ADVISORY REPORT ON FUTURE EXPLORATION AND DEVELOPMENT WORK

EMANCIPATION MINE
BOULDER COUNTY
COLORADO

By

H. W. C. PROMMEL

August 1929

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Report furnished by: H. W. C. Prommel.

H. W. C. PROMMEL
CONSULTING GEOLOGIST
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DENVER, COLORADO

August 30th., 1929

LETTER OF TRANSMITTAL

Dr. John A. Oille,
112 College St.,
Toronto, Ontario,
Canada

Dear Sir:

In compliance with your personal request under date of August 24th, 1929, I accompanied you to the Emancipation mine, eastern Ward mining district, Boulder County, Colorado, to inspect those mine workings which are now accessible, interview the natives in the vicinity regarding the past merits of the mine and advise with you regarding the merits and costs of additional exploration and development work. One and one half days were spent at and near the property in company with you, after which cost data were gathered by me in Denver.

In the following summary I have briefly set forth the general geologic features of the property and have listed, together with their costs, the different pieces of work which should be undertaken and which, based on the past available history of the mine and existing geologic conditions, are warranted to be undertaken. The summary is followed by a more detailed discussion of costs and an outline of the development campaign. The report is herewith respectfully submitted.

Very truly yours,

(Signed) Harold W. C. Prommel.

HWCP:LMM

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SUMMARY

On the pages following this summary the location, general geology, and history of the Emancipation mine Boulder County, Colorado, are briefly discussed. They are followed by detailed cost data and advisory matter regarding an exploration and development program briefly outlined in this summary.

The past history and general geological conditions present at the mine warrant further exploration and development work, a summary of which is set forth as follows:

1	A cross-cut 125 feet long from the Gardner tunnel level to the Emancipation shaft. Average cost per foot $5.25 (labor, power and supplies). Time 21 working days, two shifts per day.		$ 656.25
2	Shaft station for hoist and sheave wheel, cars, etc. Labor, power and supplies	$ 200.00	
	Machinery such as hoist, bottom valve bailer bucket, ore buckets, bucket cars, sheave wheel and cable.	1,536.00	
	Unwatering Emancipation shaft from 60 feet below Gardner tunnel level to 400 foot level. Labor, power and supplies. Working time 22 days.	783.00	$2,519.00
3	Drifting north on fourth level under Gardner tunnel winze ore shoot, according to Newell's map. 150 feet of drifting; labor, power and supplies. Working time 20 days, two shifts per day at $4 per foot.		600.00
4	Cross-cutting 50 feet from Emancipation vein on Gardner tunnel level to probable ore shoot on National State vein; labor, power and supplies. Working time 10 days, two shifts per day at $5.25 per foot.	262.50	
	Cleaning up and timbering on Gardner level	75.00	337.50
5	Continuing surface cross-cut tunnel under probable ore shoot on 50 foot Emancipation level. Labor, power, and supplies. Working time five days, two shifts. 25 feet at $5.25 per foot	181.25	
	Rails and ties for 125 feet of tunnel	69.00	250.25
	General Expenses in connection with work outlined;-		
	Workman's compensation insurance - 13 men at $25	325.00	
	Freight Boulder to mine, supplies, machinery, hoist, rails, pipe, etc.	100.00	
	Amount General Expenses for'd	$425.00	
	General expenses continued -		
	Installation of machinery	$250.00	
	750 feet of 2 inch galvanized pipe	211.00	
	Surveying and maps	100.00	
	1 foreman, two months	500.00	
	Assaying	100.00	

Consulting Engineer, Retainer $250 per month.	500.00	
1 Drifter drilling machine	300.00	$2,061.00

Total approximate cost of exploration work outlined $6,424.00

The above work will require sixty three actual working days. Taking into consideration shut-downs and unforseen emergencies three months should be figured on in which to complete the work in which event costs would increase slightly. The above estimates are based on the cost of new machinery, taking into consideration machinery already at the mine. Ample time has been allowed for all work if efficiently and economically done.

UNWATERING EMANCIPATION SHAFT FROM FOURTH TO SIXTH LEVEL. This work should not be undertaken before all of the above work, which can partly be done at the same time, is completed. If it is then desired to unwater the Emancipation shaft from the fourth to the sixth level this can be done in two ways, namely -

First. Shutting down all other work in the Emancipation shaft levels and using the hoist and water bailer for unwatering. Total time required would be sixty one days at a total cost of $1,285, without installation of station pump to keep the water down. Depending upon the amount of inflow water it could then be determined whether it would be advisable to install a station pump, or to use the water bailer during part of the day.

