MR 193-3

United States Department of the Interior

BUREAU OF MINES

ALASKA FIELD OPERATIONS CENTER
P.O. BOX 550
Juneau AK 99802

February 24, 1983

Sandra Garbowski
Geological Information Technician
Division of Geological & Geophysical Surveys
P.O. Box 80007
College, AK 99708

Dear Sandra Garbowski:

Enclosed are the copies of maps from MR 193-3. The only other report we have written by Seraphim is a confidential report to the Bureau of Mines. This report contains sample analysis data and data on the property management. We cannot release confidential data without written permission. The report title is Kantishna Area-Alaska and included is a Memo Re Kantishna written in 1961. R.H. Seraphim's address is 316-470 Granville, Vancouver 2, B.C.

If the Department of Natural Resourses works with the Bureau of Mines on a project in the Kantishna area you will have official access to the report. However, we cannot release the report to you for public viewing. Thank you for your understanding in this matter.

Sincerely,

Helen Jacobson

Helen Jacobson
Bureau of Mines Library

enc9maps

(3-1-83
Tom Burdtzen has maps.)

MR 1403

KANTISHNA - 1962

SUMMARY AND CONCLUSIONS

The veins previously known, or indicated by geochemical survey, were well exposed in numerous places by 6700 ft. of 'dozer' stripping to bedrock in 1962.

The Red Top lode has been exposed in eight cross-trenches, only one of which contains interesting grade of mineralization, 3.0 ft. of 0.32 oz. Au, 67.8 oz. Ag in Trench 3. The tranches, together with previously available information, indicate one shoot about 50 ft. long, and one which might be 150 ft. long. The 50 ft. shoot (at 5850 E.) has been stoped to 50 ft. depth as shown on section 3 in the 1960 report. It is open at depth. The other shoot, indicated by the small stope at 5950 E., Trench 3, and Davis' data on a cut at 6080 E. now caved, is not attractive where sampled at tunnel level 60 ft. below outcrop (map 8 in 1960 report). A third shoot may exist near the Silver King shaft but information, as reported previously, is inadequate. Ky 66-15

The source or sources of float and soil anomaly on the Friday and Martha Q. claims was not discovered, and much expensive stripping would probably be required to determine them. Kx 66-15

The Silver Pick vein-system was closely explored over a strike length of 1000 ft. The high-grade type of mineralization is even more erratic than that on Red Top. A 140 ft. length on close sampling gave 0.64 oz. Au and 27.5 oz. Ag across 2.8 ft. width but the shoot would require bulk-sampling to give reliable information on grade. The values are concentrated in high-grade lenses which average a foot or less in width, and about twenty ft. in length. Several other veins or vein sections contain high-grade mineralization of similar extent. Kx 66-15

The 'Upper Little Annie' vein was exposed south-west of the stope, where high-grade massive galena mineralization was found to terminate at a greywacke-graphite schist contact. Stripping north-west of the stope was not completed. At least 180 ft. of length containing 'high grade' probably existed. Although Davis' report indicates depth persistence is very doubtful, the shoot could have a flat south-west rake. Kx 66-15

The galena veins on the Little Annie No. 2 claim average only a few inches wide and a few tens of feet long.

The Gold Dollar vein contains a distinct high-grade shoot in the hanging wall of and extending east of an earlier low-grade type quartz vein. The shoot, previous to partial stoping, probably averaged more than 0.37 oz. Au and 78 oz. Ag across 1.8 ft. for 180 ft. length. Kx 66-15

Two lodes on the Gold Eagle contain the high-grade type of mineralization. The lode near the West boundary is known to have discontinuous shoots in its 100 ft. length. The east lode contained the high-grade type in Trench 9 but not in Trench 10, sixty feet distant. Kx 66-15

Trenching on two lodes east of Quigley Hill disclosed attractive values but insufficient length to justify further work.

The high grade silver-bearing lodes on Quigley Hill, and also in the entire Kantishna area, in spite of their abundance and attractive grade, have failed to show sufficient extent to make further exploration attractive. More than a dozen of those considered most promising have now been, or were originally, sufficiently exposed to determine their surface dimensions. The veins investigated are in a variety of geological environments. Although most work has been completed on Quigley Hill in the 'limestone and chlorite' facies, mineralization in and near the porphyry plugs such as on Frank Bonnell's Neverswet property, and in the higher grade of metamorphic rocks such as on the Merry Widow, McGonagill, Greiss, and Florence showings appears equally as erratic and limited in tonnage.

