Winthrop Wash. Nov. 2 1945

Mr. J.R. Atkeson 4039 Evaston Ave.

Dear Sir Your letter of Oct 30th is at hand.

In reply will say i am afraid you will be disapointed in my history of the Copper Glance. in the first place i donot know the location date. It 2 or 3 years before World War No. 1. We put in a shot on the croppings took a test from the choise ore. it went 46% copper. i donot bring to mind what the other values were. Then we sent of a 45# sample to the smelter for a mill run test of the same class of ore it went $4.60 gold at 20. per oz. 24% copper 24 oz silver, 3% lead, then we got out 2½ tons of the choice ore and the smelter returns showed 20% copper, silver 12 oz & no lead as the tacoma smelter does not handle lead. During that time, an Engineer by the name A. K Parker came in & looked us over in the interest of a contempelated railroad co. for shipping tonage. he mad us 2 offers on the property, one was a $50000 cash offer & one of $100000 on a 10% royalty basis, but on either deal he wanted a 20% commission which was to high to suit us so we turned him down. annother Engineer tried to deal with on a royalty basis, but we turned him down on account of his crooked deals. Then we let a contract to drive a tunnel 300 feet but the contract was not completed. During that time a circuit Engineer by the name of Martin came in to look us over in the interests of the Grandby Mining Co. of Phenix B.C. he offered us $30000 on a work bond, but he took tests & it averaged about same as our tests did, then he offered us our price of $50000 on the 3-year working bond provided the Head engineer did not turn it down, but through misunderstanding of his plans we never got together on the deal.

Page 2

Ed Richardson might be able to enlighten you on that deal. also the might enlighten you about a later deal. that was offered us from Wenatchee people, that later proved to be the Clarck cindicate of bute Montana, a $100000 deal that Ed Cross refused & said nothing under 100000 would touch it. then after World War No. 1 all offers stopped, in fact all mineing work was at a standstill for a long while. i carried on the developement in a way from that on.

The lower tunnell is in about 180 ft. on the right hand side is a 24 ft crosscut that shoes a good bit of high grad ore. & the left side crosscut is in about 53 ft. that is where we crossed the 12 ft ore that averaged to 12# to the ton, picked samples like those you took, went from $30 to $50.00 that is the same ore we shipped from the upper works that you were in) i cannot find my assays from the Copper Glance i am afraid have got them in with my waste papers & burned them up. the width of the like is about 60 ft. wide. it all carried some values. in the upper claims there is a good bit of ore in the upper tunnel, which is about 350 ft up the hill from where you were, with several open cuts & car development, there is an approise from the lower tunnell to the workings we shipped from that you were in or rather from the left hand crosscut.

Yours respectfully

S. A. HOTCHKISS
Winthrop Wash

STATE OF WASHINGTON)ss
COUNTY OF [illegible]

[illegible] that the above [illegible] letter is an exact copy of [illegible] letter [illegible] Nov. 2, 1945.

WITNESS my hand and seal this [illegible] day of April, [illegible]2.

Notary Public
[illegible] Expires
[illegible] 1948

/S/ Verle Griffith
Notary Public in and for the State of Washington, residing at Seattle

A Preliminary Geologic Mine Report on the "Copper Glance Mining Property", Methow Valley, Washington - by Jack D. Sauers, Geologic Consultant - June 28, 1963.

Property

The name of this property is the "Copper Glance Mine". The principle ore mineral is zincian - tetrahedrite, with lesser amounts of chalcopyrite. Considerable silver is reported to be present in the tetrahedrite by the owner, (50 oz./ ton). The ore should thus contain copper, zinc, silver, and antimony as its primary valuable metallic constituents.

Location

The property is located in the Eightmile Cr. drainage of the upper Methow Valley, Okanogan Co., Washington, on "Copper Glance Creek". This is on the southeast side of the lower portion of Big Craggy Peak. It is in the N.E.1/4 sec. 35, T. 38 N., R. 20 E., W.M.

