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THE FLUME TUNNEL, EAGLE RIVER MINE,
EAGLE RIVER REGION,
July 19, 1936.
J. C. Roehm

The Flume Tunnel represents the latest and lowest workings of the Eagle River Mining Company. It is located on the present Eagle River property which consists of eighteen claims held by option by Messrs. Arthur Thane and R. E. Robertson of Juneau, Alaska. This property is located 25 miles northwest of Juneau at the head of Eagle River. The property is reached via the Glacier Highway 27 miles to Eagle River and thence over a government trail 5 miles in length to the camp. From the camp, El. 220', a trail leads up the slope to the Flume Tunnel, El. 560'.

History:

A description of the Eagle River mine is contained in U. S. G. S. Bull. 502, "The Eagle River Region" by Adolph Knopf, pp. 44-46. The upper orebodies mined are described by F. E. & C. W. Wright in "Mineral Resources of Alaska, 1905", Bull. 284, p. 35. Several tunnels, crosscuts, raises and stopes were the result of this operation. These old workings are inaccessible at the present time. A total of 70,112 tons of ore was milled which had a gross value of \$396,819.42, or an average value of \$5.65 per ton (old price). From the gross value of the ore \$372,612.35 was recovered. These figures represent the amount of milling from 1904 to 1912 prior to the Flume tunnel, as taken from mill sheets of the company held by Mr. A. Thane.

In 1912 the Flume tunnel was started to tap the orebodies at a greater depth and to get below the much faulted condition which was present in the upper workings. This last operation under new finance raised by Mr. B. Thane extended from 1912 to 1915. The mill ran for a period of two years on ore encountered in the Flume tunnel. A total of 4,764 tons were milled which had a gross value of \$48,318.79 and averaged \$10.14 (old price). From the gross value of the ore only 56.5% was extracted or a total of \$27,379.33. Nearly all of this ore came from the two small stopes shown on accompanying sketch.

This Flume tunnel was re-opened last season and since the condition of the ground is bad, the probability of its remaining open for any length of time is uncertain. Thus the accompanying geological map was made and this report herewith contains conditions as observed in this tunnel.

Geology of the Flume Tunnel:

The Flume tunnel is located at an elevation of 560' on the south slope of the divide between Eagle River and Yankee Basin. The tunnel was driven approximately 3,000' in a zig zag northwesterly direction following a somewhat intercalated contact of slaty schistose graywacke and graphitic slate. The slate appears to rest on the graywacke and both dip to the northeast. This contact is a zone of weakness which occurs as a soft crumpled, crushed mass which contains small quartz lenses, stringers and gash veins. Where the quartz stringers are numerous along the zone it constitutes a low grade ore. Thus this tunnel was driven more or less following this zone and two small lenses or faulted blocks of lenses were encountered as shown by the stoped areas on accompanying sketch.

Past the first stoppe a fault zone was encountered that displaced the zone horizontally. With the aid of a diamond drill the zone was found displaced approximately 250 feet to the west. Since this zone is tightly timbered, movement along the zone could not be seen. Minimum small slip faults or joints were encountered over the entire distance of the tunnel. They vary considerably in dip and strike. Two large normal fault zones were encountered in the tunnel and marked as Nos. 1 and 2 fault zones on the map. These zones are wide crushed areas and very recent. They appear to have been caused by the melting away of Eagle River Glacier leaving a very steep bluff which later crumbled down and over. These show only vertical movement and only small amounts distributed through the crushed zone. They carry considerable water and necessitate timbering. An altered dike rock occurs over a width of 100 feet located approximately 1300 feet from the portal. This dike has a schistose structure and lies parallel to the foliation of the schistosity. Its color ranges from various shades of green to a yellowish brown, the latter on the outer edges shows considerable alteration. Numerous large to small pieces of this dike material are found in several places occurring in bunches along the drift.

In Bull. 502, "The Eagle River Region" by A. Knopf, pp. 45 in describing the upper workings, Knopf mentions green augite melaphyre sheets, as

"The rocks at the mine consist of an interstratified series of clay slates and graywacke slates, with which are associated a few thin intrusive sheets of green augite melaphyre. A few other types are found, but they are exceedingly rare. Near the end of the 200-foot crosscut into the footwall on level No. 1 a 3-foot bed of light-colored siliceous schist was encountered, which simulates an aphanitic flowbanded rhyolite with small porphyritic crystals. Such rocks that differ greatly from the associated beds may perhaps be of service when attempts are made to relocate orebodies lost through faulting."

Orebodies:

The orebodies consist of small tabular lenses or faulted blocks distributed along the zone of weakness or apparent contact of the two sediments. Two workable lenses were discovered and mined in this tunnel. These are shown in the stoped areas. These appeared to be faulted blocks of a larger body and contained commercial values. Other small bunches of quartz and ore are evident as shown by the red areas on the map. These were not sampled, but some were reported to contain commercial values. The depth to which the ore below the stope will extend is uncertain. (Short faulted blocks are very uncertain as to depth.).

