

COPY

August 30, 1941.

Mr. S. K. Droubay, Supt.,  
Defence Chrome Operations,  
Columbus, Montana.

*Walker Mine*

Dear Mr. Droubay:

I wish to thank you for the information given in your recent letter regarding the occurrence of green chloritic material and its possible relationship to higher gold values in certain portions of the North Piute orebody in the Walker Mine. We also note your comment that the hangingwall greenish quartz seams assayed 0.10 oz. gold, which is probably .05 to .07 oz. higher than that in the balance of the vein. I believe the association of green (ferrous (?) iron minerals) usually is indicative of a relatively higher gold content in a gold bearing vein or orebody. At least, such occurrences are too common in many deposits <sup>to be</sup> merely coincidental.

Chamberlain stopped in Butte for a few hours last week upon his return trip from Great Falls to the Walker Mine. I was surprised to find out that, to date, no prospecting has been done to test the possibilities of the footwall zone of 712 orebody beneath the outcrop of the silicified iron-stained reef extending 850' W from the Piute outcrop. Chamberlain will map this surface area immediately and probably outline, at least, a couple of drill holes to test the zone. You will recall our previous discussions regarding this rather prominent topographic feature and the possibility of a vein lying along the north

## ANACONDA COPPER MINING CO.

C O P Y

Mr. S. K. Droubay

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Aug. 30, 1941

margin of some. The outcrop of such a vein could be concealed by the alpine bog and vegetation which has developed from the accumulation of deep snowbanks. The abrupt drop in the surface contour at the north edge of the mineralized reef may be the result of more rapid erosion of softer limonitic vein material lying above a possible orebody. The occurrence of bornite as disclosed in the 712 ore zone also makes this prospect an attractive gamble for drilling two or more holes into the footwall area from conveniently located points, say on the 400, 600 or deeper levels.

This prospect came to my attention in July, 1938, after spending a day in scouting the main vein outcrops on the Walker property. At the time I discussed the matter with Messrs. Wood, Dugan, Boyer and Kildale. The latter planned to map same, but apparently he was detoured on other work.

I will appreciate any comment or suggestions you may have about exploring the footwall area of 712 ore zone.

With kindest regards, I am

Yours very truly,

H. H. GIBBEL

MHO/cw

cc: OEW  
 HES  
 T.L.  
 JED  
 VIE ✓  
 VC

611

318 Kearns Building  
Salt Lake City, Utah  
September 5, 1940

Mr. R. H. Sales  
P. O. Box 157  
Butte, Montana

WALKER MINE

Dear Mr. Sales:

I visited the Walker mine August 23 - 29, accompanied by Droubay, and examined underground and surface geology.

The Walker geological problem may be resolved into two phases, one relating the geology to operating and the other to exploration.

From an operating standpoint, recent development on the 900 level Plute presents an interesting problem. I mapped these workings and noted a definite localization of better grade values, particularly on the hanging wall and footwall of this body. There is a possibility that selective stoping might be applicable to the Plute area, but before any definite plan can be established, careful channel sampling is essential. Droubay is undertaking a thorough sampling job this week. I have hopes, based on grab sampling, that the mining grade might be raised to 2 - 2.5 per cent copper, handling less tonnage and with attendant profit. The limited shaft capacity at Plute dictates that if a profit is to be realized below the 700 level, a reasonably high mining grade must be maintained.

My observations generally tend to the belief that careful sampling is essential to proper study and solution of the Walker Mining problem.

The exploration possibilities at Walker are clouded by the fact that the mine has not made money on most of the ore bodies that have been developed in the past. Therefore, we must evaluate the chance for finding better grade ore. This chance may be resolved into structural and mineralogical elements.

