Arctic Development

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EXECUTIVE SUMMARY

This report completes the first phase of a two phase study of the feasibility of establishing some marine based industry in the Baffin Region.

The objective of Phase I was to define the opportunities in general terms; with the detailed analysis to be done in Phase II.

The offshore shrimp fishery had the most potential of any part of the renewable resource sector as a focus for industrial development. Two business opportunities were identified:

- a cargo terminal consisting of an all weather dock and a cold storage

- a shrimp processing plant with fish and scallop processing as an option

An evaluation of possible sites was done and Iqaluit was selected as the most logical location for both the cargo terminal and the processing plant. Iqaluit was found to offer the best compromise of all the key parameters, nearness to shrimp grounds, open water season, existing infrastructure, and available labour pool.

CARGO TERMINAL

A survey of all sixteen licensed shrimp trawler operators was done to determine their interest in using a cargo transshipment terminal located in South Baffin. Of the ten respondents, nine stated they would use such a terminal to varying degrees. It was estimated that the seasonal shrimp volume could be up to 12,000 metric tons. The annual Iqaluit sealift of approximately 8,000 metric tons could also be handled at this terminal.

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There are two site options within the Iqaluit area. A terminal with a 77 metre T type wharf similar to that proposed in 1980 for the Ministry of Transport could be built at Inuit Head for an estimated $24 million. Shrimp transshipment would require a significantly longer wharf than this with a higher undetermined capital cost. Alternatively a terminal using a floating dock arrangement could be built at the old causeway site for an estimated $11 million.

It is believed a cargo terminal in Iqaluit could be economically feasible, recovering its direct operating costs and possibly making a contribution to the recovery of the cold storage construction cost.

The terminal would employ an estimated 55 people during the three month operating season, paying annual wages and salaries of $390,000 and generating a total impact of $600,000 to $1 million in the community. Since most of these jobs would be seasonal, there would be the additional effect of unemployment insurance benefits beyond this.

The shrimp cargo business could not justify the investment in a major wharf itself, however it would likely be the major user of such a facility if it existed. This dock would also allow some savings in annual sealift costs as well as possibly generate new business, in tourism for example, by attracting cruise ships to the region.

The Eastern Arctic / Baffin Region Port Facilities Study currently underway will likely outline further requirements for an Iqaluit dock. The fishery related ones here should be incorporated at an early stage.

PROCESSING PLANT

An Iqaluit shrimp plant using the *Pandalus montagui* resource as its principal raw material would be potentially economically feasible. This plant would purchase approximately 1,200 metric tons of frozen industrial size shrimp from trawlers during the open water season and then process it on a year round basis. The finished product would be flown south to market on regularly scheduled airlines. The annual sales revenue would be in the order of $2 million.

A conservative analysis of raw material costs and market returns indicates the plant would generate a margin of $1,00() to $2,000 per metric ton of product to pay direct operating costs (excluding raw material) and overheads. Many Atlantic Canadian shrimp plants allow approximately $1,200 per metric ton to cover the same costs, which suggests an Iqaluit plant would be competitive. Because *Pandalus borealis* has better overall yields and generally higher market prices, any processing of this species will result in a higher average margin.

In the interests of simplicity all the above analysis was based on operating a single production shift per day. As Operating experience was gained the plant could change to a double shift operation which would increase net revenue particularly during the periods of high market prices.

Weak market conditions and the high per unit cost of shipping product from Iqaluit made it unlikely that a large volume groundfish processing operation would be economically feasible, at least at the present time.

A plant designed for processing shrimp only would cost an estimated $4.1 million. A larger plant designed to also process a mix of other species, primarily groundfish, would cost an estimated $6.1 million Although there would likely be some equity investment interest from private sources, a significant amount of public financial assistance would be required.

The ideal location for the plant would be the Iqaluit Industrial Park, however the difficulty and costs associated with supplying process water and disposing of waste water and offal may make this impractical. An alternative would be to build where the disused runway is nearest the harbour.

The shrimp only operation would employ an estimated sixteen people year round with an annual wages and salaries payment of $322,000 and an impact on the community of $500,000 to $800,000. The larger multi-species plant would employ 34 with an annual wages and salaries payout of $628,000 and an impact of $1.0 million to $1.5 million.

Depending on its eventual size and diversity a processing plant would have a significant influence on the development of the inshore fishery in the area. It would be a convenient buyer for their catch, a supplier of ice and other services, and would likely evolve as a general centre of fisheries expertise and training.

GENERAL

The construction of the dock is not a prerequisite for the building of the plant. The frozen shrimp could be offloaded from trawlers using the current sealift barge method and stored at the plant cold storage. If both the terminal and the plant were built, it would be logical for only one large cold storage to be built at the dock where it would serve both the transshipment and plant storage fictions.

A visit to Greenland early in Phase II to see how they have developed their fishery and related marine infrastructure under similar constraints is highly recommended.

Any public sector investment required for these projects should be evaluated relative to a similar expenditure on social support programs. These investments would generate long term net economic gain which income assistance generally does not.

Although Phase I was intended to be merely an overview, every attempt was made to be as practical and operationally realistic as possible in the discussion and assessment of the projects. When evaluating projects in a preliminary way for less developed regions, such as Baffin, it is difficult to ensure all possible problems have been identified. In a developed area, construction costs and operating scenarios can generally be extrapolated from existing businesses with a reasonable degree of certainty. Every attempt has been made to highlight areas of uncertainty and to be cautious when estimating. The detailed engineering work and business plan development to be done in Phase II will evaluate in detail the conclusions in this report.

1.1 Objective

Using the renewable resource sector as a principal basis for developing the Baffin economy is the stated policy of the Government of the Northwest Territories. The fisheries is potentially the most significant of all the region's renewable resources.

The Fisheries Infrastructure Steering Committee was formed with representatives from Qiqiqtaaluk Corporation, the Baffin business sector, and the Government of the Northwest Territories to initiate a study of the feasibility of building infrastructure based on this resource. This report constitutes Phase I of this Feasibility Study.

1.2 Study Approach

This study is being undertaken in two distinct phases. This first phase is a broad overview of the potential for some fishery based industry in the Southern Baffin area.

It was decided that there were two distinct possibilities based on the offshore shrimp fishery:

- a cargo transshipment terminal
- a shrimp processing plant

These two facilities could be built as a combined facility or completely independently; possibly even in different communities.

There are also some development opportunities associated with the 2,250 metric ton offshore groundfish quota available to Qiqiqtaaluk Corporation and with the inshore fishery. The Phase II study would examine this groundfish option in detail.

There are very significant constraints to industrial development of any kind in Baffin Island. This Phase I Report describes in a general way how they would impact on potential projects.

It was also realized that projects would not only be considered on their feasibility as commercial operations, but also in terms of their ability to contribute to expansion of infrastructure and human resource skills, and to the long term diversification of the regional economy in general.

CONSTRAINTS TO DEVELOPMENT

2.1 General

This section outlines the basic problems associated with establishing any new fishery project in the Baffin region. The impact of these problems on the actual selection of a specific site for the cargo terminal and the processing plant is discussed in Section 3.

22 Environmental

Harsh environmental conditions are the most significant hindrance to development. A marine based facility has to deal with high winds, cold temperatures, heavy snowfall, high tides and so on. These can all be dealt with through appropriate engineering design, and of course, expenditure of money.

The single most difficult constraint for any business involving vessels, however, is sea ice. The open water time frame at any location effectively defines the operational period for any fishing or cargo related activity.

2.3 Cost

Everything in the North costs more. A commonly used rule of thumb is that building in the north is three times as expensive as equivalent construction in the southern part of the country. Building materials and skilled labour have to be imported and tight scheduling is critical due to the narrow “weather window”.

Operating costs are generally higher as well because of limited support infrastructure and the high unit cost of services and supplies. One positive factor here is that the regularly scheduled airlines have significant back haul cargo space available.

The projects examined in this report are all capital intensive and would require careful design and project management to avoid significant cost overruns during construction.

2.4 Infrastructure

In terms of industrial development, the basic problem is not the actual lack of support infrastructure, because that is a common factor, but rather that the comparative cost will be very high. If this incremental investment is considered to be a direct cost of a specific project then that project will not look economically viable. This problem will affect any project investment decision however, and therefore the challenge is to identify opportunities which can justify, to the maximum extent, the infrastructure required to support them.

2.5 Human Resources

The lack of sufficient human resources in terms of both numbers and skill levels can be one of the most serous constraints for any project. Often a significant part of the rationale for a project in a less developed region such as Baffin, is to provide a means for the training of the local work force in basic industrial skills.

There is a limited population base in Baffin from which to draw a regular work force and although no actual inventory was taken it is assumed that the specific processing, technical, and managerial skills required for a marine or fishery based business would be in short supply. The existence of high levels of unemployment does not automatically imply that it will be relatively straight forward to put together a good work force. This process requires a lot of experience and patience and can be very expensive. People with excellent senior and middle management skills and / or the potential for these roles are critical for the success of a new industry and this would be particularly true for a processing plant.

It is assumed that outside experts will have to be brought in at least for the startup period regardless of where a project is built. However, a-site with a reasonably deep labour pool to draw from has much more potential for success than one without.

2.6 Fishery Resources

The fishery resources of the Baffin Island region can currently be considered in two separate groupings; those that are proven, and those that are not.

The offshore shrimp fishery conducted off Labrador, in the Davis Strait, and to some extent, in the Hudson Strait region, has become reasonably well defined in recent years. There is a fairly good idea of the scope of the resource, where it exists, and an annual management plan process in place so that an industrial development project based on shrimp can be established with some confidence.

On the other hand, there is only a limited and uneven database on the other fish resources in the area. There has been some research cruises and some limited commercial fishery activity; however, there has been no significant potential identified to date which would justify a major processing investment.

There has been a very encouraging development with the turbot fishery at Pangnirtung in 1988/89, and this could probably be a model for future inshore development efforts. There is definitely a need for further research, particularly from the viewpoint of determining what is accessible to, and practical for, a community based fishery. The recent proposal from the Department of Economic Development for the purchase ofa multi-purpose research and training vessel would seem to be a good idea.

For the purposes of this report, it has been assumed that any major fishery based investment would have to be tied to the shrimp fishery in some way.

EVALUATION OF POTENTIAL SITES

3.1 General

Both projects have many site requirement parameters in common, although those for the processing plant are more constraining. Potential sites are evaluated in one section and differences in requirements from one project to the other are noted where applicable. The cargo terminal and processing plant are examined in specific terms in subsequent sections without a repetitive discussion on site evaluation.

In order to be thorough, all existing communities in the southern Baffin region were examined as potential sites. In addition, the practicality of building in totally new locations at the mouth of Frobisher Bay, or at Cape Dyer was also evaluated. Such sites would have the advantage of being relatively close to all the major fishing areas. This would be especially attractive for a cargo terminal.

32 Ice

As was mentioned previously, sea ice is the most serious natural constraint acting on either of the two projects. Both projects require ice-free access by large shrimp trawlers and the cargo terminal also requires accessibility by freighters. It is necessary to carefully define “accessibility”. Just because it is physically possible to get a vessel through broken ice to a dock does not necessarily imply that commercial vessel owners will want to do so. Trawlers will not make the trip into a port to unload if there is any risk of damage to the vessel, there is an unacceptably long time taken in traveling through the ice (i.e. lost fishing time), or even more serious, there is a risk of getting caught in ice for any period of time. The same arguments would also apply to the freighters.

Exhibit 3.2.1 is a graphical illustration of the approximate time period when open water could be expected at each potential site. The data was collected from several sources including verbal discussions and is believed to be reasonably accurate. Fortunately, there is very little variation from year to year in the timing of breakup and freeze up; plus or minus one week is normal.

EXHIBIT 3.2.1

"ICE WINDOWS"

Location	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total Open Weeks
Broughton Island													7
Cape Dyer													8
Pangnirtung													12
Mouth of Frobisher Bay													16
Iqaluit													14
Lake Harbour													16

Notes:

"Open Water", designated by solid line, is defined as the time period between Breakup and Freezeup.

Where: - breakup is defined as the point when sea ice coverage becomes less than 1/10.
- freezeup is defined as the point when sea ice coverage becomes greater than 1/10.

"Navigable Water" either side of "Open Water" designated by dashed line is the estimated period when large vessels could proceed without normally requiring the assistance of ice breakers

"Total Open Weeks" is the estimated time period during which the location could reasonably be expected to be accessible to trawlers and freighters without assistance.