The investigations have included work on the older gold-quartz veins, and this has only served to confirm earlier opinion that grade and size of this type is also insufficient for profitable operation under present conditions.

RECOMMENDATIONS.

The known shoots of high grade mineralization are now fairly accurately delimited on surface, and none show promise of sufficient tonnage to warrant the more expensive underground work. A lessee might be interested in the small tonnage, and if so is directed to the paragraphs herein dealing with the Gold Dollar vein. This vein appears the most likely to provide shipping ore at lowest expenditure, if the crosscut at 2415 elev. can be re-opened. Assuming the participants do not wish to refer the property to a lessee themselves, it should be allowed to revert to the vendors.

INTRODUCTION

A report dated December 1961 recommended a program of stripping to obtain vein exposures at fifty foot or less intervals under close geological and geochemical guidance. Cost of the project, involving a D-6 bulldozer with operator, a geologist, a geochemist, and two laborers was estimated at $27,000.00.

The 'dozer' operated approximately 475 hours, which include 40 hours for major repairs and 30 hours for servicing and maintenance. Stripping to bedrock at average depth of six feet totalled 6700 lineal feet. In addition, the U.S. Bureau also completed about 300 lineal feet in 1962, and had completed about 1200 lineal feet in 1961. Frozen ground was met in all trenching. Several days' thaw was usually allowed between removals of the foot or less of thawed material.

All important mineralization was further trenched using jackhammer, pick, and shovel for added depth and more reliable sampling. Most trenches were tested geochemically at 25 ft. or less intervals during or after 'dozing' to provide optimum direction to the 'dozing' and ensure that no important mineralization was overlooked. Sampling and geological mapping of the trenches had to follow the 'dozing' very closely because further thawing soon caused the trench walls to slump.

Complete costs are not yet available but will probably be well within estimate.

Maps included with this report are:

1. a set of three 100 scale geological maps (1961 copies with additions).

2. a set of three 100 scale geochemical maps (1961 copies with additions) for overlay on the above.

3. Assay plans with detailed geology on 40 scale of Red Top, Silver Pick - Little Maude, Gold Dollar - Gold Eagle, and Little Annie - Little Annie No. 2 claims.

CLAIMS

The option agreement with Red Top Mining Co. was maintained. The option payment of $2,000.00 on February 1, 1962 was made, and the next payment is $3,000.00 on February 1, 1963, followed by $5,000.00 on February 1, 1964.

The option on the Dalton estate property is complete except for the executor's signature on the escrow instructions, and the placing of the document in escrow. A payment of $1,000.00 to the estate is overdue, but awaits the executor's signature. An option payment of $1,000.00 is due February 1, 1963.

Two claims covering the 'Parky' showing, discussed below, were staked and recorded. Assessment work on all located claims under our control has been recorded.

GEOCHEMISTRY

The method and application described in the 1961 report need not be repeated. The initial work in 1962 filled in a number of areas where further work was necessary for better interpretation of the 1961 data.

The strike of the Star and Martha Q. veins partially exposed on Quigley ridge was checked, but important mineralization apparently does not extend southwesterly, in which direction trenching is feasible. Some high readings were found to the north-east, but heavy talus on the north-facing slope here would make trenching slow and expensive.

Further geochemical survey on the Friday claim, when interpreted in the light of the results previously obtained by 'dozing' in the Gold Dollar - Little Annie area, suggested that the erratic high readings and local float on the Friday are derived from mineralization several hundred feet up-slope. Subsequently, trenching on the Friday - Martha Q. boundary disclosed only a few small pieces of float quartz with traces of sulfide. The topography in this area makes it one of the more difficult to trench, particularly because the associated foliage makes thawing very slow. Thus further trenching to bedrock could probably not have been completed in 1962 and was not attempted, although otherwise it might have been justified. The geochemical readings obtained in the completed trench suggest that the source of some of the float and soil anomaly is perhaps higher and further east. No vein structures of importance were found in the trench. Judging by similar conditions found elsewhere on Quigley Hill, the source is likely a number of short veins rather than one continuous vein.

