

best 'block' - not specific

SILVERADO PROPERTY, CASSIAR

*WMS
Egan*

MINES

*Check following
for pay's report*

801048
Prosperity-
Idaho Mine

(WMS kept to be, largely, for possible participants)

SUMMARY

The Prosperity-Idaho mine produced nearly 30,000 tons of selected shipping ore that averaged 77 oz. of silver per ton before being forced to close down in 1930 when the price of silver slumped to 28¢ per ounce.

sl. indicated

*B.W.U.
3000 net
in 1964*

Although not fully proved there is a reasonable expectation of at least 100,000 tons of ore being present in the main oreshoot of the D vein from 100 feet below the level up to the surface at 500 feet above the level. The grade is estimated at 22.5 ounces Ag per ton, 2% Pb and 2% Zn with a recoverable value of \$25.00 per ton. *get CM+S schedules*

100' - 1000'?

In addition there are subsidiary blocks of ore below the bottom levels of the Blind and Prosperity veins. Also an unknown amount of medium grade ore is present in dumps and stope fill.

It does not appear practical to operate the mine and a mill on the almost inaccessible mountainside of the present mine. However it is proposed to carry out a development programme in these workings for two seasons using a helicopter to service the operation in the expectation that sufficient ore will be developed to warrant a haulage tunnel 7,000 feet long from the other side of the mountain where a mill would be located.

This tunnel would facilitate the exploration of the extensions of the shear zones which are largely concealed by the ice-cap of Mount Rainey.

Air photo study may help here.

INTRODUCTION

In 1955 I made an examination of the various properties of Cassiar Consolidated Mines in the Stewart Area, B.C. including the Prosperity, Porter, Idaho and Silverado group. A summary report was prepared at that time to supplement previous reports by B. W. U. MacDougall, P. Eng., in 1951 and C. Rutherford, P. Eng., in 1954.

Fortunately all of the engineering plans including assays and geology for the Prosperity and Porter-Idaho mining areas have been preserved and some of those for Silverado.

In this account the property is described and discussed in more detail than before.

C. Rutherford report available?

*Need copy of claim maps
this area +
list of claims.
now 46 claims - 1964*

SITUATION

As shown on the government claim map the property stretches for 15,000 feet east from the head of Portland Canal to the west side of the north fork of the Marmot River.

The elevation ranges from sea level to 6,500 feet on Mount Rainey. An ice-cap conceals most of the ground above 5,500 feet on the southeast side and above 4,000 feet on the northwest side.

The terrain is precipitous and combined with the heavy snowfall has been a major factor in delaying the exploration of this mineralized area. *Even then U.I.*

Access at present is by mountain trails or by helicopter.

HISTORY

see also Ore bodies

The original discovery on the Prosperity claims was made in 1921 and small shipments commenced in 1924.

In 1927 the Premier Gold Mining Company acquired the control of the Prosperity-Idaho group of claims and started an extensive underground development. An aerial tramway with steel towers was constructed from the mine to the mouth of Marmot River and a subsidiary tramway was built between the upper and lower workings.

A production of 1,700,000 ounces silver from 23,300 tons shipped was made during 18 months between 1928 and 1930 when the price of silver fell from 58¢ at the beginning of the period to only 28¢ per ounce.

Since then the property has been idle and has gradually fallen into a state of disrepair. The most unfortunate happening has been the destruction of some of the main towers of the upper section of the aerial tramway and the dismantling of the lower section.

In 1955 several of the tunnels were inaccessible and the upper ones were full of ice. Fortunately the D tunnel which gave access to the main ore reserve was still open and the stopes were found in good condition.

The Silverado area was first explored in 1921 also but the veins corresponding to those on the other side of the mountain in Prosperity corresponding to those on the other side of the mountain in Prosperity ground were not found until 1927 - just below the end of the glacier.

*mining
access
ice problem
for expansion
see #1 - p. 8*

*4
72,000,000
1964*

The claims were acquired by the Premier Gold Mining Company who did about 2,000 feet of underground work on four levels with limited results. Leasors then shipped about 100 tons of sorted ore from the upper tunnel.

In 1946-7 the Big Four Silver Mines re-opened the property by raising a 200 foot vertical shaft, drifting 55 feet and raising 100 feet on the top level and erecting an aerial tramway. No work has been done since.