Several people have mentioned that in many cases,. the practical "ice windows" could be lengthened if the Coast Guard could be convinced to provide extended ice breaker service. The Coast Guard are extremely reluctant to do this, stating budget restrictions. Any project should be Justifiable within existing constraints. It is likely however, that once a terminal or processing plant is being seriously planned an upgrading of future ice breaker service could be negotiated.

3.3 Distance **From Fishing Grounds**

For fishing, as in any industrial activity, down time is to be minimized as much as possible. Therefore the round trip steaming distance (and time) from the adjacent fishing grounds to a proposed cargo terminal or processing plant is very important. For this evaluation, three shrimp grounds have been considered as significant as they are the closest to any potential Baffin site. These are the Davis Strait fishery, the Hopedale Channel fishery off Labrador, and the Hudson Strait - South Baffin fishery.

This distance factor is more critical for the cargo terminal than for the processing plant. In order for the cargo terminal concept to work, a significant percentage of the trawler fleet would have to be attracted to the terminal for unloading and transshipment of their cargo during a relatively short period of time. The principal attraction for these vessels will be a fast and economical turnaround. The facility's competition for this business will be ports in Greenland and in Newfoundland. Since these ports already have this business to a varying extent, any new facility will have to be relatively better to attract the business. The principal attraction a Baffin terminal could potentially offer would be nearness to some of the fishing areas.

The processing plant on the other hand, as envisioned, would only require 3-5 trawler loads of industrial size frozen shrimp. This could conceivably be contracted from one or two vessels, and proximity to the grounds is not as important.

3.4 Infrastructure

The level of existing infrastructure at any site is critically important to its attractiveness for either the terminal or the processing plant. Both would require water supply, electrical power, reliable communication links, good air service and so on. Theoretically, a seasonal cargo terminal could be built in a new site, such as the mouth of Frobisher Bay, which was very conveniently located for the trawlers and freighters. Temporary power, water supply, worker accommodations, communication links, and other necessary services could be put in place for a three to four month operation.

If the shrimp transshipment business could generate sufficient net revenue to cover the investment in the dock and the related infrastructure then such a site would conceivably make sense. This does not appear economically possible. Investing in a new seasonal community would likely run contrary to government policy in any case.

Building a year round processing plant where there is no existing community is even less practical. Since the finished product must be shipped to market regularly for business cash flow reasons, a reliably scheduled air service with adequate cargo space is a necessity for a processing plant.

For the reasons above it is difficult to seriously consider any site for either project which is significantly lacking in existing infrastructure.

3.5 Relative Capital Costs

It was outside the scope of this report to prepare cost estimates for the construction of either of the projects and their applicable infrastructure for all the possible sites. It was possible to generalize however, about the relative magnitudes of total incremental investment required based on what was already in place in each location.

3.6 Conclusions

3.6.1 Community Selection

The various attributes of the potential sites for a cargo terminal and/or a processing plant are shown in Exhibit 3.6.1. As mentioned some of these factors are more significant for a cargo terminal than for a processing plant and vice versa.

A review of this Exhibit leads to the conclusion that the only realistic alternative for either the cargo terminal or the processing plant is Iqaluit. The reason for this decision is that Iqaluit is the best compromise in terms of all the key parameters; open ice period, nearness to fishing grounds, relatively good harbour. However, the most important single factor is that the population and infrastructure base is already in place.

3.6.2 Site Options within Iqaluit

The remainder of this report assumes Iqaluit as the location of both the cargo terminal and the processing plant. Within Iqaluit there are a couple of specific site options available depending on which facility is being built or if they are both to be built.

EXHIBIT 3.6.

SITE EVALUATION

	Distance from [1] Shrimp Grounds (km) a)	/ b)	/ c)	Good Harbour?	Air Service	Population/ Available Labour	Other Infrastructure?	"Relative" Incremental Capital Cost
Potential Site/ Baffin Island:								
Broughton	200	975	1375	po	HS 748	470/ limited	limited	high
Cape Dyer	150	825	175	possible			none	very high
	625	725	1200	tidal flats	HS 748	,100/ yes	limited	high
Mouth of Frobisher Bay	775	350	825	possible			none	very high
	1025	550	1025	high tides	727	3,500/ yes	yes	medium
Lake bo	1225	300	1050	small harbour	Twin Otter	350/ limited	limited	high
For Comparison:								
Greenland; Godthaab	550	850	1000					
H	275	975	1250					
Sukkertoppen	400	875	1100					
Newfoundland: St. Anthony	1850	1375	600					
Harbour Grace	2350	1875	1100					

Notes [1]: Straight line distance from approximate mid-point shrimp ground:
a) - indicates distance from Davis Strait fishery
b) - indicates distance from South Baffin fishery
c) - indicates distance from Hopedale fishery

Cargo **Terminal Only-**

If only the cargo terminal is being built, then the dock and cold storage should be located adjacent to each other. An option would be to build the cold storage in the industrial park, where services are more easily obtained. This would not be recommended however, for two significant reasons. The trucking of all the product back and forth to the dock would be time consuming and expensive, and there is a much greater risk of damage to the shrimp.

Assuming the dock and cold storage are being built as one facility, two potential sites have been identified, at Inuit Head and at the old causeway. A preliminary engineering assessment indicates both sites could be acceptable although the Inuit Head option will be much more expensive.

shrimp Plant Only-

If the shrimp processing plant alone was to be built, the logical choice would appear to be somewhere within the serviced area of Iqaluit. The industrial park would be the ideal location. This would pre-suppose that the frozen shrimp would be landed from the freezer trawlers using the current sealift method and trucked to the cold storage at the plant (Minor damage to the frozen shrimp would not be a problem here because this product would all be cooked and peeled). The difficulties associated with process water supply, and offal and waste water disposal may rule out an industrial park site however. In this case a possible alternative is to build where the old runway is closest to the harbour.

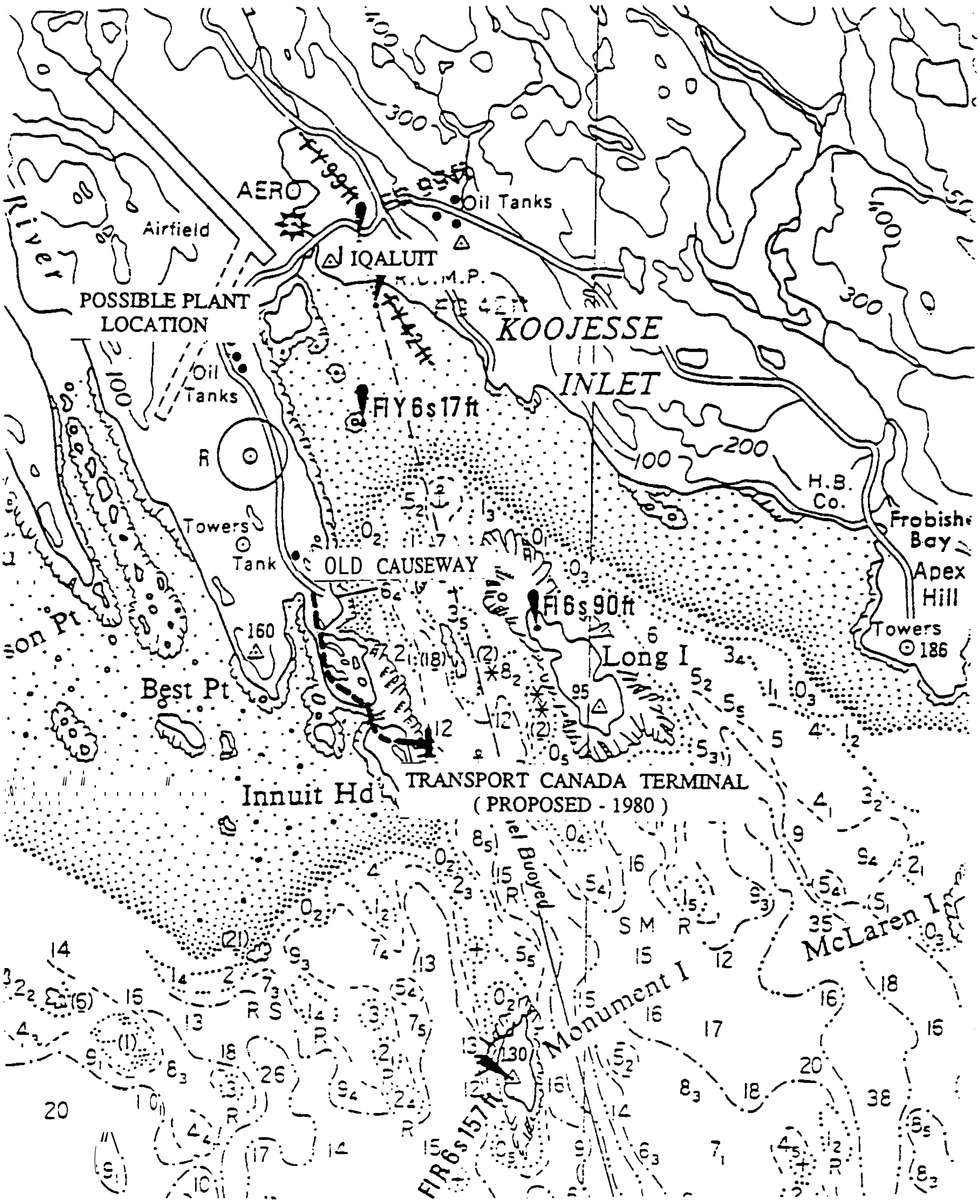
Cargo **Terminal and Shrimp Plant-**

If both the cargo terminal and the processing plant were constructed it would seem most logical to build a cold storage at the dock of sufficient size to handle the transshipment requirements as well as holding the frozen raw material (shrimp and perhaps groundfish) inventory which the plant would use throughout the year. The plant itself would likely be best located at a town site as mentioned above with perhaps a very small chill or cold room to act as a buffer for the inevitable production scheduling problems.

The various potential Iqaluit sites are illustrated in Exhibit 3.6.2.

EXHIBIT 3.6.2

SITE MAP - IQALUIT



4.1 Outline of Business Concept

The presence of the sixteen vessel shrimp trawler fleet off the coast of Baffin Island for a significant part of each year provides an opportunity for a transshipment service.

This facility would consist of:

- a large dock suitable for shrimp trawlers and cargo vessels which could be worked at all tide levels
- an adjacent cold storage of sufficient capacity to enable trawlers to be continuously unloaded while awaiting a cargo vessel

The design of a suitable cold storage is straight forward. On the other hand because of the ice and tide situation in Frobisher Bay the design of the dock itself is more difficult. The specific site and design does not affect the business evaluation here but it would have an impact on the costs and timing of construction.

4.2 Shrimp Trawler Fleet

4.2.1 Current Operations

There are sixteen trawlers licensed by Canada to fish shrimp in the Northern Shrimp Areas. A current listing of these vessels and the licensees is given in Exhibit 4.2.1. Exhibit 4.2.2 is a map of Northern Shrimp fishing areas showing principal communities and the minimum and maximum annual ice coverage. Exhibit 4.2.3 summarizes the 1989 Northern Shrimp Management Plan from a total and individual vessel point of view.

