

~~CONFIDENTIAL~~

AN EVALUATION  
OF THE  
ARCTIC MINING AND EXPLORATION LIMITED  
PROJECT

by

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AND  
NORTHERN DEVELOPMENT

TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION .....	2
SUMMARY .....	2
COMPANY INFORMATION .....	3
ACCESSIBILITY .....	3
HISTORY .....	4
PHYSIOGRAPHY, GEOLOGY AND MINERALOGY .....	4
ORE RESERVES .....	5
METALLURGY .....	5
RATE OF PRODUCTION .....	6
CAPITAL COST .....	6
EVALUATION .....	6
Assumptions .....	6
Results of Evaluation .....	7
CONCLUSIONS .....	8

MAPS

MAP NO. 1 - LOCATION MAP

MAP NO. 2 - LOCATION OF PERMANENT ACCESS ROAD

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FIGURES

FIGURE 1 - PRESENT VALUE PROFILE

### INTRODUCTION

Arctic Mining and Exploration Limited, a Canadian company incorporated in 1964 with a British Columbia charter, has announced its intention to bring a gold-silver mine into production in the Carcross area of the Yukon Territory. The Company has applied to the Federal Government for financial assistance under the Northern Roads Program to build a permanent access road from Carcross to the mine. MAP 1, shows the location of the Arctic Mining and Exploration property and MAP 2, shows the location of the proposed permanent access road from the village of Carcross, Y.T. to the mine property.

An evaluation of the proposed mining operation has been carried out based on information provided by Dr. D.D. Campbell, (1) consulting engineer, to the Company.

### SUMMARY

An evaluation of the Arctic Mining and Exploration Limited project has revealed that, at current prices for gold and silver, the revenue from the project over its estimated life of three years will yield a rate of return of approximately 30 per cent on the capital invested in the property.

The most important benefit which will accrue to the country, and the Yukon in particular, from this mining operation will be the impact of

(1) Feasibility Report, Carcross Operation, Arctic Mining and Exploration Limited, October 15, 1967. Dolwage, Campbell and Associates Ltd.

the 100 new jobs which will be created by the project. This benefit will be of particular importance to the village of Carcross which, at present, holds very few employment opportunities for its residents, many of whom are Indians. Unless more ore is discovered to ensure a longer life for the mine, no corporate income taxes will be collected from the mine and only minor amounts will accrue from Yukon royalties and Territorial taxes.

It is considered that the possibility of finding more ore at the property is very good.

#### COMPANY INFORMATION

The head office of the Company is at Suite 1130, 355 Burrard Street, Vancouver, B.C. Officers and directors of the Company are:

J.A. Simmons - Chairman  
G.C. Snell - President  
P.M. Reynolds - Vice President and Treasurer  
B.J. Reynolds - Secretary  
M.A. Stuart - Director  
R.K. Cheng - Director  
J.C. Snell - Director  
R. Newson - Director

#### ACCESSIBILITY

Access to the property is gained by a very low standard trail from Carcross, Y.T. Carcross is situated on the White Pass and Yukon Railway and

is also connected to Whitehorse by road. The Company has obtained permission from the White Pass and Yukon Railway to use the railway bridge which crosses the Nares River at Carcross.

#### HISTORY

The property was discovered between 1900 and 1910, by prospectors who were employed by Col. J.H. Conrad, a mining promoter. A 100 ton per day mill was built which operated intermittently between 1915 and 1921. Several thousand tons of high grade gold-silver ore were shipped from the mine before it was forced to close in 1918 because of rising costs and labour shortages.

The Company's mineral claims are made up of two groups - the Arctic Caribou group of 84 claims and a group of 36 claims farther to the south which includes the Montana, the Mountain Hero, the Uranus and the Joe-Petty properties. Work done to date on the Arctic Caribou property (including the work done by Arctic Mining and Exploration Limited) includes 5800 feet of drifting and cross-cutting, 780 feet of shafts and raises and 25,000 feet of diamond drilling plus some stoping. No recent work has been done on the southern group of claims but records indicate that some shaft sinking and drifting was done there in earlier days.

#### PHYSIOGRAPHY, GEOLOGY AND MINERALOGY

The Arctic Mining and Exploration property is at an altitude of 5,500 feet in a rugged, mountainous area. The ore deposits are located on the eastern flank of the Coast Range Batholith in a belt of Mesozoic sedimentary and volcanic

formations. All of the known ore occurrences on Montana mountain are vein deposits containing values of silver and gold. The veins are cherty quartz with arsenopyrite, galena, sphalerite and chalcopyrite. The gold and silver values appear to be associated with these sulphides. Veins are variable in width, ranging from a few inches to five feet.