Mineralogically there is definite evidence of a zonal arrangement

2- Mr. H. H. Sales

September 3, 1940

with high temperature quartz, pyrrhotite and low grade copper at the south end of the mine close to the granodiorite. Whether the granodiorite or some hidden intrusive represents the parent magma, the high temperature locus appears to be at the south end of the property. High grade chalcopyrite in the upper part of the main ore body, bornite in the 712 ore body and better grade chalcopyrite in the Piute area, are facts that confirm this theory. Then, too, the quartz changes from a glassy pegmatitic character at the south end to a granular and finally a vein like character at the north end. The proportion of quartz to sulphides is much greater at the south end of the Walker vein system than at the north end.

Therefore, while the deeper levels near the granodiorite do not present an attractive mineralogical picture, the north end of the mine may represent a temperature-pressure zone favorable for the segregation of better grade copper.

The Walker fracture zone is remarkably persistent. Generally the schistose country rock is uniformly sheared along the strike of the Walker zone and offers no particularly obvious focal point where a deep seated concentration of sulphides might be anticipated. But there is one exception and that is the area embraced by the 712 - Piute workings. In this section the schist and the fissuring are bent from the general northwest strike to northeast, and the flat east dipping Piute ore body moves increasingly farther to the east with respect to the 712 zone as deeper levels are approached. Is there a chance this zone, which is on the northeasterly prolongation of the 517 fissure, has deep seated structural significance?

Results of recent development are rather encouraging. The better grade ore at the 900 Piute is definitely an improvement in grade over mineralization on the 700 and 800 levels.

3- Mr. R. H. Sales

September 3, 1910

At the 1200 level, the showing of vein material recently encountered in the main north working is of notable interest. However, this mineralization is typical dark "Walker" quartz with scattered chalcopyrite and there is no particular improvement in copper content. Further development will be necessary to determine the extent and grade of this mineralization.

Just before leaving the Walker I had an opportunity to examine the last core from Hole 49, being drilled horizontally from the north end of the Finte workings at the 900 level. At 115 feet the hole encountered abundant chalcopyrite in green schist. From 115' - 120' there is fair chalcopyrite; from 120' - 122.5' the mineralization is lean; the last pieces of core to 123 feet show abundant chalcopyrite, and the bottom of the hole is in ore. There is little or no quartz with the sulphide. Droubay is sending assays as soon as available.

The showing in Hole 49 may be a significant discovery. It is north of any known ore in the Walker mine. Further drilling will be necessary before the importance of this latest development can be determined.

Sincerely yours,

*V. D. Perry*  
V. D. Perry

VDP:P

cc: Mr. C. F. Kelley  
Mr. J. R. Robbins  
Mr. C. E. Wood  
Mr. J. C. Hilton  
Mr. J. F. Dugan  
Mr. Tom Lyon

Signed for Mr. Perry in  
his absence

## C O P Y

May 2, 1941.

Mr. S. K. Droubay,  
c/o Copper Canyon Mining Co.,  
Battle Mountain, Nevada.

Dear Mr. Droubay:

I received your letter of April 17th, stating your interpretation of the structural and mineralogical relationships of the ore occurrences in the Walker Mine, and note that you have given the subject serious study, particularly in regard to the matter of recommending adequate prospecting work, to test the possible downward extensions of the more promising Piute and North Piute orezones below present bottom levels.

Do you think the appearance of chloritic alteration at the north end of the mine has any significance? We have noted in many ore deposits that the associated greenish alteration minerals such as fuchsite, malaposite, chlorite, serpentine, cummingtonite, etc., appear to have some relation or indicate an increased gold ratio to other metals occurring in the orebody. Is there an increase in the gold ratio in the North Piute orebody in respect to the other oreshoots?

The implication is, the ferrous iron constituents in the greenish gangue minerals indicate that certain chemical conditions had existed in the mineral bearing solution which deposited relatively more gold (if present) and also reacted to form the associated, greenish alteration gangue minerals. For

ANACONDA COPPER MINING CO.

C O P Y

Mr. S. E. Droubay --- 2

May 2, 1941

example we know that gold is somewhat soluble in ferric salt solutions and that it is precipitated from solution by ferrous salts.

