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**REVIEW OF
SOCIO-ECONOMIC BENEFITS
ATTRIBUTABLE TO
CASSIAR ASBESTOS**

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1. EXECUTIVE SUMMARY

1.1 INTRODUCTION AND STUDY OBJECTIVES

The asbestos mine at Cassiar has been a major contributor to the social and economic fabric of the northwest and of British Columbia for the past thirty years. Given favourable economic conditions, the mine could continue to operate for another thirty years or more at presently planned rates of mineral extraction.

However, the Cassiar area is in the remote corner of northwestern B.C. and three factors limit the future potential of the area. These factors are:

1. the administrative structure of the town of Cassiar;
2. the cost of transportation, and;
3. the cost of electric power.

A fourth factor - time - becomes important if Brinco is to achieve a smooth transition from open pit mining to underground mining, without interruption to output and employment.

The objectives of this study centre on estimation of socio-economic benefits attributable to Brinco's operation of the Cassiar asbestos mine, and on the delineation of future prospects for the mine and for the community of Cassiar. In addition, this study presents an evaluation of the impact of the mining camp administrative structure upon the community services and upon Brinco's costs of operation.

1.2 SUMMARY OF MAJOR FINDINGS

1.2.1 Socio-Economic Impacts

The Cassiar Mine directly employed about 520 people in British Columbia in 1983, including about 450 in the Cassiar area. These Brinco employees paid about \$6 million in income taxes in 1983.

Cassiar and the two smaller mines which depend on it for services accounted for 510 direct jobs at the mine sites, and about 220 indirect and induced jobs in northwestern B.C. These mines generate at least 925 jobs in British Columbia, directly and indirectly. These 925 jobs generated wage incomes (including fringe benefits) of about \$35.8 million in 1983 in B.C.

Total indirect and induced employment in Canada associated with mining activity around Cassiar was estimated to amount to about 935 jobs. Added to the direct employment, this yields an estimated total employment impact of 1,575 jobs in Canada. The wage income (including fringe benefits) associated with these 1,575 jobs amounted to about \$56 million in 1983.

Direct British Columbia tax revenues from operations of these mines (including the provincial share of income taxes) are expected to amount to about \$6.5 million for the 1983 tax year.

1.2.2 Future Prospects

The economic reserves of the present open pit asbestos mine at Cassiar will be depleted in mid 1990, after which potential exists to maintain operations at reduced levels for five years, to reprocess mine tailings.

Given favourable economic conditions, the mine life can be extended at least until the year 2003 through development of additional fibre resources which already have been identified. These developments will entail a capital expenditure of over \$50 million (1983 dollars), and will fuel employment expansion of 60 to 100 in Brinco's mine operations.

This "drilled reserve" scenario centres on development of a new underground mine - the McDame deposit - and likely will be the largest mining development in the northwest (excluding Klappan coal) before the turn of the century.

In a more optimistic scenario which infers additional reserves in the undrilled portion of the McDame deposit, and which considers potential exploitation of small deposits and the reprocessing of mill tailings, the Cassiar Mine's life is extended to 2025 or beyond.

In addition to the two small precious metal mines presently operating in the Cassiar area, at least ten other significant mineral deposits have been identified. The probability of one or more of these coming into production in the future would be greatly enhanced by the presence of a healthy, stable community at Cassiar.

1.2.3 Community Services/Community Funding

The community of Cassiar currently has a surplus of housing available and a quantity of developable land sufficient to meet near term and long term future needs.

In the past, consideration of Cassiar as a regional centre for future resource development has identified two barriers. One was the anticipated limited life of Brinco's operations in the area - but the company's long range plans now indicate that potential exists for operations to continue well into the next century.

The second barrier identified was Cassiar's status as a company town. This barrier could be eliminated by a policy decision. Incorporation of Cassiar would eliminate many of the inequities identified in the funding of community services, and would open the community to further development - clearly making Cassiar a service centre for future economic expansion in the area.

The problems associated with the present administrative structure of the town have been emerging over time. While the mining camp approach to town administration was appropriate in the past, it now is out of step with current needs. The town no longer is a camp - but has evolved into a community which is constrained by the camp administrative structure, and by the lack of publically funded infrastructure which is provided to almost all other residents of the province.

Brinco now pays nearly \$1.3 million in provincial property taxes annually - but also pays \$1.4 million to support municipal services and to subsidize electric power usage and distribution. These two services are publically funded in virtually every other community in B.C., including many communities much smaller than Cassiar. The town receives much less assistance from the provincial government in providing services than other towns of similar size and character - most of this differential can be traced to barriers imposed by the administrative structure now in place.

Local residents may resist incorporation, because of expected cost transfers from the company to residential tax payers. However, these concerns may be largely unfounded, to the extent that the town is already endowed with significant municipal facilities and with incorporation could expect to recapture much of the property tax already paid in the area, which presently goes to the provincial general revenue account.

1.2.4 Time Frame For Decision Making

The decisions related to the future of both the town of Cassiar and Brinco's mining operation are separable only for the purpose of discussion. The decision to develop the McDame deposit, which rests to some degree on establishing a more equitable administrative structure for the town, must be made early in 1985 if interruptions to output and employment are to be avoided.

Delays in the decision making process incur the risk of permanent loss of markets and the loss of an opportunity to secure the future of the region well into the next century.

2. INTRODUCTION

Brinco Mining Limited owns and operates the Cassiar Asbestos mine in Northwest B.C. Construction of the mine was initiated in 1951 by Cassiar Asbestos Corporation Limited, and production commenced in 1953. Brinco purchased the mine in 1980-81.

The Cassiar mine is an open pit asbestos mine with a maximum production capacity of 100,000 tonnes per year of high-grade chrysotile asbestos fibre, mainly in the asbestos cement grades. It is located in North Central British Columbia just south of the Yukon border.

The mine is situated 1800 metres above sea level on the top of McDame Mountain. Extensive mining of barren rock which overlaps the ore deposit is required to access the asbestos ore. Crushed ore is carried three miles from the mine to the mill on an aerial tramway capable of moving over 270 tonnes per hour.

The Cassiar mine produces a large proportion of high grade long fibre material used in textiles, packing and electrical insulation. Only one other mine (in Zimbabwe) produces long fibre asbestos of similar quality.

Graded fibre is packaged in 50 kg. reinforced plastic bags and palletized in 1-tonne units which are shrink-wrapped with plastic covers. The sealed pallets are trucked 515 kilometers to the port of Stewart, British Columbia, then barged to the company-owned wharf at North Vancouver for shipment to markets throughout the world.

In the early 1950's, Cassiar Asbestos Corporation Limited built the town of Cassiar to house its employees. Since then, the size and nature of the town have changed substantially as Cassiar has evolved from a mine camp to a community which offers the most fully developed service sector in the northwest.(1)

(1) See Appendix 1 for an overview of Cassiar's history.

Community services still are largely funded by Brinco through the mining camp administrative structure which has been carried over from earlier stages of development. Costs borne by Brinco to provide these community services are high, due to the remote location of the mine and to the limited availability of publically funded infrastructure which is commonly available to residents of the rest of the province.

The Cassiar townsite likely will remain a centre of mining activity, and a service centre to local residents and visitors for the foreseeable future. Open pit reserves of asbestos will be depleted in 1990, thereby threatening the longevity of the mine.

The most significant known alternative source of asbestos fibre in the area is the McDame deposit. This partially defined deposit will require underground mining with a work force significantly larger than that currently employed at Cassiar in the open pit, and will require a capital investment of approximately \$50 million. Proposed pre-production planning and development work will take six years.

