

WALKER MINING COMPANY

WALKERMINE
PLUMAS COUNTY, CALIFORNIA

613

L. F. BAYER, MANAGER

March 9, 1937

Mr. Tom Lyon, Chief Geologist
International Smelting
& Refining Company
Salt Lake City, Utah

Dear Sir:

Please find enclosed geological sketches for February development, a March 1st sheet for addition to the available ore reserve, also tables and long sections for preparing the 1937 Ore Reserve booklet.

Very little development work was done during February, but I am sure that this next month will show a decided change. Now that the company is on its feet again, Mr. Bayer has talked of starting all headings and raises that have promise of finding ore. He has asked me to plan a development program that will be similar to the system in vogue at Butte wherein a ton of ore will be found and prepared for every ton that is mined. I think that by tabulating the life of each prepared stope, and estimating the development required to prepare known orebodies, we will be able to work out something very practical. This can be carried in conjunction with monthly operating ore reserve sheet.

In regards to the Statement of Ore Reserves---Perhaps I have gone too far in trying to prepare a comprehensive estimate that is possible for the operating department to comply with, in regard to both tonnage and grade, but I have tried to make it into something with which we will not fool ourselves. I am not aware of what excuses will have to be made to the Stockholders and Directors, but from the experience of this past year, it looks as though it is better to be in a position to credit exploration work with the finding of new ore rather than make excuses for

ore blocks that have failed to materialize after being fully explored. When large tonnages of high grade ore from the Central, North and 712 Orebodies were available, many lower grade stopes could be run for volume rather than grade without lowering the mill heads appreciably. Now that this better ore is gone, we must confine our stoping to closer limits and therefore measure our ore blocks accordingly. I trust that these changes will meet with your approval.

Our monthly reports show that there is quite a discrepancy between breakage, production and mill head assays. In the past, for practical purposes, production assays have been reduced by $12\frac{1}{2}\%$ to correct for the difference between these and the mill heads. Experience during the past year indicates that the error in Piute is greater than that of the rest of the mine, also, we have been fairly well assured that Piute has in reality, produced at about 1.00% Cu. rather than the anticipated 1.28% Cu. So with these figures in mind, a ratio is worked out wherein production assays are corrected to fit the mill heads:

Total tons to mill (1936) = 464,065 at 1.247% Cu. (Mill assay) and 1.460% Cu. (Production Assay).

Tonnage from Piute = 219,922 tons @ 1.00% Cu. (Actual).

Tonnage from the rest of the Mine = 244,143 tons @ 1.469% Cu. (Actual).

Production assay for Piute = 1.25% Cu. for rest of mine = 1.606% Cu.

Therefore $\frac{1.00}{1.25} = .800$ correction factor for Piute and $\frac{1.469}{1.609} = .914$ correction factor for the rest of the mine.

These factors have been applied to all assays as shown on the long sections but were not used directly in the cases of ore in place. Here, a re-calculated assay was made for each block and then corrected rather than just multiplying the pre-existing assay by its factor. In a good many cases the averages had previously been cut to some extent, so to guard against any possible double reductions, all blocks were re-checked.

There are two sets of long sections enclosed; one to be photostated and the other showing color distribution. I would like to have the colored set returned if it is convenient, for I would like to keep a record of the figures shown on them. The other set may be colored and retained there for reference. I would also like a booklet of the reserves after they are made up.

I sincerely hope that the changes made in the ore statement will be accepted and that it will prove to be dependable.

Very truly yours,

Seth K. Droubay

SKD
W

WALKER MINING COMPANY

WALKERMINE
PLUMAS COUNTY, CALIFORNIA

L. F. BAYER, MANAGER

October 18, 1939

Memorandum on Development

Mr. Sales spent October 17 and 18 at Walkermine, and recommended that the following projects be carried out at the earliest possible convenience.

Project No. 1

To Determine the Behavior of the 517 Vein Below the Extreme South Portion of 471 CDS.

Sections indicate that the vein, if it extends to the 500 and 600 levels, should lie in the approximate position shown on the sketch.