Geochemical survey in 1961 had shown a number of anomalously high readings near the north-east corner of the Polly Wonder. Further detailed geochemistry failed to produce a sufficient alignment of high readings to enable us to predict location of a vein. However, the area was easy to trench so one trench was completed. Bedrock is barren greywacke, and high readings prevail only in the first couple of feet of overburden. These conditions suggest that the source of the metal in the soil is a considerable distance up-slope. The source might be the main Little Annie vein, which outcrops 500 ft. up-slope.

Detailed geochemical survey showed a strong anomaly where the projected easterly strike of the main Little Annie vein crosses the Banjo road. A trench here failed to expose bedrock in all the critical area, but did uncover much coarse quartz float, including one boulder which would weigh at least a ton. The float was obviously low grade so trenching was discontinued.

The geochemical work in 1961 had shown anomalously high readings in the most easterly of the cuts (Trench 9 on the 40 scale map) then existing

on the Gold Eagle. On the basis of that information further 'dozing' was completed and did uncover a new high-grade type vein.

Geochemical testing of trenches in progress was very helpful in directing 'dozing'. When high readings near surface decreased markedly with depth in the trench we were obviously 'dozing' too far down slope to uncover the source, and such portions of trenches were not deepened further. Trenches were continually being extended, or discontinued before exposing fresh bedrock, on the basis of geochemical tests.

GEOLOGY

Geological survey was limited to the area mapped in 1961. Additional information gained from trenching is added to the same base-maps, and discussed below in the sections dealing with individual areas. The State Division of Mines in co-operation with the University of Alaska made a short reconnaisance in Kantishna, and may begin mapping next season. One of their capable geologists suspects that Wells (U.S.G.S. Bulletin 849 F) mapped the north-east trending belt of chlorite-limestone separate from adjoining rock units on the basis of metamorphic grade, and suggests that an early stage of folding with almost horizontal axial planes may have preceded the later doming, and account for the bedded-type schistosity (i.e. this schistosity may be axial plane cleavage in recumbent, isoclinal folding).

Apparently their work has shown this condition to exist in similar strata in the Fairbanks area. If it does exist in Kantishna it may also account for abrupt lateral transitions such as the chlorite-greywacke contact which terminates mineralization easterly in the Silver Pick area, as discussed in the 1961 report. In general, however, trenching has not shown unexpected discontinuity of beds, except where a fault on the Gold Eagle has produced probably even greater offset than the Red Top fault mapped last year.

Red Top (refer to 40 scale plan)

Trenches 2, 3, and 7 (a double trench) are new, and trenches 5 and 6 were deepened considerably this season. Trenches 5, 6, and 7 all exposed the Red Top lode below the zone of oxidation. The lode in trenches 5 and 6 is a fairly strong fault, with five to ten feet width of gouge and brecciated rock. Vein material makes about ten percent of the lode in trenches 5 and 6 and is chiefly crumbled quartz with traces to several percent of sphalerite, galena, pyrite, and arsenopyrite. The lode in both legs of trench 7 is fault gouge with brecciated and drag-folded rock; no vein material was found. Thus although a strong structure continues easterly, incentive for further trenching is lacking because mineralization is low-grade and weakening.

Trenches 2 and 3 were completed to determine the width and grade of vein or veins between and near the old stopes. These trenches were completed to almost twenty feet depth (ten feet below bedrock surface) but did

not bottom the oxidized zone. Trench 2 showed, from south to north,

a. coarse greywacke, becoming shattered near (b)

b. a fault zone, dipping 80 deg. south, consisting of 0.9 ft. to 1.5 ft. of crushed quartz and gouge. Five to ten feet up the trench wall some opaline quartz fragments up to 3 in. diameter contained several percent of grey sulfides which included a few grains of 'ruby' silver.

c. fractured, 'bullish' quartz, 8.7 ft. wide, containing only traces of pyrite at the floor of the trench but containing about 5 percent galena at higher elevation.

d. crushed quartz, yellow stained, 1.5 ft. wide.

e. thin bedded greywacke.

