MR85-2A

COPY

F. Le Roi Thurmond

Mining Engineer
Metallurgist

Snohomish, Wash.
Sept. 26,1929

MR 85-64

Mr.H.I.Staser,
Anchorage, Alaska,

Sir:

In compliance with your commission to examine and report on the property of The Monarch Mining Company,at Girdwood,Alaska, I am pleased to present herein,my report,based on data gathered during a two days stay at the mine,together with a scrutiny of all available records of The U.S.Geological Survey,and other relevant documents.

I wish first to summarize my findings,and conclusions,which will be followed by a detailed analysis.

SUMMARY

The Monarch Mining Company's property on Crow Creek,near Girdwood,Alaska,embodies the essential requirements of a successful small gold mine.

The veins of which there are a number,are fissures in a slate-graywacke formation, which in two nearby mines, The Cliff Mine at Valdez, and The Granite Mine at Port Wells, has prdduced about two million dollars. Many smaller mines in this same formation near Seward, and on Turnagain Arm, have produced very considerable amounts of gold. The placer production of Kenai Peninsula amounting in the aggregate to several million dollars has come from this same series of rocks.

The mine is most favorably situated with reference to transportation, being close to a railroad, and having a first class auto road suitable for hauling all necessary supplies, from end of standard guage road.

The mine is developed to the point where it can be put on production on short notice, by the construction of a small inexpensive mill.

Mine timber and lumber can be had at a reasonable cost from a nearby sawmill.

The quantity of ore indicated,and the gold content of the ore is sufficient to constitute a profitable enterprise. The metallurgy of the ore is simple, and a satisfactory recovery of the gold can be made with inexpensive equipment.

The financial structure of the Company is sound, and the management of the Company is in the hands of conservative and competent hands.

A detailed analysis follows: -

LOCATION

The mine of The Monarch Mining Company is located 10 miles from Girdwood station, on the Alaska Railroad, 74 miles from Seward, the Railroad terminus, and chief ocean port of South central Alaska. The mine is on Crow Creek,near the head of the valley,at an altitude of 3000 feet. A graded and surfaced auto road extends to within 2 miles of the mine. The maximum grade on this road does not exceed 7%. A forest service trail,six feet wide,suitable for sleds in winter, and small caterpillar tractors in summer,extends from the end of road past the mine, Freight can be hauled from Girdwood to the mine for about eight dollars per ton.

AREA

There are four claims in the group,forming an irregular rhomboid, and having approximately three million square feet,or about seventy acres.

TOPOGRAPHY

The topography is that of a recently glaciated mountain area, with deeply incised U shaped valleys,and sharp rugged peaks. At the heads of the valleys remnants of the glaciers still exist. The mine is on a mountain, having a slope of fifteen to thirty five degrees, at an elevation of three thousand feet.

TITLE

The mines were first located in 1909, and had a checkered career spiced with high finance,mismanagement,and wildcatting, until the rights of the owners were lost thru failing to keep up the annual assessment work. They were then located,1926,by Clyde Brenner,who subsequently transferred them to the Monarch Mining Company. Inc., who gave a lease and bond to H.I.Staser,of Anchorage,Alaska. This bond has been assigned to Crow Creek Gold Corporation, incorporated under

the laws of Alaska,and capitalized for fifty thousand dollars. The capital stock is divided into five hundred shares of one hundred dollars par value, of which stock fifty one per cent is owned by H.I.Staser of Anchorage, Alaska. The validity of the title has been passed upon by competent legal authority, and is unquestioned. A patent has been applied for, and the survey has been approved.

GEOLOGY

The rock formation at the mines is slate and graywacke,of Mesozoic age. Intrusions of acidic dikes,has introduced mineralizing solutions, which following fault fissures, and joint cracks, has deposited quartz,with gold,silver,and other associated minerals in well defined lenticular bodies, in veins traversing the slate and graywacke.

The acidic dikes are striking features of the region. They are light in color, and contrast strongly with the black slates, where they cut boldly across the rugged mountains for thousands of feet.

The principle series of dikes strike Easterly and Westerly, and dip northerly, and the important ore veins have similar strikes and dips.

At a distance of about one mile, a great granitic intrusive mass cuts the slates, and near the top of a mountain fingers out into small stringers of dikes. The dikes cutting the slates at the Monarch mine are offshoots of this granite mass, which is a differentiation of a greater granite mass lying under the area.

It cannot be doubted that the intrusive granite was the source of the mineral bearing solutions, which deposited quartz, and gold with their associated minerals in the vein fissures.

The veins carry in addition to quartz and gold,limonite, resulting from decomposition of pyrite, arsenopyrite, pyrite, galenite, and chalcopyrite. Galenite and arsenopyrite are closely associated with the gold, but rich concentratons of gold exist where these minerals no longer exist, but are represented by their oxidation products, limonite, and cerussite.