A. Further prospecting along 517B should be done a little more to the west, as indicated on the sketch, keeping in mind that the main vein may continue $S 45^{\circ} W$.

B. If the ore continues along the 500 level, then prospecting from the 600 level should be carried out by extending 668B in a southerly direction along the weak fissure. See sketch.

Project No. 2

Prospect the North End of the 712 Orebody, where the Several Footwall Fissures Join the Main Vein.

There are several streaks of ore on the 600 sub, 600, 500 and 400 levels that should be opened up to determine whether or not this zone contains enough ore to warrant stoping.

400 Level:

A. Extend 484CxcW far enough to expose the extreme footwall split of the fissure, or to be sure it does not extend this far.

B. Open up the mineralized zones that lie along the first two fissures cut by 470CxcW, and follow out in both directions.

500 Level:

544B may have to be extended to meet 556B, if the fissure proves productive above.

October 18, 1959

600 Level:

A. 649D should be extended far enough to cut all of the fissure zone.

B. All mineralization in this zone should be opened up the same as recommended for the 400 level.

C. A crosscut should be driven from the main vein to the end of 618E to obtain another assay cross section of this footwall area. 648D averaged 1.07% Cu.

600 Sublevel:

699B should be extended in a northeasterly direction to determine the extent of the mineralization. Part of this work may be done by exploring from 6048DW.

Project No. 3

Explore the small high grade vein exposed in 4500EW near 760BR, by raising and by drifting south into the 710 Orebody.

Project No. 4
Diamond Drilling

A. It was decided that the footwall country of north Piute had been sufficiently explored by the old surface diamond drill holes Nos. 5, 8, 10, 11, 12 and 14, and that therefore drill hole No. 23, drilled west from the end of 9048DW, should not be continued beyond its present 209 foot depth. The objective of cutting the footwall quartz exposed in 900CzeW was obtained.

B. A 200 foot hole should be driven south of hole No. 25 to obtain another cross section of the footwall mineralization exposed by holes No. 22 and No. 25 drilled from the 1200 and 1000 foot levels of the Central Orebody.

C. Two short holes may be drilled from the face of 1017IN to locate some trace of the 712 mineralization.

Respectfully submitted,

S. K. Droubay

ANACONDA COPPER MINING CO.

C O P Y

May 23, 1939.

Mr. S. K. Droubay,
Walker Mining Co.,
Walkermine, Calif.

My dear Droubay:

In reply to your letter of May 19th, addressed to
Mr. Gidel.

While I do not feel that we could find enough mineral showing in the basalt covering at the north end of the Walker, to sustain a mineral location, I think we should cover the ground with locations about as you indicated on your map. This should be done in order that we might have whatever possessory rights that might be flowing to such location. If we extend our 900 level, or any other level, northerly on the Piute Vein, we could claim discovery at such time as our drift or drifts reached a point beneath one of these surface locations on basalt.

Under the above plan, I think we would be able to hold the ground as against anyone else trying to locate it. Instead of covering the entire area indicated by blue line locations on your map, we might add smaller groups of locations, keeping the same within, say two or three claim lengths of our present boundaries, and it might not be necessary to cover so much ground in an east-west direction as you indicate.

Yours very truly,

RHS:KM

cc: Messrs. Elton
Lyon ✓
Bayer

RENO H. SALES

WALKER MINING COMPANY

WALKERMINE

PLUMAS COUNTY, CALIFORNIA

L. F. BAYER, MANAGER

July 12, 1939

Mr. Tom Lyon, Chief Geologist
International Smelting & Refining Co.
818 Kearns Building
Salt Lake City, Utah

Dear Tom:

Please find enclosed available ore tabulation for the months of May and June, also some cost data that may be of interest to you.

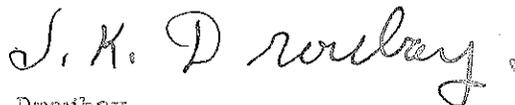
There was a slip up and your May reserve sheet was not sent in. The cost data was compiled to give the operating department a picture of how much margin they had in mining each of the ore blocks.