Second. If ore is developed on the fourth level and it is desired to keep development work going. In this instance an electric station pump capable of raising water 600 feet should be installed on the fourth level and a Number 7 Cameron sinking pump, capacity 50 gallons per minute with present compressor capacity at the mine, should be placed in the shaft for unwatering purposes. This pump would take all of the air from the present compressor so that no drilling could be done on other development work. If other development work is to be carried on the compressor capacity should, therefore, be doubled. The time required to unwater the Emancipation shaft from the fourth to the sixth level, using pumps, would be thirty-five days, at a cost approximately as follows:

1 Electric Station Pump	$ 900.00
1 Number 7 Cameron Station Pump	422.50
Labor and Power	920.00
1 Compressor	2500.00
Total Cost - - - - - -	$ 4742.50

This cost could probably be reduced by renting an additional compressor for the unwatering period. After unwatering, the electric station pump should be moved to the sixth level.

Before undertaking any of the above work a working map should be obtained from Mr. Armstrong, Civil Engineer, Boulder, Colorado. From this map Mr. Armstrong should lay out the work and set line-up props as the work progresses so that the cross-cuts could be kept straight. All additional work done should be carried on to the working map.

If the above development work proves successful a detailed geological study should be made of all the mining claims under lease, in connection with which a topographic and areal geology map should be prepared. Past mining on this property has been concentrated solely on extraction of the rich ore shoot north of the Emancipation shaft and little or no exploration and development work has in the past been done on the property. This lack of past foresight enhances the speculative value of the property, as a number of veins and their intersections with the Fortune dike fall within the property lines.

In connection with the detailed geologic work a claim map should be prepared to study the legal status of ore bodies encountered and thus avoid litigation in the future if additional ore bodies are opened up.

From information now obtainable it appears that the greatest amount of free gold in the ore occurs on the third level of the Emancipation shaft. While some free gold is said to be present on the sixth level, Tellurium ore predoninates. The length of the ore shoot mined in the past above the sixth level is approximately 200 feet. Its length and depth below the sixth level can at this time not be predicted. Ores in the Ward district have been mined to a depth of 1100 feet, below the zone of secondary enrichment. It is, therefore, safe to assume that ore may be found to a depth of 800 feet below the collar of the Emanciapation shaft with the ore decreasing in value as additional depth is obtained.

Respectfully submitted,

(Signed) Harold W. C. Prommel.

HWCP:LM

August, 1929.

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DENVER, COLORADO

ADVISORY REPORT ON FUTURE EXPLORATION AND DEVELOPMENT WORK EMANCIPATION MINE, BOULDER COUNTY, COLORADO.

By H. W. C. Prommel   August, 1929

The object of this report is to state briefly geologic conditions at and near the Emancipation mine, give a summary of past activities and mining, and outline future exploration and development work with cost data for such work.

FORMER REPORTS Reports on the property have in the past been made by Mr. L. A. Newell, mining engineer, Caribou, Colorado; Mr. E. J. Temple former owner of the mine, and Mr. Chas. E. Emigh also a former owner of the mine. There is also a brief report on the property by Ernest Le Neve Foster, former State Geologist of Colorado. His report is dated February 19, 1885, at which time the main shaft of the Emancipation mine had been sunk 357 feet. The writer has studied all of the above reports.

LOCATION The Emancipation mine is situated in the eastern part of the Ward mining district, Boulder County, Colorado. It is reached from Boulder over a good automobile road, a distance of eight miles.

GENERAL GEOLOGY The country rock at the Emancipation mine is granite with some granodiorite and granite gneiss. The country rock is traversed by rhyolite, and dacite porphyry dikes. One of these porphyritic dikes known as the Fortune dike crosses the claims and intercepts the veins on the property. The strike of this dike is northeast southwest and it dips 35 degrees to the northwest.

The mineral bearing fissure veins on the claims strike in a north northeast direction and dip slightly to the northwest. Ore shoots on the veins show a northerly pitch. The gangue material of the veins is a rotten country rock(granite) which usually surrounds a blue quartz vein, varying from several inches to a few feet in width. Owing to the many small quartz feeders throughout the gangue material the walls of the vein are irregular, the average width being about four feet. The quartz is almost free from pyrite and carries gold values in the form of native wire gold and plated gold and tellurium, with occasional high silver values.