For the past seven years both properties with the ground in between have been held by Cassiar Consolidated Mines whose president is Mr. W. R. Wheeler. - *date of org. by Capt. W. R. Wheeler.*

officers etc

GEOLOGY

According to Hanson's map in Memoir 175 of the Geological Survey of Canada on the Portland Canal Area the mineral claims are in a volcanic series of breccias, tuffs and lavas with minor argillaceous sediments known as the Bear River Formation that has a northerly trend and is folded into at least one major syncline and one anticline. These rocks are abruptly cut off to the south ^{west} by a mass of granodiorite dipping uniformly at 80° northeast over a vertical range of at least 4,000 feet. On the west the volcanic rocks are cut off by the north-trending Bear River Fault that has a relative horizontal movement of 8,000 feet southward for this area with granodiorite on the west side. A smaller mass of granodiorite is situated to the northwest.

To the east the volcanics give way to the underlying Bitter Creek Formation that consists mainly of sediments.

A number of lamprophyre dykes are present in the mine area. *on Silver Bow (w/ white)*

No direct evidence for the attitude of the country rock appears on the geological maps of the underground workings and little was recognized on the surface. The rock was mapped as fine breccia with occasional patches of "argillite" of ill-defined shape and attitude that may actually be sheared volcanic.

ORE STRUCTURES

Most of the mining development in the past was on the southeast side of Mount Rainey between elevations 4,200 and 5,700 feet.

There are five parallel main shear zones from 550 to 650 feet apart that strike northwest and dip from 50° to 70° southwest. Certain sections of three of these shear zones, known as the

Note shear photos indicating faulting, ± N dipping, bedding on vic. of ridge north of the property mine, at property portal, and at the portal of the tunnel on the flat vein (vic. Silver Bow No. 1 claims).

*revised
new regional mapping
BSC*

regional structure

Prosperity, Blind and D veins in order from west to east have been mined for their high grade silver ore. The Wake and Angelo structures further to the east have received very little exploration.

The limited evidence available suggests that the mineralized shears are parallel in strike to a major anticline but they dip across the easterly dipping limb of the fold.

No

About 6,000 feet to the northwest along the strike of this group of shears there is a similar set in the Silverado area with two major ones spaced 400 feet apart, one minor one between them and another at 150 feet to the southwest. They have been recognized at intervals from an elevation of 2,500 feet up to 4,000 feet where they disappear beneath the glacier of Mount Rainey.

It is reasonable to assume that the same group of shears extend through the mountain under the ice-field which is quite small but happens to be elongated in the direction of the shears. Its size varies from year to year but presumably it is dwindling for the most part so that new exposures may be uncovered in a year of light snowfall and hot summer weather such as 1961.

A few cases are known of mineralized structures having a very flat dip. Thus in the southwest corner of Silver Bow No. 1 claim there is an old tunnel at elevation 4,450 feet that has developed a vein dipping about 5° northeast. It appears to follow a bedding plane in the volcanics.

Need Street Study "P.B. style"

Prospect trenches on the east side of the Slide and the Prosperity Fr. M. C. s show veins dipping at 30° to the northeast and north respectively at elevations of 5,700 and 5,800 feet.

The so-called Big Rig Fault that strikes 10°N of E and dips 45° to 50°N interrupts the southern extension of the main veins and is itself mineralized in places.

take this all in.

any S in w. or beds.

MINERALIZATION

The valuable constituent to date has been the silver content of the veins which is present as native silver, ruby silver and as silver bearing galena and friebertite. Pyrite, sphalerite and more rarely chalcopryite are also present.

Small interference w. cyanide process - Any Mill tests

PRODUCTION

Much of the ore shipped was wholly or partly oxidized and presumably enriched.

Nothing on fresh exposures?

The total recovery of metals from the Prosperity - Idaho group recorded by the Minister of Mines is:

Prosperity Property - Idaho

844 oz. Au, 2,329,064 oz. Ag, 57,679 lbs. Cu, 3,001,439 lbs. Pb, and 6,070 lbs. Zn from 29,904 tons of ore giving an average of: 0.028 Oz. Au and 77.0 oz. Ag per ton, 0.1% Cu, 5.0% Pb and 0.01% Zn.