DEVELOPMENT

The principle vein on the property is known as the South vein. It has a strike of S.83 degrees East, and dips 55 degrees North. It varies in width from eight to forty six inches.

This vein has been explored for two hundred and fifteen feet on its strike, by a drift. A winze in the drift follows the vein downward on it's dip for forty two feet, this winze is partly filled with debris at present, and measures thirty eight feet from the floor of drift.

This drift follows a strong fissure vein from the portal to it's face. The average width of vein in the drift from nineteen measurements is thirteen inches.

Eight feet from the floor of the drift, in the winze the vein splits into two stringers, and separate drifts follow each stringer for a distance into the mountain. It is apparent however that the footwall stringer, which is followed by the main drift is the most important, and that it is this part of the vein which outcrops at the surface where the discovery was made.

Nineteen samples were cut across the vein in the tunnel, by careful mailing. These samples were assayed by Falkenburg & Co. of Seattle. The average geometric, or weighted value of these samples in gold per ton of ore was $21.70. The average width sampled was 13 inches.

Fourteen samples were cut in the winze, at three foot intervals from bottom to top. These gave an average weighted value of $10.44 per ton.

The samples from tunnel and winze combined, represented an average width sampled of 15 inches, and gave an average weighted value of $16.02 per ton.

A sample cut 15 inches wide at the open cut where vein was discovered, gave a value of $468.00 per ton.

The location of these samples, with width in inches, and values per ton of ore are shown on assay map accompanying this report.

A lower tunnel has been driven to develope this South vein, and also to develope a cross vein which strikes S. 18 degrees East. This vein has been but little explored but is a source of possible ore. The lower tunnel has not cut the South vein but should do so in a distance of from ten to twenty feet. It should then be continued as a drift on the vein until under the winze, when a raise would connect with the winze, and furnish a passageway for the ore from the upper level to the lower.

This lower tunnel is the point from which ore should be drawn to the mill which is projected. A photograph accompanying this report shows the portal of this tunnel, above the blacksmith shop. The excavation to the left of the blacksmith shop is designed to furnish a site and foundation for the mill. The vertical distance from lower to upper tunnel is 100 feet. This lower tunnel should develope much valuable ore, and will thus serve a dual purpose most economically. The sketch accompanying this report showing the longitudinal section on plane of vein illustrates well the relationship of these features.

The North vein has been developed by a drift 100 feet in length. This vein strikes N. 87 degrees East, and dips 63 degrees N.

It varies in width from 10 inches to three feet. Only one sample was taken on this vein, which was from a width of 24 inches near the discovery on this vein. This gave a value of $52.00 per ton. It is apparent that this vein may be a source of highly important ore bodies.

ORE MINED

A small quantity of ore estimated at 3½ tons was mined at the discovery on the South vein. This was milled in a small test mill on the property and returned gold bullion, to the value of $ 2185.00. The per ton value of this test lot is thus seen to be $624.00 per ton. As a check on this an assay cut in the present face of the open cut gave $468.00 per ton.

This outcrop is thus seen to be the top of a rich ore shoot which is seen in the drift level, and which continues down to an undetermined point.

EQUIPMENT

Mining equipment on the property consists of a 15 H.P., Z type Fairbanks-Morse gasoline engine, driving a 7" x 6" Sullivan air compressor. There is also air receiver, Jackhammer drill, hose connections, mounting columns, and necessary blacksmith tools. Buildings consist of blacksmith shop, cabin, and test mill. The test mill consists of a 300 lb. stamp, small crusher, feeder, amalgamating plate, and gasoline engine. The capacity of this equipment is from 800 lbs to 1200 lbs. per 24 hours, and is only suitable for very high grade ores.

POWER

There is a fine water power site about one half mile from the mine. A photograph of this site accompanied this report. Power may be developed here up to 500 H.P. It is probable however tht the mine would not require over 50 H.P,, which may be developed with a Pelton wheel, connected to a generator.

WATER

Water for domestic and milling purposes may be had in part from the mine workings, and in any required quantity, from a creek about 1300 feet from the camp.

METALLURGY

Metallurgy of the ore is simple. The gangue is quartz and iron oxide, the gold is free, that is in the metallic condition, and the ore needs but to be crushed to the requisite fineness to free the gold from it. In practice however, some form of crushing device is used, which scours or abraids the gold particles, making them more easily amalgamated. There are many devices on the market recommended by

by the makers either because of their cheapness, or because they embody some peculiar feature - freak mills - which are to be avoided at all costs.
A simple and effective flow sheet for this ore would be as follows:- crusher, fine bin, ore feeder, stamps or chilean mill, amalgamating plates, coarse amalgamator, and Wilfley table.
Recovery in a mill of this type should be about 95 per cent of the gold contained in the ore.