Ownership and History

The examination on June 20, 1963 (Thurs) Was made at the request of Mr. Fred A. Lawless of 17401 - 10th N.E., Seattle, Wash., who together with his partner Mr. Wayne G. Montgomery constitute the Bridgewater Mining Co. of Seattle, Washington. The Bridgewater Mining Co. is the lessee from the Copper Glance Mining Co., the owner, also of Seattle.

Early development work on the property, done long ago by hand methods was in the form of one adit over 200 feet long, another over 60 feet long and several additional cuts on the main tetrahedrite vein. The high grade ore was then taken out by pack train to the smelter. Two tons of hand - sorted ore were shipped to the smelter in 1914. Mr. Montgomery indicates that 2 1/2 carloads of high grade ore were later shipped.

At present, there is a good dirt forest service road to the cabin and two smaller ones on the millsite claim on Eightmile Cr. This is 23 miles by road from Winthrop and 63 miles by road to the rail head at Pateros on the Columbia River. Now considered preferable to ship to Tacoma Smelter ~~It is about 212 miles from Pateros to Kellogg, Idaho and the Smelter of the Bunker Hill Co. (approx. 275 mi. from mine to smelter)~~. From the Eightmile Cr. road there is a narrow but passable, somewhat steep access road up the mountain right to the outcrop of the large tetrahedrite - chalcopyrite vein and the dumps from the adits. (I rode up to the vein in a 1 - ton Dodge Power Wagon that had previously towed an air - compressor up to the vein.) With only slight improvements and widening this road could be used to ship ore. The records indicate that there are 12 unpatented lode claims and a millsite. Mr. Lawless has in his possession a map of the claims showing the roads and development work.

A previous preliminary report on this property was made to Mr. Ralph La Flamboy of the Copper Glance Mining Co., last year, and it is not deemed necessary to repeat that information. Aerial photographs of the property were also interpreted at that time. A brief description of this property is mentioned in Bull. 37, "Inventory of Wash. Minerals, Part II, Metallic Minerals, Div. of Mines and Geology, Olympia, Wash."- by Marshall T. Huntting, 1956, P. 63.

Geology

No detailed geologic map was made of the area in this brief one day visit. However, several sketches of the outcrops were make, noting such structural features as were apparent and a detailed hand lens examination of the ore was made. On - the - spot observations and recommendations were communicated to Mr. Lawless to facilitate future exploration, development, and mining. Samples were taken for study and assay, as well as photographs.

The general geology of the area is indicated on the "Geologic Map of Washington" - 1961, by the above state department. From this and my own observations it is apparent that a large essentially vertical fault of considerable vertical displacement goes down the valley of Eight mile Cr., parallel with the valley and the trend of the creek.

The rocks to the east of this fault are granitic rocks and those to the west (on the side of the "Copper Glance" claims) are andesitic volcanic rocks. The granitic rocks to the east appear to have been faulted up relative to the volcanic rocks. The fault is still tectonically active. The volcanic rocks are supposedly of Mesozoic age according to the "State Geologic Map", (225 - 135 million years old). Into this volcanic sequence a fairly coarse - grained, porphyritic, quartz - monzonitic to granodioritic plug has been emplaced on the lower portion of the property. It is visible on the steep mine road between the Eightmile Cr. road and the bridge across Copper - Glance Creek.

It is largely in the volcanic sequence that the hydrothermal chalcopyrite - tetrahedrite veins are found as well as other sulphide - bearing quartz veins.

My observations will be presented in chronologic order as I observed them.

We drove to the cabin and then took the "Power Wagon" up the mine road leading toward the "Copper Glance Lake trail". We stopped first to look at a quartz - monzonite outcrop before reaching the bridge across Copper Glance Cr. The rock was highly altered and weathered and there was a small vein of chalcopyrite a few inches wide on the north end of the outcrop. We then proceeded up the hill to the bridge. Along the way the

outcrops seemed to be porphyritic andesite. At the bridge across Copper Glance Cr. itself, we stopped. On the south side of the bridge was a fine - grained dike with finely disseminated chalcopyrite in it.