Actually at least as much zinc is present as lead in the fresh sulphide ore.

For the Silverado the production is given as: 17 oz. Au, 22,009 oz. Ag, 2,357 lbs. Cu and 34,675 lbs. Pb from 106 tons an average of: 0.16 oz. Au and 211 oz. Ag per ton, 1.1% Cu and 16.4% Pb.

All the ore from both properties was more or less selected and hand cobbled when necessary to obtain a high grade product that could be shipped to a smelter.

OREBODIES

The first vein to be mined was the Prosperity No. 1 where four oreshoots were found over a length of 1,000 feet and over a vertical depth varying from 200 to 650 feet. These oreshoots diminished considerably in size and grade with depth so that on the bottom level (5,100 feet) a total length of 240 feet of ore is present as compared with 500 feet on the top level (5,400 feet el). A further 600 feet of vein was explored to the north on the 5,400 level without encountering ore. # 2 Prosperity 5200

In the 1,700 feet of cross-cut on the ⁵¹⁰⁰~~5,200~~ level to develop the Prosperity vein a previously unrecognized vein was encountered and named the Blind vein. Actually it corresponds to a series of open cuts on the surface but further to the north. An oreshoot was developed over a length of 117 feet and largely mined out to the surface. It assayed 136 oz. Ag and 9.2% Pb over an average width of 0.9 feet. No mining was done below the level.

Some surface showings were explored at the 4,700 foot elevation on the D vein but they proved to be small. The adit was extended for 700 feet where it encountered the largest orebody on the property. Economic values were found over a length of 350 feet of which the first 100 feet averaged 25 Oz. Ag over a width of 23 feet. This ore can still be seen in the cross-cuts and it consists of primary sulphides. The high grade section was explored by a raise for 300 feet and then stoped in an irregular manner by mining out the rich lenses.

The I tunnel was driven 460 feet lower in elevation on this vein and was within 150 feet of the projected position of the oreshoot when the mine was closed down in 1930.

The D vein was also cut by the main crosscut on the 5,100 level where it assayed 26 oz. Ag over 6 feet. At the surface

30,070 tons

limited depth (3)

map all to cuts on 100 scale

D orebody

I tunnel "D" depth

(?) good lead?

up dip from here I cut a sample in an old trench that assayed 47 oz. Ag over 4.7 feet. South of this point everything was concealed by scree and the edge of the ice sheet was only 200 feet to the north.

The composite map, scale 1 inch to 100 feet, shows that the major oreshoots in the three veins discusses above are opposite each other in an east trending belt. Such a disposition is not uncommon in parallel veins and suggests that a similar arrangement may be present further to the north along the zone of shears. It also suggests that more exploration is needed on the Wake and Angelo structures.

*Strike
Plays
control
indicated
perhaps W side
N as on
main fault
to west
Note rel.
bedded
structures +
vein shoots*

*a.k.
but
any off
control?*

On the No. 1 vein of Silverado at elevation 3,450 feet two small oreshoots were developed in a length of 440 feet. The first at 35 to 80 feet from the portal averaged 0.02 Oz. Au, 18.9 oz. Ag, 1% Pb and 2% Zn over 3.8 feet. The second from 140 to 220 feet averaged 41.1 oz. Ag over 2.1 feet which is equivalent to 21.6 oz. Ag over 4 feet. *with white trace*

The 106 tons of ore that was shipped by lessors was obtained by mining out the high grade sections along the drift.

According to a sketch section the first oreshoot was found to extend up a raise for 80 feet to the surface and for 80 feet down a winze where it was followed to the northwest for 40 feet. No ore was found in 450 feet of drifting on the 3,170 foot level below.

Apparently on the assumption that an ore grade would only be found in the oxidized and enriched zone near the surface the Big Four Silver Mines company raised 100 feet from a point 320 feet from the portal on the 3,450 foot level but with indifferent results.

Exploration?

VERTICAL RANGE OF OREBODIES

On the southeast side of Mount Rainey in the Prosperity vein the main ore ranged from 5,100 feet up to the surface at 5,750 feet whilst on the D vein it ranges from below the 4,700 level up to the surface at 5,300 feet.