Although this section is partially oxidized, it obviously contained very little sulfide originally. Sulfide content at bedrock surface is higher than at the section sampled.

Trench 3 showed, from south to north,

a. coarse blocky greywacke, becoming more shattered near (b).

b. gouge, rusty from oxidation, with small pockets of crumbled quartz - width 1 ft.

c. oxides, partly 'clinkery', appearing originally to have contained much sulfide - width 3 ft. This gave the only high assay (0.32 oz. Au - 67.8 oz. Ag.)

d. shattered greywacke with reticulating quartz veinlets less than 1 in. wide comprising perhaps 5% - width 3 ft.

e. crushed quartz and greywacke, including two steeply dipping quartz veins about 3 in. wide - width 3 ft.

The near-bedrock float in this trench included many pieces of massive sulfide. This sulfide is very fine grained, principally pyrite and arsenopyrite, with minor galena and sphalerite. The oxides associated with this float are very similar to the oxides in zone (c).

The Red Top is obviously a complex lode, with several periods of faulting and mineralization. The following genesis is suggested.

A fairly persistent vein of 'milky' quartz with pyrite, arsenopyrite and in places minor coarse grained sphalerite and galena, containing in places sub-ore gold (0.2 oz. maximum?) and silver (5 oz. maximum?) values was deposited along the footwall of a fault. The early galena has a silver-lead ratio of about 1 oz. to the unit. Further faulting preceded

a much less persistent but much higher grade mineralization consisting of opaline quartz, very fine grained arsenopyrite and pyrite, and medium to fine grained galena, sphalerite and silver-rich minerals including freibergite and 'ruby' silver. A third period of faulting has in places crushed and disrupted these high-grade sulfides.

This sequence appears common on Quigley Hill. The presence of galena and sphalerite with both ages of sulfide makes it difficult in places to determine the high-grade mineralization by visual inspection but several criteria appear important. The high-grade sulfides

1. are commonly finer grained, particularly the pyrite and arsenopyrite.

2. in many places have a characteristic yellow stain, possibly from oxidation of minerals containing antimony.

3. in places show azurite and malachite from oxidation of the freibergite.

Our trenching on Red Top has failed to disclose sufficient extent to the high-grade type of mineralization to recommend further exploration. We now have information on over 1000 ft. of strike length, with erratic ore grade mineralization localized in two sections totalling about 200 ft. of strike length, doubtfully persistent to depth (see plans and sections in 1960 report).

Friday - Martha Q.

Our work on the Friday was limited to geochemistry and one trench crossing the Friday - Martha Q. boundary in an attempt to find the source of float and wide-spread, locally strong, but erratic geochemical anomalies. As discussed above under 'Geochemistry', it might require much expensive trenching to locate the vein or, perhaps more likely, number of veins, responsible for the float and anomalies.

Geochemical work near the south-east boundary of the Martha Q. indicates the veins exposed in the trenches in that area do extend northeast but trenching is not attractive because the exposed veins are only a few inches wide, and stripping conditions difficult.

Silver Pick - Little Maude (see 40 scale map)

The 1600 ft. of stripping to bedrock on the Silver Pick - Little Maude has shown a vein system persisting for 800 feet, but only erratic shoots of high-grade mineralization. The best shoot, resampled in 1962, averages 2.8 ft. width - 0.64 oz. Au - 27.5 oz. Ag, uncut, for 140 ft. of length. None of the stripping reached completely below the zone of oxidation but most of the material sampled was sufficiently fresh to discount leaching of values.

The wide section of vein near the portal of the tunnel consists of sugary quartz with fine grained, disseminated arsenopyrite and pyrite. Except for one short section of about 40 ft., in which traces of galena were found, it does not approach ore grade. To the west, near and on its swing to follow the greywacke - graphitic schist contact, mineralization is better grade. Here, the typical high-grade sulfides are present, but in an irregular series of separate quartz lenses rather than a continuous vein. Some of the lenses are only a few feet in longest dimension, and this year's trenching in places bottomed values obtained last season. The 140 ft. shoot mentioned above differs in size and grade from that reported in 1961 because of this erratic mineralization.

