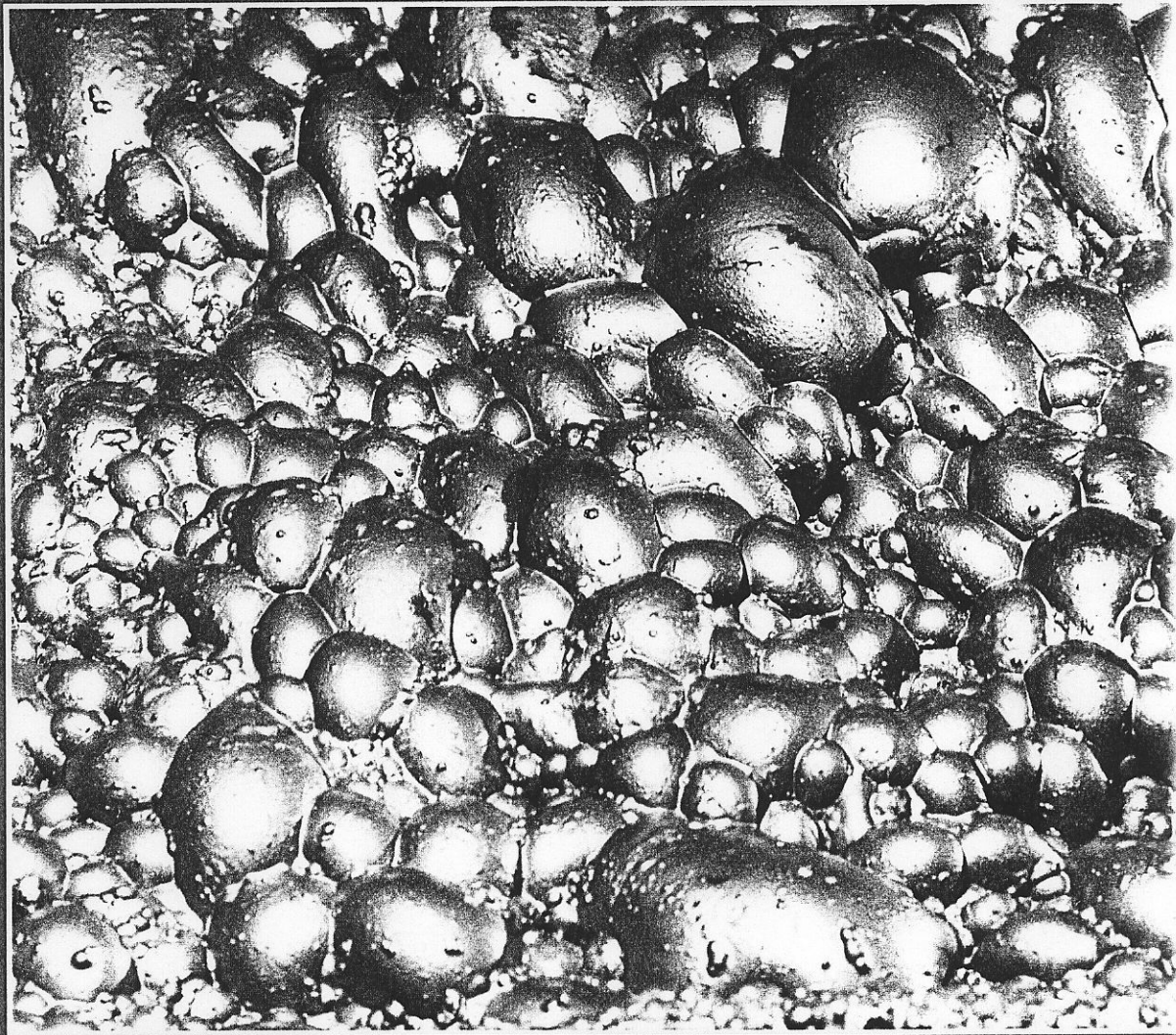


Cassiar  
Mining  
Corporation

104P005 Cassiar  
Property File

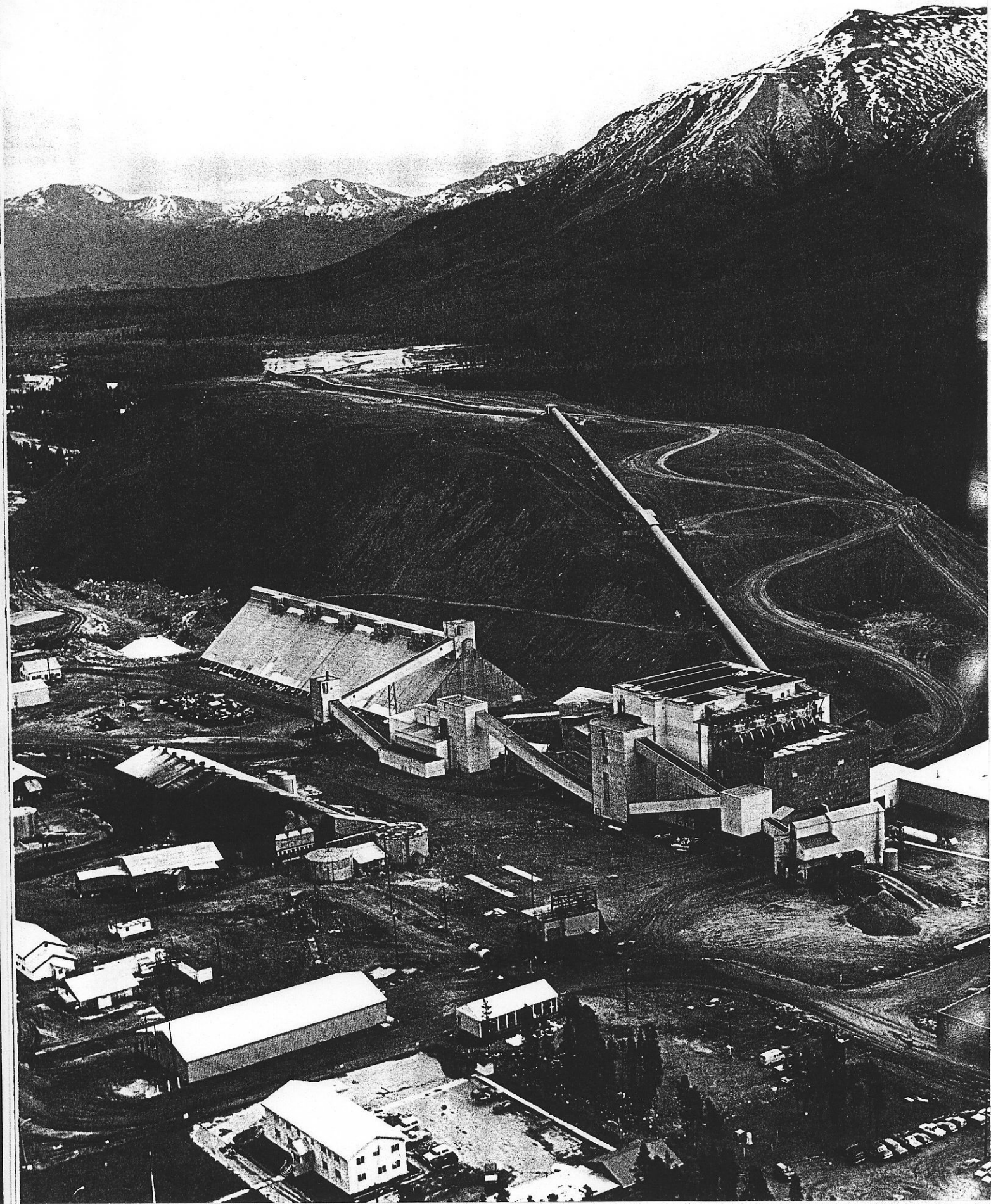


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*Annual Report*





## Cassiar Operation

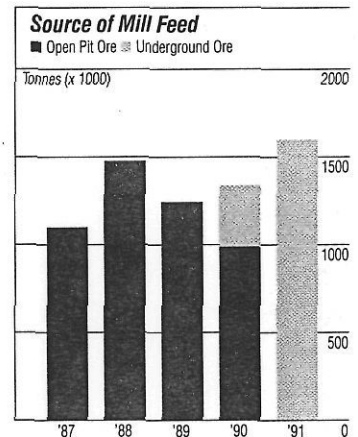
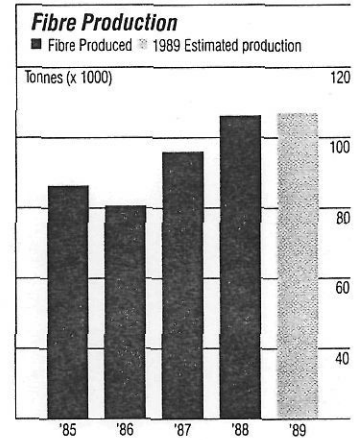
The Cassiar Mine achieved a 35 year production record of 106,085 tonnes of fibre in 1988. This was due, in part, to the decision to operate the mine throughout the year in order to meet the continued strong world wide demand for asbestos products. This was the first time since 1981 that the operation ran for the full twelve month period.