All the vessels utilize a similar fishing pattern; following the ice breakup northward during the late spring to fall and then receding southward with the ice freezeup during the winter and early spring. When each trawler's capacity is reached the catch must be offloaded for transshipment to market. When the vessels are fishing off Labrador or farther south they tend to use Newfoundland ports for unloading. When they are fishing in the Davis Strait or in the northern Labrador / Hudson Strait area, they are more likely to unload in one of several Greenland ports. In the majority of cases this product is picked Up by cargo vessel

EXHIBIT 4.2.1

NORTHERN SHRIMP LICENSE HOLDERS

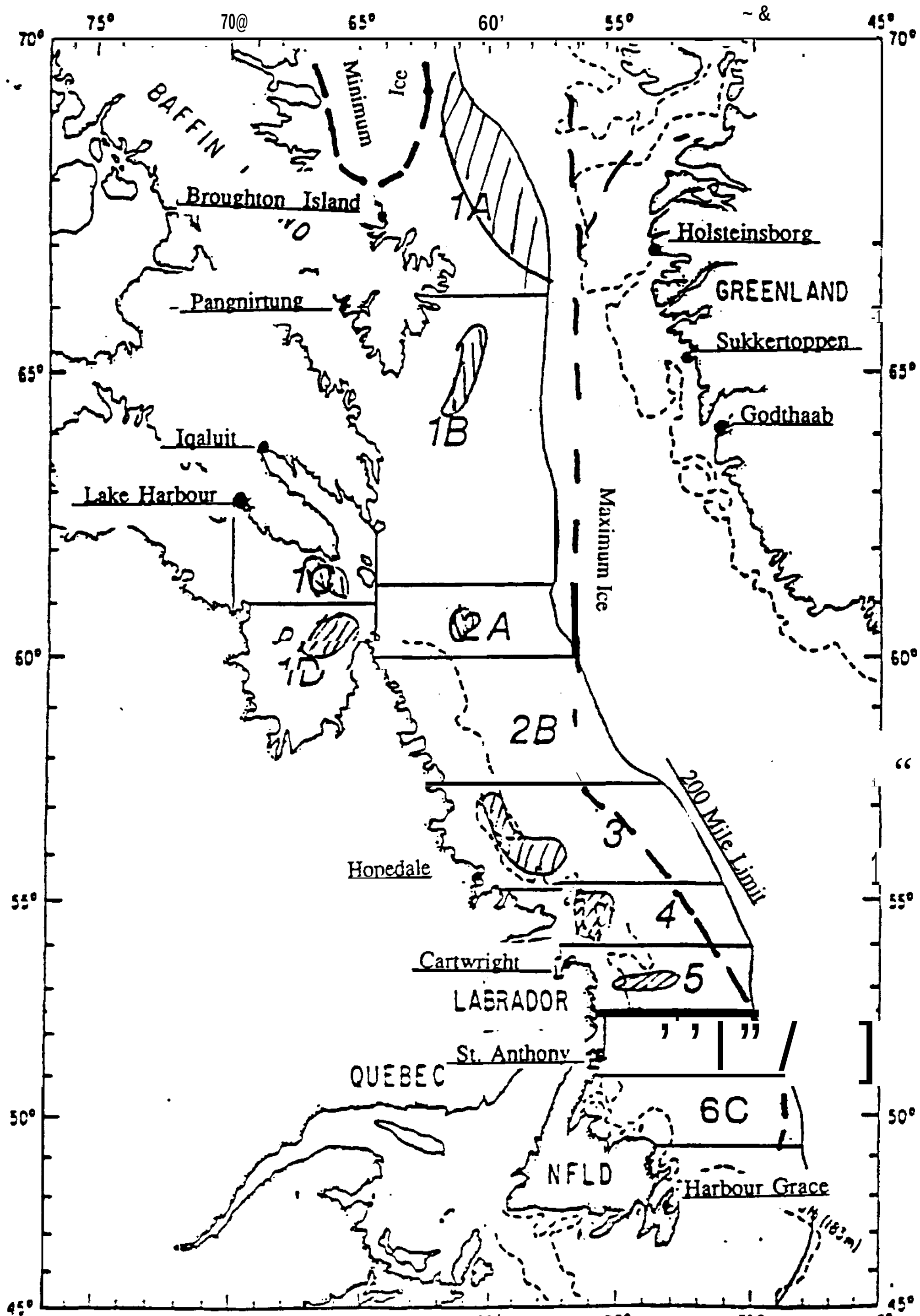
	Company	Vessel Used
1.	Seaku Fisheries/Makivik	Aqvik (C)
2.	Kinguk Fisheries/ Qiqiqtaaluk	Kinguk (C)
3.	155977 Can. Inc./ Unaaq Fisheries	Atlantic Champion (C)
4.	Peches Nordique	Lumaaq (C)
5.	Torngat Co-op	Ocean Prawn (F)
6.	Pikaloyak/ NSP	Faroe Prawn (F)
7.	Fishery Products Int.	Newfoundland Lynx (C)
8.	Fishery Products Int.	Hviltenni (F)
9.	Labrador Fisherrnens Union Shrimp Company (LFUSC)	Thor Trawl (C)
10.	LFUSC	Kiviuq 1 (C)
11.	Mersey Seafoods	Mersey Venture (C)
12.	Mersey Seafoods	BCM Atlantic (C)
13.	Ocean Marine Mgmt. Co.	Montreal Viking (C)
14.	Harbour Grace Fishing Co.	Northern Kingfisher (C)
15.	Lameque Co-op	Northern Osprey (C)
16.	Caramer	Arctic Viking (F)

As of January **20,1989**

(C) - designates Canadian Registered Vessel
(F) - designates Foreign Vessel

EXHIBIT 4.2.2

NORTHERN SHRIMP FISHING AREAS



Major **Shrimp Fishing Grounds**

EXHIBIT 4.2.3

NORTHERN SHRIMP AVAILABILITY - 1988/89

(Metric Tons)

m

		Total Allowable Catch [1]	Precautionary Quota [2]	Per Vessel [3]
Davis Strait	1A	7,520	3,500	470
	1B			219
Eastern Hudson Strait	1C	1,000		63
Ungava Bay	1D		200	13
NAFO 2G North	2A	1,080	00	67
2G North	2B			94
Hopedale Channel	3	4,400		275
Cartwright Channel	4	1,600		100
Hawke Channel	5	2,000		125
St. Basin	6A	1,600	2,000	100
	6B& 6C			130
Totals		**19,200**	**7,200**	**1,656 [4]**

Notes:
1. Total Allowable Catch - fixed tonnage evenly split among all vessels.
2. Precautionary Quota - all vessels may apply to fish against ; no fixed limit per vessel.
3. Assumes 16 licensed vessels.
4. Of the total, 1,200 MT "belongs" to each vessel, remaining 456 MT is pro-rata share of quota.

and is eventually sold in Denmark for further processing for the European or U.S. market. Japan is also a significant final market for the larger sizes.

4.2.2 Vessel Operator Requirements

A survey questionnaire was sent to representatives of all sixteen shrimp license holders in order to determine some basic facts about their fishing operations and the requirements they would have for a cargo transshipment facility in the southern Baffin Island region. A copy of this blank questionnaire is included in the Appendix and a summary of the responses on some of the key items is shown in Exhibit 4.2.4 .Answers were received from representatives often of the sixteen license holders.

The answers received were sufficient to define in general terms what the parameters of a cargo transshipment facility would be. For the purposes of establishing a preliminary design and service requirements it was assumed the "typical" trawler would be as shown at the bottom of Exhibit 4.2.4 and would require:

- to unload 400 MT in 65 hours
- 400,000 litres of fuel
- 30 MT of salt
- changing crews
- to have available some type of repair and parts facilities and fishing gear supplies
- possible on shore accommodation for crews

Operators were also asked for their comments on factors they thought would be in favour of, and acting against, a possible terminal in Iqaluit. In general everyone was supportive if it could be commercially competitive with Greenland, and almost all the respondents said they would use it at least once or twice a year. Their major concerns were the ice-free time period and the difficulties associated with the high tides.

In theoretical terms the potential maximum "market" for the terminal would be the transhipment of all the shrimp caught from the Hopedale Channel north inclusive. In 1989, this would total in excess of 19,000 MT. Any shrimp caught in the Cartwright Charnel or further south would more conveniently be transshipped in Newfoundland. Some vessels are Nova Scotia based and currently land there when not using Greenland. It is not realistic to expect that all 19,000 MT could be attracted to Iqaluit. On the other hand, vessel operators answering the survey (over 60% of the licensees) indicated they would be Potentially interested in unloading a total of 7-8,000 MT (see Exhibit 4.2.4). Obviously, if the Iqaluit

EXHIBIT 4.2.4

SHRIMP TRAWLER SURVEY- SUMMARY

Vessel	Le	Min Water	Possible # Trips to Iqaluit	Avg. Offload	Turn Time	ee	Interest in Services: Fuel ('000 l)	Salt mt	Crew Change	Other [1]
Aqviq	5⊖m	4.6 m	6	170-200 mt	48hr	Godthaab	160	10	no	yes
Kinguk	5⊖ m	4.6 m	6	70-200 mt	48hr	Godthaab	160	10	no	yes
Atlantic Champion	ξ3 m	7.5 m	3-4	500 mt	60-80 hr	{Sukkertoppen Godthaab	700	40	yes	yes
BCM Atlantic	59 m	8.0 m	1-2	300 mt	90 hr	Sukkertoppen	price?	25	yes	possible
Mersey Venture	67 m	9.0 m	(max)	450 mt	100 hr	Sukkertoppen	price?	30	yes	possible
Vi×ng	5⊖m	5.2 m	1-2	300-350 mt	75 hr	Holsteinsborg	no	yes	no	no
Northern Osprey	ξ3 m	7.0 m	none	375 mt	40 hr	Holsteinsborg	250-400	yes	yes	yes
NFLD L ynx	65 m	7.25 m	2	240 mt	48 hr	Godthaab	400	yes	yes	yes
FPI (new)	6⊖m	7.25 m	2	420 mt	48 hr	Godthaab	price?	?	yes	yes
Faroe Prawn	?	?	3	450 mt	n/a	n/a	yes	yes	yes	yes
"Typical " Trawler	63m	8.0 m		400 mt (assumes target rate of 6mt/hr)	65 hr		400	30	yes	[1]

Note: [1]- 50,000 litres fresh water,provisions for 1500 person days ,440/220/3ph/60 power
- fishing gear supplies, misc. vessel repair parts

Total potential tonnage indicated above 7300-8800MT terminal proved to be attractive enough to attract this 8,000 MT it would also likely attract additional business from some of the remaining vessels.

Therefore, it would seem reasonable to assume if an economic and efficient terminal is built, and the fishery maintains its current health, the dock could be handling 10-12,000 MT of shrimp. If the potential for the *Pandalus montagui* resource south of Baffin is realized, this volume could be significantly increased because Iqaluit would be the most convenient port.

It will be very important for this facility to operate efficiently. If trawler operators and/or their customers are not confident that vessels will be turned around quickly, and that their product will be handled properly, the terminal will get very little business. In the development of a business plan, it will be necessary to allow for a conservative startup period of perhaps two seasons. It would be very difficult to recover from a bad reputation with the shrimp fleet, particularly when the Baffin season is so short and Greenland is already providing adequate service. The strategy should probably be to demonstrate that the terminal can do a good job by perhaps concentrating first on attracting business from a few of the smaller vessels.

4.2.3 D.F.O. Canadianiztion Policy

The Department of Fisheries and Oceans has evolved a Canadianization policy for the northern shrimp fishery since the initial issuance of licenses in 1978.

This policy has various elements:

- to encourage indigenous economic development by making licenses specifically available to native peoples' organizations in the north
- to allow joint ventures with foreign owned freezer trawlers, but to require that these vessels be replaced with Canadian registered trawlers by April 30, 1990 at the latest
- to require Canadian vessels to land only at Canadian ports commencing with the 1991 fishery

The rationale for this last element was to ensure an accurate record of catches could be maintained for resource management purposes and also to ensure the maximum incremental economic benefit from the resource would be retained in Canada. This policy has been relaxed for the 1989 fishery by permitting the vessels to land where they wish but requiring them to have a Canadian fisheries observer on board at all times.

In practical terms this means the trawlers can continue to unload in Greenland when it is appropriate for them to do so. None of the vessel operators were particularly enthusiastic with using Greenland; because of the generally high costs and the difficulty transferring crews. On the other hand, none of them would be happy to be forced to use an uneconomic Canadian port because of a condition on their license.

It should be noted that a Canadian-ports only policy will affect the smaller vessels more than the larger ones because they have to make more unloading "cycles" for the same tonnage of product. Therefore, the Iqaluit terminal will likely be more attractive to the smaller vessels.

It is very unlikely that D.F.O. will make a final ruling on this issue without considerable input from the licensees and a thorough evaluation of the financial impact on the fleet. Representatives of Baffin should make it known to D.F.O that they are seriously considering a terminal to service the shrimp fleet. It would not be in the long term interests of this potential terminal, however, to be seen by the trawler operators to be actively lobbying for a Canadian-ports only policy so as to force them to use Iqaluit.

4.3 Capital Cost Estimate

The amount of effort directed at costing the cargo terminal was reduced when it was learned that the Eastern Arctic / Baffin Region Port Facilities Study had been commissioned.

Nevertheless, in order to get some concept of the scale of the investment needed to build a terminal, it was decided to do an update of the estimate prepared for the Ministry of Transport of a T-type dock at Inuit Head. In 1980, this wharf was estimated to cost $10.6 million. The equivalent 1989 cost was determined to be $18.2 million. It should be noted that at 77 meters long this wharf would not be long enough to accommodate two shrimp trawlers. and therefore would not be adequate for this terminal. A dock of at least 150 meters would likely be required. A capital cost estimate was not done for such a wharf.