Assay for Quartz + Gold

Further up the road, on the crest of the ridge, we examined a quartz vein. It was about 15 - 20 feet wide and had a strike of N. 25° E. and was almost vertical. Finely disseminate sulphides are present all through it, though they are now weathered on the surface. It is possible that this may be a gold vein. Samples of fresh rock from a blasted cut across it should be taken. It was examined down over a small cliff below the knob. Fracturing, shearing, and possibly microbrecciation are present.

We next proceeded to the area of a large spring just up the hill. Here a bulldozer cut over 400 feet long had been made through about 12 feet of weathered overburden and down several feet into the fractured bedrock beneath. About 365 feet of bedrock was exposed in place horizontally along the hill in a north - south direction. It was all highly oxidized since the original bedrock had considerable sulphides disseminated through it originally. The sulfides seemed to be originally pyrite and marcasite, though at the northern end of the cut crystals of chalcopyrite up to an eighth of an inch are disseminated through the rock. It appears to have been largely the volcanic andesite

before mineralization and alteration. It seems to be propylitized now with chlorite, sericite, calcite, alkali feldspars, as well as considerable fluorite and quartz as the dominant gangue minerals. Narrow quartz veins, a few inches wide , again with a trend of N. 25 E., and dipping vertically cut through the trench south of the spring near the center of the ~~trench.~~ trench (The spring is the site of an old prospect adit, now caved.) There are also gouge seams, as well, with the quartz stringers, and they have approximately the same trend. A chipped grab sample was taken later from the bedrock at the north end of the cut for a spectrochemical analysis. It has been designated as #6.20.63 - 5. It has also been submitted for a gold and silver assay. This richer portion of the cut seems to trend about N. 25 W. (attitude unknown) off in the direction of the large tetrahedrite vein which was visited next. A considerable zone of mineralization and a large vein is inferred to be present in this proximity. The temperature of mineralization ~~is~~ is thus inferred to be high medium temperature or mesothermal and the mode of ore mineralization for the disseminated sulfides is largely replacement. The quartz veins and gouge seem to be largely later and of lower temperature. It is possible that they may contain tellurides. ? Assay for Te ? or Se ? The exceedingly high gold assays are reputed to have come from quartz seams, as indicated by Mr. La Flamboy and Mr. Lawless.

As indicated previously, all of the overburden in in the trench is highly oxidized and leached, and the upper few feet of the bedrock as well. This zone is not at present considered to be ore at the surface, though ore may lie under this zone. It might best be explored further at depth by diamond drilling, particularly at its northern end, where chalcopyrite is visible. It quite probably will improve with depth. It should be noted particularly if tetrahedrite appears in the cores in any substantial amount. It might then be correlated with the main tetrahedrite vein. or considered a branch thereof?

The main large tetrahedrite - chalcopyrite vein was visited next. This was the one from which the old two ton ore shipment was made. It strikes N. 80 W. and appears to be fairly vertical, though it may dip somewhat to the south. At the lower largest (200') adit, it was measured out to be 54 feet of minimum width from the point where mineralization decreased on the south side to a point on the north side where the bedrock goes under the thin overburden or "iron cap" gossan. The State Inventory indicates the width of the vein as 80 to 100 feet. It may well be, It appears to be exposed for 200 feet up the hill along the strike without any appreciable decrease in width. Mr. Lawless indicates that it goes further, though we did not investigate it further at this time.

Down the hill below the lower adit, the structure plunges beneath the cover. There may be a steep rake to this structure at this point. Mr. Lawless had his equipment set up to intersect this structure by diamond drilling below this outcrop when we left. This is quite commendable. It could probably be intersected by an adit from just below here and the ore mined by stoping.

A large grab sample of the high grade ore was taken from a deep blasted trench in the middle of the vein, up the hill from the lower adit. It was designated #6.20.63 - 2 and was submitted also to the Metallurgical Laboratory of Mr. Willis Ott for assay. The constituents to be assayed for are copper, lead, zinc, antimony, mercury, gold, and silver. A semi - quantitative spectrochemical analysis was also requested on this sample.