The topography did not permit strike-stripping east of the portal, but 'dozer' and hand trenches across strike show the vein system is disrupted by many minor faults. Typical high-grade sulfides were found locally in several narrow and irregular veins south of the main vein, but persist for only a few tens of feet.

In general, the Silver Pick is now well explored by surface trenches but no shoots of sufficient size and value to warrant underground development have been found.

Little Annie - Little Annie No. 2. (see 40 scale map)

Our trenching in this area was directed to determine the nature and persistence of the 'Upper Little Annie' vein which had been partially stoped, and the galena-bearing veins near the south-west corner of the Little Annie No. 2 claim from which high silver assays had been obtained.

The south-west extension of the 'Upper Little Annie' vein was well exposed by trenching. A shear zone two to three feet wide dips 65 deg. S.E., cutting flat greywacke beds. Galena stringers follow the walls of the shear zone, and one stringer was noted swinging from wall to wall. Shear zone and mineralization peter out south-west where they meet graphitic schist.

One might suspect that the mineralized shear would follow on southwesterly under the capping graphitic schist. The only pertinent data available concerning depth is Davis' statement "It was discovered that the high-grade values rarely continued to a depth of more than 60 ft. from the surface." Our work has tended to show that the high-grade in Kantishna occurs in separate lenses, which do not grade out into mineralization which is economic now, but was not in Davis' time. Thus exploration of the 'Upper Little Annie' vein at depth can not be considered attractive, although a shallow shoot may plunge southwesterly.

Slow thaw in the brush-filled draw along the north-east strike of the vein prevented stripping to bedrock, thus we have no information on the vein in this direction.

The galena-bearing veins near the south-east corner of the

Little Annie No. 2 were exposed in several places. These veins average only a few inches wide where exposed, and pinch out to mere fractures in the greywacke within a few tens of feet.

The main Little Annie vein was exposed in two places in conjunction with the above work in order to check its mineralization near the projected intersection with the 'Upper Little Annie'. No high-grade type mineralization was found.

No further exploration on these two claims appears warranted under the circumstances, although the trench crossing the projected strike of the 'Upper Little Annie' vein near 5700 north should be continued to bedrock if it were not expensive to do so.

Gold Dollar - Gold Eagle (see 40 scale map)

Fifteen hundred feet of stripping to bedrock exposes the Gold Dollar - Gold Eagle vein system intermittently for a strike length of 1000 ft. In this length one section 180 feet long is of ore grade. Three veins containing the high-grade type of sulfide were found in the system.

The vein on the Gold Dollar claim is the most persistent. It might lie south of the bedrock exposed in Trench 1; the greywacke exposed here showed only minor fractures which gave fair geochemical reaction, but frozen ground hindered stripping further south. Trenches 2 and 3 showed strong quartz vein containing only the low-grade type of sulfide. Trench 4 exposes the vein for 250 ft. of strike length. The westernmost hundred feet of exposure (west of the shaft located where the vein changes strike) contains both the early, low-grade type of mineralization, and the later high-grade type. The 'high-grade' lies in the hanging wall, and gradually narrows until it disappears about sixty feet west of the shaft. It has been stoped from about twenty feet west of the shaft to a cross-fault sixty feet east of the shaft, and again in a short section from 80 to 110 ft. east of the shaft. A fault block from 60 to 80 ft. east of the shaft was apparently missed by the 'old-timers'. The easternmost exposures show the high-grade sulfides lensing out in the shearing.

The early, low-grade type of vein exposed in the western hundred feet of trench 4 averages about twenty percent pyrite and arsenopyrite, which percentage is considerably higher than normal in Kantishna, and which probably accounts for the better than normal gold content.

The later, high-grade, vein material in the fault block remnant east of the shaft is almost massive sulfide, chiefly galena, but in places west of the shaft it contains several percent sphalerite, and very fine-grained pyrite. Minor freibergite is associated with both sphalerite and galena. Calculation of the assays from 60 ft. west of the shaft to 120 ft. east of the shaft from the high-grade type of vein gives 0.37 oz. Au, 78 oz. Ag, over 1.8 ft. width for the 180 ft. The calculation assumes that the vein stoped averaged the same as the remnants, whereas it probably averaged higher grade.