The 1980 report indicated that studies by Transport Canada had identified Inuit Head as the optimum location for a marine terminal. Because the ice clears first there, Inuit Head has an almost four month shipping season while that of the inner harbour is only three months.

Initially, it was thought that there was no other alternative to the Inuit Head facility. The high cost of building this, in particular the cost of the roadway, suggested the causeway option be re-exarnined. No preliminary engineering has been done, however it appears that an adequate floating dock arrangement could be built, for an investment of approximately $5 million.

A cold storage of approximately 2,000 **square meters would be necessary to handle the 12,000 metric tons of product potentially available during a three month season. This assumes cargo vessels would arrive every two weeks. The prefabricated panels over a steel structure type cold storage would be the most appropriate to use here.**

Another building, which may or may not be attached to the cold storage, would be required for general administration offices and as a storage and repair facility for forklifts and other equipment owned by the terminal. A building of 200 square meters would likely be adequate for this, and could also store the salt required by most of the trawlers.

No attempt was made to estimate the size or cost of any vessel repair or servicing facilities. These could vary depending on the level of service it was decided to make available. They would offer ideal opportunities for individual businesses to take advantage of at the appropriate time.

The vessels would require access to fresh water supplies and shore power. The fresh water servicing may be difficult from the town system. However, for the purposes of establishing an estimate a 50,000 litre tank system was assumed to be at the terminal.

The provision of fuel was more problematic. Some vessels indicated they would take on up to 400,000 litres while others would not be interested as they currently buy at sea. The provision of a large, main fuelling depot at the terminal or adjacent to it would be very expensive, and given the short season may not be practical. It was assumed, however, that the terminal would have to offer at least a minimum refueling capability so a 100,000 litre capacity tank system was allowed for in the estimate.

Exhibit 4.3.1 summarizes the capital cost estimate for the cargo terminal for both the Inuit Head location, and an alternative using the causeway as a base. It must be emphasized again that all these estimates are very preliminary in nature; the intention being only to get a reasonably accurate idea of the scale of the capital cost involved.

4.4 Socio-Economic Impact

4.4.1 Employment

The principal impact of a cargo terminal on the community of Iqaluit will be through the wages paid to the employees. The facility would only be providing a transshipment service; there is no processing or other form of manufacturing value added. Exhibit 4.4.1 is an estimate of the composition of the work force and the income they would earn handling 12,000 metric tons of frozen shrimp (ie: 12,000 metric tons unloaded / stored / re-shipped for a total of 24,000 metric tons actually "crossing the wharf'). The annual sealift of 8,000 metric tons could be in addition to this. Whether or not the sealift business could be accommodated, the actual volume of shrimp handled, and consequently the number of workers required, would depend primarily on the number of docking locations constructed because this would determine the facility's scheduling flexibility.

The income multiplier effect is estimated to be in the 1.5 to 2.5 range for Baffin. Therefore, if the total wages and salaries paid out by the Terminal is in the area of

EXHIBIT 4. 3.1

IQALUIT CARGO TERMINAL
PRELIMINARY CAPITAL COST ESTIMATES

($ 000)

	Inuit Head	Causeway Location
Dock	$ 15,000[1]	$ 5,000
Roadway	$ 3,200	incl. in dock estimate
Cold Storage	64 5,400	$ 5,400
Admin/Maintenance Bldg	$ 330	$ 33○
Electrical Power	$ 200	$ 50
Fuel Tank	$ 60	$ 60
Water Tank	$ 50	$ 50
Total	**$24,240**	**$ 10,890**

Note: [1] Update of 1980 estimate for a 77 metre dock only.

EXHIBIT 4.4.1

CARGO TERMINAL - EMPLOYMENT ESTIMATES

	Number	Workyear	Payrate	Annual Income Per Worker	Annual Income Total
Hourly Paid:					
G :					
4/Trawler x 2 Trawlers	8	3 months	$ 8.00/hr	$ 5,100	$ 40,800
Extra Shift for 1 Trawler	4	3 months	$ 8.00/hr	$ 5,100	$ 20,400
10/Cargo Vessel	10	3 months	$ 8.00/hr	$ 5,100	$ 51,000
Cold Storage	4	3 months	$ 8.00/hr	$ 5,100	$ 20,400
Forklift Drivers	15	3 months	$ 9.00/hr	$ 5,800	$ 87,000
Tallymen	6	3 months	$ 9.50/hr	$ 6,100	$ 36,600
Foremen	3	3.5 months	$12.00/hr	$ 8,900	$ 26,700
Hourly Paid Subtotals	50				$282,900
Administration / Other:					
Manager	1	12 months		$40,000/yr	$ 40,000
Accountant	1	12 months		$30,000/yr	$ 30,000
Secretary	1	12 months		$15,000/yr	$ 15,000
Maintenance (incl. forklifts)	1	6 months		$12,500/6mths	$ 12,500
Warehouse/Stores	1	6 months		$9,000/6mnths	$ 9,000
Admin./Other subtotal	5				$106,500
Totals	55				$389,400

Above estimates apply to transhipment of 12,000 MT only; annual sealift may or may not be able to be od ed as th this workforce.
Payrates are for illustration only, using $8.00/hr for general labour as a base.

All hourly paid are assumed to work regular 40 hour weeks plus earn an additional 33% for working 25% overtime @ time and a half . It is assumed to be preferable to have a good reliable labour force and pay them overtime on a regular basis then to have a much larger " call-up " list of less productive workers earning less money on average.

It is assumed that the facility would operate on an as-required, round-the-clock basis.

If a total of 24,000 MT is handled (12,000 MT in+ 12,000MT out) the direct labour cost averages $12/MT ($282,900/24,000 MT) .

$390,000, there would be an approximate total impact on the community ranging from $600,000 to $ 1 million. This does not account for the unemployment insurance payments received by the seasonal workers which would also create a ripple effect in the local economy.

4.42 community spin-off Effects

It is possible to perceive of a variety of other positive impacts on the community beyond the general increase in activity directly due to the cargo transhipment.

A good dock should result in some reduction of sealift costs. At the present time, sealift vessel crews do their own unloading so there would be no incremental labour cost saving to the companies from using a dock. There would be, however, a significant shortening of the total unloading time. One vessel operator estimated the ability to unload regardless of bad weather might cut turnaround time in half and result in cost savings of $10-15 /"delivered ton. For a total sealift of 8,000 tons, this would theoretically result in a saving to the 'community' of the order of $100,000.

Such a dock may encourage the development of a summer cruise ship business which could have significant repercussions throughout the area on businesses such as restaurants and outfitting which cater to tourists. This potential should definitely be investigated further. Because of the characteristics of the harbour, there is the possibility of conflict regarding wharf space and anchorages with shrimp trawlers and freighters.

The community would generate municipal tax revenue of some sort from the facility plus other revenue from selling water, power and other services.

4.5 Conclusions

- the shrimp trawler fleet would be interested in using a cargo transshipment terminal at Iqaluit.
- this terminal should be able to recover the full direct operating costs of labour and cold storage and maintain competitive rates. It is possible that part of the capital cost of the cold storage could also be recovered
- it is very unlikely that any part of the dock and support infrastructure capital cost could be recovered from the shrimp operations
- it is estimated that such a terminal would employ fifty hourly-paid and five administrative people during the open water season. The annual wages and salaries paid would be in the order of $390,000 with a possible total impact of up to $1 million

- the current Eastern Arctic / Baffin Region Port Facilities Study may identify other requirements for a dock in Iqaluit which will be complementary

5.1 Outline of Business Concept

What a seafood processing plant "looks like" is primarily determined by the raw material it has access to and the market demand characteristics for the products which can be produced from that raw material. In this case, it is relatively easy to define the raw material base and the related markets and products.

For the purposes of this discussion, it is assumed that the processing plant is a stand-alone facility; that is, the cargo transshipment facility is not in place.

The general concept behind the processing plant project is to convert some portion of the shrimp caught near Baffin into marketable products. Shrimp is inherently more attractive than groundfish or other species because it is available in large volume and has a higher unit value. Therefore, it has the capability to generate a relatively high revenue stream. The processing of any future inshore catches and of the Qiqiqtaaluk groundfish quota could provide useful business for the plant but would not justify its long term existence on their own without shrimp.

5.2 Raw Material sourcing

5.2.1. Shrimp

For reasons which will be outlined later, it is proposed that the plant use about 1,200 metric tons of whole, frozen, industrial size shrimp as its annual raw material base. This volume would be purchased from the trawlers during the open water period.

There are actually two distinct shrimp resources available:

- the *Pandalus borealis* fishery in the Hopedale Channel, in Davis Strait, and to a less well-defined extent, off Cumberland Sound
- the *Pandalus montagui* source south of Baffin Island; in the Hudson Strait - Ungava Bay region.This stock is still managed on an experimental basis although catch rates have reportedly been quite high

At first glance it would seem that purchasing *P. borealis* shrimp would be more attractive because of its processing and marketing advantages, however, there is one major drawback. Catches of *P. borealis* tend to have a size mix ranging from 65 / kg to 150 / kg. The market for the shrimp larger than 120/kg is principally in

Europe or Japan in the unpeeled form, either cooked or raw. Any of this limited processing is normally done on board the vessel. Any subsequent on-shore processing is basically re-packaging which would not be an economic business for an Iqaluit plant. Therefore, the only product which would be unloaded and sold to an Iqaluit processing plant would be the industrial size grade (120 plus / kg) which has to be cooked and peeled before marketing.

It is very unlikely that any trawler operator would be interested in steaming to Iqaluit only to sell a portion of his cargo. The possibility does exist, however, that a vessel or vessels may catch a very high percentage of small *P. borealis* near Iqaluit on some trips, and / or market prices may be such as to make partial unloading in Iqaluit economically attractive. This would be the exception rather than the rule however. The plant cannot be based primarily on the *P. borealis* resource.

The *P. montagui* fishery seems to be potentially an ideal raw material source for an Iqaluit plant. Iqaluit has a distinct location advantage over any other existing port for vessels fishing in the Hudson Strait area. Harvesting information available to date indicates high catch rates of uniformly small shrimp. The annual requirement of 1,200 metric tons could easily be obtained from a dedicated fishing operation by only a limited number of vessels. This assumes that an annual quota is set for this stock at this level or more.

The raw material could be bought on the 'spot' market; however, it would likely be purchased through annual contracts with a limited number of vessels before the fishery starts.

5.2.2 Groundfish

Groundfish raw material could potentially be obtained from both inshore and offshore fisheries.

The inshore fishery in the Baffin region has not been well researched as yet. In 1987, a survey done around Killiniq did not indicate any commercial potential for groundfish. It is not known whether this conclusion could be extrapolated across Hudson Strait to Baffin Island. Other exploratory surveys which were directed towards shellfish found no dramatic evidence of groundfish in nearshore waters. This does not necessarily mean significant resources are not present but it does probably indicate that there is no potential for a medium to large scale Baffin-based trawler fishery.

The very successful 1989 winter turbot fishery at Pangnirtung is probably more representative of the potential that exists. If such a resource was also identified in the Iqaluit area, it would be a worthwhile addition to the plant's input. It is thought that Frobisher Bay may be too shallow for turbot and other groundfish, however.

The offshore fishery in this case really refers to the Qiqiqtaaluk quota of 2,250 metric tons of cod and turbot. This is a potentially valuable resource for the plant , particularly if the fish was landed frozen and could be stored for regularly scheduled year-round processing as is planned for the shrimp operation.

523. **Other**

An inshore fishery for Iceland scallops has developed in Cumberland Sound and there may be similar potential in the Frobisher Bay area. In 1987 a survey by an offshore dragger found no areas in the southeastern Arctic with sufficient resources to support a large commercial fishery. There was evidence of small pockets of scallops in shallower nearshore waters which could possibly support a small boat fishery along the south and east coast of Baffin Island.

There is also the possibility for processing char, although there is limited potential for greater volume from the immediate Iqaluit area and existing production is already being marketed smoked. The Fresh Water Fish Marketing Corporation may be interested in some contract processing.

It would seem most likely that, with the exception of the Qiqitaaluk offshore quota, any significant volume of non-shrimp raw material will be delivered to the plant by some future fleet of multi-purpose inshore vessels.

5.3 Markets

5.3.1 Shrimp

Shrimp, in its various species and forms, is an internationally traded commodity. As a result, any producer, and in particular a small one such as the proposed Iqaluit plant, is very much a “price-taker.” Shrimp, as with most shellfish, is viewed as an ‘up-market’ product by consumers and therefore as economic prosperity has increased throughout much of the developed world over the years, so has the demand for shrimp. This general trend is expected to continue into the future.