The McDame deposit well may be the only viable large scale mining project (other than Klappan Coal) in the Northwest before the turn of the century.

However, both the type of future development of the community of Cassiar and the viability of long-term continued operation of the asbestos mine depend in part upon restructuring of the responsibility for the townsite and for other services to that area.

3. STUDY OBJECTIVES

This study has three objectives.

The first is to identify principal socio-economic benefits that have been generated by the Cassiar mine's operation in the past. These benefits will provide perspective on the importance of continued operation of the asbestos mine, and a measure of potential losses that would occur should Brinco's operations cease.

The second objective is to outline the future prospects for the town of Cassiar and for its role in the northwest sector of the province.

The third is to present a comparison of community services offered at Cassiar with those available at Dease Lake and Good Hope Lake. Particular attention is directed toward the way in which services are supplied to the residents of the area, and how this affects equity, and participation of local people in decision - making processes.

4. SOCIO-ECONOMIC IMPACTS

4.1 CASSIAR'S POSITION IN THE INTERNATIONAL ASBESTOS MARKET

In 1982, Canada produced about 20% of the world's output of asbestos fibre, and Canadian fibre accounted for approximately 50% of world exports. The majority of Canadian output originates in Quebec, and is predominantly a lower quality and lower priced product.

The output from Brinco's mine at Cassiar is of higher grade, and is sold world-wide (see Table 4.1.1). In 1983, prices of the various grades of Cassiar's product ranged from \$500 up to \$2,000 per tonne. By comparison, the price for Quebec asbestos averaged approximately \$440 per tonne, while Cassiar's weighted average price is approximately twice this value.

The market for asbestos has been adversely influenced by the controversy regarding health effects of asbestos usage. To date, however, a substitute which is both cost competitive and equal in performance to Cassiar's long-fibre product for use in textiles and concrete products has not been found. Less developed countries in particular favour asbestos for use in cement products (mainly pipe) because of the relatively high local value added component compared to competitive products based on metals or plastics.

Table 4.1.1
Distribution of Sales of Cassiar Asbestos

Market Location	1980	1981	1982
North America	23.0%	21.5%	13.5%
South America	6.0%	8.5%	8.6%
Asia	27.0%	24.5%	20.3%
Continental Europe	26.0%	29.0%	32.9%
Australia/New Zealand	17.0%	13.5%	11.9%
Middle East	1.0%	4.0%	8.8%

Economic reserves of asbestos are, in any case, limited in comparison to cumulative future demands and increasingly stringent health regulations will impose high costs on new producers.

Cassiar, by contrast has considerable expertise in handling its product and its long fibre reserves are less prone to produce asbestos dust. Future costs at Cassiar associated with health regulations will be low in comparison to those of potential competitors.

Although health regulations affecting end users of asbestos may limit product demand, Brinco's control of a significant share of high quality fibre and experience with health regulations affecting asbestos production should offer the company a comparative advantage in world markets.

4.2 OUTPUT FROM THE CASSIAR MINE

Table 4.2.1 summarizes volumes of over burden moved, ore mined, and fibre output and the average values of fibre produced by the Cassiar mine from 1978 to 1983. All volumes were at very high levels during the economic boom years of 1979 and 1980. Output of fibre declined between 1981 and 1983, to levels reflecting generally poorer economic conditions which have affected virtually all resource industries. However, prices of Cassiar's products have not suffered the large declines experienced by other mineral products - probably a reflection of their unique qualities in the world market.

Table 4.2.1
Production Indicators: Cassiar Mine

Indicator	1978	1979	1980	1981	1982	1983
Overburden Moved (Million Cu. Metres)	3.9	4.8	5.5	3.7	3.5	3.2
Tonnes of Ore Mined (000's)	751	982	1309	1228	983	895
Tonnes of Fibre (000's)	74	99	97	89	78	82
Value of Sales (Million \$)	55.7	74.5	84.1	76.3	76.0	70.2

Sources: Annual Reports; Brinco & Cassiar Asbestos Corp.

4.3 EMPLOYMENT GENERATED BY THE CASSIAR MINE

4.3.1 Definitions

An understanding of employment impacts attributable to a resource development is aided by the separation of three components of total employment impacts. Separation is based upon the differentiation of the sources of demand for labour.

Direct employment refers to jobs directly associated with the operation of the mine.

Indirect employment is defined as jobs created by the purchases of goods and services by the company, to support the operation of the mine.

Induced employment is defined as jobs created by the purchases of goods and services by direct employees of the mine and their families.

Brinco's continued responsibility for operation of much of the public and retail sectors of Cassiar's local economy clouds the distinction between direct and other employment effects. However, payroll data is sufficiently disaggregated to provide a general overview of employment effects by major component. Each component defined above is discussed separately in the sections which follow.

4.3.2 Direct Employment

Table 4.3.2 presents a history of the employment associated with the Cassiar Asbestos operations. The direct employment estimates at Cassiar include a number of jobs which ordinarily would be considered to be indirect or induced employment. For example, the total at Cassiar includes full and part-time Brinco employees operating the retail store, and other functions related to managing the town. These estimates exclude operations (such as the hospital) which are subsidized but not owned or run by Brinco.

Changes in mining employment reflect output increases occurring in the 1978 to 1981 period. Despite a large increase in employment from 1978 to 1979, productivity measured by tonnes of fibre produced per employee (at the mine) increased from 141 to 166. Declining output in 1981 and 1982 resulted in declining productivity, although employment was maintained throughout 1981 to complete an unusually large amount of overburden removal. By 1983, however, productivity levels were greatly increased (to 176 tonnes per mine employee) and markets remained depressed. Employment level reductions therefore reflect productivity gains, but are also related to lower output brought on by the recession.

Direct employment at the townsite declined slightly. Much of this can be attributed to the movement of health professionals from Brinco's payroll to the hospital's. When this is taken into account, overall employment declined by less than 10% at the townsite; a reflection of the relatively fixed costs associated with operating the town.

Table 4.3.2
Direct Employment
Mine, Townsite & Lower Mainland

	1978	1979	1980	1981	1982	1983
	----	----	----	----	----	----
Mine, Power Plant, Mill	450	508	490	485	419	341
Mine Staff	81	81	83	85	79	70
Townsite *	57	58	57	54	49	48
	---	---	---	---	---	---
Total at Cassiar	588	647	630	624	545	459
Head Office (Vancouver)	53	41	43	47	39	45
Port - Full Time	24	21	20	18	17	17
Port - Casuals	8	7	6	4	4	3
	---	---	---	---	---	---
Total Vancouver *	85	69	69	69	60	65
	===	===	===	===	===	===
Total B.C.	673	716	699	693	605	524
	===	===	===	===	===	===

* Includes casuals and part-time. Values are based on employment levels at December 31 of each year.

Table 4.3.2 also indicates the extent of direct employment creation in the Lower Mainland area. Head Office functions accounted for 45 jobs in 1983 (down from 53 in 1978) while longshore operations at Brinco's North Vancouver terminal provide 17 full-time jobs, and work for about 4 casuals. Productivity increases and reduced product volumes have resulted in fewer employees at the port. In total, the company currently provides over 60 jobs in the Vancouver area, representing a broad range of managerial, administrative, professional, labouring and clerical skills.

4.3.3 Indirect Employment

In the case of Cassiar, distinguishing direct, indirect and induced employment is difficult because the company buys and resells most retail goods, and employs people to provide many retail and most municipal services which are generally provided by the private sector or by government.

Some indirect employment is readily identified, however. About 40 Arrow Transport employees provide tug and barge, long shore, trucking and equipment maintenance services to Cassiar. About 30 of these people live in or around the town of Stewart, B.C. and so contribute significantly to the economy of that town. The balance, consisting of tug crew, are probably residents of the Lower Mainland.