HISTORY The Emancipation was worked as early as 1882 by Mr. Charles C. Emigh. Litigation developed at a later day and the property was sold to Mr. E. J. Temple. After Mr. Temple's death his wife inherited the property and is at this time the owner of the property. Prior to Mr. Temple's death the property was open to leasers and this is the present method of working it. The main ore shoot which has been mined on the property occurs a short distance north of the Emancipation shaft, on the intersection of the Emancipation, Western Slope and State National veins, which intersection is cut on the fifth level of the mine by the Fortune dike. The ore shoot is about 200 feet in length and extends from the surface downward to and past the 600 foot level which is the lowest level opened on this ore shoot. Some twenty-five years ago leasing operations were stopped on the property and the mine was allowed to slowly fill with water. At a later date the Gardner tunnel was driven to the Emancipation vein. The tunnel level corresponds to a depth of 188 feet below the collar of the Emancipation shaft. On this level a second ore shoot north of the one just described was encountered and some stoping was carried on above the tunnel level. A winze was also sunk on this ore shoot to a depth of approximately 80 feet and rich ore extracted from this winze. A southward drift finally connected with the old stopes. The water level in the mine is now at the bottom of the winze or approximately 80 feet below the Gardner tunnel level. The winze and the workings therefrom are in very poor condition and it is not deemed safe to continue work therein. The present holders of the lease have extracted some ore from the winze and have done some mining on the vein between the ore shoots above mentioned but the value of the mill-heads has been too low to make the undertaking profitable to-date.

COST DATA

The cost data briefly set forth in the summary are based on the following items:

Cross-cut and Drifting work:

1 shift, 8 hours, breaking 3 feet of ground with 8 holes.

1 mucker	$4.50
1 machine man	5.00
Power (electricity)	2.00
Powder (8 holes, 24 sticks)	1.80
Fuse	.24
Caps	.25
Rails, 8 pounds	1.60
Ties,	.10
Carbide (2 lamps per shift)	.18
Total	$15.57

Average cost per foot $5.19. In the case of drifting on the vein it is estimated that four feet of ground can be broken with the same materials.

Machinery necessary for unwatering the shaft will approximately be as follows:

1 Electric Hoist (single friction drum 20 H.P. motor varying speed electric motor)	$870.00
2 Ore Buckets (900 lbs. capacity, $7\frac{1}{2}$ cu. ft.)	80.00
2 Bucket Cars at $28	56.00
1 Sheave Wheel with bearings, etc	200.00
600 feet of $\frac{1}{2}$ or $\frac{5}{8}$ inch cable at 30¢ per ft.	180.00
	$1,386.00

Cost estimates on unwatering the Emancipation shaft from 80 feet below Gardner tunnel level to the 400 feet level were obtained as follows:

Figuring 20 cubic feet per bailer of water, hoisting speed for round trip, including emptying bailer, three minutes; allowing 18 working hours a day and 4 hours water inflow into the mine. This would give 360 trips of the bailer per day or 7,200 cubic feet of water lifted during a day of 24 hours. Note 18 working hours, 4 hours water inflow, and 2 hours for delays, repairs, etc., giving total of 24 hours.

The size of the space to be unwatered, taking into consideration old stopes is, according to Newell's map, approximately as follows:

Depth 140 feet, length 200 feet, average width 5 feet, total 140,000 cubic feet. Allowing for 25% fill in stopes leaves 105,000 cubic feet of water to be raised.

105,000 cubic feet at 7,200 cubic feet per day is equal to 15 days; allowance for sloppage, additional delays, repairs, timbering seven days, total estimated time 22 days.

The cost of labor is figured at:

3 Hoisting Engineers at $4 per day for 22 days	$330.00
Power $13.50 per day	297.00
Timbers and ladders	100.00
Labor, timbering, 2 men 7 days at $4	56.00
Total	$783.00

Cost estimates of unwatering the workings from the 400 to the 600 foot level are based on similar figures above given, allowing, however, five minutes for the round trip of the bailer, 18 working hours per day, four hours water inflow, and 2 hours for repairs. Amount of water to be hoisted is based on same void calculations. Total time required for this work would be 61 days at a cost of $1,284.50.

Driving the cross-cut tunnel to the Emancipation shaft and prospecting for the ore shoot on the State National vein can be done at the same time, with present power facilities at the mine. Driving the cross-cut tunnel under the south ore shoot on the Emancipation vein and unwatering the shaft can be done at the same time. It remains thereafter to drift under the Gardner tunnel level winze ore shoot. With efficient practical management at the property and supervision by a competent engineer all of the above work should be completed in not more than three months at a cost of not exceeding $7,000. This work would determine whether it would be advisable to unwater the Emancipation shaft from the fourth to the sixth level which would require an additional outlay of approximately $5,000 if other development work is carried on at the same time. The working map of the Emancipation mine should be kept up to-date every month. Ore from the property should be screened. The screenings should be sampled to obtain their value and according to their grade either shipped or milled on the property. Coarse ore should be rough-sorted before shipping or milling. A careful study should be made regarding the amount of powder necessary for breaking ground in the stopes so that unnecessary wide breaking can be avoided. At times it is necessary to break wide on account of the number of feeders. Wherever possible the ore should be mined narrow to avoid introduction of unnecessary waste into the mill-heads. Sampling of all ore encountered should be done by a competent mining engineer.

Respectfully submitted,

(Signed) Harold W. C. Prommel.

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