One result of this steadily increasing demand for shrimp, and the essentially static level of wild harvesting, has been the dramatic development of shrimp farming. It is expected that aquiculture will play a bigger role in the world shrimp industry in the future. Cultured shrimp tends to moderate price fluctuations and to lessen the opportunities for windfall profits from dramatic price increases. Considering all the factors affecting an Iqaluit plant; a relatively stable world marketplace with steadily increasing overall demand is probably the ideal scenario.

Since the proposed plant would be processing a new species and stock, *P. montagui*, it is important to compare its annual volume with the existing supply to see if there would likely be any impact. Exhibit 5.3.1 illustrates the coldwater shrimp supply situation. Obviously the 1,200 metric tons of additional shrimp

EXHIBIT 5.3.1

COLDWATER SHRIMP SUPPLY

	Landings - Metric Ton	
	1988	1989 (Projected)
Canadian East Coast	29,000	30,000
Norway	40,000	40,000
Greenland	73,000	54,000
Iceland	29,000	32,000
Us.	36,000	31,000
Total	207,000	187,000

Source: DFO, Shrimp Market Outlook, April, 1989.

processed by this plant would represent a change of much less than 1% on a world scale; which is not significant.

On the other hand, if it is assumed that roughly 30% of the total eastern Canadian shrimp catch is of the industrial size then the new Iqaluit tonnage represents a 10% increase in production from this area which may have some impact.

The *P. borealis* shrimp caught in the northern fishery are essentially marketed three ways depending on the size:

- Shrimp larger than 90 / kg are frozen whole, raw and packed on board in 1 kg cartons for the Japanese market. This size has historically represented approximately 10% of the catch
- Medium size shrimp ranging from 90 /kg to 120/kg are cooked and frozen whole and bulk packed in 5 kg cartons on board for re-packaging in Europe (usually Denmark) for European and U.S. markets. Exhibit 5.3.2 illustrates the price trends over the last two years for this medium size. The current price is Danish kroner 27 / kg (or about U.S. $3.54/ kg) delivered to Denmark.
- Industrial shrimp that are 120 / kg and smaller are frozen whole, raw, and bulk packed on board for further processing (cooking and peeling), primarily in Denmark, for European and U.S. markets.

Since the plant w-ill be processing this industrial size grade, its final product will be in the 250- 350/lb and 350- 500/lb market categories. These small sizes have the lowest prices in the coldwater shrimp market. Exhibit 5.3.3 illustrates the price trends for Canadian 250-350 /lb *P. borealis in* the U.S. market over the last two years. The current price for this size range is in the U.S. $3.80-3.90 / lb range. The smaller 350 - 500 / lb grade is worth significantly less. Current prices are in the U.S. $2.35- 2.50 / lb range and are likely to weaken somewhat due to production from Oregon and eastern Canada. Prices could rebound to U.S. $3.50 / lb or more by Christmas.

Since *P. montagui* is not established in the market place, it is not possible to illustrate any historical price trends. However, it will likely remain closely linked to *P. borealis*. It maybe able to be sold for an equivalent price.

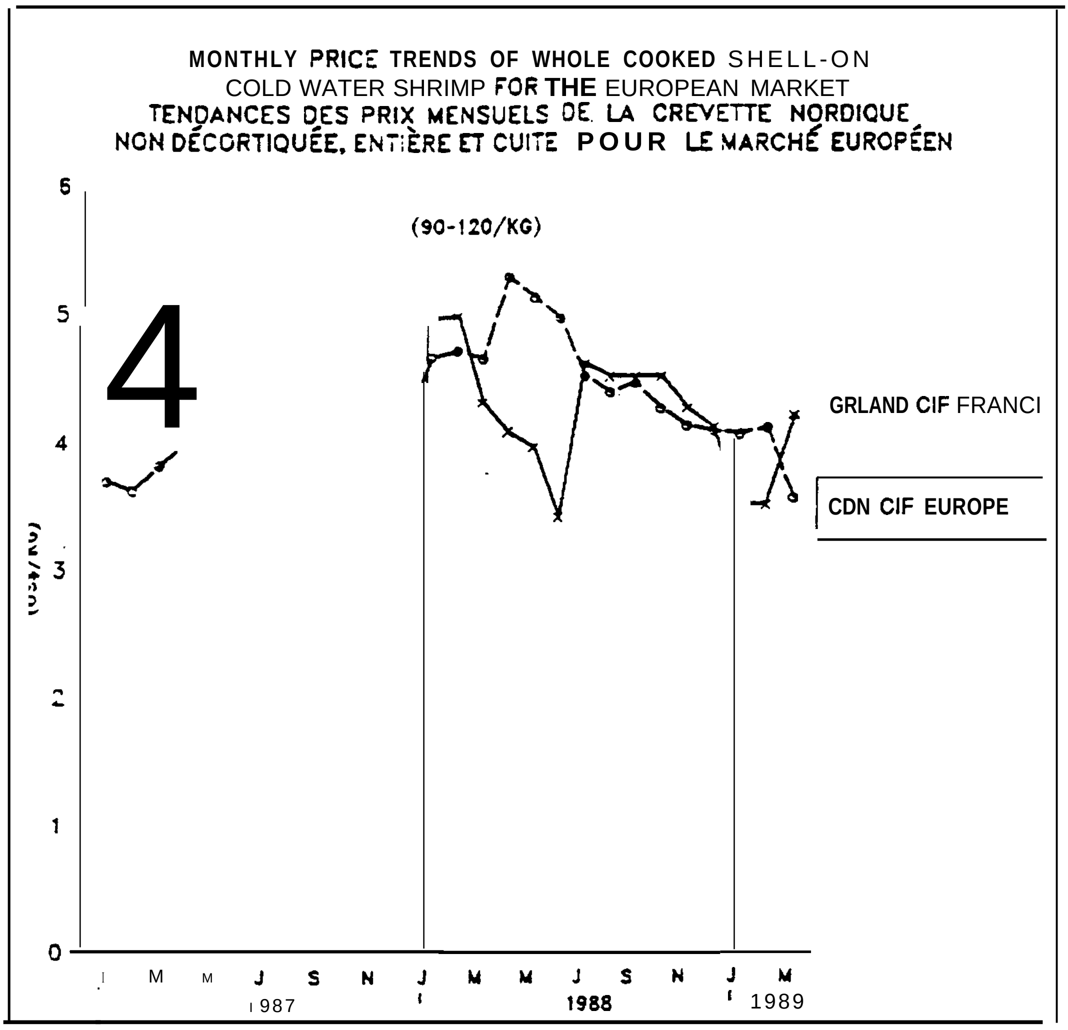
5.3.2 Groundfish

The market situation for cod can be used as a rough proxy for groundfish in general. The Iqaluit plant could potentially be producing fresh, frozen or perhaps even salted groundfish products. In general terms, the current market outlook is not particularly good. Many established plants in Atlantic Canada are having difficulty making a profit under present conditions.

In the last four years, frozen cod prices have climbed to levels never seen before and then fallen quickly back to more “normal” levels. For example, cod blocks

EXHIBIT 5.3.2

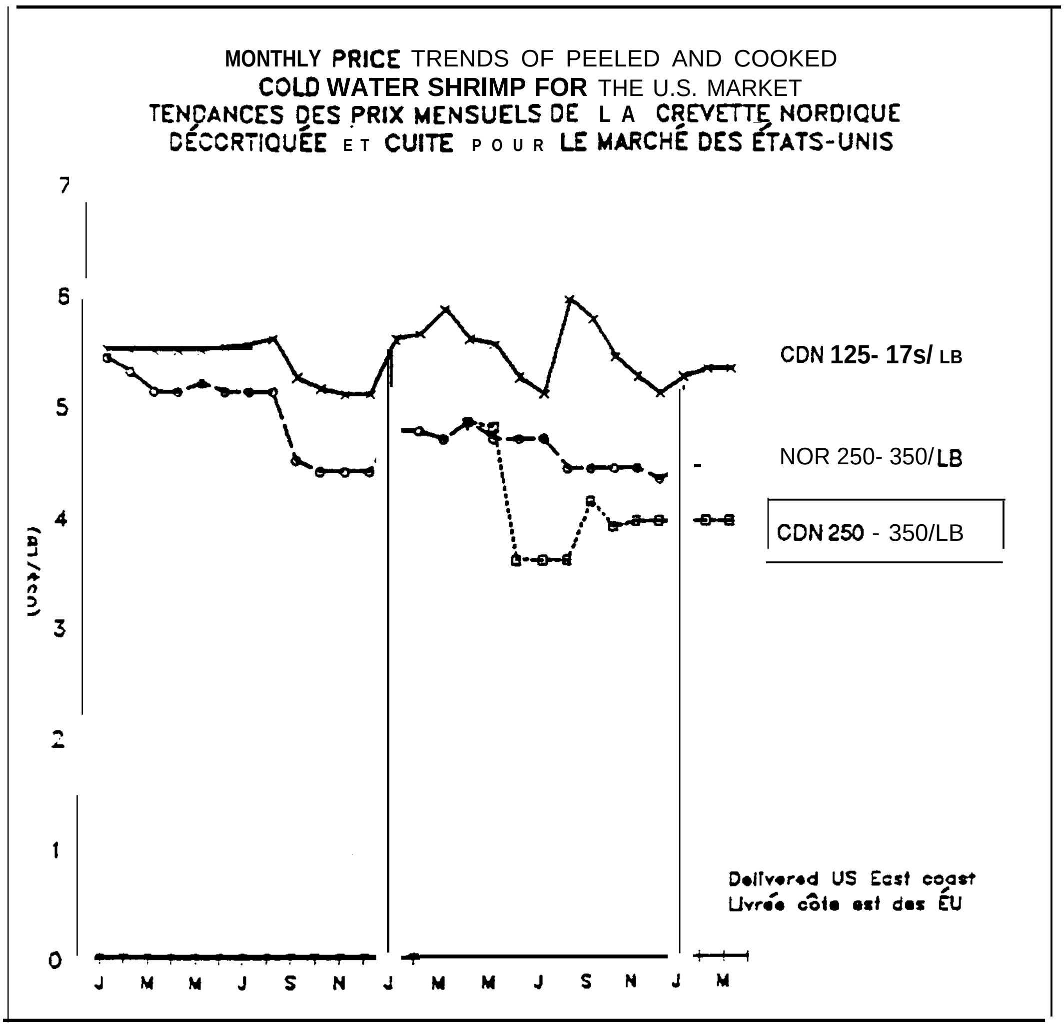
PRICE TRENDS 90 - 120/ KG



Source: DFO Shrimp Market Outlook, April 1989

EXHIBIT 5.3.3

PRICE TRENDS 250 - 350 / LB



Source: **DFO Shrimp Market Outlook, April 1989** reached more than U.S. $2.00 /lb in 1987, fell back to U.S. $1.20 /lb in late 1988, and are now in the U.S. $1.55 / lb range. Boneless fillets packed in 5 lb cartons for the restaurant trade reached the U.S. $2.50 /lb level in early 1987, fell to the U.S. $1.35 /lb level in mid 1988, and are now in the U.S. $1.55- 1.65/lb range. Prices have not rebounded to previous highs in spite of the dramatic reduction in Canadian quotas in 1989. The reason for this is during the period of high prices many buyers in the U.S. searched the world for substitutes, and having found them, are no longer desperate for cod products. The salt cod market, which is influenced primarily by Spanish and Portuguese demand, is also weak at present with no immediate prospect of improvement.

A low volume, inshore based, winter fishery along the Pangnirtung model designed for the higher priced fresh market is probably the only profitable market opportunity at present.

5.4 Processing / Marketing Options

5.4.1 General

The various processing / marketing options available to the plant are examined in Exhibit 5.4.1. The necessity of shipping finished products by air is an important constraint here, particularly for groundfish. Typically in southern plants, frozen fillets would be accumulated in inventory and sold to the U.S. in truckload quantities. The resulting transportation costs, from Nova Scotia to New England for example, would be in the area of 5 cents / lb. The Iqaluit plant would not be able to compete with this.

5.4.2. Marketing /Sales Arrangements

There are several ways in which the marketing of the plant's production could be done. An individual company brand could be developed and all products (shrimp, fish fillets etc.) sold under that label. Alternatively, arrangements could be made with other seafood companies to pack under their established labels. There are likely several organizations that would be interested in having the shrimp packed for them. Most seafood companies utilize a mix of these two approaches.