Other indirect jobs generated by the mine can be identified in the Cassiar area. These include about 30 jobs distributed among Finning Tractor, Major Security and other suppliers of goods and services.

Identification of indirect jobs outside of Cassiar is not as easily accomplished, but relative magnitudes of these job impacts may be estimated from the company's expenditures.

Table 4.3.3 summarizes expenditures by the mine in 1983. It indicates that about 80% of the expenditures made for the mine operation are made in British Columbia. The majority of suppliers are located in the Vancouver area, although businesses in Vernon and Fort St. John directly benefit from the company's purchasing. Businesses in the Yukon communities of Watson Lake and Whitehorse also derive substantial benefit from Cassiar's purchases.

Table 4.3.3
Distribution of Expenditures by Service or Commodity
and Location of Purchase for the Cassiar Mine, 1983*

Type of Purchase	Amount Spent (1983 \$ Cdn.)	Location of Purchase
1. Fuel	6,000,000	Vancouver
2. Lubricants	1,000,000	Vancouver
3. Mining Equipment Rental and Maintenance	2,400,000	Vancouver
4. Packaging	1,100,000	Alberta
5. Forest Products	412,000	Vancouver
6. Explosives	1,700,000	Calgary 70% Whitehorse 30%
7. Hardware	223,000	Vancouver
8. Steel Castings	511,000	Vancouver
9. Electrical Supplies	222,000	Vancouver
10. Powerhouse Supplies	312,000	Vancouver
11. Safety Equipment	53,000	Vancouver
12. Plumbing Supplies and Services	50,000	Vancouver
13. Parts, Mine/Mill Equipment	1,128,000	Vancouver
14. Other Equipment Repairs	326,000	Vancouver
15. Tyres	383,000	Vernon 97% Vancouver 3%
16. Liquid Gas and Welding	129,000	Vancouver 94% Ft.St. John 6%
17. Automotive Parts and Repair	697,000	Vancouver 20%
18. Printing and Stationery	60,000	Vancouver
19. Laboratory Equipment	20,000	Vancouver
20. Drill Bits	258,000	Vancouver 9% Ontario 60% Alberta 31%
21. Emergency Supplies	70,000	Watson Lake
	=====	=====
Total B.C. Purchases	13,462,000	B.C. 79%
Rest of Canada	3,593,000	Other Cdn. 21%
	=====	=====
Total Expenditures	20,800,000	
(Not Allocated Above)	(3,745,000)	

* Table excludes purchases of food (\$2,500,000) and transportation of product to Vancouver (\$6,200,000).

Brinco spent about \$20.8 million on goods and services (excluding transportation and security) for its mining operation in 1983. Of this, about \$4.7 million went to suppliers located outside of British Columbia. The balance - about \$16.1 million - was spent in British Columbia. \$6.0 million of this \$16.1 million was spent on fuel.

Non-fuel expenditure in B.C. - about \$10.0 million - is estimated to generate about 135 jobs. Indirect jobs are primarily in B.C., but income leakages indicate a few will be generated elsewhere in Canada.

Mining related expenditures outside of British Columbia are estimated to generate about 60 jobs.

Total indirect employment in British Columbia and the rest of Canada is estimated to be about 265 jobs. Much of this - about 100 jobs - can be attributed to British Columbia.

Inclusion of transportation expenditures substantially increases the B.C. share of total expenditures, to about 85%. Note also that a significant proportion of the benefit is felt in the port of Stewart, B.C., where about 30 Arrow Transport employees reside.

4.3.4 Induced Employment

Induced employment stemming from demand for goods and services on the part of Cassiar employees is readily identified in the immediate area of the mine. However, it has been noted that Brinco employees provide many induced services which are usually provided by other sectors. This includes full and part-time retail clerks, purchasing and management, as well as townsite management, administration and maintenance. These functions accounted for about 42 jobs in 1983.

Government provided services (police, education, post office, government agent, MHR, etc.) accounted for about another 50 jobs.

The hospital and dental office provide 15 jobs.

Other business including communications, transportation, financial services, personal services etc. provide about 55 jobs.

The total number of induced jobs in the Cassiar area including Brinco employees who would ordinarily work for private sector or municipal employers, summed to about 160 in 1983.

Much of the induced employment associated with the expenditures of Cassiar employees is felt in the rest of British Columbia, and in the rest of Canada. Estimates of the overall level of induced employment could not be prepared specifically for Cassiar, but employment multipliers calculated for other mining and resource sectors may be indicative.

4.3.5 Employment Multipliers & Total Employment Impacts

Total direct employment in the area, including both Cassiar mine employees and employees of Erickson, Hearne Taurus and in other resource-based activity sums to 530. Indirect and induced employment sums to 190, resulting in calculated local multiplier of 1.36. The value of the multiplier may be somewhat exaggerated, to the extent that resource-based employment is presently below normal levels. A more typical value associated with full employment in the area's mines would be about 1.3.

These values are at the low end of the scale (2), typical of resource towns which obtain a substantial proportion of their services from other areas.

Much of this lower-than-average multiplier may be attributed to an almost complete absence of government employment in Cassiar. Comparisons to other resource areas in British Columbia illustrates this point.

(2) See "Regional Employment Multipliers"; I.S.B.D., AUG. 1981.

In Vanderhoof, a town which operates as a service centre to the adjacent towns of Fort St. James and Fraser Lake, government administration accounts for over 11% of total employment. When police, education and post office are added to this total, it accounts for almost 23% of total employment.

In the town of Fraser Lake, government administration accounts for 5% of employment. The addition of education and the post office increases this to about 12%. However, Fraser Lake residents may receive itinerant government services out of Vanderhoof, or they may make the relatively short trip (about 35 minutes) to Vanderhoof.

Cassiar's employment in government administration, by contrast, accounts for less than one tenth of one percent of the total. Broadening the definition to include education, police, and post office increases the share to under 7%.

Most of the deficit is made up by Brinco employees who manage, administer and maintain the town, but the share of employment still is only comparable to Fraser Lake, which has the benefit of nearby Vanderhoof to provide a broader range of government services.

Although the local employment multiplier can be estimated (and shown to be lower than average), similar estimation of a provincial employment multiplier was beyond the scope of this work. However, use of an employment multiplier of 2.65 which was calculated for metallic and non-metallic primary mining and milling in the Canadian economy permits derivation of total employment impacts associated with mine operations at Cassiar.

This approach indicates that Cassiar (including the Vancouver Head Office) generates a total of about 785 indirect and induced jobs in Canada. Other mines in the area, with about 120 direct employees, account for an additional 200 indirect and induced jobs. Table 4.3.5 summarizes the location of the direct, indirect and induced jobs, to the extent that locations can be known.

Table 4.3.5
 Direct, Indirect & Induced Components
 of
 1983 Employment
 at
 Cassiar, B.c.

Location	Direct Employment		Indirect Employ- ment	Induced Employ- ment	Total Employ- ment
	Cassiar Mine	Other Mines			
Cassiar	410	120	30	160	720
Stewart	-	-	30	10	40
Other B.C.	65	-	100	-*	165
B.C. TOTAL	475	120	160	170*	925
Other Canada or Unknown	-	-	105	545	650
CANADA TOTAL	475	120	265	715	1,575

* Some induced employment in "Other Canada or unknown" will be in B.C.; B.C. total induced therefore is a minimum estimate.

Note: Indirect and induced employment refer to jobs generated both by Brinco's operations and by the two smaller mines in the area. Some Brinco employees providing retail and municipal services are included in the induced estimates.

