significant start-up capital, competition for these contracts could be high.

LOCATION: Norman Wells (for its current facilities) and Inuvik and/or Tuktoyaktuk during the production phase.

CONDITIONS/REQUIREMENTS: Line pigging crews typically involve at least three workers. A short-term training program for local workers should be investigated after the development/production phase is well underway.

LIKELIHOOD/TIMING: Good prospect for local company. Medium to long-term depending on Beaufort production decision. Immediate opportunity at Norman Wells for part-time employment.

MISCELLANEOUS COMMENTS: Early arrangements could prove opportunistic.

Phase : Production  
Category : New Supplier Development

OPPORTUNITY: Real Estate Development Services

SECTOR: Industrial Servicing

DESCRIPTION: Opportunities for real estate development will occur during the development/production phase. Increases in residential and commercial development are likely which will require a full range of real estate services.

MARKET/UTILIZATION: Market will be oriented towards municipal/territorial/private land in the communities of Tuktoyaktuk and Inuvik. The major portion of real estate development is likely to occur in Inuvik.

COMPETITION: No competition at present. However, both municipalities and the territorial government have the option of being involved directly in real estate development.

LOCATION: Inuvik and Tuktoyaktuk

CONDITIONS/REQUIREMENTS: Will require production decision. The municipalities and territorial government must decide on their level of involvement in future real estate development so that the private sector can position itself accordingly.

LIKELIHOOD/TIMING: Good prospect, short to medium term depending on Beaufort Sea production decision.

MISCELLANEOUS COMMENTS: Community plans may need to be updated for each municipality. Housing, commercial, and servicing policies will need to be established by Councils. An opportunity for manufacturing prefabricated housing systems could arise locally as a direct result of the production phase.

Phase : Production  
Category : New Supplier Development

OPPORTUNITY: Oilfield Supplies

SECTOR: Industrial Supply & Servicing

DESCRIPTION: During the development and production phases, rig operators and oil companies will purchase a variety of specialty control valves, gas lift valves, air and oil filters, special fittings, etc. The types of products will not be known until a production decision is made. At this point, it is likely that an oilfield supply store from Alberta will be initially involved in expediting these products. As maintenance and repairs are required, this function could be performed by a local company.

MARKET/UTILIZATION: Contract orders directly with the oil companies.

COMPETITION: Southern suppliers, with their knowledge of industry requirements, will clearly have an advantage over new companies establishing in the North. A representative agent is likely to establish in Inuvik.

LOCATION: Inuvik or Tuktoyaktuk.

CONDITIONS/REQUIREMENTS: Unlikely that an oilfield supply store will develop until production levels are established so that suppliers are aware of long-term industry requirements for servicing the Northern operation.

LIKELIHOOD/TIMING: Initial oilfield supplies handled directly from southern suppliers. Long term prospect for establishment of Northern supplier after production levels are reached and on-going maintenance requirements are known.

MISCELLANEOUS COMMENTS: Joint venture possibility.

Phase : Production  
Category : New Supplier Development

OPPORTUNITY:

Wirelining and Dewaxing Servicing

SECTOR:

Industrial Services

DESCRIPTION:

Opportunity for the establishment of a highly specialized service to provide wirelining and dewaxing services. The company would contract with the oil company once the wells were in production. The volume of work can be irregular and will depend on the number of wells in operation and the quality of the crude oil.

MARKET/UTILIZATION:

Contracts directly with the oil companies.

COMPETITION:

Major competition from southern-based companies, particularly where specialized services (i.e., notably on diagonal holes) are required.

LOCATION:

Establishment of a company would be preferable in Inuvik or Tuktoyaktuk when sufficient demand occurs.

CONDITIONS/REQUIREMENTS:

Quality of the crude oil will determine amount of wirelining and dewaxing required. Oil companies may find it advantageous to train local personnel for this work and perform services in-house until demand reaches a level which justifies the establishment of a new business.

LIKELIHOOD/TIMING:

Unknown. Timing based on a variety of factors that cannot be determined at present.

MISCELLANEOUS COMMENTS:

Joint venture possibility.

Phase : Production  
Category : New Supplier Development

OPPORTUNITY: Industrial Cleaning Supplier

SECTOR: Industrial Supply Company

DESCRIPTION: Establishment of a company to provide a variety of industrial cleaning products to the oil companies.

MARKET/UTILIZATION: Direct purchase by the oil companies.

COMPETITION: A number of companies provide sales to the oil companies from their Calgary outlets. Business that retail these products are also located in Whitehorse and Yellowknife.