The lowest known ore is on the presumed D vein in the first 45 feet of the camp or F tunnel at elevation 4,480 feet, the average grade being 116 oz. Ag over 1.2 feet. On the northwest side in the Silverado workings possible ore grade was found as low as 3,370 feet.

whether level w. Wake (also 4700-4280) Sect of vein

A control that appears possible for the known vertical distribution of the orebodies is that they occur within a breccia horizon about 1,000 feet thick that dips to the east on the east flank of an anticline that is plunging to the northwest at about 10°.

? ?

See "I" tunnel

W.P.

Such an arrangement would place most of any new ore well above the previously proposed exploration and haulage tunnel at the 4,000 feet elevation so that a still higher level should be explored. For this reason it is now proposed to extend the D level (el. 4,700 feet) a total of 2,000 feet in two seasons. - *They advanced to*

support con'n of activity on near-surf. enriched ore.
ORE RESERVES

The major reserve of ore is on the D vein as shown on the accompanying sketch plan where a total of 100,000 tons averaging 22.5 oz. Ag per ton is indicated from the surface down to 100 feet below the D level. Because little of this ore is developed on at least three sides it can only be classified as probable. If the ore extended undiminished to the I level at 4,235 feet another 85,000 tons would be present. *x C + drilling (Ave) indicated here.*

*# Indicated
many on
side.*

It is assumed that selective mining will enable a third of the tonnage of the northern 250 feet of this orebody that averages 10 oz. Ag over 18 feet to be mined at an average grade of 20 oz.

It is expected that the ore will average 2% Pb and 2% Zn.

On the assumption that the orebodies in the Prosperity and Blind veins extend below the 5,100 foot level there could be another 10,000 to 15,000 tons of ore present but considerable development would be necessary to make such ore available.

*Prosperity
Blind?*

An unknown amount of broken ore is present in stope fill and dumps that was rejected in order to maintain a shipping grade of 70 oz. Ag per ton.

MINING

Below the effects of surface alteration the rock conditions appear good for stopping operations so that with reasonable care there should be no problem with dilution. Open stopes with pillars that can be recovered subsequently would be the standard method of mining. *or (pillared) shrinkage stopes or steep ore shoots*

where is this?

MILLING

It will be important to obtain large, representative samples of oxidized and fresh sulphides ores from the D orebody for the purpose of milling tests. The sulphide ore will no doubt respond well to normal flotation practice to give a galena concentrate containing most of the silver and a zinc concentrate. The oxidized ore however may require the cyaniding of the tailings from a flotation circuit.

X

DEVELOPMENT

The most difficult problems concerning this group of claims are accessibility and transportation. The original aerial tramway up the Marmot valley to the Prosperity is practically destroyed. It was difficult to operate under severe winter conditions.

B.W.W. 1900 -
map? Previous investigators favoured a crosscut tunnel from the Silver Bell group at 4,000 feet elevation aimed directly at the Prosperity workings 5,000 feet away and hoped to intersect further parallel veins. Alternatively a crosscut tunnel from the same site aimed to the northeast would cut the projected position of the Prosperity vein at 3,000 feet and midway between the Silverado and Porter-Idaho mines. Another 3,000 feet of drifting, 1,000 feet of cross-cutting and 200 feet of raising would be necessary to make a connection with the north end of the I tunnel.

all of them? I have *not now?* favoured exploring the length of the possible ore structures with a 7,000 feet drift at the 4,000 feet elevation from the Silverado to connect with the I tunnel with a 200 foot raise. This would involve using the present Silverado workings to get from the 2,950 feet level to the 3,450 feet tunnel and then raising another 550 feet to the 4,000 feet elevation. At present rates this preliminary work could well cost between \$250,000 and \$300,000. Another \$700,000 would be consumed in driving through the mountain to make the known ore accessible and to discover any new zones that may well be present. To date this expenditure has not appealed to prospective developers because of the limited amount of ore in sight.

*all the
Pb-Cu
raises
had for
access by
helicopter*

The modern helicopter now makes it possible to consider planning an extensive development programme in the Prosperity-Idaho workings to prove sufficient ore that will then justify a haulage level from the Silverado side and the erection of a mill. *water, mill site contingent on water & Fisheries Dept. etc. (if possible and)*
It is hoped that the following development programme over a period of two seasons will prove 300,000 tons or more of ore that averages at least 22 oz. Ag per ton, 2% Pb and 2% Zn.