All estimates are rounded to the nearest 5.

4.4 DIRECT, INDIRECT AND INDUCED LABOUR INCOME

Employees at the Cassiar mine earned a total of \$18.6 million in 1982. Estimated total earnings for 1983 indicate a decline to about \$16.9 million, as a result of lower levels of employment at the mine.

Expenditures by the mine, its employees and their families in 1983 generated the estimated numbers of indirect and induced jobs summarized on Table 4.3.5. These estimates of induced and indirect employment impacts were used to generate the estimates of indirect and induced labour income effects presented on Table 4.4.

Total direct mining wages in the Cassiar area are estimated to have been about \$22.3 million in 1983. Added to these direct wages were about \$27.7 million in indirect and induced wages in British Columbia and the rest of Canada, for a total \$50 million wage impact from the mining activity in the area.

These wage estimates include holiday and vacation pay but exclude other employer funded non-wage benefits, which would add about 12% to the overall value of compensation. With non-wage benefits included, total compensation would amount to about \$56 million annually in the Canadian economy.

Table 4.4

Estimated Direct, Indirect & Induced
Labour Income - 1983
(in millions of 1983 dollars)

Location	Cassiar Mine	Other Mines	Indirect Income	Induced Income	Total Income
-----	-----	-----	-----	-----	-----
Cassiar	\$15.3	\$ 4.5	\$ 1.0	\$ 4.3	\$25.1
Other B.C.	2.5	-	4.4	-	6.9
Rest of Canada or Unknown	-	-	3.5	14.5	18.0
Total	\$17.8	\$ 4.5	\$ 8.9	\$18.8	\$50.0
	=====	=====	=====	=====	=====

Income of some Brinco employees is counted in the induced column.

4.5 GOVERNMENT REVENUES

4.5.1 Income Taxes

In 1982, Brinco remitted \$5.2 million in income tax on behalf of its mine employees. Total tax remitted if all Brinco employees working because of the Cassiar Mine were included (i.e. including dock and head office employees) would exceed this amount by a considerable margin - the total would approach \$6.0 million.

Income tax remittances are expected to decline for 1983 in response to declining employment levels, but will probably exceed \$5.5 million.

4.5.2 Other Tax Payments

Table 4.5.2 summarizes taxes paid by Brinco for its properties associated with the Cassiar Mine.

Excluded are property taxes paid on residential or commercial buildings at Cassiar which are owned by local residents, rather than by Brinco Mining. Also excluded are tax payments made by the other two mines in the area which rely on Brinco for services.

Property taxes paid by individuals or by corporations other than Brinco in the area are not known, but would probably increase provincial (non-income) tax revenues coming out of the Cassiar area to about \$4.2 million in 1983.

The values on Table 4.5.2 also exclude provincial shares of income taxes. Addition of these provincial revenues would increase the total by about \$1.6 million per annum. This would bring the total provincial revenue paid by Brinco to a level of about \$6.0 million in 1980 and to about \$5.2 million in 1983.

Total provincial tax revenue in 1983, including income taxes and property taxes of other employers in the Cassiar area, is expected to amount to about \$6.5 million in 1983.

Table 4.5.2

Mining, Capital, Sales and Property Taxes
Paid by Brinco for the Cassiar Mine
(\$ 000)

	1980 ----	1981 ----	1982 ----	1983 ----
Mining Tax	1795	423	-	-
B.C. Capital Tax	78	92	163	160
Provincial Sales Tax	1040	1340	1230	1240
Provincial Fuel Tax	410	554	756	733
Property Taxes				
Cassiar	950	1540	1470	1260
Stewart	48	52	47	55
North Vancouver	104	106	142	150
Sub Total	1102	1698	1659	1465
Total Tax to Province	4425	4107	3808 *	3598 *
Federal Sales Tax	720	680	640	600

* Mining Tax not calculated for these years.

4.5.3 W.C.B., C.P.P. & U.I.C. Payments

In 1982, Brinco remitted almost \$1.4 million to Workmen's Compensation, the Canada Pension Plan and Unemployment Insurance on behalf of mine employees.

4.6 EMPLOYMENT AND INCOME AT DEASE LAKE AND GOOD HOPE LAKE

In the two northwest communities closest to Cassiar (Dease Lake and Good Hope Lake), employment is predominantly funded by government. The Ministries of Forests and of Highways account for about 55 jobs on average in these two settlements. Induced commercial activity is extremely limited, and is centred almost entirely around Dease Lake. Total employment in these two communities amounts to about 75 jobs. No direct income estimates were obtained, but the total would be in the range of \$2.0 million per year. Provincial income tax revenues would amount to about \$150,000.

5. FUTURE PROSPECTS

5.1 BRINCO'S CASSIAR ASBESTOS OPERATIONS

5.1.1 Introduction

Brinco's existing open pit reserves will be fully exploited by mid 1990. Future prospects are promising, however, as Brinco has defined another major ore body (the McDame deposit), has explored the feasibility of extraction of additional (lower grade) asbestos from the tailing pile, and is continuing to explore and evaluate other deposits in the area.

Exploitation of these additional reserves obviously depends upon international demand for the product, and upon the costs of delivery to world markets. The worst case scenario (short of a collapse in the demand for asbestos) shows a mine life of about 11 years (to 1995). The "drilled reserves" scenario indicates 19 years of production (to about 2003) - and a more optimistic projection shows production at currently projected rates of mineral depletion lasting until 2025.

Each of these projections is based upon current planned mining and milling capacity. The integrated technology of the existing plant does not readily permit marginal increases in capacity. The entire mill would have to be replaced - or a parallel line established (at high cost) if significant output increases were to be achieved. The projections which follow therefore are based upon sequential exploitation of the various reserves at current levels of output, until modifications to the mill are undertaken to process either the McDame reserves or the mill tailings.

5.1.2 Cassiar Open Pit Operations

The existing open pit mine has sufficient reserves for economic exploitation to mid 1990. Beyond that time, the amount of waste that must be removed to access the remaining asbestos prohibits open pit mining. The volume of waste is large enough to make this finding valid even if asbestos prices were to increase substantially; the projected life of the open pit mine is relatively insensitive to price changes.

5.1.3 Retreatment of Cassiar Mine's Tailings

An assessment of the asbestos reserves in the tailings pile indicates that with modifications to the mill another five years of production could be sustained through retreatment of the tailings. The tailings contain approximately 8.3 million tonnes of ore.

Retreatment of the tailings would require changes to the mill and could create financial losses. It therefore is likely that this resource would be the last to be exploited at Cassiar. If other ore bodies prove economic, milling of the tailings would be delayed. A delay in this phase of development also would reduce capital costs required for retreatment, because some of the required alterations to the mill would be undertaken to process the new reserves. Therefore, the worst case scenario assumes production from the open pit to 1990, followed by milling of the tailings to 1995. The latter would be accomplished with a reduced work force, as functions like blasting and overburden removal would be eliminated.

5.1.4 Cassiar Underground Mine

An underground mine can be designed to recover, by sub-level caving, about 1.2 million tonnes of ore left after the completion of the open pit mining activity. This additional recovery program would require a capital expenditure of about \$3.2 million (1983 dollars) and would require a lead time of one year to establish access by decline, for waste drifting, and to provide a haulage system. There is a possibility of recovering an additional 1.3 million tonnes of ore from the Cassiar underground mine.

Addition of this development to the worst case scenario would extend the projected mine life to mid 1997.

5.1.5 McDame Underground Mine

Proven reserves of approximately 12 million tons of serpentinite bearing very high quality asbestos have been identified in the McDame deposit. Extraction of these reserves would extend the mine life by 7 years at currently planned depletion rates.