Thanking you for your continued interest in the above matters, I remain

Sincerely yours,

M. H. GIDEL

MHG/aw

cc: C.E.W.  
R.H.S.  
T.L.  
V.D.P. ✓

# WALKER MINING COMPANY

WALKERMINE  
PLUMAS COUNTY, CALIFORNIA

April 17, 1941

H. M. HARTMANN, MANAGER

Mr. M. E. Gidel, Assistant Geologist  
Anaconda Copper Mining Company  
Hennessy Building  
Butte, Montana

Dear Mr. Gidel:

Re: Geology of Walker Mine.

I have given considerable thought to the questions you asked in your letter of March 17, 1941, and will give you my interpretation of conditions as I have found them. There is still considerable doubt in my mind, and for this reason I have tried not to form any definite opinions that may later be proved to be entirely wrong.

1. Do we consider the No. 1 Main hanging wall Fissure to be pre-mineral or post-mineral? (We are now almost certain this ties in with the footwall clay of the Piute Orebody.)

The relation between our Main Orebody mineralization and this fissure, has been one of the important geological problems since the opening of the lower levels, and it has not yet been fully determined. Development work along the North Orebody 900 and 1000 Levels, shows that the fissure weaves in and out of the vein, without any apparent displacement of quartz which suggests little, if any, post-mineral movement. From this, we should not consider the Orebody strike faulted, and should not expect a displaced portion on the East side of the fissure lower down. The gradual diminishment in size and grade of the vein with depth, before coming in contact with the fissure also supports this line of thought. We could explain the presence of brecciated quartz along the fissure on the 900 and 1000 Levels, as due to the slight post-mineral adjustments that resulted from the cooling of the granite and the surrounding rocks. This brecciated quartz is found only in places where the vein is right against the fissure. The present clay and breccia zone of the fissure, (including broken vein quartz), would in this case, be the result of the same adjustment. In other words, the pre-mineral fissure zone has been roughly transversed by a post-mineral adjustment. This passed from the fissure zone into the wall rock at points of weakness where the vein flattened and where it changed direction in strike. Thus, our No. 1 hanging wall fault would be a post-mineral adjustment which followed the original channel of the advancing ore fluids, until a change of dip was encountered at the approximate 1000 Level, and a change of strike was encountered North of the 718 Orebody. The fracture took the line of least resistance, which carried it into the hanging wall of the main orebodies and along the footwall of Piute.

There is quartz and mineralization in association with this fissure on the 1200 Level under the Central and North Orebodies, also on the 900 Level at Piute, which suggests bottle necks through which ore fluids passed.

On the other hand, there is evidence in favor of considering the possibilities of ore at lower levels under the present orebodies, but in my estimation, these are not too sound. The fact that we have vein segments on the hanging wall side of the No. 1

Mr. M. H. Gidel, Assistant Geologist  
Anaconda Copper Mining Company

Sheet 2.

fissure along the North Orebody 900 and 1000 Levels, suggests a possible fault throw, however 1200 Level developments directly under this area are not very promising. There exists some streaks of footwall mineralization, that may get better at depth, also there is the possibility of favorable conditions having existed along the fissure at lower depths, that have caused ore depositions of a different type than we have developed and mined above. Perhaps some Diamond Drilling to cut the fissure at lower depths should be done from the 1200 Level. I think Mr. Sales and Mr. Lyon have given considerable thought to such a plan.

Since development work along the 900 Level of Piute and especially North of Piute, has indicated a zoning condition that may give us a better grade ore in the Northern regions along our vein zone at greater depth, it is my belief that it is in this country that rests the future of Walker Mine.

2. Is there anything significant about the probable zoning of schist and vein minerals?

There is a marked decrease in the relative amount of pyrrhotite in association with chalcopyrite, progressively North from the granite contact at the South end.

