

GM 58829

SUMMARY REPORT ON DEVELOPMENT PROGRAMME

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SUMMARY REPORT
ON
DEVELOPMENT PROGRAMME
ON THE PROPERTY OF
GOLD HAWK MINES LTD.
CADILLAC TOWNSHIP, QUE.

Montreal, Que.

March 29, 1974.

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GM 58829

S U M M A R Y

The property of Gold Hawk Mines Ltd. in Cadillac township consists of the former producing properties of Central Cadillac and Wood-Cadillac Mines. The results of a ~~recent~~ ^{the} surface diamond drilling programme conducted by Gold Hawk Mines Ltd. have been correlated with previous development and production data on the properties.

On the basis of the previous production data and the recent drill results, it would appear the average grade of all ore developed on the property will approximate 0.16 ozs. gold per ton, *although*

The total tonnage potential of the property, as indicated by previous and present work, amounts to 1,546,000 tons made up of probable - 306,000 tons, drill indicated - 404,000 tons, and geologically inferred - 836,000 tons. However, this tonnage is in blocks that are widely spread and thus are subject to high development and mining costs.

The development of the property is not regarded as economic at the present price of gold but at \$200.00 per ounce, the results should be re-evaluated. At that time, some consideration should be given to the possibility of a large tonnage, lower grade operation as opposed to the selective mining carried out in the past.

SUMMARY REPORT
ON
DEVELOPMENT PROGRAMME
ON THE PROPERTY OF
GOLD HAWK MINES LTD.
CADILLAC TWP., QUE.

INTRODUCTION

The property of Gold Hawk Mines Ltd. in Cadillac township now consists of all of the claims formerly held by Consolidated Central Cadillac Mines. The property covers a length of 7,500 feet along the gold producing Cadillac shear. Underground development and production has been carried out by means of 3 shafts and a winze along a length of 3,500 feet and to a maximum depth of 1,000 feet.

Gold Hawk Mines Ltd. has completed a programme of surface diamond drilling in two separate areas on the property. In addition, the workings were de-watered to the 100 foot level at the No. 3 shaft and an examination made of the underground development on this level.

The following is a summary report of the exploration carried out by Gold Hawk Mines Ltd. and its correlation with the previous development. Estimates are also made of the future potential of the property.

MINERALIZATION AND ORE OCCURRENCES

The ore occurrences on the Gold Hawk property are found essentially within a favorable host with a width of about 75 feet. This favorable horizon is bounded on the north by a band of iron formation and on the south by the Cadillac shear zone which consists essentially of talc schists.

Two types of ore deposits are recognized within this favorable zone and are described as follows:

1. "Sulphide ore" which occurs as vertical lenses along or close to one or both contacts of the iron formation band. They are usually well mineralized with pyrite

and some arsenopyrite accompanied by silicification and in some cases vertical quartz veins. The gold in many places is irregularly distributed with some high grade streaks. The ore mined from this type of ore was of better grade and served as sweeteners in former production.

2 Quartz-tourmaline ore, which proved to be the most important from the point of view of tonnage mined and indicated, consists of quartz, tourmaline, pyrite, and arsenopyrite with some scheelite and native gold. Usually, the wall rock is impregnated with massive, fine grained tourmaline and mineralized with arsenopyrite and smaller amounts of pyrite.

Although the zone between the Cadillac shear zone and the first band of iron formation, within which the veins are located is essentially vertical, the quartz-tourmaline veins themselves are flat. They occur as ribbon-like veins and are quite narrow but extend laterally along strike over lengths exceeding 1,000 feet.

INTERPRETATION OF RECENT EXPLORATION

The recent exploration completed by Gold Hawk Mines has consisted of surface diamond drilling, together with a limited examination of the 100 foot level on the former Central Cadillac property. As a result of the two types of ore occurrences described above, correlation of individual drill intersections is very difficult. However, the presence of gold-bearing intersections in the drilling, combined with production and development data from the previous operators, makes it possible to arrive at approximate tonnage and grade figures.

The recent drilling programme was carried out in two separate areas of the large property.

1. No. 4 Shaft Area - Wood-Cadillac Property

The drilling here consisted of 10 holes with a total footage of 3,853 covering a strike length of approximately 1,200 feet. This extends from the common boundary between the Wood-Cadillac and Central Cadillac properties to 400 feet east of the Wood-Cadillac No. 4 shaft. In this area, very little stopeing has been carried out above the 300 foot level and none below the 750 foot level.