Inclusion of the drilled reserves in the McDame deposit pushes the mine life at least to 2003 in the "drilled reserves" scenario.

Consideration of the undrilled reserves in the McDame deposit substantially increases the potential life of the mine at Cassiar. The currently defined ore body is open to east and to the south. Although estimation of additional reserves is highly speculative, the shape of the defined ore body, and the apparent absence of intersecting fault lines indicates that it is reasonable to estimate additional undrilled reserves in the McDame deposit at least equal to the drilled orebody - and possibly much larger. There is a reasonable probability that the orebody contains 24 - 30 million tons - and a chance that as much as 60 million tons exists in this deposit.

Acceptance of the likely 24 million tons indicates a mine life extending to about 2010. Inclusion of the possible 60 million tons indicates a potential mine life of over 40 years to beyond 2025 at planned rates of production.

Brinco's estimates indicate that the work force necessary to mine the McDame deposit would be 60 to 100 larger than current employment in the open pit - and development of these reserves would require a capital investment of nearly \$49 million (1983 dollars). Direct employment expansion of this magnitude should generate an additional 20 to 30 induced jobs in the local area, and result in population increases of approximately 185 to 310 persons at Cassiar.

The McDame deposit clearly is the most significant potential mining development in the northwest for the foreseeable future with the possible exception of Klappan coal, to the south. Realization of this potential not only will generate additional growth in the area, but will be necessary to avoid the economic and social disruption that would otherwise accompany termination of Brinco's operations at Cassiar in the early 1990's.

The timing of decision making regarding this potential mine now is of critical importance if a smooth transition is to be realized between termination of open pit operations and the start of underground mining. To achieve a mid 1991 startup date, a pre-

production program should start in early 1985. The proposed pre-production program would have two phases, consisting of two years of further feasibility work followed by four years of pre-production work.

5.1.6 Other Ore Bodies

Brinco's least cost alternative for the exploitation of other ore bodies is tied to open pit mining techniques which can use existing machinery and expertise. To this end, the company's exploration program is focusing on further assessment of deposits identified in recent magnetometer surveys which could be mined using open pit techniques. Most of the deposits located are small. Successful reserve identification likely would extend production by eighteen months to two years per site. The possibility of such development has a minor impact on the optimistic scenario, which is dominated by the inclusion of undrilled reserves in the McDame deposit.

5.2 OTHER MINERAL DEPOSITS IN THE CASSIAR REGION

Two other mines are currently operating in the Cassiar area. The Erickson Gold Mine produces about 21,000 ounces of gold per year, providing employment to 90 people. The Hearne Taurus mine is somewhat smaller, providing employment for about 30 people.

Employees of these mines rely on Brinco's store for many of their day to day needs and make use of community facilities - such as the hospital and the recreation centre - at Cassiar. Hearne Taurus rents a singles camp from Brinco on the east side of Cassiar. Erickson provides the majority of its own accommodation. Employees at both of these mines have expressed great interest in acquiring family accommodation in Cassiar.

In addition to these two operating mines, ten other significant deposits with mine potential have been located in the vicinity of Cassiar. Some of these must await changes in market conditions prior to development (particularly the molybdenum deposits) but others could become small mines which, like Taurus and Erickson, could not support townsites of their own.

Development of such small mines clearly depends upon the continued availability of a local centre to provide community and personal services to employees. Further, mineral occurrences are frequent enough in the area to encourage continued exploration. The presence of a stable, well serviced community provides a base of operations for exploration, as well as focusing attention on an area where small mines could develop, but would be less likely to do so in the absence of an established community.

6. COMMUNITY SERVICES/COMMUNITY FUNDING

6.1 INTRODUCTION

Over the past thirty years the town of Cassiar has evolved from an isolated mining camp into a much more complete community. However, most of the property in the community is owned and managed by Brinco Mining. This camp administrative structure is at odds with the needs of both the company and the community, and apparently has constrained the development of the area, particularly with regard to the distribution of public funds in the northwest. The future of the community of Cassiar is not only constrained - it may possibly be threatened - by the administrative structure of the town.

The impacts of the company town administrative structure on the future of Cassiar are widely recognized, and were articulated in the "Settlement Options" report of the 1983 "Northwest Economic Development Studies" published by the B.C. Ministries of Municipal Affairs, and Industry and Small Business Development. That report concluded that "... the company town nature of the community is a serious impediment to economic and social diversification." (See Section 4.2.1 of the report).

The "Settlement Options" study also reported that the issue of incorporation of the community "requires careful consideration of the following: suitability of the site for continued expansion; the possibilities of it becoming a regional centre to serve other resource developments; the longevity of the resource; the financial costs and appropriate sharing of the costs; and, last but not least, the wishes of local residents".

These five topics are not completely separable issues. For example, the longevity of the resource is influenced by financial costs of town administration and the provision of other infrastructure, and wishes of the local residents cannot reasonably be evaluated independently of arguments regarding appropriate sharing of costs.

However, four of the five topics are presented separately in this section of the report, following an overview of the existing community facilities. The longevity of the resource was assessed

in Section 5 of the report - and should not be viewed as an impediment to incorporation. Section 5 also reviewed prospects for other resource developments in the northwest, and covered some aspects of their potential impact on Cassiar. The additional issue of incorporation and of development of these other resources is discussed here.

6.2 OVERVIEW OF EXISTING COMMUNITY

The Cassiar townsite is approximately 14 Km. from Highway 37, about 122 Km. from Dease Lake and 160 Km. from Watson Lake. The only other centres of population on the 240 Km. road from Watson Lake to Dease Lake are the Ministry of Highways camp at Good Hope Lake (about 25 Km. northeast of Cassiar) and the Erickson Gold Mine camp (about 18 Km. from Cassiar, south on Highway 37).