*SKERL
PRELIM
PROGRAM*

The helicopter costs are based on the following figures:

1. Machine from Ketchikan that can take a load of 800 pounds to an elevation of 5,500 feet. *(G-3)*
2. Charter at \$130 per hour of flying time.
3. One hour for flight from Ketchikan to Stewart.
4. *25 men (Klondike Hel.)* Half hour for return trip between Stewart and mine.

A total of sixteen men would be employed as follows:

- 1 manager & acct-clerk.
- 1 engineer
- 1 geologist
- 1 engineer assistant
- 8 miners
- 2 diamond drillers
- 1 cook
- 1 bull cook

FIRST SEASON

Preliminary

Rehabilitating bunk house for 16 men		\$10,000
Helicopter taking in supplies		20,000
Cargo plane dumping oil drums and lumber in <u>snow</u>	<i>where?</i>	10,000
2 compressors (each good for 1 diamond drill and 2 machines)		30,000
2 mucking machines, 2 air trammers, 8 cars, 4 machines		30,000
		<u>100,000</u>

Miscellaneous

Helicopter 1 day per week	20,000	
Radiophone rent and operation	500	
Bunkhouse operation @ \$100 per day	14,000	34,500
		<u>134,500</u>

D Level

Clean up and slash to take equipment	5,000	
Advance main heading 1,000 feet	80,000	
Diamond drill flat to E from N 14,000 position 700 feet	3,000	
Diamond drill + 30°W to E from N 14,000 position 500 feet	2,500	
Diamond drill fan of holes at 250 feet and 750 feet advance	20,000	111,000

20.00/ft - 1 incl. timber to be air-lifted.

I Level

Clean up and slash to take equipment	10,000	
Advance main heading 500 feet north	40,000	
Raise 500 feet to D Level	40,000	90,000

Contingencies 14,500

Total 350,000

Handwritten notes on left margin: "Preliminary report on..."

Handwritten scribbles at bottom of page.

The above expenditures could demonstrate:

1. Another cross zone of ore shoots within 1,000 feet of the present. *basis for theory?*
2. The amount of ore in the D vein below the 4,700 feet level.
3. The extension of the ore shoot in the Blind vein below 5,100 foot level.
4. Possibility of an ore shoot on the Wake vein.

If the results are sufficiently encouraging a second season of exploration would be carried out as follows:

SECOND SEASON

Preliminary

Helicopter	20,000	
Cargo plane	10,000	
<u>Miscellaneous</u>		
Helicopter 1 day per week	20,000	
Radiophone	500	
Bunk house operation	14,000	

D Level

Advance main heading another 1,000 feet	80,000	
Raise in new ore found in previous year 500 feet	40,000	
Extend main raise on original ore-body to surface	24,000	
Sub-drift at 4,890 feet el to north 200 feet	16,000	
Second raise at 150 feet further north to surface 550 feet	44,000	
Sub-level at 5,100 feet el 500 feet	40,000	
Continue diamond drilling in main heading	20,000	
Crosscut to Blind vein if ore indicated by drill	<u>48,000</u>	312,000

I Level

Sub-level in ore from raise 500 feet		40,000
Contingencies		<u>23,500</u>
Total		440,000

As a result of the above work the decision can then be made as to whether the driving of a tunnel at the 4,000 feet elevation from the Silverado side is justified by the amount of ore proven.

REMARKS

1. The figures presented above suggest that the cost of using a helicopter to service a development campaign in the lower Prosperity workings would not be prohibitive - an expenditure of \$50,000 out of a total of \$350,000 to re-open two levels, do 2,000 feet of drifting and raising, 5,000 feet of diamond drilling and spend \$60,000 on equipment. In comparison a 5 1/2 mile road up to the lower portal of the Silverado workings would cost \$60,000.
2. For helicopter transportation the compressors, mucking machines, air trammers and mine cars should conveniently break down into 800 pound loads. The other major items for transportation in one season will be:

	Diesel oil	100 tons	
	Explosives	20 tons	
<i>For sub-levels --</i>	12 pound rail	18 tons	<i>- 16"-20" for haulages.</i>
	4" Aluminum air line	2 tons	
	<i>(for develop. only)</i>		