An adit up the hill from this cut was measured to be 62 feet deep. It was all in the vein and the vein here appeared to be as wide as down below. It had an interesting fracture pattern present in the face of the portal that was suggestive of an anticlinal fold that was tightly folded and breached by an axial plane fracture. This was in the center of the vein and may have controlled the mineralization. (see sketch #1).

This large vein would thus quite possibly intersect the previously mentioned two vein systems down the mountain and possibly at depth (see sketch # 2), below the lowest

Sample # 6-20-63-2 June 20-1963
Bunker Hill Lead Smelter Control Assay
Kellog Idaho July 10-1963

Gold 0.03 ozs/ton
Silver 8.0 ozs/ton
copper 13.3 wet %
Lead 1.6 wet %
Iron 7.3 %
Insol. 30.8 %
Lime 6.4 %
Sulphur 11.7 %
Zinc 3.2 %
Antimony 4.0 % — ~~antimony~~ over 1 %
Arsenic 4.92 % — arsenic over 1 %
Bismuth 0.0005 %

Run by Lamar H. Burgess - Chief Chemist
~~From~~ The Bunker Hill Co.
Box 29 Kellogg Idaho
Metallurgical Div
R. H. Marchesi, Metallurgical Analyst

$ 82 Cu
10 Ag
1 Au
$ 93.00 ton value based on Cu, Ag, Au content

Kellog does not want as there is too much Copper. They are lead & zinc smelter

adit.

A consideration of the mineralogy of this large vein is important at this point. The principle ore mineral is zincian - tetrahedrite. This is sometimes called gray copper ore or fahlore. Its chemical formula is $(Cu, Fe, Zn, Ag)_{12} Sb_4 S_{13}$. It is gray, massive, and isometric, often cubic. Copper is predominant with varying degrees of substitution by the iron, zinc, and silver. It can run up to a maximum of about 45% copper, however the presence of zinc, silver, and iron substituting for the copper would bring the copper percentage down. It is also possible that lead and mercury may substitute for the copper. The antimony that is present in the second radical may also have some arsenic and bismuth substitute for it. The antimony can run as high as 29% in this mineral. Within one deposit it usually is fairly consistent however.

Chalcopyrite seems to be the second most important ore mineral. Its chemical formula is $CuFeS_2$, and it is an ore mineral of copper. It is sometimes called yellow copper ore, due to its brass yellow color. It is tetragonal and of course has a greenish black streak. It has 34.5% copper in it.

The chalcopyrite has some coatings of what appear to be supergene or secondary bornite, though this is not certain as yet. The bornite [illegible]