Unless a person is familiar with the stopes, and the stages of their development, these figures may be misleading in certain places, especially where a stope is first being put into operation. However, it may be used as a general guide.

Mr. Sales spent a day going over the geological maps with me. I suppose he wanted to refresh his memory in regards to the future possibilities of Walker Mine for the purpose of considering the extension of its credit to see it through a development program.

The gold property at Downieville is not ready for inspection as yet. I am going to look at a large gravel deposit next week. It belongs in part to a fellow who works here at the mine, and he and his family want to sell it. Lindgren examined the property in 1916 and wrote a very favorable report on it. If it looks too big for the several fellows that are going to make the trip to handle, it may be worth while for the International to look over.

Very truly yours,



S. K. Droubay

SW

Encl.

ANACONDA COPPER MINING CO.

C O P Y

April 26, 1939.

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

Dear Mr. Droubay:

I received your letter of April 21st with geological sketches showing recent advances made in 471-C drift and 904-B drift in the Walker Mine, also copy of recommendation No. 22, and three tabulations of available ore reserves in the mine on February 1st, March 1st and April 1st.

I note the following monthly decreases in ore reserves to be:

During	January	22,599 Tons
"	February	22,599 "
"	March	5,994 "

which, on April 1st leaves a total reserve of 1,538,922 tons, averaging 1.27% copper.

I concur with your suggestion to drive 471-C drift southwesterly beyond 559-B Raise on the extension of 712 Ore zone, in preference to drifting on the weaker vein structure exposed in the southwest faces on the 500 and 600 levels. Last summer, Mr. Kildale and I traversed the surface above this mineralized zone and concluded that it would be desirable to drift some distance to the southwest towards a plug of diorite porphyry, which terminates a highly silicified, iron-stained, sheared zone that cuts across the schist. The porphyry plug is approximately 1500 feet, S. 50° W. from the face of 471-C drift.

I also note that Recommendation No. 22 proposes a plan for the normal development on the 900 level of the downward projection of the south

ANACONDA COPPER MINING CO.

Mr. Seth K. Grayson--2

C O P Y

April 26, 1939.

portion of the Piute orebody. This proposed work should make available a considerable tonnage of ore.

I find that our maps do not show the position of diamond drill hole No. 10, drilled from the surface and in the area north of the Piute orebody. Did this hole cut any mineralization? Judging from the north-west strike of the northernmost ore found in 904-B north drift, it may be advisable to soon turn a crosscut to the west from the north face of the drift to test the possibility of the vein structure extending in that direction.

I am glad to know that Virgil Chamberlain is rendering good work.

Yours very truly,

MHC:EM

cc: Messrs. Kelley

Weed

Sales (Inc. sketches and
Lyon Apr. 1, ore reserve
Dugan Statement).

M. H. GIDEL

(COPY)

WALKER MINING COMPANY
WALKERMINE
PLUMAS COUNTY, CALIF.

April 21, 1939.

Mr. M. H. Gidel, Asst. Chief Geologist
Anaconda Copper Mining Company
Butte, Montana

Dear Sir:

Please find enclosed several geological sketches that may be of interest to you, a copy of recommendation #22 as submitted to Mr. Lyon and Mr. Dugan for approval and the last three monthly tabulations of our available ore reserves which should bring up to date the set I had been sending to Mr. Sales from time to time.

The composite sketch and section of the 517 footwall fissure zone of the 712 Orebody gives a picture of development to date. 619E has been stopped for the time being. Mineralization was so weak and scattered, that it seemed wiser to see what the extension of 471C beyond 559B raise would bring. Although we have ample information and mineralization to warrant a raise being driven, in preparation of mining ground under the 500 level, we may have to extend 654 ExcNW to determine whether the vein steepens or pinches below the 500 level.

The 904B DN from the Piute Orebody is well under way. We are out of the gray, sheared fissile schist and into a more crystalline formation. It may be wise to extend a crosscut to the footwall slip to be sure we do not get too far away from it.