From my observation, there seems to be considerably more garnet progressively North with the exception of the North Piute Orebody, which is considerably different from Piute. At least, the garnet is much more conspicuous in lower Piute, where it occurs as veinlets cutting through the vein quartz as well as a dissemination throughout the schist and the vein. The dissemination of garnet is rather common throughout the Mine, especially in the wall rock where there are zones that are more highly concentrated than usual. I have generally believed that the garnet as well as the magnetite, are your so-called schist minerals, and are residual within the vein. However, the coarse garnet as it occurs in the veinlets of the lower Piute ore, seems to have been introduced during a later surge of mineralization in association with Barite, Magnetite, Chalcopyrite, also some Zeolites and Calcite.

Magnetite is abundant in all orebodies, both in the vein and in the wall rock. Some is coarse and some is fine grained, and local concentrations may be found in any orebody. I imagine a microscopic study would reveal a number of generations of magnetite.

I would not say that the relative amounts of garnet or magnetite has any bearing on the grade of ore.

With the exception of the North Piute Ore, where chalcopyrite is deposited along the structure of chloritic schist, I would say that the deposition of copper minerals is usually accompanied by silicification. It appears that veins were formed by more than one stage of mineralization, starting with the typical glassy quartz vein, containing some sulphides, that was later fractured and enriched by chalcopyrite being deposited along the fractures. It is not uncommon to see lighter colored quartz veinlets of a later stage, cutting through the glassy quartz vein, and these veins as a rule, carry coarse chalcopyrite, chlorite, micas and possibly, other minerals.

Mr. M. H. Gidel, Assistant Geologist  
Anaconda Copper Mining Company

Sheet 3.

Primary chalcocite is very rare, and what I have seen, comes from areas that carry bornite. Bornite is quite common and occurs principally as localized disseminations along shoots in the 712, Piute, and North Piute Orebodies. These minerals do not seem to be associated with the extreme silicification that accompanies most of our ore, but is accompanied by a chloritic alteration of the host rock that leaves it distinctly green in color. Very often the bornite occurs intergrown with approximately an equal amount of chalcopyrite, and the combined minerals form small isolated masses disseminated in the vein. Bornite and chalcocite are not associated with the barite, garnet and magnetite, as they occur in lower Piute, although there is some bornite in this country. I think the bornite is earlier than these minerals.

3. Does the strike of our vein conform generally with the banding of the schist?

From my observations, the strike and dip of the Walker Vein to the 712 Orebody, conforms very closely with the banding of the schist, which averages about North 25 degrees West. North of the point where the footwall vein of the 712 Orebody intersects the Main vein; the Piute and North Piute Orebodies are off-set to the East, and their strike changes to practically due North. However, the banding of the schist still remains roughly North 25 degrees West, and carries normal dip, (plus - minus 55 degrees), even though the orebodies flatten to 40 degrees or less.

The hanging wall of the South, Central, and North Orebodies is very often banded with parallel quartz veinlets for a few feet into the massive wall rock, which suggests a direction of shear before mineralizing fluids were introduced. This banded structure is often apparent throughout the full width of the vein, presenting parallel layers of quartz and schist that make up the vein. This is generally referred to as "horses" of waste within the vein. On the other hand, in Piute especially, this parallel banding of quartz and schist angles to the strike of the orebody and usually dips steeper than its footwall. This banding has the normal North 25 degrees West, strike and roughly the normal 60 degrees to the East dip, but the footwall of the orebodies, (Piute and North Piute), are approximately North and South.

These conditions suggest that the original schist was banded with a North 25 degrees West shear, but the ore fluids came in along a later fissure that followed the banding to the 712 Orebody, but cut across it where Piute and North Piute was formed. The quartz banding and schist structure of these two orebodies, are very pronounced and definitely make an angle with the footwall (strike) of the orebodies.

These conditions suggest that the banding of the schist was developed at an earlier date than the vein was deposited.