By using 1" plastic water line and 16" plastic vent tubing a large saving can be made both in cost and weight. *Nelson Mack, Stosh*

3. The development work in the first season is aimed at:
 - a) determining the extent of the ore below the D level which, if substantial, could nearly double the reserve on this orebody and
 - b) finding a new set of orebodies within 1,000 feet of the present workings which would assure a profitable operation.
4. The work in the second ^{season} would develop the indicated ore into the proven category and also explore still deeper into the mountain for further orebodies. At some time during this period it is hoped that sufficient ore will be proved to warrant going ahead with a haulage tunnel from the Silverado side and the erection of a mill.
5. A visit should be made by helicopter to the Prosperity mine this year if possible or early next season to ascertain the present conditions of the H and I tunnels, the gauge of the track, what miscellaneous materials such as rail and pipe are available, the condition and renovations necessary at the lower bunkhouse. Suitable dumping sites for the fixed wing air-craft and landing spots for the helicopter at the portals of the two tunnels and at the bunkhouse should be chosen.

6. Recently (October 1961) an extraordinary flood is reported to have destroyed the air-strip on the gravel flat alongside the river at Stewart. This report should be checked and if true the plans for rebuilding ascertained. If a float-equipped cargo plane has to be used it will not be as efficient.

SILVERADO TUNNEL SCHEME

As an alternative to developing from the old Prosperity-Idaho workings I have previously (1955) advocated the driving of a tunnel at the 4,000 foot level from the Silverado workings for 7,000 feet and connecting with the I tunnel by a 200 foot raise. It was hoped that new orebodies would be found as the heading progressed through the mountain.

In order to gain access to the 4,000 foot elevation via the Silverado workings and to maintain an operation throughout the year the proposed scheme involves the following expenditures before driving can commence:

1. Log bridge across river at Stewart	3,000
2. Truck road at 10% grade from sea level to 2,950 feet	60,000
3. Rehabilitation of 2,950 level	5,000
4. Air hoist for men and supplies in 200 foot vertical shaft	15,000
5. Retimber old raise between 3,150 and 3,450 feet levels	3,000
6. Equip raise with hoist for men and supplies	15,000
7. Slash out 3,450 foot tunnel for equipment	5,000
8. Extend 3,450 foot drift for 500 feet on vein	40,000
9. Raise 550 feet to 4,000 foot level	44,000
10. Equip raise with hoist	15,000
11. Drift to daylight to north on 4,000 foot level	16,000
12. Mucking machine, air trammer, 2 jacklegs, 4 cars	15,000
13. Compressor	10,000
14. Engineering	14,000
15. Contingencies	40,000
	<hr/>
Total	300,000

ECONOMICS

The following figures illustrate the amount of ore required to warrant putting the mine into production with a 300 tons per day mill:

Mill	500,000
Ore pass and tunnel	1,000,000
Pre-production development	800,000
	<hr/>
Total Capital requirement -	2,300,000

The net value of the ore is calculated as follows:

	<u>Grade</u>	<u>Recovery</u>	<u>Price</u>	<u>Net</u>
Ag	22.50 oz.	95% or 21.35 oz.	90¢	19.20
Pb	2%	90% or 36 lbs.	10¢	3.60
Zn	2%	50% or 20 lbs.	10¢	2.00
				<hr/>
		Total net recovery -		\$24.80

Operating costs would be approximately as follows:

Mining	\$ 5.00
Milling	3.00
Transportation	1.00
Miscellaneous	2.00
Development	3.80
	<hr/>
Total	14.80

These figures suggest that a working profit of \$10.00 per ton could be achieved and that 300,000 tons of ore of the average grade indicated would be needed to pay back the investment with interest and replace with a similar ore-reserve. A net profit of \$1,000,000 per year would then be obtained if the same rate of production is maintained.

RECOMMENDATIONS

1. As soon as possible make a trip by helicopter to inspect the present conditions at the Prosperity mine.
2. Make detailed plans and assemble equipment and supplies during this winter so that an early start can be made next spring to open up the lower Prosperity workings for development.
3. Carry out the programme for the first season's work as outlined in this report.

(Signed - A. C. Skerl)