The recent drilling results, correlated with drill intersections from the Wood-Cadillac work, indicates that there is a more or less continuous zone containing intersections of both types of ore above the 300 foot level. From examination of mine data, it appears that the greater portion of this area has not been mined.

All recent holes drilled were angle holes and intersections ranged from 0.39 ozs. gold per ton over 20.0 feet (C73-4) to 0.44 ozs. gold per ton over 1.7 feet (E73-8). Lower grade intersections include 0.05 ozs. over 30.0 feet (C73-4) to 0.10 ozs. over 9.3 feet (C73-3). It is difficult to determine true widths as it is not always known whether the intersection is cutting the vertical sulphide ore or the flat-lying quartz-tourmaline veins. If we average all intersections in this area, the average grade is above the mine average of 0.167 ozs. gold per ton. However, past experience from mining here and other mines along the belt indicates that generally drill intersections are higher but actual mining has shown that the average grade is quite uniform at about 0.16 ozs. gold per ton. This is discussed in more detail later in the report.

In addition to the strike length of 1,200 feet described above, there is an extension to the east of about 1,000 feet along which there is some underground development and surface drilling. In this area there is only limited stoping, largely between the 375 foot and 500 foot levels with practically nothing below 500 feet. In examining the earlier drilling in this area, it is found that the drill intersections reported were largely over narrow widths. However, the drill logs show arsenopyrite in the wall rock with lower values which allows us to use greater widths containing lower grade material. Examples of this are as follows:

Hole 68-1 (1,400' east of No. 4 Shaft)	0.13 ozs. gold per ton over 41.9 feet.
Hole 68-7 (800' east of No. 4 Shaft)	0.25 ozs. gold per ton over 59.6 feet.
Hole 68-8 (1,000' east of No. 4 Shaft)	0.06 ozs. gold per ton over 34.8 feet.

2. Northeast Area - Wood-Cadillac Property

This area is in the northeast corner of the property where it is bounded on the north and east by Belleruche Mines (controlled by Upper Canada Resources). The diamond

drilling programme here consisted of 6 holes with a total footage of 3,593. This drilling has outlined a strike length of 750 feet of the typical ore zone containing intersections between the Cadillac shear and the iron formation to the north. This is apparently the faulted section of the zone from the Wood-Cadillac workings to the west. The 750 foot length of the ore zone in this area on the Gold Hawk property continues to the west and east onto the Salleroye property and most of the ore above 300 feet is also on the Salleroye property to the north. The dip carries it onto the Gold Hawk property below this horizon but it is apparent that any mining in this area would require a joint venture or acquisition of the Salleroye holdings.

The drilling outlined what appears to be the vertical type ore near the iron formation for a length of 500 feet with an average width of 5.6 feet. The average grade indicated is 0.26 ozs. gold per ton which is above the mine average grade of 0.16 ozs. per ton. This bears out the earlier statement that the vertical type ore was used as "sweeteners" in the former production. The other intersections obtained in the drilling in this area were generally lower grade and likely represent the flat-lying veins.

UNDERGROUND EXAMINATION

The recent drilling has been confined to the Wood-Cadillac property with only one hole on the recently acquired Central Cadillac property which adjoins the Wood-Cadillac property. This property covers a strike length of 1,600 feet developed underground and the workings are connected to the Wood-Cadillac underground development.

From data examined on this property, there is an indicated ore body developed on the 100 foot level with a length of 241 feet. This is referred to as the 1-BE ore body and channel samples averaged 0.65 ozs. uncut and 2.52 ozs. cut over an average width of 4.9 feet. Duck sampler averaged 0.52 ozs. gold per ton. Data available indicated only 3,445 tons had been mined above the level averaging 0.33 ozs. per ton and it is apparent that this orebody is above mine average grade.

On the above basis, the 100 foot level was de-watered using the No. 3 shaft, so that proper examination and sampling could be conducted. This work revealed

that the 1-8E orebody consisted of a flat-lying ore body and it would appear that it has been completely mined. There were no other indications of additional ore and the workings were allowed to flood.

TONNAGE AND GRADE ESTIMATES

From the recent drilling results, combined with the previous data, it is obvious that there is a substantial tonnage of gold-bearing material along a strike length of 5,400 feet. This includes 3,500 feet of underground development plus an additional 1,900 feet from the east end of the Wood-Cadillac workings to the Bellerocche boundary at the extreme east end of the property.

As mentioned earlier, it is difficult to accurately calculate both tonnage and grade due to the two types of ore structures involved. However, previous production *data* figures appear to establish both tonnage potential and grade figures and there is every indication that any extensions to the mined areas is of a similar nature.