RECOMMENDATIONS

I would recommend that the lower tunnel be turned to a direction of true North, and driven ahead, untill it intersects the South vein, which should be within twenty feet. It is possible that however that the vein flattens out on the dip in which case it would be found farther to the North. When the vein is cut, it should be followed with a drift, to a point below the winze, on the dip of the vein. Connection should then be made with the winze.

Further development should consist of driving lower drift ahead to come under high grade shoot exposed on the surface, and in upper drift.

The only advisable variant from this plan, would be to sink the winze to the lower tunnel level, and then drive the tunnel to connect. This plan while having the advantage of being on ore from the start, would cost more in the end.

A raise should also be driven from the upper tunnel to the surface. this should be located 75 or 80 feet East of the winze.

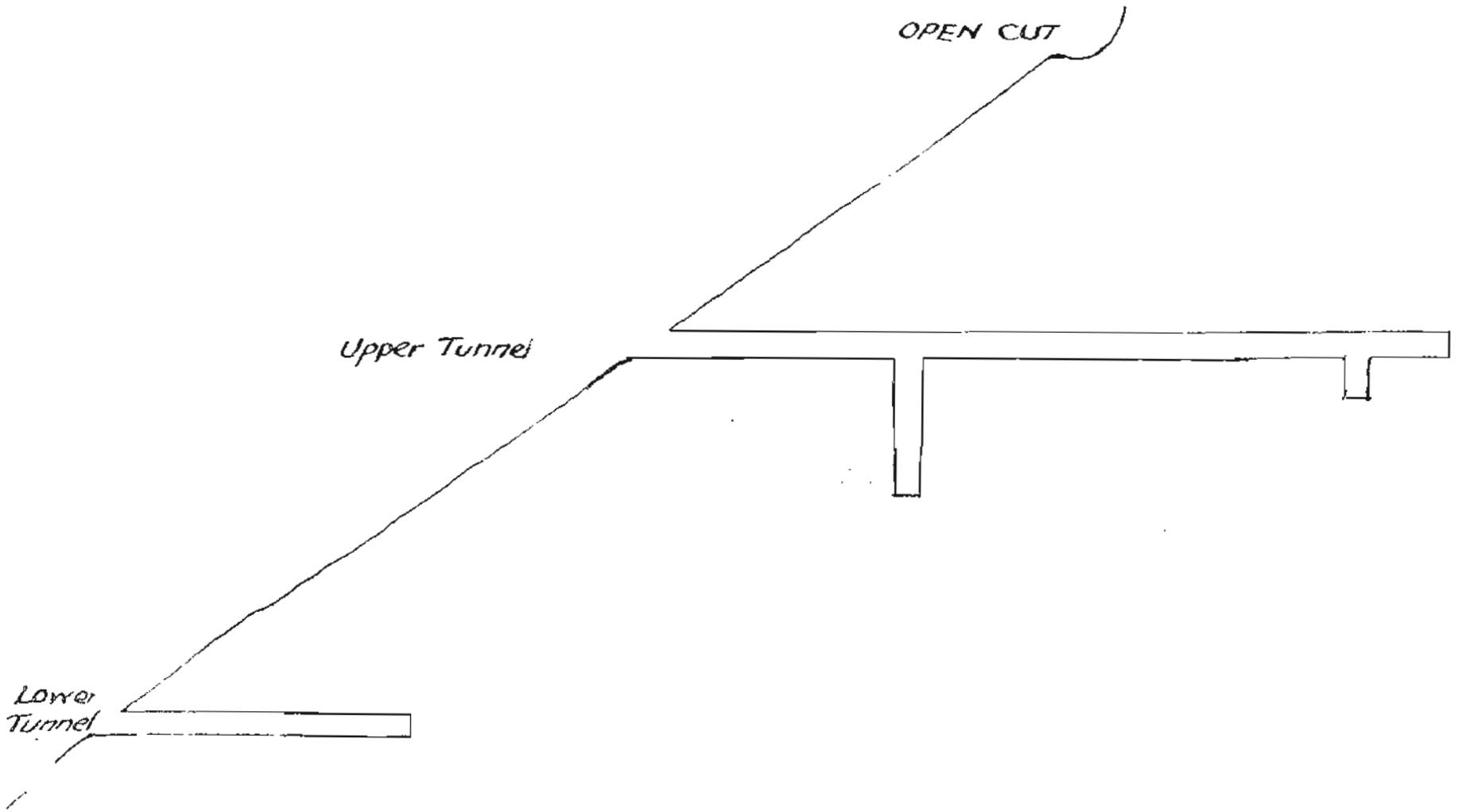
A small mill should be built, the cost of which should not exceed $6,000.00 ready to run. The capacity should be about ten tons in 12 hours. The choice of fine grinding machines should be limited to stamps, Lane Chilean Mill or Denver Quartz Mill. Good used equipment can be had which will materially lower the cost.