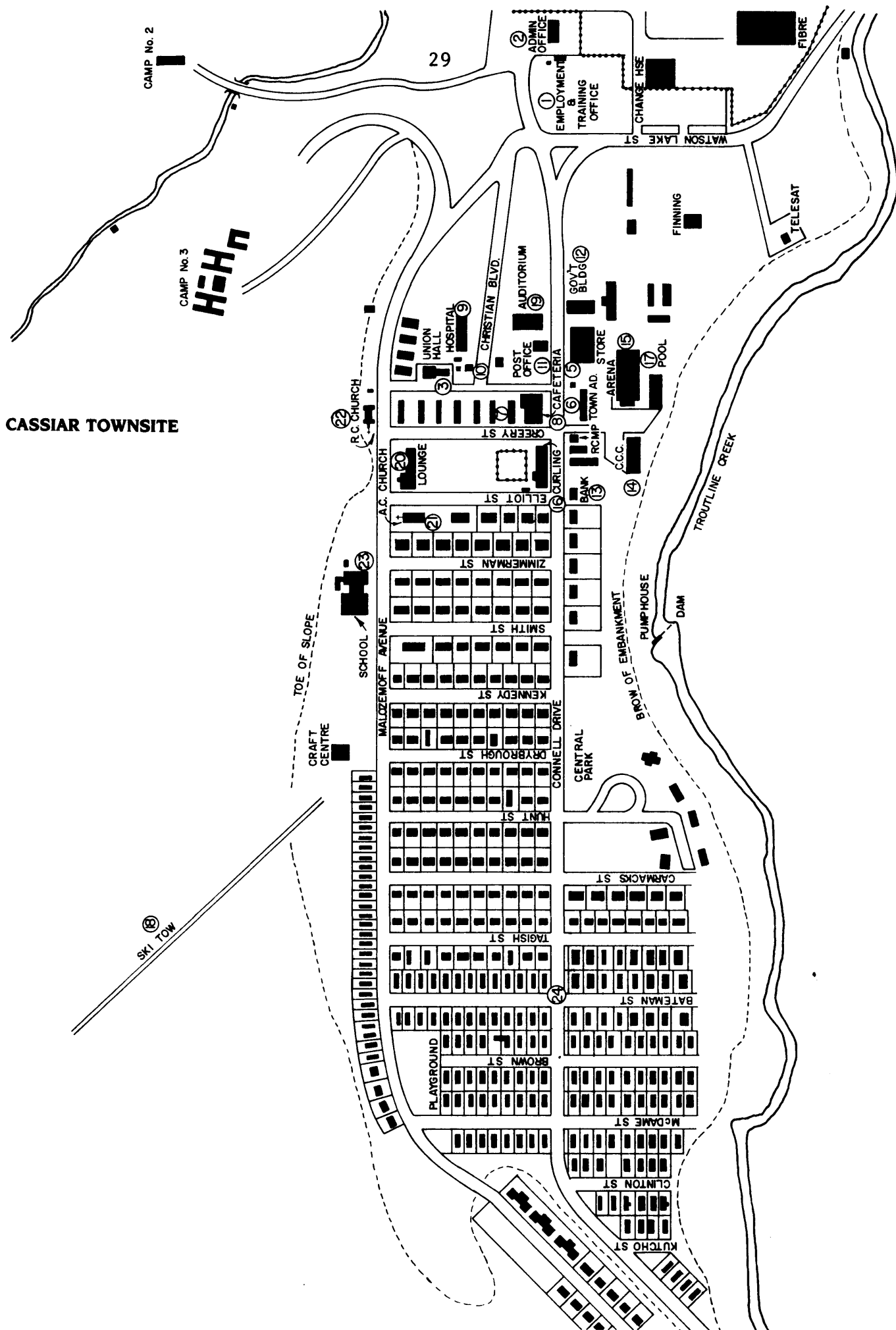
The Cassiar townsite is by far the largest and most fully serviced centre of activity in the Stikine. The existing town is attractive and well-planned, (see map which follows) although some of the lots are small compared to current standards. (These small lots could be amalgamated into larger properties. Brinco's town administration is moving in that direction, by reserving the narrow lots as they become vacant.)

The townsite itself houses over 75% of the population of the Stikine Region, and provides some services to persons throughout the region.

Services available include a hospital (which is the largest in the Stikine), other health services, elementary and secondary schools, post office, airport, retail stores, a bank, government agent, recreation facilities and the RCMP offices. Most of these services are either directly funded or subsidized by Brinco Mining Ltd.

Additional demands for these services and for housing would directly impact upon Brinco's costs. Therefore the townsite effectively is closed to persons who are not employed by Brinco except for those who provide services to Brinco and its employees.

CASSIAR TOWNSITE



SKI TOW

CAMP No. 3
HCHN

CAMP No. 2

29

TOE OF SLOPE

CRAFT CENTRE

SCHOOL

R.C. CHURCH

A.C. CHURCH

LOUNGE

UNION HALL

HOSPITAL

POST OFFICE

CAFETERIA

AUDITORIUM

GOV'T BLDG

FINNING

TELESAT

FIBRE

EMPLOYMENT & TRAINING OFFICE

ADMIN OFFICE

CHANGE USE

WATSON LAKE ST

GREERY ST

ELLIOT ST

ZIMMERMAN ST

SMITH ST

KENNEDY ST

DRYBROUGH ST

CONNELL DRIVE

HUNT ST

CARMACKS ST

TAGISH ST

BATEMAN ST

BROWN ST

MCDAME ST

CLINTON ST

KUTCHO ST

BOTTOM OF EMBANKMENT

PUMP HOUSE

DAM

TROUTLINE CREEK

RCMP TOWN AD. STORE

ARENA

BANK

CURLING

C.C.C.

POOL

GOV'T BLDG

FINNING

TELESAT

FIBRE

WATSON LAKE ST

GREERY ST

ELLIOT ST

ZIMMERMAN ST

SMITH ST

KENNEDY ST

DRYBROUGH ST

CONNELL DRIVE

HUNT ST

CARMACKS ST

TAGISH ST

BATEMAN ST

BROWN ST

MCDAME ST

CLINTON ST

KUTCHO ST

Such additional demands exist now. For example, the town administrator reports numerous enquiries from married people employed at the nearby gold mines, who are seeking residence in Cassiar.

6.3 SITE SUITABILITY

Although the administrative structure of the town impedes growth, the site itself does not place a significant physical constraint upon expansion of facilities.

There is excess capacity in the townsite now, as a result of the 30% reduction of employment that accompanied the last recession. Further additions to the town could be achieved by servicing lots currently on the periphery of the development. The "Settlement Options" report concluded that: "Although the site is not ideal in climate or aspect there do not appear to be significant physical constraints to development."

6.4 REGIONAL CENTRE FOR OTHER RESOURCE DEVELOPMENTS

The possibility that Cassiar could become a regional centre to service other resource developments is a factor in the evaluation of incorporation, involving another assessment of site suitability based upon locational characteristics. The "Settlement Options" report concluded that locational disadvantages associated with distances from potential base metal and coal mines was a major impediment to development, although it "can and does serve as a residential base for a number of precious metal deposits."

This conclusion of the "Settlement Options" report was based in part upon the assessment that "the one company nature of the town makes it difficult to utilize it as a base for long range, block time commuting".

Distance and location are factors to be considered in the assessment of the feasibility of Cassiar becoming a centre for block time commuting. But the argument that chances of the community being incorporated are adversely affected by the impact

of the one company structure of the town upon the probability of block time commuting leaves Cassiar in a "Catch-22" situation. Development as a centre for block time commuting is discounted because the town is not incorporated - and the chance of incorporation is discounted because the town may not develop as a centre for block time commuting. This clearly is unfair; Cassiar's future needs to be assessed in a scenario which includes a changed policy variable; i.e. as an incorporated community.

At the time of writing the "Settlement Options" report, it appears that information on the McDame ore body was not available. Therefore, the assessment of locational advantage gave no weight to the potential longevity of asbestos mining in the area. (See Section 6.1.) Site suitability was influenced by prospective new developments and new jobs, but the opportunity to preserve an existing operation and existing employment levels was not taken into account.

If that assessment were amended to include consideration of the McDame deposits and consideration of the potential of an incorporated town of Cassiar, there seems little doubt that Cassiar's site suitability would be markedly enhanced in the eyes of provincial policy-makers.

6.5 FINANCIAL COSTS AND APPROPRIATE SHARING OF COSTS

6.5.1 Introduction

Financial cost considerations in the assessment of the incorporation of Cassiar should focus on the issue of appropriate sharing of costs, rather than upon the absolute levels of costs.

A quick scan of the list of 46 incorporated B.C. communities on Table 6.5 which had populations of less than 2000 in 1981 provides many examples of centres that are one industry towns, and which likely have a tax base similar to or smaller than that found in Cassiar. (Thirty-three of these incorporated villages, municipalities and cities have populations smaller than Cassiar's.)

Some municipal operation costs at Cassiar are higher than would be encountered in most of the other centres - but, offsetting these costs is the existence of significant capital stock in municipal works at Cassiar.

In addition, the assessment base could be extended. Incorporation of Cassiar need not be restricted to a geographic area defined by the existing Brinco townsite. Boundaries could extend along the Cassiar access road corridor - possibly even as far as the intersection with Highway 37. This type of area definition is not without precedent (e.g. Vanderhoof's boundaries extend along Highway 16 to enclose the mill at Engen), and would bring in the additional tax base associated with the Hearne-Taraus and Plaza/Erickson mine mills. Extension of the boundaries would facilitate continuation of orderly development in the area - a sharp contrast to the pattern evident elsewhere in the northwest, (e.g. Dease Lake; Good Hope Lake).