The property now held by Gold Hawk Mines Ltd. consists of the ground held by Central Cadillac Mines Ltd. and Wood-Cadillac Mines Ltd. Both mines have been partly developed to depths of 750 and 1,000 feet respectively and from 1939 to 1943 total tons milled amounted to 377,489 tons averaging 0.167 ozs. gold per ton with minor amounts of silver and tungsten. Production was resumed in June 1947 and continued to September 1949. During this period, a total of approximately 282,000 tons were milled with an average grade of 0.13 ozs. gold per ton. The reason for the lower grade of ore milled during this period is that most of the vertical type ore with a grade of 0.25 ozs. gold per ton had been previously mined. As a result, almost all of the ore mined in this period was of the flat-lying quartz tourmaline veins which is subject to heavy dilution.

The above indicates that the average grade to be expected from a combination of the two ore types is 0.167 ozs. gold per ton. A study of other production figures along the Cadillac belt (excluding O'Brien which is on the south side of the Cadillac shear) shows that this figure is fairly constant.

The total tonnage milled from the combined mines amounts to 659,489 tons. From a study of the production

data, the Wood-Cadillac property appears to have the greater tonnage potential. In this mine the tonnage potential is calculated to be 50 tons per vertical foot for every 100 feet of strike length. In the Central Cadillac, the potential is calculated to be 35 tons per vertical foot for every 100 feet of strike length.

Using this data, combined with drill and geological data, a tonnage estimate can be made divided into the following categories:

1. PROBABLE ORE - indicated by previous underground development and diamond drilling.
2. DRILL INDICATED - That ore indicated by surface and underground drilling but not investigated by underground development.
3. GEOLOGICALLY INFERRED - This category applies to the depth possibilities beyond drill indicated ore as there is no indication of a change in the geological conditions below 1,000 feet.

The tonnage estimates are as follows:

PROBABLE ORE

Block C	- West end of old Central workings	56,000	
Block D	- Wood-Cadillac between 500 and 1,000' levels	<u>250,000</u>	306,000

DRILL INDICATED ORE

Wood-Cadillac	- No. 4 Shaft Area above 250' level	72,000	
"	" - East of Underground workings	80,000	
"	" - 800 to 1,000' levels	152,000	
"	" - East end - 400 to 500' level	30,000	
Central Cadillac	- Between 500 and 750' levels	<u>70,000</u>	404,000

<u>GEOLOGICALLY INFERRED</u>		<u>Tons</u>	<u>Tons</u>
Wood-Cadillac	- 1,000 to 1,500' Level	360,000	
" "	- East of underground workings above 300'	84,000	
" "	- East end - 500' to 1,000' level	120,000	
Central Cadillac Property	- 750 to 1,500' Level	<u>272,000</u>	<u>636,000</u>
	Total:		1,546,000

METALLURGY

Mill tests have recently been completed by Malartic Gold Fields Ltd. on drill core rejects. The average grade of the test sample was 0.2144 ozs. gold per ton.

The results of these tests showed that with a grind of 95% minus 200 mesh, a recovery of from 94 to 95 percent could be expected. Production records indicate a similar recovery was obtained during the operation.

CONCLUSIONS AND RECOMMENDATIONS

Based on a study of production data, previous development and recent drill results, there is an estimated potential to a depth of 1,500 feet of 1,546,000 tons grading approximately 0.16 ozs. gold per ton. It is quite possible that at least a portion of this tonnage will have a grade of closer to 0.20 ozs. gold per ton. This is based on the consistently higher average grade indicated in the recent drilling programme which may indicate a higher percentage of the sulphide ore in the upper horizons. ~~The higher grade ore sheet shown in the upper levels on the recently acquired Central Cadillac property is also encouraging.~~

At the present gold price of approximately \$175.00 per ounce, the recoverable grade should range between \$26 and \$33 per ton. Malartic Goldfields Mines has indicated that it will treat any ore from the property on a custom basis, thus eliminating heavy capital expenditures in any mining operation. On this basis and using selective mining, total operating costs would probably be in the vicinity of \$20.00 per ton. However, there is a possibility that with the high price of gold, a large tonnage lower grade deposit

could be developed rather than resort to selective mining with its high costs.

The next stage of development for the property is underground as the potential has been well indicated by previous work. The initial programme should consist of de-watering the workings to the 500 foot level, followed by geological examination and sampling. The estimated cost of this programme is \$250,000.00 and at the completion an evaluation can be made to determine the programme for the further development of the property.

Respectfully submitted,

H.O. Bergmann, C. Eng.

Montreal, Que.
March 29, 1974.