In conclusion, I might say that it is very possible that a favorable zoning condition exists in conjunction with Walker Mine Ore, and that lower temperature orebodies of better than average grade may be found at intervals along the strike to the North.

Mr. H. H. Gidel, Assistant Geologist  
Anasconda Copper Mining Company

Sheet 4.

I trust that these opinions are not too far from right, and that future developments at Walker Mine will disclose something worth while.

Very truly yours,

S. K. Droubay  
S. K. Droubay

SKD:DM

cc - Mr. Wood  
Mr. Sales  
Mr. Lyon  
Mr. Perry ✓

## C O P Y

March 17, 1941.

Mr. S. K. Droubay,  
Walkermine,  
Plumas County, Calif.

Re: Walker Mine  
Plumas Co., Calif.

Dear Mr. Droubay:

I received your letter of February 22nd (including map), in which you summarize the results of your study of the structural and mineralogical relationships in the respective ore-bearing zones developed in the Walker Mine. After reviewing this interesting information, I am prompted to comment on certain items, as follows:

South Orebody - last two lines on page 1, quote:

"The east vein has pitched against the hangingwall fissure on the lower levels and will die out against the fissure, if it does the same as the Central Orebody".

This statement leads me to ask if you consider the clay seams to be pre-mineral or post-mineral, a highly important question bearing directly on the possibilities of finding any ore in the South, Central and North ore zones in the Walker Vein at elevations below present bottom levels. If the orebodies are gradually cutoff by post-mineral strike faults, is it possible that the vein may be pulled apart or displaced downward below present bottom levels? If so, should some prospecting be done to check such a possibility?

However, quoting the next to last paragraph in your letter:

"From a casual glance of the 900 level plan, one could almost imagine that the Piute and North Piute orebodies are thrust faulted lower portions of the Central and North orebodies".

You imply a possible lateral or thrust displacement along the fault aggregating 2500 feet or more. This idea appears fantastic, even though the Piute orebodies are on the hangingwall side of the fault clays and the southerly orebodies are largely on the footwall side of the clays.

From your description of the mineral associations in the Walker Vein, I get the impression that there may be a general zoning, that is, a higher ratio of pyrrhotite to chalcopyrite in the south portion of the mine compared with decreasing amounts of pyrrhotite existing in the North, 712, and Piute orebodies. Also, it appears that there is an increase in the relative amounts of garnet in the vein zone as you go north in the mine. What

## ANACONDA COPPER MINING CO.

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Mr. S. K. Droubay--2

March 17, 1941.

about relative amounts of magnetite or other "schist" minerals? Do you think there is anything significant about this probable zoning of schist and vein minerals, including the types of associated quartz and the rarer occurrences of bornite and primary chalcocite?

Referring to your map, I note that the dip of the vein structure varies gradually from 90° at south end of the mine to 35° east (9340 drift) at the north end of the Piute workings. Do these dips (and the strike) conform generally to the banding in the schist? According to your description (Page 3) the Piute orebody at least occurs in a sheared zone which angles slightly to the schist banding. In other words, was a large portion of the mineralization in the Walker Vein deposited contemporaneously with the development of schistosity, or was it introduced following later intrusives into the schist, such as the diorite plug northwest of 712 ore zone, and/or the granite farther south?

I appreciate receiving the map and letter summarizing your observations of the geology at the Walker Mine. Otherwise, at this time, I would not be prompted to ask the above questions regarding the subject, further study of which might suggest some prospective possibilities of importance.

With kindest regards,

Yours very truly,

MHC:KM

cc: C.E.W.  
R.H.S.  
T.Lyon  
V.D.P. ✓

M. H. GIDEL

## WALKER MINING COMPANY

WALKERMINE

PLUMAS COUNTY, CALIFORNIA

H. M. HARTMANN, MANAGER

Memorandum of cost and possible Ore Reserves developed, by developing the 1000, 1200, and 1400 Levels of the Piute and North Piute Orebodies, the extent of the mineralization as exposed along the present 900 Level. It is assumed that the areas and grade of ore will be the same on each Level.