If 904B is continued on its present course for 800 feet it will be 500 feet in the hanging wall of the ground explored by surface diamond drill hole #10.

Recommendation #22 gives a general picture of how the ore along the Piute 800 Level pinches to the south. Although it is questionable whether strong mineralization will extend to the 900 Level, there will be a substantial tonnage of ore to be mined from below the 800.

Vergil Chamberlain is getting along very nicely.

Very truly yours,

(Sd.) SETH K. DROUBAY

SW

ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department

RENO H. SALES, Chief Geologist

M. H. GIDEL, Asst. Chief Geologist



Feb. 8, 1939.

Mr. Tom Lyon,
818 Kearns Bldg.,
Salt Lake City, Utah.

Dear Tom:

Thank you for copy of Mr. Kildale's letter concerning the recommendations for development at the Walker Mine, which were submitted by Mr. Droubay.

With limited funds for development, Recommendation No. 15, proposing development of the North Orebody on the 1200 level, undoubtedly is the most important one to start first, to determine whether or not commercial grade ore extends beneath the best ore exposure on the 1000 level.

In regard to prospecting the northerly extension of the Piute orebody on the 900 level (Recommendation No. 18), I believe it would be best to extend the drift on its present course through all possible footwall branches of the fault, 100' to 200' into solid ground before turning a crosscut to the east to test for a right hand displacement or an eschelon branch of the vein structure. In the stope at the north end of the 700 level, I noted "drag" blocks of vein material to the right, implying a throw in that direction. The first test crosscut should give some idea of structure to the north, and thereby govern the plan of prospecting beyond that point; which might be considerably different from that sketched on the Recommendation Sheet. Any lateral that is to be driven should not be too distant from the vein structure.

Should a diamond drill be available at the mine, I would suggest that some drilling be done in lieu of crosscutting off the new lateral. If ore should be found in any of these projects, drifting should be done on same in preference to lateral work, unless heavy, wet ground should preclude making desired advances.

In other words, the recommendations as written suggest a plan for development, subject to whatever changes it may be desirable to make as the work proceeds, based on the relation and character of vein and fault structures.

Yours very truly,

M. H. Gidel

MHG:S

cc - Mr. Reno H. Sales
Mr. C. E. Weed

INTERNATIONAL SMELTING AND REFINING CO.



GEOLOGICAL DEPARTMENT
KEARNS BUILDING

TOM LYON

SALT LAKE CITY, UTAH

January 28, 1939

Mr. Tom Lyon

Offices

Dear Sir:

The following comments are submitted on the last four development recommendations for the Walker mine (Nos. 15, 16, 17, 18) as submitted for your approval by Mr. Droubay in his letter of January 25, 1939.

Recommendation No. 15

This is the recommendation applying to the drift northerly on the 1200 level off of 1082 winze. It follows the general plan already agreed upon and appears to be satisfactory with the possible exception of the two pairs of crosscuts designated to be run from this drift at distances of 140 and 340 feet from the winze. If no strong mineralization is encountered along the fault zone in the crosscut easterly directly off the winze station, it is believed that the north drift should be pushed as rapidly as possible along the footwall of #1 fault until a point under 1060 A drift and on the downward projection of the north ore body is reached -- without delaying this drift to run the first two sets of crosscuts as shown on the recommendation sheet. When a point about 600 feet north of the winze is reached, crosscutting of the zone should be done to locate the downward projection of the north ore body along which, if found, the drift can be continued to the north as shown.

Recommendation No. 16

This applies to a drift southerly from 1082 winze on the 1200 level. Its general plan is suitable but if sufficient development funds are not available at the present time for both the north and south drifts on the 1200 level, this proposed drift to the south should be left in abeyance until the north drift is completed. The ore zone of the central ore body on the 1000 level in this area is narrow and it is believed that the northerly development drift under the north ore body is more important than this drift to the south.