The issue of an appropriate sharing of the costs would be the subject of some negotiation - and Brinco obviously will continue to contribute a substantial share of the community's finances. (The company now pays nearly \$1.3 million in property taxes.) However, the existing cost sharing clearly is inequitable given the evolution of the community of Cassiar. Greatest inequities now apparently arise because provincial funding is denied to several elements of Cassiar's infra-structure because the town is a company town. Services provided to the community, their existing costs and cost sharing arrangements, and comparisons with the two nearest places in the northwest are reviewed separately in the sub-sections which follow.

6.5.2 Town Administration

Brinco Mining Ltd.'s Cassiar Division now assumes full costs of the provision of municipal services to the Cassiar townsite, although the town serves a substantial population not directly employed by Brinco. During 1983, Brinco spent approximately \$400,000 on municipal services. This total included approximately \$100,000 in unallocated administrative salaries (other wages and salaries were allocated to various services provided), \$133,000 on snow removal and other road maintenance, \$85,000 on garbage disposal and clean-up.

Table 6.5
 Incorporated Places With Less Than 2,000 Population 1981

Incorporated Place	Population
-----	-----
1. Silvertown	280
2. Pemberton	282
3. Zeballos	329
4. Slocan	351
5. Port Clements	380
6. Lytton	428
7. Belcarra	430
8. Sayward	482
9. Harrison Hot Springs	569
10. Alert Bay	626
11. Midway	633
12. McBride	641
13. New Denver	642
14. Clinton	804
15. Pouce Coupe	821
16. Keremeos	830
17. Telkwa	840
18. Kaslo	854
19. Greenwood	856
20. Taylor	966
21. Port Edward	989
22. Lions Bay	1,078
23. Sechelt	1,096
24. Valemont	1,130
25. Salmo	1,169
26. Lumby	1,226
27. Montrose	1,229
28. Cache Creek	1,308
29. Hudson Hope	1,365
30. Whistler	1,365
31. Granisle	1,430
32. Stewart	1,456
33. Nakusp	1,459
34. Port Alice	1,668
35. Lillooet	1,725
36. Tahsis	1,739
37. Burns Lake	1,777
38. Chase	1,777
39. Enderby	1,816
40. Oliver	1,893
41. Fruitvale	1,904
42. 100 Mile House	1,925
43. Cumberland	1,947
44. Invermore	1,969
45. Warfield	1,969

In addition, Cassiar provided approximately \$35,000 per year to support an elected town council, an advisory body which makes suggestions to Brinco Mining regarding town improvements. Brinco even funded a mosquito spraying program (at a cost of about \$10,000 per annum) - a function normally undertaken by local or regional government.

Total 1983 costs of town administration summed to approximately \$446,000, all of which was funded by Brinco Mining.

In the neighbouring unincorporated communities of Dease Lake and Good Hope Lake, some of these services are not available (or more appropriately, are undertaken by individual residents), and the major cost services (road maintenance and snow removal) are provided by the Ministry of Highways without surcharges to local residents or employers. The current cost sharing at Cassiar clearly is inequitable, given the distributions of such costs elsewhere in the northwest, and indeed, throughout the rest of B.C.

6.5.3 Electric Power

Brinco Mining Ltd. operates diesel generators to provide electric power for the mine and community of Cassiar. The company is faced with the responsibility of providing power to residents of the community whether or not they are associated with Brinco. This power is supplied to new residential users at a price of 3 cents per Kwh for employees and at 14 cents per Kwh for non-employees. Current costs of production of this power exceeds 14 cents per Kwh, for operating costs alone (i.e. excluding capital costs and depreciation).

Brinco's forced role as a power utility cost the company approximately \$629,000 in subsidies and distributing costs in 1983.

Residents of Dease Lake and Good Hope Lake receive electric power from B.C. Hydro at a heavily subsidized price of 7 cents per Kwh. This inequitable situation also is a product of Cassiar's continued company town administrative structure.

6.5.4 Airport Facilities

Cassiar Asbestos built a private airport adjacent to the townsite. Brinco spends approximately \$35,000 per annum to maintain the 3,500 foot gravel runway. This facility too is used by persons unconnected to Brinco's Cassiar operations - but full costs are borne by the company.

In February 1979 the Town Council of Cassiar presented a brief to the provincial Ministry of Transportation, Communications and Highways seeking funding for upgrading of the local airport facility. This request was denied, reportedly due to the one company nature of the town and due to the need to fund an airstrip for forestry and emergency medical use at Dease Lake.

That decision also appears to have been inequitable, given the fact that the only hospital and the only heavy industry in the region are located at or near Cassiar.

The Cassiar area includes at least three quarters of the area population. Some of these persons may choose not to use the Dease Lake air facility for medical evacuations. (The trip from Cassiar to Watson Lake is slightly longer - but medical support facilities there are superior to those available in the small clinic at Dease Lake.)

Continued refusal to fund airport facilities at Cassiar restrains the community's growth potential by reducing its advantages as a centre for other resource development in the northwest, and contributes to the very high costs of transportation to the area.

6.5.5 Recreational Services

The Cassiar townsite has a recreational plant with an estimated replacement cost of \$3.5 million. Included are a recreation centre, arena, tennis court, squash court, seasonal swimming pool, curling rink, playing field, ski hill, lounge, snack bar, theatre (closed) and an arts and crafts building (unused). These facilities have been built in part with community labour, and have been heavily funded by Cassiar Asbestos and by Brinco.

Between 1978 and 1981 Cassiar Resources contributed \$930,000 in capital costs for recreation facilities. Operating costs are funded from Cassiar Community Club operations, and from grants provided by Cassiar Asbestos. In 1981, operating costs were \$470,000; including \$112,000 contributed by Cassiar Asbestos.

Provincial capital grants have been denied to the Cassiar Community Club, again because of the company town image given to Cassiar. Minor funding for specific travel or sports events has been provided.

Incorporation of the community would open the door to more equitable distribution of funds for recreation to the northwest. The magnitude of the current inequity is illustrated by the government assisted construction of an integrated recreation centre at Sayward, B.C. - one of the smallest incorporated centres in B.C. with about one-third the population of Cassiar.

6.5.6 Health Services

Residents of Cassiar do receive the publically funded services provided through Public Health, and the Cassiar Hospital is partially funded by the provincial government. (Until 1982 the hospital was totally funded by Cassiar Asbestos. When the facility was transferred to the Cassiar Hospital Society for \$1.00, the company included five residential lots and three dwellings to the new Society). Cassiar Asbestos continues to support the hospital's operational costs by paying retainers to the two doctors, the doctors' rent, two thirds of a nurse's salary, and a share of reception and typing costs. These costs likely are in the range of \$100,000 to \$150,000 per annum - and are costs additional to those encountered by the vast majority of employers in the province.

The inequities inherent in this funding of hospital services are apparent when Cassiar's hospital operations are contrasted with the operations of the health clinic at Dease Lake. That facility is totally funded by the provincial government for both capital and operating costs.

Similar (though smaller) imbalances appear in the support of dental services in the two communities.

6.5.7 Other Services

The services reviewed account for the largest dollar costs experienced by Brinco as a result of the company town structure of the community. The company also provides at least partial subsidies to numerous other functions that are not similarly treated elsewhere. For example, the company provides fire protection services and maintains the local cemetery.