#### ORE RESERVES

To date the Company's exploration program has been confined to the Arctic Caribou Mine where ore reserves are reported to be as follows:

Proven ore - 47,710 tons at 0.855 oz/ton Au. 25.63 oz/ton Ag.

Probable ore- 111,405 tons at 0.592 oz/ton Au. 16.69 oz/ton Ag.

Total - 159,115 tons at 0.682 oz/ton Au. 19.70 oz/ton Ag.

An additional 75,000 tons of ore reserves in the "possible" category is reported for the Arctic Caribou property. In the Consultant's opinion the possibility of finding additional reserves both in the Arctic Caribou and in the Montana property are excellent.

#### METALLURGY

Metallurgical testing of the Arctic Mining and Exploration Limited ore indicated that recoveries of 96% for both gold and silver could be achieved by producing the following:

1. A jig concentrate.
2. A silver-lead flotation concentrate.
3. A gold-arsenopyrite concentrate.

The high arsenic-gold concentrate, if sold as such, would be subject to penalties from purchasers. It could be treated at the mine by cyanidation, but gold and silver losses would be high. A combination of cyanidation and roasting would be necessary to obtain good recovery of the silver and gold. Since no plans have been made for the construction of a roaster, the Company plans to ship concentrates to custom smelters for treatment.

#### RATE OF PRODUCTION

The mill which is under construction at the Arctic Mining and Exploration Limited property will have a capacity of 300 tons per day. The Company plans to operate the mill at only 200 tons per day until such time as additional ore is found. At this rate, based on 350 operating days per year, the proven and probable ore reserves at the mine will last for 2.27 years.

#### CAPITAL COST

The Company's consultants have estimated the cost of bringing the Arctic Mine into production to be approximately \$1.5 million. This figure does not include expenditures made prior to September 30th, 1967. This estimate is considered to be low and for purposes of this evaluation an estimated capital expenditure of \$3.0 million is used. Funds for the project have been provided in the form of a loan of \$1.5 million from Hans Willi, Swiss financier.

#### EVALUATION

##### Assumptions

In evaluating the Arctic Mining and Exploration operation, the following assumptions have been made:

1. The life of the mine is estimated to be 3 years. Although proven and probable ore reserves are sufficient for a life of only 2.27 years, it is considered to be a reasonable assumption that the possible ore reserves, plus the favourable potential of the area will be sufficient to increase the life of the mine to a minimum of 3 years.
2. The Company's consultants estimate that operating costs will be approximately \$16.75 per ton. It is considered that this figure is low and for this evaluation costs are estimated to be \$25.00 per ton.
3. Metal prices are assumed to be:  
Gold - \$35.00 U.S. - \$37.80 Cdn. per ounce.  
Silver - \$1.80 U.S. - \$1.94 Cdn. per ounce.
4. Assuming that concentrates are shipped to Tacoma, Washington, for treatment, it is estimated that the value of the ore per ton is \$50.00 (after deducting freight costs). Therefore, annual gross income =  
$$350 \times 200 \times \$50$$
$$= \$3,500,000.00$$
5. Estimated capital expenditure required to bring the mine into production is \$3.0 million.

#### Results of Evaluation

Based on the previously mentioned assumptions, the rate of return to Arctic Mining and Exploration Limited on its investment of \$3.0 million will be approximately 30 per cent.

There will be no benefit to the Crown in the form of income taxes since, unless more ore is found the mine will not operate beyond the end of its tax -

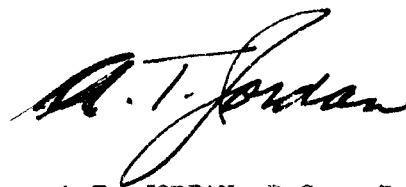


free period.

It is estimated that Yukon quartz royalties amounting to approximately \$150,000 will be collected over the 3 year life of the mine.

CONCLUSIONS

1. At the assumed prices for silver and gold of \$1.94 Cdn. and \$37.80 Cdn. per ounce respectively, the Arctic Mining and Exploration Limited mining project will yield an excellent rate of return (approximately 30 per cent) on its capital investment.
2. Although the direct benefits to the Crown from the Arctic Mining and Exploration project will be small (unless more ore is discovered) there will be indirect benefits resulting from the employment of approximately 100 persons. The village of Carcross, which at present has no economic base and very little opportunities for employment, will benefit appreciably from the mine. This is of particular significance since a large part of the population of Carcross is made up of Indians.
3. The Yukon Territorial Government will benefit somewhat from fuel oil and gasoline taxes collected as well as motor vehicle licence fees.



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