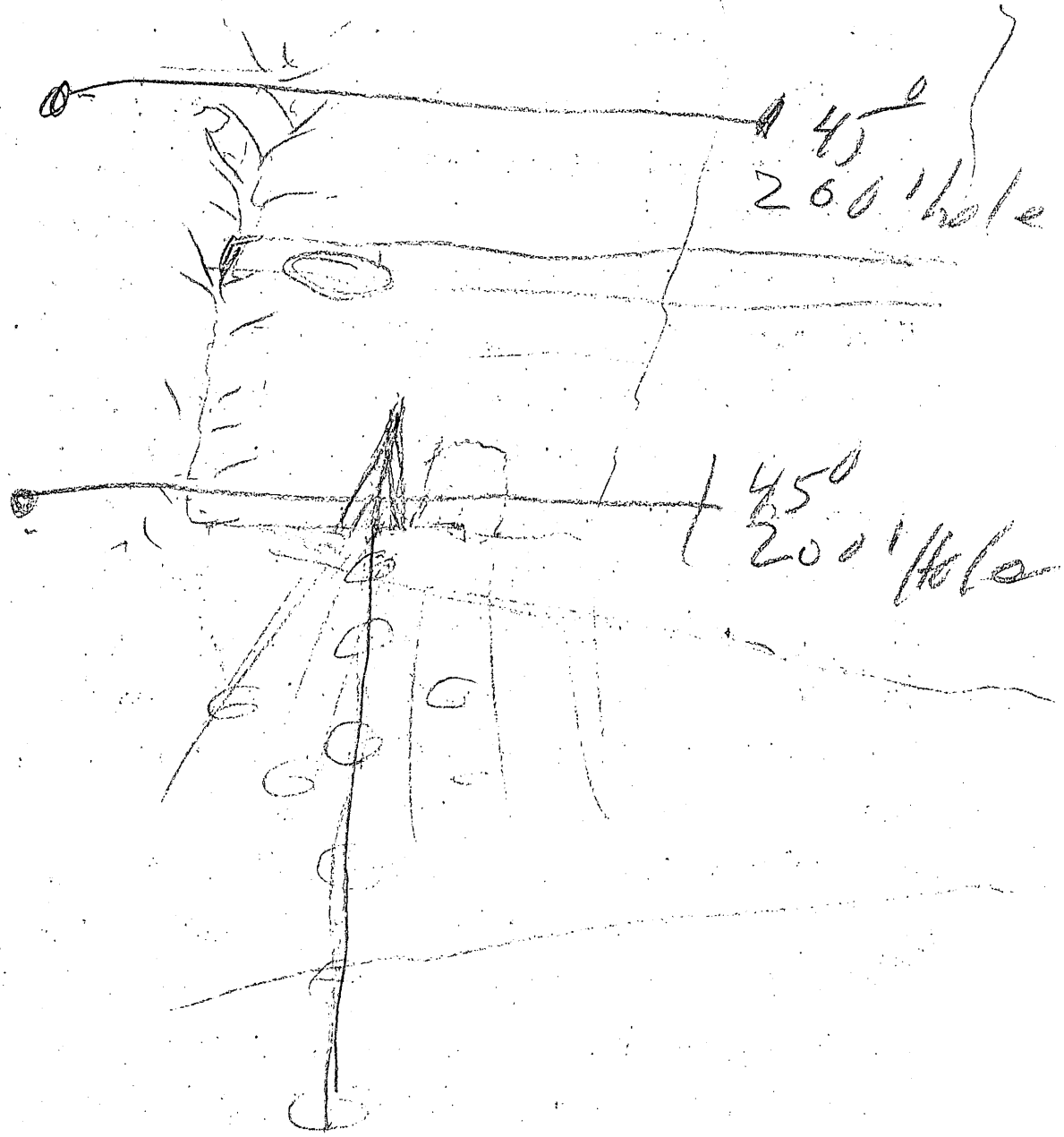
The bornite (Cu_5FeS_4) sometimes called purple copper ore or peacock ore, is brownish bronze on fresh fracture but tarnishes to variegated purple and blue. The percentage of copper in this mineral is 63.3% when pure. Pyrite (FeS_2) is present as a common mineral as well as large well developed crystals of marcasite (FeS_2). The pyrite is more yellow than the marcasite and is present in finer crystals. The marcasite forms large striated crystals and of course the marcasite is often called, "white iron pyrites".

Barite ($BaSO_4$), fluorite (CaF_2), quartz (SiO_2), calcite ($CaCO_3$), hematite (Fe_2O_3), ankerite ($CaCO_3$;(Mg,FE,Mn) CO_3)and limonite ($FeO(OH:nH_2O + Fe_2O_3 \cdot nH_2O$ are the chief gangue minerals as well as some of the secondary copper carbonates on the weathered surfaces.

Chalcopyrite seems to be the first ore mineral deposited along with pyrite. This was accompanied by chloritization, sericitization, and fluorite, quartz, and carbonate deposition under the general conditions of hydrothermal propylitization of the andesites as the ore minerals were deposited by replacement. This is under medium or mesothermal temperatures probably in the 200° - 300° C. range.