The evidence suggests that movement along and extending east of the earlier type vein allowed emplacement of the later high-grade shoot.

Before we trenched in the area, we were hopeful that the Gold Dollar vein might continue to, or be closely related to, the vein known in the cut on the Gold Dollar - Gold Eagle boundary, in spite of the fact that these veins have opposite dips. However, as described above, the Gold Dollar vein peters out easterly into shearing. Furthermore, the apparently important fault exposed in trenches 9 and 10 projects into the bed of Friday Creek, and undoubtedly offsets or terminates the vein shear.

We attempted to open up the long crosscut at approximately 2415 elevation, driven south-easterly from Friday Creek, but were not successful. This crosscut is mentioned in an old report on Red Top Mining Co., but we have no information on its geology. It should intersect the Gold Dollar vein, but the available information suggests the vein was not drifted. A drift easterly on the vein would be roughly fifty feet below the level of the older tunnels developing the stopes. The crosscut could probably be re-opened during freezing weather. The potential tonnage involved is certainly too small to interest most mining companies but might be sufficient to interest a lessee.

A vein of the high-grade type is exposed in trenches 5 and 6 on the Gold Eagle, and was exposed in an old tunnel underneath these, now caved, but reported on by Davis. The vein is not found in trenches about fifty feet on projected strike to the east and to the west. Its attitude is parallel to the bedding, and the 'break' apparently loses its identity in the schistosity paralleling the bedding. The mineralization consists of quartz with five to ten percent of fine grained pyrite, arsenopyrite, galena, and freibergite. The vein material is in lenticular pods; the pod in trench 5 lensed out where the trench was deepened four feet, that in trench 6 appears lenticular, and Davis reports that only 30 or 40 ft. length of vein less than a foot wide was found in the tunnel. As discussed above, this vein does not extend towards and is not closely related to the Gold Dollar vein. Our exploration indicates it is too small to warrant further work.

A vein previously not exposed, but indicated by geochemical work, was stripped in trenches 9 and 10. The vein was highly oxidized when sampled in Trench 9, but obviously high-grade float and vein were obtained elsewhere in this trench. The fault found in trench 9 cuts off the vein very sharply. The width of gouge and breccia in the fault is greater than any seen elsewhere on Quigley Hill, and suggests major displacement. The vein where exposed in trench 10 is chiefly quartz with minor pyrite and arsenopyrite, obviously the early, low-grade type of mineralization. Thus exploration further east is not encouraging, particularly since geochemical survey showed only weak anomaly in this direction.

The high-grade shoots found on the Gold Eagle, like those elsewhere on Quigley Hill, fail to show sufficient size and proximity to justify further work.

Showings other than on Quigley Hill

One day's 'dozing' exposed an old showing known as the Merry Widow, located about a mile east of Quigley Hill. The vein contained two bands of high-grade material; 0.5 ft. of .06 Au, 113.7 Ag and 3.0 ft. of 0.02 Au, 57.2 Ag, separated by 5.0 ft. of 0.02 Au, 8.7 Ag. The vein was exposed for twenty feet between a major fault on the south-west and a pinch-out to the north-east. K-66-31

Enthusiasm for work on this vein was as short as the shoot.

A new discovery, named the 'Parky', was made by Mark Rogers, one of our employees. It is located several hundred yards south of No. 77 (on the 1 mile to the inch map reporting 1961 prospecting). Initial 'grab' of high-grade material assayed 0.78 Au, 902.1 Ag, with 4.1% Cu. Subsequent hand trenching and sampling at about ten foot intervals gave:

Width	Oz. Au	Oz. Ag
2.4'	0.26	182.3
3.0'	0.04	111.5
1.9'	0.14	172.8
2.4'	0.02	23.4

The vein swings and pinches out on strike both south-west and north-east, giving about thirty-five feet of shoot.

Several visits were made to the 'Neversweat' property being explored by Frank Bonnell. The workings are in and near the contact of a porphyry plug similar to the one exposed in Friday Creek. In general, the mineralization is even more erratic, and values obtained average lower, than in Quigley Hill area. K-66-41

NOVEMBER 1962

R.H. Deyholos