LOCATION: Establishment of a company representative and retail outlet in Inuvik and/or Tuktoyaktuk by one of the Yukon or NWT based supply companies.

CONDITIONS/REQUIREMENTS: Oil companies need to be convinced that products can be delivered as quickly and as economically from Northern suppliers as from southern suppliers.

LIKELIHOOD/TIMING: Good prospect. Short to medium-term depending on increases in exploration activity and production development.

MISCELLANEOUS COMMENTS: Company should also be sufficiently diversified to provide other high turnover items for industrial camps.

Phase : Production  
Category : New Supplier Development

OPPORTUNITY:

Pipeline Instrumentation Servicing

SECTOR:

Industrial Servicing

DESCRIPTION:

Establishment of a company which will recruit, train and schedule instrumentation mechanics. The company would contract with oil and gas companies once a pipeline is completed to carry-out tune-ups, instrument calibration, etc. at pipeline compressor stations. Oil and gas companies would contract out this requirement instead of hiring and supervising its own personnel for the work.

MARKET/UTILIZATION:

Pipeline owner/operator. Service is essential.

COMPETITION:

No competition at present. During the production phase the pipeline owner/operator has the options of recruiting maintenance personnel directly.

LOCATION:

Company could be based in Tuktoyaktuk, Inuvik or Norman Wells while maintenance mechanics could and would live in communities along the pipeline route.

CONDITIONS/REQUIREMENTS:

- Production phase must be achieved with pipeline construction.
- Pipeline owner/operator must be convinced to contract an external service from to undertake this work.

LIKELIHOOD/TIMING:

Good prospect. Medium to long-term depending on Beaufort production decision.

MISCELLANEOUS COMMENTS:

Advanced preparation and planning is essential to take advantage of this opportunity. Instrumentation mechanics need approximately two-years of training (e.g., at the Northern Alberta Institute of Technology or the Southern Alberta Institute of Technology). Company could employ up to 20 people, both full time and part time.

Phase : Production  
Category : New Supplier Development

OPPORTUNITY: Machine Shop Services

SECTOR: Industrial Services

DESCRIPTION: Establishment of a machine shop with lathes, thread forms and guages to cut specified threads according to API specifications to a particular thread designers license.

MARKET/UTILIZATION: Direct contracts with oil companies and oil rig operators.

COMPETITION: None in the North at present. A number of companies located either in Yellowknife or Whitehorse have the capability of establishing a business in the Beaufort area. Strong competition from Alberta.

LOCATION: Inuvik and/or Tuktoyaktuk

CONDITIONS/REQUIREMENTS: Oil companies would have to be prepared to use local business rather than send out equipment to be machined in the south. This business could be combined with a specialty welding shop.

LIKELIHOOD/TIMING: Good prospect. Production decision would be required.

MISCELLANEOUS COMMENTS: A combined machine shop/welding service is seen as a viable operation. Skills upgrading and certification for specialized welding will be required for existing businesses who are interested in pursuing this opportunity. Strong competitive pressure can be expected from Alberta-based companies.



Phase : Production  
Category : New Supplier Development

OPPORTUNITY: Construction and Operation of Accommodation Facilities

SECTOR: Construction/Serviceing

DESCRIPTION: Establishment of a company to build and operate accommodation facilities for workers and visitors to Inuvik and Tuktoyaktuk. This could be a significant opportunity if the existing oil companies limit their involvement in providing additional accommodation facilities during the production phase.

MARKET/UTILIZATION: Oil companies will be primary customers. Utilization by employees, government representatives, and visitors.

COMPETITION: None at present in Northern Canada. Increased activity in the Beaufort will require substantial accommodation facilities (i.e., hotel rooms, housekeeping rooms, and executive apartments) for short term duration visitors. Strong southern competition.

LOCATION: Inuvik and Tuktoyaktuk.

CONDITIONS/REQUIREMENTS: New accommodation facilities will be dependent on a production decision and on the policies of the oil companies to provide accommodation facilities to their workers. Operational and service reliability will be a major aspect in the success of this opportunity.

LIKELIHOOD/TIMING: Good prospect. Short to medium term depending on Beaufort production decision.

MISCELLANEOUS COMMENTS: Joint Venture on consortium possibility.

