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DOLLY VARDEN MINES LTD  
SUMMARY REPORT

INTRODUCTION

I have reviewed the potential of the company's properties in the Kitsault Valley other than the Torbrit Mine in the light of the enhanced price of silver and the detailed geological mapping by the staff of Norment Exploration in 1967.

SUMMARY

An ore reserve of 900,000 tons averaging 8.6 oz Ag plus a significant amount of lead, zinc and cadmium has been calculated of which about 50% is considered proven, 30% probable and 20% possible.

This amount will justify operating at 500 tons per day. It is estimated that a net smelter return of \$20.00 per ton will be obtained of which \$10.00 per ton would be working profit.

About two million dollars will be required for capital expenditures to go into production plus about \$300,000 for working capital.

There are a number of areas, including the old Torbrit mine, where there are excellent chances of developing further substantial amounts of ore.

ORE RESERVES

WOLF

Here a considerable amount of lower grade material can now be regarded as commercial. The re-calculated reserve is as follows :

Vein	PROVED		PROBABLE		POSSIBLE		TOTALS	
	Tons	oz Ag	Tons	oz Ag	Tons	oz Ag	Tons	oz Ag
No 1	40,000	15.0	25,000	12.0	35,000	8.0	100,000	11.80
No 2	140,000	7.4	110,000	9.0	110,000	9.0	360,000	8.4
No 3	-	-	50,000	8.0	50,000	8.0	100,000	8.0
TOTALS	180,000	9.0	185,000	9.0	195,000	8.6	560,000	8.9
After Dilution	200,000	8.2	200,000	8.4	210,000	8.0	610,000	8.2

The stopes would be from 20 to 60 feet wide in excellent ground in most cases.

No systematic assaying was done for lead and zinc but at least 0.5% Pb and 2.0% Zn would be a reasonable estimate from the appearance of the ore.

#### NORTH STAR

Many of the drill hole intersections in the main ore-body here were assayed for Pb and Zn both originally and by Newmont Exploration so that the content of these metals can be evaluated. Newmont also assayed for cadmium in a number of cases from which I have estimated a conservative ratio between the zinc and cadmium.

Calculations for this ore-body gave 175,000 tons that averaged :

Ag 8.9 oz per ton    Pb 0.93%    Zn 3.30%    Cd 0.066%

After dilution this becomes 200,000 tons that average :

Ag 8.0 oz per ton    Pb 0.85%    Zn 3.00%    Cd 0.060%

The stoping widths would be from 28 to 50 feet horizontally for an average dip of 45°.

Partial exploration with diamond drilling and raises has proved at least 11,000 tons averaging 9.4 oz Ag per ton in a faulted segment of the ore zone immediately to the north. After dilution this becomes 12,000 tons at 8.6 oz Ag.

A second faulted segment to the north is estimated to contain another 25,000 tons of probable ore averaging 6.8 oz Ag per ton or 28,000 tons at 6.0 oz per ton after dilution.

The limited assaying suggests that the lead and zinc contents are 0.2% and 1.0% respectively for both segments.

#### DOLLY VARDEN

Because of the lack of more details the old reserve is used here namely 50,000 tons of probable ore averaging 20.0 oz Ag per ton.

#### TOTAL RESERVE

The various ore blocks are summarized as follows :

ORE BLOCK	PROVED		PROBABLE		POSSIBLE		TOTALS	
	Tons	oz Ag	Tons	oz Ag	Tons	oz Ag	Tons	oz Ag
Wolf	200,000	8.2	200,000	8.4	210,000	8.0	610,000	8.2
North Star	212,00	8.0	28,000	6.0			240,000	7.9
Dolly Varden			50,000	20.0			50,000	20.0
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Totals	412,000	8.1	278,000	10.2	212,000	8.0	900,000	8.7

The above figures were obtained after allowing for dilution during mining.

#### VALUATION

The value of the ore is calculated on the basis of the following prices :

Ag \$2.00 per oz, Pb 14¢ per lb, Zn 13¢ per lb and Cd \$2.85 per lb.