Diamond drill hole No. 1 was reported as having cut two feet of ore which assayed \$5.95 in gold per ton (old price). Holes Nos. 2 and 4 no doubt hit the ore as the later development led to the mining of the stope. Holes Nos. 3, 5, 6 and 7 were reported barren. The dips and depths of these holes are not known, but locations and lengths were taken from an old blueprint of the tunnel from which this map was constructed.

Mineralization:

The ore mined in this tunnel, according to aforementioned mill sheets, shows a much higher per ton value than the ore milled from the old above workings. However, the recovery shows a remarked difference in the amount of free milling gold. Only a 56.5% recovery was made from the ore milled in this tunnel by the processes of amalgamation and concentration. It was reported by Mr. Thane that a 90% recovery was made from flotation tests. This shows that the mineralization contains less free gold and is of a somewhat more complex nature in depth. The ore is a milky white to grayish quartz that is banded with graphitic streaks. It contains sulphides to the extent of 2 per cent by volume and numerous flattened and angular wall rock pieces. It contains free gold, pyrite, galena, arsenopyrite, pyrrhotite and chalcopyrite. This mineralization is well distributed through the quartz. Sulphides of zinc have been reported found in places in the ore. Pyrite and arsenopyrite appear to be the main mineralization of the stringer zones in both the small veins and country rock. Some sections were reported to have showed assay values up to \$3.75 (old price) per ton. To arrive at a conclusion as to the amount of ore in this tunnel at the present time is undeterminable. To determine this would necessitate considerable sampling and some development work. How far the ore goes in depth below the mined stopes is unknown, whether it extends above is also not known. The small quartz bunches as shown on the accompanying sketch contain some ore, but this amount could not be considered large. Whether or not sections of the stringer zones contain values to be considered ore is undeterminable without sampling.

Thus a study of all reports, mill records and such with a few days spent in working out the geology of this sections, would allow one to arrive at a fair conclusion as to future possibilities.

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B. D. STEWART
(Commissioner of Mines)

MR Juneau 112/36

INTERIOR

LETTER REPORT - EAGLE RIVER MINES:

On July 18 and 19, 1936, the writer made a week-end trip to the old Eagle River mining claims. The visit was made on invitation of the parties now holding an option on both this group of claims and the Yankee Basin group adjoining. He accompanied the associate Territorial Mine Inspector, J. C. Roehm. The party traveled to the mouth of Eagle River by car and then by foot trail up the river to the site of the old mining camp near the glacier at the head of the river.

These properties lie on the mineralized belt of slates and schists which extends along the coast of southeastern Alaska between salt water and the peaks of the diorite batholith. The large mine at Juneau is the only producing mine on this immediate zone, although a few other small mines were worked on surface concentrations in earlier years. The Eagle River lode workings were started in 1902 and a 20-stamp mill was erected in 1903 by capital raised in Macon, Georgia. Some broken and displaced blocks of ore were found and mined until 1915 when low values and lack of developed ore caused the mine to be shut down. Only one camp building now remains, used as a dwelling by the two men who are holding on to keep the later tunnels and prospect holes open so that representatives of mining interests can be shown the property. It is the purpose of the men holding these claims under option to interest capital in taking over these properties which have reverted to the status of prospects. This situation has continued for 20 years, due perhaps to the relative uncertainty of finding ore in sufficient persistence and grade to justify the large outlay for development needed.

The ore mined during active years was from quartz lenses and high grade stringers. The average value was from \$5 to \$10 per ton. The ore zone is designated as a stringer lode, formed by mineralizing solutions in the black slates which sheared and are schistose. Greenstone and graywacke beds which form part of the sedimentary series are also altered, but because of their firmer structure were not impregnated and mineralized by the quartz veinlets as were the weak slates. Surface faulting, both from intrusive action and glacial erosion, has shifted sections of the ore zone near Eagle River, but this condition does not extend into the Yankee Basin property.

Possibilities of this property are uncertain. There is a stringer zone several miles long and perhaps a mile in width. In this zone portions may be sufficiently mineralized to mine as low grade ore on a large scale. There may be spotty small lenses of quartz running up to \$20 a ton. To estimate or determine the extent or average grade of minable ore would require diamond drilling or drifting from adit-openings on a large scale. The quartz veinlets are irregularly and locally

mineralized with metallic sulphides, and these have a tendency to be massed in and around fragments of slate inclosed in the quartz. Arsenopyrite, pyrite, galena and pyrrhotite are found. The gold is locked in these sulphides, so that primary ores are not free milling. Flotation would be required.

It is probable that this zone will be explored by some large mining concern, but it may be considerable time before conditions or other local developments bring this about. There is little promise, but the property cannot be entirely condemned on present knowledge.

The visit to this property gave interesting information as to the status of numerous mining properties of this type in this region. Several men are usually living or working on these prospects. To reach them with services of the Bureau is a problem worth considering, but not solved at this time.

Respectfully submitted,

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Assistant Engineer.