6.5.8 Summary of Costs

During 1983, the company spent between \$1.3 million and \$1.4 million in support of the municipal services and electric power. All of these costs should be viewed as inequitable in comparison to the financial structure of virtually all other communities in B.C., including others in the northwest.

6.6 WISHES OF THE LOCAL RESIDENTS

The "Settlement Options" report cites wishes of local residents as a final criteria to consider when evaluating the incorporation issue. These wishes are not known at present, although it may be that if a referendum were held on the issue, local residents likely would reject incorporation simply because it would be expected to transfer costs from the company to individual residents.

While this may be a valid assessment of likely voting patterns, the basic premise that costs would be transferred to the individual may be faulty. In most of the examples cited, the transfer would be from company funding to provincial support, i.e. the taxpayers of Cassiar would receive a more equitable redistribution of their tax contributions. If moves toward incorporation are initiated, Brinco should attempt to inform the local residents about expected changes in taxes and benefits.

There are indications that many of the residents now view the community as an entity separate from the company, and resent some of the perceived paternalism inherent in company control of town administration. For example, local residents have supported the Cassiar Community Club and the Cassiar Hospital Society, and have contributed significant time and labour to the development of community facilities.

Perhaps one of the best examples of the shift from a mining camp to a community was provided by a recent survey of bunk house residents. A company proposal to convert the heavily subsidized bunk house operation (the room, board and laundry subsidy cost Brinco approximately \$1.8 million in 1983) into residential apartments met with strong support. Over 85% of the respondents specified a desire to change from bunk houses to private apartments, even when faced with higher rental costs. Only 11 of the 136 bunk house residents were categorized as transient individuals with goals to save a specific number of dollars in a specific time.

This type of response is clear evidence of a marked change in community structure. That type of change - and worsening employment opportunities - also is reflected in continued reductions in turnover rates from over 150% per annum in the mid 1970's to less than 20% per annum in 1982 and 1983.

Finally, assessment of wishes of residents should not be restricted to wishes of current residents of the Cassiar townsite. Employees of other mines in the area have expressed a desire to locate in Cassiar - and their needs should be recognized.

7. TIMEFRAME FOR DECISION MAKING

If Brinco is to achieve a smooth transition of activity from open pit to underground mining, the decision to develop the McDame deposit should be made early in 1985. If the decision to proceed is delayed - or rejected - the negative socio-economic impacts on Cassiar and on the rest of B.C. begin to compound.

Immediate impacts will be minor - but Company experts indicate that the loss of long fibre production for about one year could result in the loss of markets to other producers or to new synthetic products. The latter change could be a permanent loss.

At minimum, a delayed decision will result in additional socio-economic disruption at Cassiar, by disrupting the transition from open pit to underground mining.

That transition will cause some unavoidable disruption as the skills required change. Preliminary estimates of labour requirements show total requirements in excess of current employment by 60 to 100 persons - and retraining would be required for 60 or 70 other employees. Training implies individual and company commitments to the area. Such commitments could most readily be made if it were clear that the town of Cassiar will continue to develop into a community with the same options and opportunities enjoyed by other B.C. resource towns.

APPENDIX 1

APPENDIX I

HISTORIC OVERVIEW OF CASSIAR ASBESTOS MINE
AND OF
THE COMMUNITY OF CASSIAR

An overview of developments noted in the Annual Reports of Cassiar Asbestos Corporation and of Brinco Ltd. follows. This review includes notes on the growth and development of the mine and the townsite in order to provide a condensed history of changes in the area.

- 1950 Cassiar Asbestos Corporation Limited acquired Cassiar properties from Conwest.
- 1951 Sixty miles of road built from Alaska Highway to Mocassin mines.
- 1952 Asbestos mill completed in November.
- 1953 Permanent townsite built 1/2 mile west of plant. 6 bunk houses, staff quarters; 8 houses, recreation hall, laundry, heating plant.
- 1954 Talus mill converted; power plant enlarged; first 4-bed hospital; new manager's residence; company assisted employee housing initiated; 14 houses erected.
- 1955 Aerial tramline completion delayed by labour strike in Skagway. Hospital destroyed by fire; replacement under construction. 12 staff dwelling units completed; additional 10 houses for employees started under company plan. Two room school under construction.
- 1956 Tramline completed; as were bunk houses and hospital. Work started on 7 Panabode staff houses.
- 1957 Tramline improved; general office, carpenter shop, electrical and mechanical shop, telephone exchange constructed. Dust collecting system and fibre storage building added to mill. Work started on Clinton Creek (Yukon) property.

- 1958 Tramline improved; recreation club lounge and cookery constructed, 2 diesel generators installed, new warehouse acquired in North Vancouver.
- 1959 Warehouse constructed; additions to school and three staff houses; 1 new home under construction.
- 1960 New community recreation hall under construction; dental clinic, 5 staff houses and 5 employee houses constructed.
- 1961 Community recreation hall completed.
- 1962 Food storage facilities added; major renovations to heat and water systems.
- 1963 Feasibility studies for Clinton Creek (Yukon) in progress.
- 1964 New wharf facilities under construction in North Vancouver.
- 1965 Wharf facilities completed; labour shortages reported; high turnover of employees. U.S.W.A. contract signed.
- 1966 1 ton pallet loads introduced for mechanized handling of shipping; skill shortages reported; company started employee training programs.
- 1967 Turnover problem reduced; test samples from Clinton Creek (Yukon) delivered to customers.
- 1968 Training program and attention to improved work standards credited with a marked reduction in turnover.
- 1969 Preliminary planning for new mill underway; longshoremen's strike in North Vancouver resulted in stock piling at Whitehorse. Nurses' residence, 16 single-women's residence and 40 room men's residence under construction.
- 1970 Rail division of White Pass & Yukon Route strike forced some shipments through Fort. St. John. Cassiar mine workers on strike for most of November; mill expansion delayed by construction trades unions strike.

- 1971 Mill extension completed; additional environmental controls installed.
- 1972 Production and maintenance activities seriously hampered by labour shortages.
- 1973 Training continuing, labour shortages persist.
- 1974 Environmental Control Department opened at Cassiar. Operational headquarters moved to Vancouver from Toronto; head office still in Toronto.
- 1975 Major improvements to mill's working environment were undertaken; new change house erected.
- 1976 Environmental Committee established; local committee at Cassiar; overview committee meets in Victoria. Improved family accommodation and overseas recruitment of tradesmen to reduce turnover and lessen skill shortages.
- 1977 60% of employees in family accommodation; courses aimed at discouraging smoking instituted for employees.
- 1978 Containerized shipment of fibre through Stewart adopted to replace White Pass & Yukon Route. Mill air system reduced dust to 2 fibres per cubic centimeter level. Strike from September 15 to January 15, 1979. Clinton Creek mine closed.
- 1979 Turnover reduced to 49%; housing improvements initiated in 1979 cited as a major contribution to this reduction. Clinton Creek fibre inventory sold.
- 1980 Brinco's acquisition of Cassiar Mine underway; Cassiar Hospital Society formed. Cassiar won the B.C. government top safety award for large open pit mines.
- 1981 Brinco's acquisition completed; environmental, safety, and community involvement projects expanded. Recession's impacts on construction sector adversely affecting demands for asbestos.

- 1982 Cassiar Hospital and property transferred from Brinco's ownership to the Cassiar Hospital Society for \$1.00. Five residential lots, three houses, and the hospital's inventory also given to the Hospital Society. Brinco continues to subsidize operating costs. Cassiar wins top safety award again.
- 1983 Cassiar wins the B.C. government top safety award for large open pit mines for the third year in four. Studies of the McDame deposit continued.