In the operation of a small mine overhead charges can be kept very low, the mine after being opened up should pay it's own way, and development risks must be kept commensurate with the probabilities. The manager need not be an engineer but he should be familiar with the common principles of geology, have had considerable practical experience in mines, and have a solid grasp of common sense business principles.

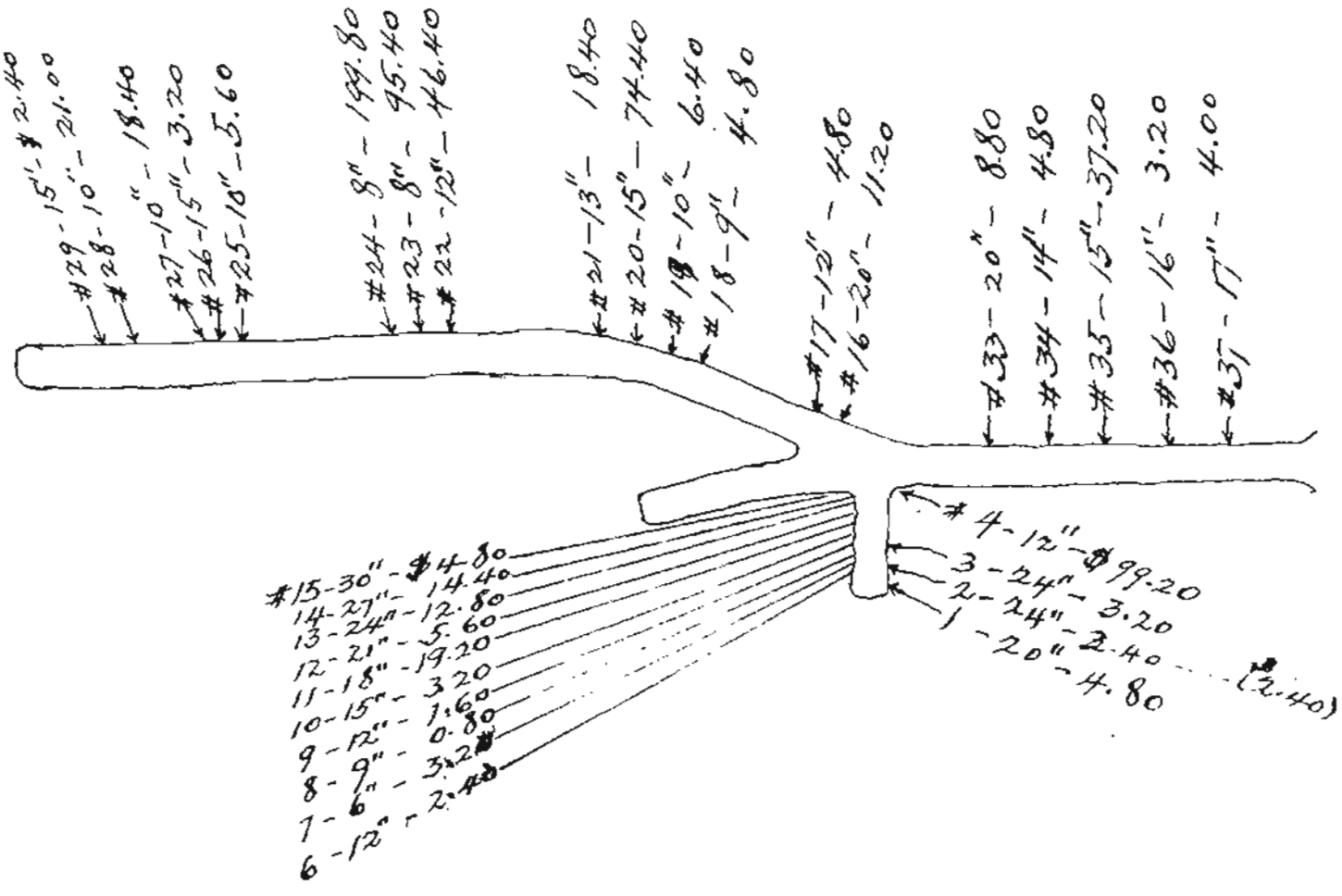
Respectfully submitted

(Signed) Le Roi Thurmond

Mining & Metallurgical Engineer



Longitudinal Section South Vein
showing (red) ore developed
Monarch Mining Co. Girdwood Alaska
Scale 1" = 40'



Assay Map
Upper Tunnel & Winze - South Vein
Monarch Mining Company
Girdwood - Alaska
Scale - 1" = 30'