There are also various sales arrangements that could be used. All sales could be made from the plant itself but it would be difficult for someone in Iqaluit to stay abreast of changing market conditions, particularly if more than shrimp is being produced. In addition, the plant will be shipping in small quantities which will likely limit the interest of buyers on the spot market.

Alternatively, a contract with a single broker could be made. This broker, probably located in Montreal, Toronto, or Ottawa, would be responsible for the sales of all the plant's production. For this exclusivity the broker would charge a lower than normal commission but it would apply to the company's total sales. Giving

EXHIBIT 5.4.1

PROCESSING / MARKETING OPTIONS

Potential Products		Local	Other NWT	Southern Canada	U.S. & International
Shrimp : (small size,cooked+ peeled, frozen)					
	P. borealis	limited	limited	good	good
	P. montagui	limited	limited	good	good
Scallops :	fresh	good	good	fair	poor
	frozen(IQF)	none	none	fair	poor
Groundfish :					
Cod:	Dressed Fresh	limited	none	poor	none
	Dressed Frozen	none	none	none	none
	Fillets Fresh	limited	limited	some	none
	Fillets Frozen	none	none	poor	none
Turbot:	Dressed Fresh	limited	limited	good	none
	Dressed Frozen	none	none	fair	none
	Fillets Fresh	limited	limited	good	none
	Fillets Frozen	none	none	some	some
Halibut:	Dressed Fresh	limited	limited	good	none
	Dressed Frozen	none	none	some	poor

Arctic Char: Fresh/Frozen contract processing for Freshwater Fish Marketing Corporation

Notes:
- Local and Other NWT markets are categorized as limited because of small population base .
- Groundfish and scallops could be sold either fresh or frozen depending on demand but it is assumed that locals would prefer fresh.
- In the case of Cod or Turbot, the fillet categories above would also include steaks or other similar types of processing.

exclusive rights to one broker can be dangerous because it cuts the plant management off from the daily realities of the market place. obviously, it can leave the producer vulnerable to dishonesty by the broker but sometimes even honest brokers with an exclusive don't push hard enough for higher prices. Again, many seafood companies use a mixture of these sales methods and that would probably be appropriate here as well.

Shrimp would be the most important part of the product mix. Considering that the species is essentially a new one and that the plant would be an unknown quantity to buyers, likely the best strategy would be to make a sales arrangement with one, or possibly two, established shrimp marketing companies. They may want to use their own brand or have a new one developed. The product would be introduced to the market by people who are already known and who have a vested interest in its success. They would also be a valuable source of guidance during the initial stages of production.

Groundfish and scallops, on the other hand, would likely be better marketed under the plant's own brand identification through a small network of brokers servicing the fresh and frozen seafood trade in the central Canadian and possibly the U.S. market.

5.4.3 Product Quality

It is very important to concentrate on quality from the beginning. This does not mean that everything the plant produces must be absolutely first grade; that is not possible as there is always some less than the top quality product. What it does mean is that everything must be consistent. In the case of shrimp for example, size gradings must be accurate, and the glaze percentage must be consistent. A reputation for poor quality is very difficult to overcome in the seafood market today.

This plant will be using frozen raw material. Although this is done in many countries such as Denmark, it is difficult to do well. Even experienced shrimp processors in eastern Canada have problems getting consistent results using frozen shrimp.

The use of frozen at sea groundfish also presents some difficulties. Although the finished products (eg: cod fillets), tend to be very consistent it is difficult to get top prices because they have been frozen twice, which affects the texture of the fillet, and they also tend to have some discoloration. In addition, freezer trawlers normally head and gut groundfish before freezing them in bulk cartons. Without a head, these fish are best filleted on shore by machine rather than by hand.

5.5 Plant Layout

Two processing plant alternatives were examined:

- a multi-purpose plant
- a shrimp-only plant

5.5.1 General Design Consideration

Regardless of the size or characteristics of a seafood processing plant, there are certain basic parameters which should always be kept in mind.

Because the seafood industry is very changeable it is important that the capability to relatively easily modify any processing plant be designed into the facility from the beginning. It is also very important not to underestimate the space required.

It is false economy to use anything less than good quality materials or to skimp on workmanship in design and construction. Fish processing is very tough on buildings. Any deficiencies in durability will quickly show up in increased maintenance work and cost, and may even begin to interfere with actual processing operations. The same logic applies to such things as energy efficiency. To the maximum extent possible, it is always preferable to err on the side of spending more capital in order to achieve a lower operating cost.

The Department of Fisheries and Oceans has strict construction guidelines covering sloping of floors, washable walls, ceiling heights, etc. Although no attempt was made here to do detailed design work, these guidelines plus the factors mentioned above were kept in mind when estimating costs.

5.5.2 Multi-Purpose Plant

This plant was designed to operate year round cooking, peeling, and freezing small shrimp as well as having the capability to deal with some quantity of groundfish, scallops or char.

The plant was sized as small as seemed economically reasonable because:

- all the raw material has to be purchased at one time and then processed throughout a twelve month period. Therefore, inventory carrying costs would be a significant factor and should be minimized as much as possible.
- all product would be shipped by air for which regular production of small quantities would be most appropriate.

- the plant would be a new concept in the area and the inevitable startup problems would be much easier to deal with if the operation was kept small.

The capacity of a single shrimp processing line effectively defines the minimum economic size of the plant. For estimating purposes a single Laitram cooking and peeling line with a nominal capacity range of 450 to 800 kg of shell-on shrimp per hour was used. An average capacity of 600 kg/ hour, a 40 hour week, and a 50 week operating year indicates an annual consumption of 1,200 metric tons of whole shrimp. There has been limited experience with *P. montagui,* so it should be noted that the annual processing capacity could vary from as little as 900 metric tons to as much as 1,600 metric tons.

Following are some comments on the various equipment and facilities in the plant:

- **Shrimp Processing Line :** consists of two Laitram peelers with steam cooking attachments, separators and conveyors. Nominal capacity is 600 kg/ hour.

- **Thawer :** automatic thawers are available but these are expensive and really more suitable for high volume operations. This thawer is assumed to be a water tank with an elevating conveyor arrangement in the bottom. The water would be kept heated by a-small amount of steam.

- **Blast Freezer :** the ideal unit for freezing I.Q.F. shrimp would be a continuous flow type such as Frigoscandia's. This would not be suitable for freezing any other types of products such as dressed fish for example. Therefore, for preliminary estimating purposes a Sabroe batch blast freezer has been assumed. Nominal capacity: 315 kg/ hour.

- **Plate Freezer :** a Sabroe stand-alone plate freezer has been included to enable efficient freezing of fillets and scallops. Nominal capacity: 240 kg/ hour.

- **Fish Processing Line :** allowance has been made for a general purpose hand cutting table, a trimming table, and a packing table, as well as one Baader fillet skinning machine.

- **Offal System :** This would consist of some form of dewatering drum and associated conveyors and storage system in a heated area. Approximately 75% of the plant's input raw material leaves the plant through this system.

- **Cold Storage :** with a maximum stacking height of 5 meters, the cold storage would have a nominal capacity of 2,000 metric tons. This would accommodate the 1,200 metric tons of shrimp plus a considerable amount of other raw material such as frozen ground fish. The actual capacity depends on the storage density of the different products and the amount of access necessary.

- **Ante Room :** this room has been made large enough to allow storage of whole fresh fish iced in large wharf boxes. It would also serve as the general shipping and receiving dock.

- **Ice :** if the plant is to handle fresh fish, some supply of ice is necessary. An integrated ice house consisting of a storage bin of ten ton capacity with a North Star five ton flake ice machine above has been assumed. The ice bin can be accessed from either the ante-room or from outside for sales to fishermen.

- **Stores :** would consist of at least two sections; one for packaging material and another for parts and general maintenance supplies.

- **Offices :** would consist of an office each for plant manager and accountant plus general secretarial space.

- **Training & Lunch Room / Lockers :** the lunch room has been oversized and the lockers kept separate so that training programs for plant employees, new applicants, fishermen, etc., could be done here.

- **Mechanical / Electrical :** the actual size of these areas would be determin ed during preliminary design.

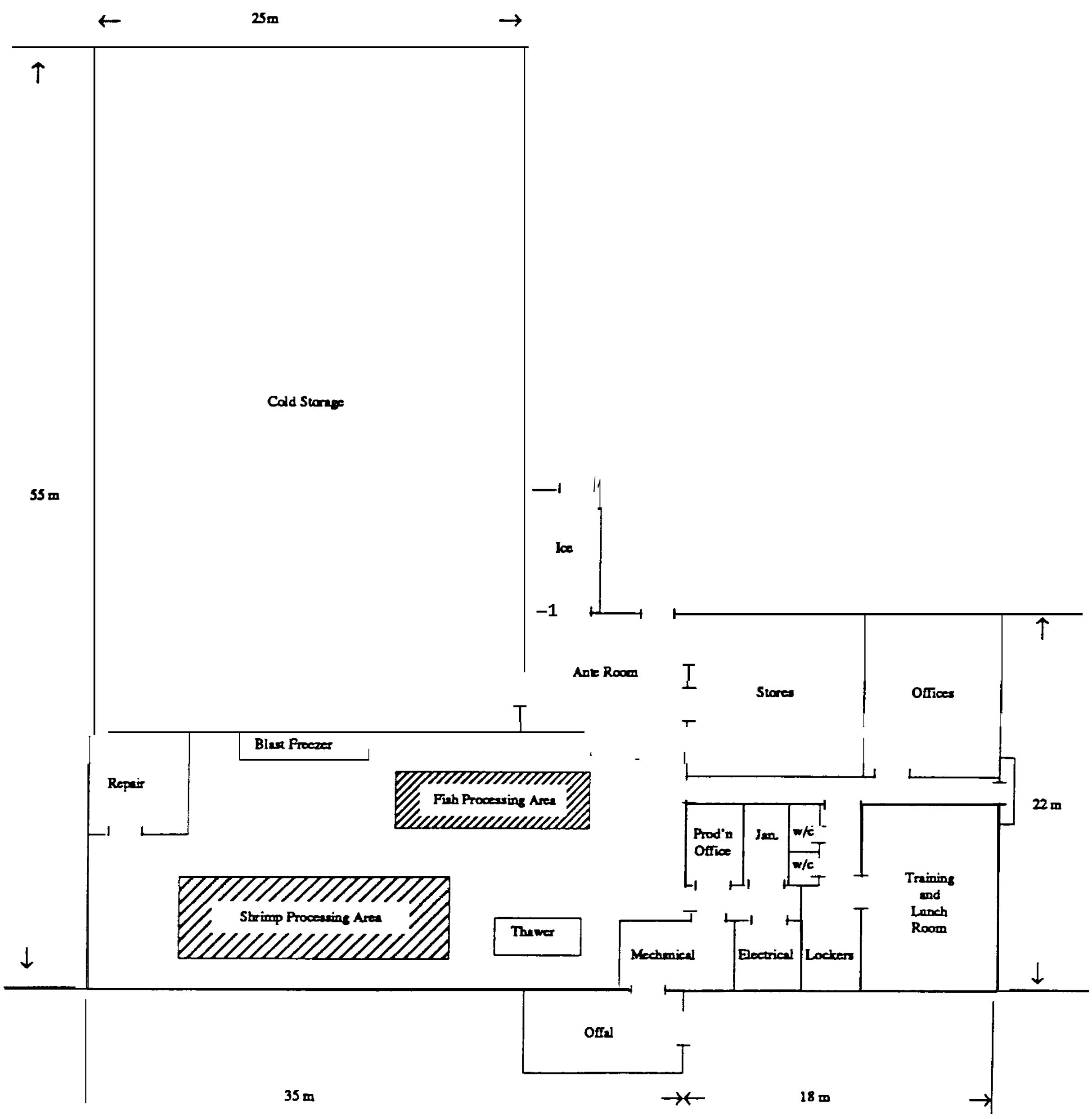
- **Repair :** small workshop/ tool crib for maintenance of plant and equipment; does not allow for welding although this may be desirable.

- **General :** to avoid the need for operating engineers on staff, as would be required with an ammonia system, it is assumed cold storage, blast freezer and plate freezer all use independent freon units.