January 28, 1939

Recommendation No. 17

This applies to the continuation of the south drift on the 800 level in the Piute ore body. It now appears possible that the southern limit of the commercial ore on the 800 level has been reached in the vicinity of 828 A and 829 A crosscuts. However, as shown on the recommendation sketch, the 886 drift on the 800 level has reached the area below the point where the Piute vein splits into two branches on the 700 level, one split following the footwall fault to the south, the second branch turning to the southeast. Thus the 800 level drift should be continued along the footwall fault as shown on the sketch and the proposed crosscut easterly at a point about 100 feet ahead of the present face should be driven a sufficient distance to be sure of cutting any southeasterly split as shown on the 700 level. The mineralized zone shown as being cut in D.D. hole #15, drilled from the sub-level above the 700, may represent this easterly branch. Recommendation as outlined covered these possibilities except that the easterly crosscut as shown should probably be extended about 50 feet further than shown.

Recommendation No. 18

This recommendation applies to the prospecting of the area north of the present Piute ore body on the 900 level off of the Piute shaft, according to the general plan already agreed upon. It is recognized that in this area two possibilities must be tested - (1) the continuation of the ore zone northerly along the flat footwall fault and (2) the presence of other ore bodies along the northeast-striking fault which appears to branch off the footwall fault in this area. This fault may itself be mineralized or may be a fault of the "cross-over" type which will lead to another ore body parallel to but lying north and east of the Piute ore body. The recommendation as submitted calls for the continuation of 904 B drift northerly along the footwall fault, with frequent long crosscuts easterly toward the northeast branch fault. It appears to the writer that these long crosscuts are neither so economical nor so satisfactory as would be a drift directly along the northeast fault. Such a drift will require less footage than the long crosscuts and give more geological information. The geological mapping of the two drifts along the footwall and northeast faults should detect any branching mineralized zones which may split off into the area between the two drifts. Hence it is recommended that this recommendation be revised to call for a drift along the northeast fault and the elimination of the long crosscuts off of the extension of 904 B drift.

Respectfully submitted,



M. B. Kildale

MBK:P

cc: Mr. M. H. Gidel
Mr. J. F. Dugan

January 28, 1939

Mr. Tom Lyon

Offices

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January 28, 1939

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Respectfully submitted,



M. B. Kildale

MEK:P

cc: Mr. M. H. Gidel

Mr. J. F. Dugan

Mr. Tom Lyon

-2-

January 25, 1939

Any comments or suggestions as to the proposed development will be very gladly received.

Respectfully yours,

S. K. Droubay
S. K. Droubay

cc-Mr. Gidel

WALKER MINING COMPANY

WALKERMINE

PLUMAS COUNTY, CALIFORNIA

L. F. BAYER, MANAGER

January 25, 1939

Mr. Tom Lyon
Chief Geologist
818 Kearns Bldg.
Salt Lake City, Utah

Dear Tom:

Please find enclosed four recommendations for development work at Walker Mine. These have been more or less under consideration for some time, and now that the mine will soon be in condition to have this work started, I have drawn up the 200 scale sketches.

As the No. 1 hanging wall fault steepens below the 1000 level, being 70° between the 1000 and 1100 levels, it is questionable just how it will act to the north and south. Recommendations No. 15 and No. 16 were drawn up by projecting structure to the 1200 level and making it fit the known position of the fault at 706 winze.

Recommendations No. 17 and No. 18 have to do with Piute. No. 18 is to prospect for ore north of our present extreme exposures of mineralization as recommended by Mr. Sales in his letter of October 27, 1937, a copy of which was sent to you. The slip coming in from the northeast just ahead of the present face is projected down from the 600, 700 and 800 levels. It may be well to prospect back through this from a point several hundred feet ahead if no mineral is found in the zone indicated. No. 17 is to keep the 800 level from taking off on an east split, as happened on the 700 and 600 levels. It looks as though we are at the end of our commercial ore here, but we should continue going south as long as we are able to drift on ore. When this fails, any further prospecting could be done from the 700, where the level is not so congested for handling waste. We have located hanging wall with 450° raises, which cost much less to run than do crosscuts.

All copies of the annual ore reserves were sent to you, and the additional long section that you requested will be sent in as soon as Ed Broadwater can finish making it up.