A higher than expected ore grade, additional modifications to the mill which increased efficiency, and added production of short fibre helped make the record year possible. Important mill modifications were made within the concentrator to increase rejection of barren rock and allow a higher mill feed grade. These refinements to the concentrator obviate the need for a second concentrator budgeted for the McDame Project.

### Mining Plan Accelerated

During the early summer, a localized slide in the southern wall of the pit, combined with cracking and other signs of instability at other locations, prompted a review of the overall mining plan. Although various methods of stabilizing the pit walls were available, the decision was made to speed up the mining program by about a year in order to reduce the risk of losing ore.

Under the accelerated mining plan, all ore will be removed from the open pit by May, 1989, taking advantage of the stability provided by the frozen ground during the winter months. Continuous operation of the pit began at the end of September and additional staff was hired to carry out the new plan. However, removing greater quantities of material in less time has resulted in greater mining efficiencies, so the overall costs have not increased significantly. The ore removed from the pit will be stockpiled and will sustain mill operations until production from the McDame underground deposit becomes available in late 1990.



Cassiar concentrator and mill complex, with potential wet mill feed stock pile in background.



*Cassiar open pit mine.*

CASSIAR	1988	1987	1986
Fibre Production (tonnes)	106,085	96,014	80,676
Ore Mined (tonnes × 1000)	1,865	1,100	794
Waste Removed (bank cubic metres × 1000)	1,561	1,416	729
Ore reserves — proven (tonnes × 1000)	2,098	3,492	4,570
Waste to be removed (bank cubic metres × 1000)	436	1,954	3,450

#### **Operating Costs**

Operating costs at the mine site declined again in 1988, continuing the downward trend of the last seven years. Operating efficiencies

in several areas, together with lower than anticipated fuel prices, helped keep production costs down. It is expected that production costs in 1989 will decrease because of the additional waste volumes mined in late 1988.