The percentage of the content of the various metals in the ore that would be paid for by the smelter are assumed to be :

Ag 90% Pb 80% Zn 60% Cd 60%

For the Wolf and North Star ores together the average mining grade is taken as :

Ag 8.0 oz Ag per ton, Pb 0.6%, Zn 2.0%, Cd 0.04%

Using the above figures the net return for the metals would be

Ag \$14.40, Pb \$1.30, Zn \$3.20, Cd \$1.30

giving a total of \$20.20 per ton.

Each increase in the price of silver of 10¢ per oz will add \$0.70 to the value per ton of the ore.

## C O S T S

At the rate of 500 tons per day the following operating costs per ton should be possible :

	\$
Stoping	3.00
Development	1.00
Haulaging underground	0.40
Trucking ore	0.50
Milling	2.50
Freight on concentrates	0.60
Camp maintenance	1.00
Administration etc	1.00
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Total	\$ 10.00

## L O C A T I O N   O F   M I L L

The choice of a mill site appears to be limited to either the old site of the Torbrit mill or adjacent to a flat area about half way between the Torbrit mine and the Wolf workings.

The old site has the advantage that the maximum amount of ore will move downhill and only that which is found below the 1000 ft level would need hoisting. As before, the mill tailing would be discharged into the Kitsault River. If this is no longer permitted then the tailing would have to be flumed for several miles to a suitable disposable area.

The second choice is about one mile south of the Wolf workings where there is a swamp area suitable for tailing disposal. It would necessitate raising all ore from the North Star and the Torbrit mine up the old Torbrit shaft and trucking it for about 1 mile. This may be the best site for the present distribution of the ore reserves but a major ore development in the Dolly Varden could shift the balance.

A closer investigation will be necessary on the ground.

PRODUCTION SCHEDULE

The following is a suggested schedule for putting the property into production with the approximate cost of each item :

1968		\$
1.	Repair hydroelectric plant	100,000
2.	Improve road between Torbrit and Wolf	50,000
3.	Buy essential vehicles	50,000
4.	Take representative samples for further mill test work(item 17)	
5.	Design mill (item 17)	
6.	Buy underground equipment as required	100,000
7.	Prepare North Star for mining	100,000
8.	Wolf No 2 vein - Raise for ore pass 1200 to 1350	9,000
9.	Wolf No 2 vein - Drift on 1350 level	12,000
10	Clear new mill site (item 17)	
11	Major overall of road from Alice Arm by government	
12	Decide on shaft or incline at Wolf and start (item 13)	
1969		
13	Complete shaft to 350 ft deep using Torbrit hoist	120,000
14	Housing at Alice Arm	500,000
15	Buy further vehicles as required	50,000
16	Buy further underground equipment	150,000
17	Erect mill (salvaging some equipment from old mill)	500,000
18	Drive 1050 level at Wolf	36,000
19	Drive 3 raises from 1050 to 1200 for mining Wolf No 2	22,000
20	Raise from 1200 to 1450 into No 1 vein, Wolf	15,000
	Contingencies	186,000
	Total	<hr/> \$2,000,000

### FINANCES

The previous figures show that \$2 million would be required to place the mine in production at 500 tons per day. In addition a working capital of say \$300,000 would be required to start with.

A working profit of \$10.00 per ton would amount to \$1,800,000 per year. Thus the past capital investment of Dolly Varden Mines plus the new investment required could both be paid back in two years. In the following three years over \$5 million in working profits should be realized. In the meantime further exploration and development should have found more ore that would keep the mine operating for several more years.

### OTHER ORE POSSIBILITIES

The presently known potential ore areas are :

1. Wolf No 2 vein - North end from 1000 to 700 elevation  
Wolf No 3 vein - South end from 1100 to 900 elevation
2. North Star below 1000 ft level.
3. Dolly Varden Vein - Extensions of known ore  
Dolly Varden Vein - New sections to east and west
4. Torbrit mine - Involves study of old records, pumping out workings and drilling.

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