This seems to have been followed by a period of somewhat lower temperatures during which the tetrahedrite was deposited as a primary or hypogene sulfide by

High Low High



replacement processes in the main vein. This was accompanied by quartz mineralization, and was in the low mesothermal or medium temperature range. The process seems to still be one of replacement, somewhere around the 200° C. range.

This in turn seems to have been followed by a still lower temperature mineralization of marcasite and barite. This is in the epithermal or low temperature range of 50° - 200° C. The hydrothermal solutions are inferred to be strongly acidic at that time and fracture may have been important. Such is the inferred sequence of ore deposition as indicated by hand lens evaluation, though more study may add other information.

From the temperature of the ore mineralization and the fissure vein character of the ore, it is believed that this vein will continue to considerable depth. It certainly should continue for a few hundred feet, at least, below the lowest adit in it now. Perhaps several thousand?

If it is anticipated to mine it from a considerable distance down the mountain, it might be wise to diamond drill this vein down the rake of the vein from a surface position at the lower adit in the center of the vein. A thousand foot hole might be interesting in this position and is suggested. Of course if it were all in ore, it should be extended. A geologist should be present to indicate the inclination of the hole. However, even without a geologist,

a vertical hole should indicate a considerable extension to depth.

The large chunks or masses of ore distributed through the vein in pieces, often a foot across and fairly closely spaced, oppose the view that this is only a low grade ore. More reliable data of the average grade of the vein can be obtained by crosscutting the vein with a diamond drill of the portable exploration type and assaying the split cores. This would be desireable if it is intended to mine by shrinkage stoping of the whole vein.

However, it might be a wiser choice at this time to ship out a few truckloads of the high grade ore from the dump to the smelter to get a more accurate picture of the true value of the high grade ore on todays market, as well as an estimate of the mining costs. The actual experience should give a more accurate picture, since there are no other operating mines close-by in this area at this time for comparison.

If the shipment of the high grade ore is profitable from the dumps, high grade mining might be continued from the surface portions of the vein itself and a more accurate estimate of drilling and blasting, sorting and loading costs obtained. This might be continued as a limited bench and slope operation until the depth became prohibitive. It would then become necessary to go to underground mining.

It is estimated that on the basis of at least a

width o

width of 20 feet and a depth of 50 feet and a height of 400 feet, there would be 600,000 cu. ft. ore or approximately 50,000 tons of ore of moderate grade available from the surface. Moreover, it is possible to infer a tonnage of 10 times as much if the vein persists for 2000 feet along its length with the same grade. It is emphasized that this is possible ore, and not proven ore. Such can be ascertained only by drilling this vein or mining it.

There seems to be adequate timber (Douglas Fir) and water on the property for mining purposes. The present cabins seem suitable for preliminary operations. The millsite seems adequate for the present.

Photographs of the veins and development and exploration work as well as assays will follow.

Respectfully submitted,

Jack D. Sauers

Geologic Consultant

P.S. - A simple gravity method might be used to sort the ore as indicated on a preliminary basis. W.R.

Sketches:

1.

Fold - like fracture system at the portal of 62 foot adit.

See other copies

2.

Diagrammatic sketch of intersecting vein systems.

See other copies

Sample No. 6-20-63-2 June 20th., 1963.

Bunker Hill Lead Smelter Control Assay.

Kellog Idaho, July 10th., 1963.

Gold 0.03 ozs /ton

Silver 8.0 " "

Copper 13.3 wet %

Lead 1.6 " "

Iron 7.3 %

Insol 30.8 "

Lime 6.4 "

Sulphor11.7 "

Zinc 3.2 "

Antimony4.0"

Arsnic 4.92 "

Bismoth .0005% Run by Lamar W. Burgess- Chief Chemist from the Bunker Hill Co. Box 29 Kellog, Idaho.

Metallurgical Div. K.H Marshisi,Analyst.

Cu. -----$82.00
Ag ------ 10.00
Au ------ 1.00
$93.00

This was not the higest grade. This about a 7 lb. Sample.