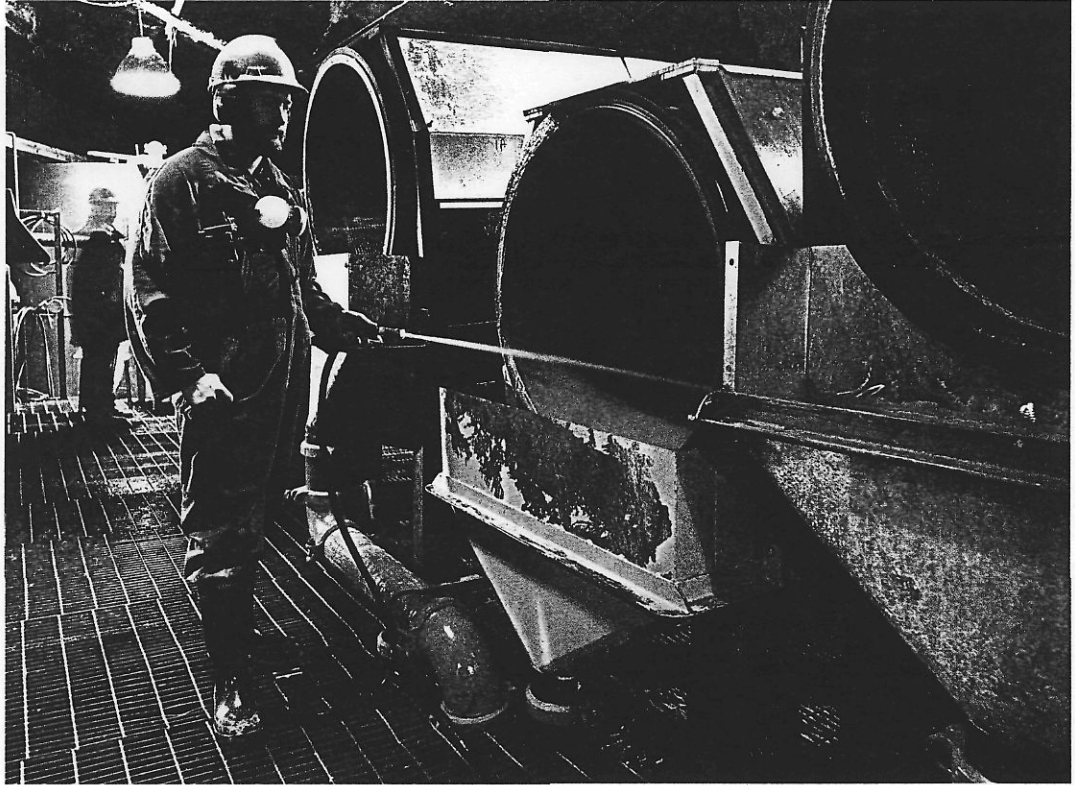
#### **Open Pit Closure**

1988 was the last full year of production for the Cassiar open pit.

The Cassiar open pit has been the mainstay of the Cassiar operation for more than 35 years, starting with a seasonal operation in 1953, using 10 ton trucks and growing to the current 100,000 tonne/year operation with 85 ton trucks and large electric mining shovels.

When mining ceases in May 1989, it will not only mark the end of an





*Cleaning trommels of wet milling plant.*

era for open pit mining, but the start of a new one with the new McDame mine currently being developed.

### **Wet Milling**

The wet milling pilot plant began operation in early August, although the instrumentation for the plant and some other process equipment was not delivered until later. Over the first few months of operation, the plant has

demonstrated it can run at its 1,000 tonnes per year design capacity and produce a marketable product. The results of tests indicate that the grading and drying circuits are adequate to handle the material produced when the plant capacity is increased to 4,000 tonnes per year; but cleaning and dewatering circuits require modification and additions.

To date, all tests have used current mill tailings, but the higher grade materials from the old tailings stockpile will be tested later. This

stockpile contains some 14 million tonnes of material, with an average grade of 3.5 percent.

Customer interest in the product from the wet mill is high, based on results from the operation of a small-scale test facility in 1987. Preliminary samples were shipped to potential customers for commercial testing in early 1989.



## **McDame Project**

**D**evelopment of the McDame project commenced in 1988, heralding the end of the open pit era at Cassiar and initiating the transition to underground mining.

### **Mining Plan**

At present, underground development is scheduled to be finished in March, 1990, well ahead of the completion date originally projected of October, 1990. The mine is expected to achieve its full production rate of 5,500 tonnes per day by the end of that year, making it one of the largest underground mining operations in British Columbia.

In order to achieve that high daily rate, a block caving mining method will be used. Key management personnel, experienced in using this low-cost technique for mining asbestos have recently joined the McDame team, and their expertise will greatly facilitate our move from open pit to underground mining operations.

An adit into the side of McDame Mountain will provide access to the ore body and a ramp will lead down to the various mining levels. Ore from the drawpoints will be dumped into an ore pass and then conveyed out of the mine. The existing tramline will be

shortened, once the open pit mining is complete, to deliver the McDame ore to the mill.

### **Progress Made in 1988**

Surface development for the project started in the second quarter, while the contract for the underground work was being awarded.

Underground work was initiated in early July. This consisted of slashing 1,295 metres of the main access drift, driving 225 metres of conveyor decline and completing a 48 metre ventilation adit.

In total, \$8.6 million was spent on the project in 1988.

### **Development Costs**

Since many of the existing plant facilities and services for the open pit operation will be used by the McDame project, the capital costs for its development are significantly lower than they would be for a totally new operation of similar scale.

At present, the total cost of bringing the new mine into full production is estimated to be \$48.1 million, including \$7.8 million for secondary development during the preproduction period but excluding the originally planned secondary concentrator. Mine access development is higher than originally estimated, because more ground support is projected to be installed in the main access drifts and conveyor decline. Mining during the gradual production build-up in 1990 will yield 467,000 tonnes of ore, with a fibre value of \$17 million.

Although original plans called for a secondary concentrator to be added to the present milling facilities, modifications which have improved the rejection rate of the primary concentrator make this unnecessary to meet forecasted production.

A \$25 million development loan from the B.C. Government, repayable from 50 percent of the cash flow generated from the asbestos assets, covers part of the capital cost of the project. Bank financing will provide another \$9.6 million. The remainder will come from cash flow internally generated by Cassiar open pit operations.

### **Reserves**

The production layout provides for mining 16 million tonnes of ore, with a mill yield of 5.6 percent fibre. These reserves will provide mill feed for a period of 10 years. Diamond drilling will be undertaken this spring to define additional reserves that were indicated in a southerly extension by drilling carried out in 1984.