Although the layout shown in Exhibit 5.5.1 is very preliminary, it does illustrate the principles mentioned in section 5.5.1. The process flow is fairly straight forward. Frozen shrimp enters the plant through the ante room and goes either to the cold storage or directly to processing. Shrimp from the cold storage goes to processing, to the blast freezer, is packaged, and returned to the ante room for shipping or placing temporarily in the cold storage. The packaging material is received directly into the stores and is easily taken to the packaging area as required. All the employees would be required to enter through the main entrance with immediate access to the lockers, lunchroom, and washrooms before entering the processing area where there would be hand wash and sanitation facilities. The offal system, which is messy and wet and must be kept heated, would be accessed through the mechanical area as well as from the outside.

EXHIBIT 5.5.1

MULTI-PURPOSE PLANT



NOT TO SCALE

TAVEL

The basic areas are set out so that the processing and people flow are relatively efficient while at the same time, the cold storage, the processing area, the stores, and the employee areas can each be increased in size without affecting any of the other areas.

5.5.3 shrimp Only Plant

This plant is essentially a "slimmed-down" version of the multi-purpose plant. The underlying assumption is to minimize the capital investment while still retaining the same shrimp processing capability. The basic design considerations outlined in Section 5.5. I still apply however. Exhibit 5.5.2 is a schematic layout of this plant.

5.6 Operational Economics

5.6.1 General

As was mentioned previously, a processing plant is really only a transfer function converting raw materials to products. The costs of raw materials and the market return for the products will both vary, but are essentially beyond the control of the plant. They will tend to move in tandem; that is when market demand and hence prices increase harvesters will increase their asking price for the raw shrimp and vice versa.

The actual development of a pro-forma operating statement is part of Phase II of - this study. Because of the nature of this project it is impossible to establish this without preliminary engineering work having been done. It was possible, however, to estimate the margin between raw material cost and market return that the plant would have to operate within.

Although the plant will no doubt process *P. borealis* at some times; perhaps even regularly, this analysis has been based on *P. montagui* for the reasons outlined in Section 5.2.1.

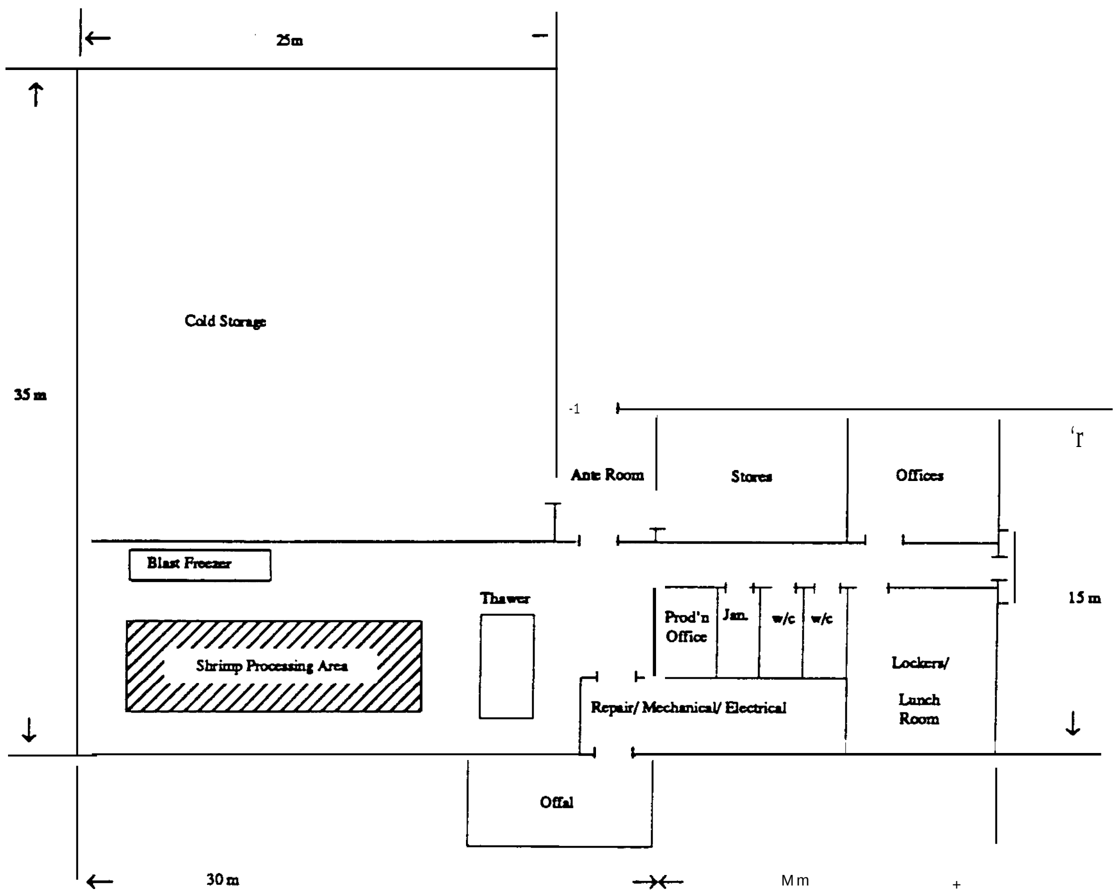
No attempt has been made to estimate the potential net returns from any groundfish or scallop processing at this time since the basic core business of the plant is the processing of shrimp. It can be assumed that these other species would only be handled if they at least made a net contribution to fixed overheads.

5.6.2 Raw Material Cost

By making some assumptions about the ex-vessel prices, inventory financing costs, processing yields, and glaze pickup, an estimate can be made of the cost of the raw material in the finished product at the plant. This is shown in Exhibit 5.6.1. In order to indicate the sensitivity of this cost to various factors 'Optimistic'

EXHIBIT 5.5.2

SHRIMP-ONLY PLANT



NOT TO SCALE

TAVEL

EXHIBIT 5.6.1

SHRIMP RAW MATERIAL COSTING

	Pandalus montagui			*Pandalus borealis*		
	Est. Current	Optimistic	Pessimistic	Est. Current	Optimistic	Pessimistic
Ex. Vessel Price $/MT fob Iqaluit	1300	1170	1500	1530	1380	1760
Labour (Vsl to Cold Storage) $/-MT	70	65	100	70	65	100
Subtotal	1370	1235	1600	1600	1445	1860
Inventory Financing $/M-r	103	74	136	120	104	140
Subtotal	**1473**	**1309**	**1736**	**1720**	**1549**	**2000**
Cooked/Peeled Yield	19%	20.5%	17.5%	23%	25%	20%
Raw Material Cost to Freezing $/MT	7752	6385	9920	7478	6196	10,000
Glaze (% of Final Prod. Wt.)	10%	10.5%	9%	10%	10.5%	9%
Raw Material Cost in Final Product $/MT	**7047**	**5778**	**9100**	**6798**	**5607**	**9174**

Notes:

Ex. Vessel Price based on current fob Greenland price of Danish kroner 10.2/kg for Industrial (120 plus/kg) P. borealis and assumes P.montagui @ 15% less Optimistic assumes 10% lower, Pessimistic assumes 15% higher (exchange rate of Danish Kroner 1.00 = Can. Dlr 0.15)

Inventory Financing assumes total purchases of 1200 MT @ total cost/MT shown in plant cold storage with usage on straight line basis through year, Current working capital cost assumed @15%,optimistic @1270, pessimistic@ 17%

and 'Pessimistic' scenarios were also done, the former representing everything going right, the latter everything going wrong.

The most significant thing to note here is the impact changes yields can have on the raw material cost in the finished product. Only limited processing trials have been done with *P. montagui*. A *safe* cooked / peeled yield estimate *is* believed to be 19%, but it is quite possible that 20.5% or more can be achieved. (It has been reported that yields of 30% have been reached in Greenland for *P. borealis).* If a processing yield of 20.5% and a glaze pickup of 10.5% were attained with the estimated current input raw material cost of $1,473 / ton, the resultant raw material cost in the final product would be $6,503 /tin rather than $7,047/ ton.

Uncler current circumstances the raw material cost would be $6.500 · 7.500 /ton of product.

5.6.3 **Market Return**

The use of U.S. market prices for this analysis does not imply that the shrimp will necessarily be sold there. There is a good chance sales will be made in the Canadian market and probably even overseas. All these price levels will be inter related at any given time however, and therefore the U.S. prices, which are the most readily available, are the most useful.

Because of the lack of market experience with *P. montagui*, the market return estimates were based on existing information on *P. borealis.* It is likely that *P. montagui* could eventually be sold at the same prices as *P. borealis*, however, in order to be conservative, and to allow for possible introductory marketing, a discount varying with market strength has been assumed here.

Exhibit 5.6.2 outlines these calculations for both "weak" and "strong" market scenarios for the two sizes; 250-350 /lb and 350-500 /lb.

Since the market price for the 350-500 /lb product is usually significantly lower than that for the 250-350 / lb product, the average market return will change considerably, depending on the size mix in the catch. Exhibit 5.6.3 illustrates this variation. For example; a change in size mix from 40%, 250-350 / lb to 90%, 250-350 /lb will increase the average market return by approximately $1,000 / ton of product (45¢ / lb) regardless of whether the market is weak or strong.

The Iqaluit / Ottawa air freight rate used is conservative; it could likely be negotiated considerably lower with the promise of year round cargo.

These above calculations illustrate that the net return to the plant per ton of shrimp product can vary widely depending on the relative strength of the market and the size mix in the catch. With the assumptions used here, this variation could be from $5,000 / ton to $10,000 / ton. (See Exhibit 5.6.3). These would be extreme cases, with a more typical level, under current circumstances likely to be in the $7,000-8,000 / ton range.

EXHIBIT 5.6.2

MARKET RETURN -- IQF SHRIMP PRODUCTS

	P. montagui				[illegible]			
	250-350/lb		350-500/lb		250-350/lb		350-500/lb	
	"Weak"	"Strong"	"Weak"	"Strong"	"Weak"	"Strong"	"Weak"	"Strong"
Market Price fob "Boston" US $/lb	3.10	4.70	2.10	3.95	3.25	4.75	2.25	4.00
Equiv. @Exch. Rate 1.15 Can $/lb	3.57	5.4	2.42	4.54	3.74	5.46	2.59	4.60
Less:								
Brokerage @ 7%	0.25	0.38	0.17	0.32	0.26	0.38	0.18	0.32
Freight:								
Ottawa/Boston	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Iqaluit/Ottawa	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Subtotal Marketing Expenses	0.62	0.75	0.54	0.69	0.63	0.75	0.55	0.69
Net Market Value: fob Iqaluit Airport ($/lb)	2.95	4.66	1.88	3.85	3.11	4.71	2.04	3.91
[equiv. $/MT]	[6503]	[10273	[4145]	[8488]	6856	[10384	[4497	8620

Notes:
- 350-500/lb would normally include some broken shrimp
- "Boston" is industry generic term for delivered U.S. east coast price
- Market value *P. montagui* is assumed to be 5 cents/lb less than *P. borealis* in a strong market but 15 cents/lb less in a soft market
- "Weak" and "Strong" prices based on current information and historical trends last two years
- Brokerage is assumed cost of either independent broker on spot market or marketing charge of an in-house marketing arm also includes miscellaneous sales expenses
- Iqaluit/Ottawa air cargo rate assumed as negotiated at 50% of quoted "Book" rate of $0.60/lb.

EXHIBIT 5.6.3

EFFECT OF SIZE MIX

Weighed Average Net Market Value

Catch Mix

Final Product Sizes		"Weak" Market[1]	"Strong" Market[1]
25○- 350) / lb	(350 - 500) / lb	($MT fOb Iqaluit)	($ / MT fob qaluit)
40%	60%	5088	9208
40%	50%	5324	9381
60%	40%	5560	9559
70%	30%	5796	9738
80%	20%	6031	9916
90%	10%	6267	10,095
R		$5,100 / MT $6,300 / MT	$9,200 / MT - $10,100 MT

(1) Notes: The "weak" market and "strong" market prices are taken from EXHIBIT 5.6.2

ie:	Weak	Strong
250 - 350 / lb	$6,503 / MT	$10,273 / MT
350 - 500 / lb	$4,145 / MT	$8,488 / MT

If prices equivalent to *P. borealis* are attainable, and the Iqaluit / Ottawa air freight rate can be reduced to 20¢/lb, the average return increases by approximately $500/ton.

This would result in an average market value at the plant of $7.500- 8.500/ton of product.

5.6.4 Conclusion

Many existing Atlantic Canadian shrimp plants consider a margin of $1,200 / ton between market return and raw material cost will cover all their operating costs including overheads.

The estimates done here indicate this plant's margins would be from $1,000 to $2,000 / ton of product.

Therefore it can be concluded that this shrimp plant is potentially economically viable.