REFERENCES

- APOA Review. Companies activities section of various issues.
- Bureau of Land Management. Alaska Outer Continental Shelf Office. Alaska OCS Socioeconomic Studies Program. 1978. Prudhoe Bay Case Study. Special Report No. 4.
- Canada Oil and Gas Lands Administration. 1983 and 1984 Annual Reports.
- Canuck Engineering Ltd. Mackenzie Delta - Beaufort Sea Development Plan: Project Description of an Onshore Crude Oil Gathering System.
- Canuck Engineering Ltd. 1981. Mackenzie Delta - Beaufort Sea Development Plan: Overland Crude Oil Pipeline System.
- Davies, Paul. 1984. "Shehtah Drilling Ltd." APOA Review, Volume 7, No. 1, Spring/Summer 1984.
- Davies, Paul. 1984. "The Beaufort Sea - Mackenzie Delta Environmental and Socio-Economic Assessment" APOA Review, Volume 7, No. 1, Spring/Summer 1984.
- Dome Petroleum Ltd., Esso Resources Canada Ltd., and Gulf Canada Resources Inc. 1982. Beaufort Sea - Mackenzie Delta Environmental Impact Statement. Study of Production Structures.
- Dome Petroleum Ltd., Esso Resources Canada Ltd., and Gulf Canada Resources Inc. 1982. Beaufort Sea - Mackenzie Delta Environmental Impact Statement. Volume 2 - Development Systems.
- Dome Petroleum Ltd., Esso Resources Canada Ltd., and Gulf Canada Resources Inc. 1983. Beaufort Sea - Mackenzie Delta Environmental Impact Statement. Supplementary Information - Environmental and Technical Issues.
- Dome Petroleum Limited, Esso Resources Canada Limited, and Gulf Canada Resources Inc. 1982. Environmental Impact Statement for Hydrocarbon Development in the Beaufort - Mackenzie Delta region. Volume 2 - Development Systems.
- Esso Resources Canada Ltd. 1982 to 1984. Socio-Economic Annual Reports: Norman Wells Project.
- Esso Resources Canada Ltd. 1982 to 1985. Esso North (Newsletter). Various issues.

REFERENCES ( continued )

- Esso Resources Canada Ltd. 1984. Business Opportunities: Mackenzie Delta - Beaufort Gas Exploration Agreement.
- Esso Resources Canada Ltd. 1984. Business Opportunities 1984: Norman Wells Project.
- Federal Environmental Assessment and Review Process. 1984. Beaufort Sea Hydrocarbon Production and Transportation. Final Report.
- Gulf Canada Resources Inc. 1984 and 1985. The Northern Report (Newsletter). Various Issues.
- Interprovincial Pipe Line (NW) Ltd. 1984 and 1985. Socio-Economic Monitoring Project. 1984: Norman Wells to Zama Pipe Line Project.
- Interprovincial Pipe Line (NW) Ltd. 1982. Norman Wells to Zama Pipeline. Discussion Material for the National Energy Board.
- J.R. Lacey International Ltd. 1974. Estimates of Expenditure and Labour force for Gas Developments, Mackenzie Delta Area, 1974-1979.
- Lee, J.E. 1985. Planning and Assessing Beaufort Offshore Facilities. Presentation by J.E. Lee, Esso Resources Canada Limited to the Canadian Offshore Resources Exposition (CORE), Halifax, Nova Scotia, Oct. 1-3, 1985.
- Monenco Ltd. and Interlog (U.K.) Ltd. 1984. King Port: A Full Service Base for the Western Arctic.
- Motyka, D.R. 1985. Presentation by D.R. Motyka, Gulf Canada Resources Inc., to the Beaufort Industry Group Conference (BIG '85), Inuvik, N.W.T. May 30, 1985.
- O'Halloran Campbell Consultants Ltd. 1985. Oil & Gas Industry Offshore Services Study. Department of Regional & Industrial Expansion.
- Polar Gas Project. 1984. Application to the National Energy Board. Volume III -Facilities.
- Polar Gas Project. 1984. Northern Business Opportunities, Marketing Area 1: Taglu to Fort Good Hope.
- Polar Gas Project. 1985. Application to the National Energy Board. Volume X - Public Convenience and Necessity.
- University of Texas at Austin. Petroleum Extension Service. 1979. A Primer of Oilwell Service and Workover.

REFERENCES ( continued )

- White, Paul S. 1978. Yukon Businesses: A Regional Assessment of Potential Economic Service to the Foothills Pipe Line Projects. 2 Volumes.
- Winterhawk Petroleum Consulting Services. 1985. Well Cost Study. Petroleum Services Association of Canada.
- Yukon Benefits Committee. 1984. Yukon and Northern Benefits of Esso Resources Canada Limited's Mackenzie Delta - Beaufort Program.
- Yukon Benefits Committee. 1984. Yukon and Northern Benefits of Dome Petroleum Limited's Beaufort Program.
- Yukon Benefits Committee. 1984. Yukon and Northern Benefits of Gulf Canada Resources Inc. Beaufort Sea Lands.