Area of South Piute Ore cross section	15,700 square ft.
Area of North Piute Ore cross section	5,000 square ft.
Slope distance between 1000 - 900 Levels	300 feet
Slope distance between 1200 - 1000 Levels	240 feet
Slope distance between 1400 - 1200 Levels	240 feet
Cubic foot factor per ton of ore	12

Assuming approximately one half gross tonnage recoverable.

			RECOVERABLE ORE (1/2 Gross)	
<u>1000 Level</u>				
Grosscut E.	410 ft.			
Drift N. (of Shaft)	1470 ft.	South	200,000 tons @ 1.5% plus	
Drift S. (of Shaft)	370 ft.	North	50,000 tons @ 2.00%	
Total	<u>2250 ft.</u>		<u>250,000 tons</u>	
2250 ft. @ \$20.00/ft.	=		\$45,000.00	
To advance 1017DN to present wrks.			18,150.00	
			<u>\$63,150.00</u>	

<u>1200 Level</u>				
Grosscut E.	460 ft.			
Drift N. (of Shaft)	1470 ft.	South	150,000 tons @ 1.5% plus	
Drift S. (of Shaft)	920 ft.	North	50,000 tons @ 2.00%	
Total at \$20.00/ft.	<u>2850 ft.</u>		<u>210,000 tons</u>	
			= \$57,000.00	

<u>1400 Level</u>				
Grosscut E.	610 ft.			
Drift N. (of Shaft)	1470 ft.	South	150,000 tons @ 1.5% plus	
Drift S. (of Shaft)	920 ft.	North	50,000 tons @ 2.00%	
Total at \$20.00/ft.	<u>3000 ft.</u>		<u>210,000 tons</u>	
			= \$60,000.00	

Shaft Sinking at \$100.00/ft. 500 ft. = \$50,000.00

<u>TOTAL COST</u>	<u>\$212,000.00</u>	650,000 tons @ 1.62% cu.
		0.04 au
		0.70 ag

Cost per ton of Recoverable ore	= \$0.31
Gross recoverable values per ton	= \$4.00
Cost per pound of recoverable copper	= \$0.0107

## INTERNATIONAL SMELTING AND REFINING CO.

GEOLOGICAL DEPARTMENT  
KEARNS BUILDING

TOM LYON

SALT LAKE CITY, UTAH

August 18, 1938

Mr. Tom Lyon

O f f i c e s

Dear Sir:

As per your request the following data are submitted to give additional information on some of the development projects recently listed for the Walker Mine and commented upon by Mr. Sales in his letter of August 10th.

THIRD LEVEL. NORTH ORE BODY

363-B drift northerly over 460 stope.

Regarding the question as to why 460 stope was stopped about 50 feet above the 400 level, the old reports show the last breakage from this stope was in March 1929. The breakage and grade for the three periods in March during which the stope was worked was as follows: March 1-8, 993 tons @ 1.35%; March 8-15, 1110 tons at 1.18%; March 16-23, 747 tons @ 0.90%. At the time of stopping 460 stope the manager's report states that the stope was being stopped "until the Third level and Second level can be driven north to prospect this area." For some reason this work was never done. There thus was apparently a decrease in the grade of the ore broken toward the top of the stope but whether this decrease was due to a weakening or scattering of the mineralization or to dilution from mining too far into the hanging-wall or footwall is not known. The back of 460 stope is now inaccessible but the stope has not caved.

August 18, 1938

The detailed geological notes on 363-B drift and 393-B drift show quartz stringers with chalcopyrite near the present faces. 363-B drift north shows strong low-grade quartz to a point 30 feet back of the face where the drift swung to the northwest or toward the footwall. Thus the North ore body shows little oxidation on the Third level which in this area is about 380 feet below the surface; just to the south, in the 340 stope area, the vein was mined to above the 200 level where it was highly oxidized.