5.7 Capital Cost Estimates

Preliminary construction cost estimates for the multi-purpose plant and the shrimp-only plant are shown in Exhibit 5.7.1. Plant construction costs were estimated using appropriate $ per square meter costs for the various parts of the building. Equipment costs were determined from current supplier quotations where possible, allowing for the current Montreal to Iqaluit ii-eight costs.

It should be noted that allowance has only been made for servicing costs "to the property line." The cost of supplying electrical power to the plant, the construction of any new roads, and any other infrastructure costs will be dependent on whether the plant is built in the industrial park, at the old runway site, or perhaps some other location. Depending on the terrain, new road construction is estimated to cost $1-2 million per km. and new power line servicing $50-80,000 per km.

The salt water process water supply system should be specifically mentioned. It was assumed the plant would be in the vicinity of the old causeway and a 500 metre, heat-traced line could be run along it to protect it from ice, and then dropped to the sea floor with an enclosed pump at the end. The cost of such a system could range from $150,000 to $350,000; $250,000 was used for the overall estimate.

The site work and pile foundation estimate assumes the plant will not be located where there are any particularly difficult site conditions.

EXH BIT 5.7.1

SHRIMP PLANT - COST ESTIMATES

$ ' 000

	Multi-Purpose Plant	Shrimp-Only Plant
Plant Construction :		
Site Work / Foundations	260	200
Building Structure	1,300	800
Cold Storage	2,700	1,700
Ice House	110	—
Water & Sewage Tank System	100	80
Saltwater Supply System	250	200
Standby Generator (essential loads only)	75	75
Miscellaneous	300	200
Subtotal	**5,095**	**3,255**
Processing Equipment :		
Shrimp Processing Line	355	355
General Purpose Processing Line	105	
Thawer	15	15
Blast Freezer	210	210
Plate Freezer	100	
Offal System	50	50
Miscellaneous (forklifts, etc.)	200	200
Subtotal	**1,035**	**830**
	6,130	**4,085**

It is assumed that building materials and equipment will be efficiently marshalled and shipped to Iqaluit, and construction will be well managed.

5.8 Financial considerations

There are two aspects to the financing of the plant; sourcing the funds to build it, and managing the money to operate it.

5.8.1 Capital Investment

Initial estimates indicate over $6 million would be required to construct the multi-purpose plant and over $4 million for the shrimp-only plant. The costs of constructing support infrastructure, such as extensions to roads and power lines, which are highly site dependent, would be in addition to this.

Investment in the plant itself would likely have to come from both public and private sources. The existing Renewable Resources Sub-Agreement would be a source of some funding although there is a current grant limit of $500,000 for a single project. Additional public support, probably in some combination of grants and low interest loans, would be required.

The most likely private sector investors in such a plant would be those already involved in the seafood, and particularly the shrimp, industry. International seafood marketing companies often take positions in processing operations as a means of ensuring supplies. European or Japanese processing companies could also be potentially interested if they felt the volume and quality of the product was significant and they would have no more than normal commercial risk.

Probably the ideal source of a significant portion of the private equity would be the Qiqiqtaaluk Corporation. Such an investment would represent a natural forward integration from their existing fishing activities. Because the ownership would be local, there would be a greater focus on the long term success of the project which would be important during the inevitable startup problems

5.8.2 Cash Flow

Cash flow management will be important to the success of the plant because of the nature of its operation. Essentially all the year's raw material would be purchased during a short period in the summer, representing a cash outlay of approximately $1.5 million (1,200 MT @ $1,300) at current prices. The cash inflow on the other hand would be more or less steady throughout the year in the order of $16(.),000 per month (20 MT @ $8,000). If packaging material and other supplies were brought in during the sealift, as opposed to being flown in on a regular monthly schedule for example, this imbalance problem would be increased. Also, since the summer and fall would normally be the weakest market period, it will be more difficult to recover cash quickly immediately after the biggest annual expenditure.

5.9 Socio-Economic Factors

5.9.1 Employment

The biggest impact from the plant will be through the employment generated and the wages earned and spent in the community. Exhibit 5.9.1 is an estimate of the plant workforce for both the multi-purpose and the shrimp-only plants and the resulting annual totals for wages and salaries. Assuming the income multiplier for Baffin is in the 1.5 to 2.5 range for an export-oriented industry the total impact will be in the $1.0 million to $1.5 million range for the large plant and from $500,000 to $800,000 for the small one.

A very important factor is that this plant is designed to operate year round. This will make it much easier to develop a good work force, and allow management to remain focused on the minimization of production costs. Seasonal plants, even long established ones in Atlantic Canada, always have annual startup problems and are generally less efficient than well managed year-round operations. Steady year round employment for a core workforce would likely have a beneficial social impact on the community as well.

Most of the necessary training could be done on the job. Process line work is not difficult but it does require workers with a good attitude and interest in their work. The quality of the finished product and hence the reputation of the plant is highly influenced by these workers. The successful development of a team of workers willing to take this responsibility would likely have a generally positive influence on the community. Women are often found to be better at this type of work than men.

Experienced people will be required for some positions. The plant manager should have a proven record in seafood and would ideally have northern management experience as well. It would be advantageous for the production foreman to have some knowledge of seafood, however, it would be more important to identify someone with the right leadership abilities who can be trained in processing. The processing equipment can be operated and maintained by people who have been trained on the job by manufacturer's field representatives, as long as they have the interest and some mechanical aptitude. The plant would require, however, at least one person qualified in general industrial, mechanical, and electrical repair and maintenance.

5.9.2 Community Spin-off Effects

The community as a whole would derive revenue from municipal taxes, the supply of water and sewage services, and so on. Trucking and other private service businesses would also benefit.

Over time, the plant would likely become a centre of fisheries expertise in the region and, depending on how the local fishery eventually developed, could become the focus of a much larger marine center.

EXHIBIT 509.1

PROCESSING PLANT EMPLOYMENT ESTIMATES

Shrimp Processing only:	Number	Pay Rate ($/hr)	Annual Income Per Worker	Annual Income Total
Hourly Paid:				
Cold Store/ Shipping/Receiving	2	$8.00	**$16,000**	$32,000
Peelers	1	10.00	**20,000**	20,000
Thawer	**1**	8.00	**16,000**	16,000
Cleaner/Separator	1	8.50	**17,000**	17,000
Blast Freezer/ Glazing	1	8.00	**16,000**	16,000
Packing	1	8.50	**17,000**	17,000
Misc. Labour	2	8.00	**16,000**	32,000
cleanup	2	8.00	**16,000**	32,000
stores	1	1050	**21,000**	21,000
Maintenance	**1**	12.00	**24,000**	24,000
Subtotal	**13**			$227,000
Administration;				
Plant Manager	1		$50,000	$50,000
Accountant	**1**		30,000	30,000
Secretary	1		15,000	15,000
Subtotal	**3**			$95,000
Shrimp-only Plant Total	**16**			$322,000
Additional for Fish/Scallop Processing:				
Hourly Paid:				
Raw Material	**2**	$8.00	**$16,000**	$32,000
Dressing/Filleting etc.	**6**	9.00	**18,000**	108,000
Skinning Machine	**1**	8.50	**17,000**	17,000
Trimming	**4**	8.50	**17,000**	68,(X)O
Packing	1	850	**17,000**	17,000
Plate Freezer	1	8.00	**16,000**	16,(X)(3
Misc. Labour	**2**	8.00	**16,000**	32,000
cleanup	1	8.00	**16,000**	16,000
Subtotal	**18**			$306,000
Multi-Species Plant Total	**34**			$628,000

Note:
- **assumes 40 hour work week/ 50 week year.**
- payrates are **for illustration** only; based on $8.00/hr for general labour.
- process workers, particularly in shrimp, would move between various jobs as the workload required.
- the groundfish labourforce illustrated would have a nominal capacity to fillet 6-7 tons of cod per shift.
- cleanup would be done during the night shift.

The plant's various training programs will produce a pool of skilled and semi-skilled workers with industrial experience.

A successful factory employing local people and local resources would be an excellent selling point when attempting to attract other industrial activities to the Baffin area.

5.10 Impact on Inshore Fishery Development

Either of the proposed processing plants would have a positive impact on the development of the inshore fishery in the region; although that of the larger plant would be much more significant. Having the built-in processing capability, it would provide fishermen with a reliable buyer. The smaller plant would probably be able to buy and freeze fish or scallops from time to time, but this could not be guaranteed because it is only intended to process shrimp.

The larger plant would also be able to sell ice to independent fishermen; the ante room is designed to hold a significant amount of iced, whole fish and the stores area is large enough to keep some inventory of fishing gear. It might also be appropriate to design the repair shop to be comprehensive enough so that mechanical work for small vessels could be done there.

Perhaps the most useful role either of the plants could have would be through their marketing arrangements. This would be particularly true for the big plant which would have a sales network dealing with other species, as well as shrimp, already in place. The fish purchased from inshore fishermen would flow right through this system. The immediate feedback to the fishermen (and plant management) on price level, quality and size requirements, etc., would be very valuable during the development phase.

Either plant would evolve as a centre of fisheries expertise in the region. The larger plant, with its greater processing capability and its combination lunch / training room, could probably be turned into a mini technical centre.

5.11 Conclusions

Preliminary estimates indicate a shrimp only plant would be economically viable. This plant would process 1,200 metric tons of raw shrimp per year with an estimated sales revenue of almost $2.0 million. An evaluation of projected market pricing and raw material costs indicates a potential for the plant to have similar operating margins to established Atlantic Canadian plants. The estimated work force of sixteen would earn total wages and salaries of $322,000. which would have a total income multiplier effect on the community of from $500,000 to $800,000. This plant is estimated to cost slightly more than $4 million to construct exclusive of infrastructure.

A larger multi-species plant could be built for an estimated $6.1 million also exclusive of infrastructure. This plant would also process the 1,200 metric tons of raw shrimp as above and would have the same economic viability as far as shrimp was concerned as the small plant. In addition it would also process a varying combination of other species such as cod, turbot, scallops and char. For estimating purposes an additional workforce of eighteen was assumed which would theoretically be able to fillet 1,700 metric tons of whole cod per year. As described this large plant would have a total workforce of 34 earning wages and salaries of $628,000. The total income multiplier effect on the community could likely be in the $1.0 million to $1.5 million range.

TAVEL LIMITED - BAFFIN INFRASTRUCTURE STUDY
SURVEY - SHRIMP TRAWLER OPERATORS

Completed by: ______________________ **Date:** ____________________

Vessel Name: ____

Registered tonnage: ________________ tons

Overall length: ____________________ meters

Minimum water depth required when vessel fully loaded: _________ meters

Cargo hold capacity - product: __________ tons

Do you currently unload in Greenland? Yes ______ No _______

If yes, which ports? Holsteinsborg _________ #/times per season

Sukkertop __________ #/times per season

Godthaab __________ #/times per season

Frederikshaab _________ #/times per season

Other _______________ #/times per season

Which Greenland port do you prefer to use? ____________________________

Why? ____

____

Which Canadian ports do you use?

Harbour Grace ______________

St. Anthony ________________

Other ______________________

Does your crew normally unload the vessel?

Always _____________

Sometimes __________

Never ______________

What is **your normal turnaround time to dock, unload, and service the vessel assuming no breakdown or weather problems?** ________ **hours**

What total tonnage of product would you unload per trip?

Minimum ____________ tons

Typical "average" ________ tons

Maximum ____________ tons

Does this vessel: have an onboard crane(s) ____________

require wharf crane(s) ______________

If there was an unloading/transhipment/vessel servicing facility located in southern Baffin Island (probably in or around Iqaluit) open when ice permits (approx. late July to early October) would YOU be interested in using it? Yes ______ No ________

If **no - why not?** ____

____

How many times **per season would this vessel likely land at this facility?** __________

How much product would you likely want to unload each time? __________ tons

Would you change crews each time? Yes _ No ________

What shore services would you require?

Fuel ____________________ gal.
Fresh **water** ____________________ **gal.**
Provisions ____________________
Accomodaaons ____________________
Electrical power ____________________
salt ____________________ tons
Misc. **fishing gear supplies** ____________
Misc. vessel parts ____________________
Minor repair/maintenance facilities __________
Other ____________________

Do your usual marketing arrangements when unloading in Greenland:
- require you to tranship directly from your vessel to a reefer vessel ________
- allow you to unload and store product in a shore cold storage for a period of time ______

From your point of view as a vessel operator what do you see as the significant factors for and against using such a facility, if it existed?

For ____________________

Against ____________________