It is also noted that the average grade of the ore mined from 460 stope is higher than that of 440 stope just to the south, although 460 stope was not carried to the 300 level.

Thus judging the available data it would seem that there is at least a possibility of developing commercial ore by driving 363-B drift further to the north. In view of the need for developing as much ore as possible above the 700 level this possibility is considered sufficiently bright to justify some further drifting here. If ore is found, there is a large block of undeveloped ground to prospect at this level between the North and 712 ore bodies.

#### SIXTH LEVEL. 517 VEIN

619 drift southwest was being driven at the time mine operations were curtailed on November 1, 1937 but this drift has not yet reached the downward projection of the strongest mineralization on the 500 level. The last portion of the 619 drift shows some quartz and chalcopyrite streaks. Above the 500 level two raises were driven on the 517 vein to the 400 level, both showing ore for the width of the raises with good values in copper (2.24%) but with lower than average values in gold and silver.

If this ore shoot rakes southwesterly or down the dip from the

south end of 517 drift it will be developed by continuing 619 drift further southwest. This drift will also head toward the area where mineralized granite (0.25% copper) was reported in diamond drill hole 13 and where porphyry and silicified schist outcrop on the surface about 1000 feet west of the main ore zone.

SEVENTH LEVEL.

1. 732 Crosscut East. South Ore Body.

Mr. Sales suggests drifting on the hanging-wall ore streak exposed in the next crosscut to the south of 732 (743 x-cut) instead of continuing 732. All of these workings are accessible and this could be done without difficulty. The only advantage to the continuation of 732 might lie in the fact that it would cut all of the hanging-wall streaks which might be present in this area. I agree with Mr. Sales that the chances of getting a new stoping block in this area are slim.

2. Crosscut east from point 380 feet southeast of 706 winze (709 crosscut east) Central Ore Body.

This was intended both to cut the hanging-wall vein as exposed to the south in the sub-level just above the tunnel and to serve as a general prospect crosscut to explore for any new veins which might lie east of, and parallel to, the present ore zone, particularly for any veins or zones which might lie along the northerly projections of the granite tongues cut in the east drill hole at the south end of the South ore body. For such general exploration purposes this crosscut was located to run out from the approximate center of the Central ore body.

The old diamond drill hole #4 which was drilled easterly from 712 drift at a point about 150 feet north of this proposed cross-cut, according to our maps, had a length of only about 100 feet. I can find no log of

this hole but it easily could not have reached the projection of the sheeted mineralized zone exposed in the face of 709-D drift. The face of the sub-level drift on the hanging-wall vein is approximate over the face of 709-D drift, both points being about 400 feet south of the proposed cross-cut.

3. Crosscut easterly from point in 712 drift 400 feet north of 706 winze.

This was intended to cross-cut again the many low-grade stringers exposed in 712 drift just south of this point and to determine if any of these, or the vein cut in hole #8, deserve further development by drifting or raising.

4. Drift southeast on east split of Piute vein.

On checking over our drill hole data I find that drill hole #15 from the sub-level above the 7th level has a total length of 903 feet and thus extends well beyond the projection of the Piute hanging-wall vein. This hole at 300 to 400 feet showed considerable mineralization with stringers of chalcopyrite.

EIGHTH LEVEL. PIUTE ORE BODY.

The reasons for selecting the 8th level instead of the 9th for the first development work on the Piute ore body were the fact that the present face of 818-A drift north shows better grade mineralization than the north drift on the 900 and also the fact that the south drift on the 800 also still shows ore in the face. Driving of the 886 drift south will thus serve to block out more ore to the south and there is operating advantage to driving two headings on the same level. After developing what ore and getting what information we can on the 8th level, if this meets with Mr. Sales' approval, we can drop down to the 9th level for further exploratory work to the north as per his instructions.

Respectfully submitted,