In the past, Mr. Sales requested that I keep him posted on our development work here. He wrote me on January 6th that he was going to South America and that in communicating geological matters to you I should send a copy of the letters and maps to Mr. Gidel at Butte. I will also send Mr. Dugan a copy of the recommendation maps, and tell him they are subject to your approval.

ANACONDA COPPER MINING Co.

C O P Y

Jan. 17, 1939.

Mr. S. K. Droubay,
Walker Mine,
Plumas County, Calif.

Dear Sir:

On my recent trip to New York City, Mr. Sales handed me your letter of December 21, 1938, in which you summarized the results of prospecting done at the Walker Mine on the several recommendations for development that were submitted last summer. So far the work has apparently found nothing of importance, the most encouragement being indicated by the possibility of finding some ore in future advance in 619 E Crosscut beyond the small seams of chalcoppyrite and bornite then exposed in the face.

A few days ago, I reviewed the development situation at the Walker with Mr. Lyon. We are hopeful that the drifting as planned on the bottom of 1200 level, will find a good grade and width of ore in the North orebody beneath that showing on the 1000 level at points 500 to 1200 feet northwest of the shaft.

I also wish to acknowledge receipt of a copy of the Table of Ore Reserves at the Walker Mine, dated December 1st, to January 1st, 1939, which you addressed to Mr. Reno H. Sales at this office.

Yours very truly,

MHC:EM

CC: Messrs. Hobbins
Sales
Wood
Lyons ✓

M. H. GIBEL

ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department

RENO H. SALES, Chief Geologist

M. H. GIDEL, Asst. Chief Geologist



New York, N. Y.
January 5, 1939

Mr. Tom Lyon,
820 Kearns Building,
Salt Lake City, Utah.

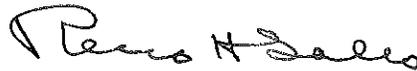
Dear Tom:

Weed, Gidel and I have discussed the Walker situation. We agreed that the 1200 level should be extended to the north as rapidly as possible, and you are authorized to go ahead with that development. As I understand it, the shaft is filled with water to a distance below the 1100.

I think a little study is necessary on the matter of the location of the north work on the 1200; that is, as to whether we should first pick up the vein and drift on it, or lay out a lateral on lines in order to reach our main objective as quickly as possible. Speed is the essence of the thing and I think the manner of doing the work is for you, Dugan and the mine management at the Walker to decide.

Incidentally, it is surprising that our Walker maps and sections do not show that the shaft is down to the 1200 level.

Yours very truly,



RENO H. SALES

RHS:D

CC - Messrs. C. E. Weed
J. F. Dugan

December 28, 1938

Mr. Reno H. Sales
Room 1726
25 Broadway
New York City, N. Y .

Dear Reno:

I have your letter of December 24th, regarding the Walker 1200. The 1200 level is 279 feet vertically below the 1000.

As stated in my previous letter it is 900 feet between the shaft and the vertical projection of the southern end of the north ore body.

The proposed hanging wall cross cut on the 1000 level is 379 feet. This, plus the station, plus several holes, will cost as much as a drift north on the 1200. The time element is an important factor as we are going to need some new stopes in a hurry. I wish to urge that no drilling be done from the 1000 and that the 1200 be pushed out beneath the north ore body. If ore is encountered on the 1200, then before any further shaft sinking is done, it would be well to drill first.

I hope you have recovered from your cold.

With kindest personal regards, I am

Very truly yours,

Tom Lyon

TL/S
cc. Mr. Dugan

ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department

RENO H. SALES, Chief Geologist

M. H. GIDEL, Asst. Chief Geologist



New York, N. Y.
December 24, 1938.

Mr. Tom Lyon
820 Kearns Building
Salt Lake City, Utah.

Dear Tom:

I have re-read your letter of December 8th on proposed Walker mine developments. Is it a fact that the 706 shaft is down to the 1200 level? I had the impression that the 1100 was the bottom. How far is the 1200 below the 1000?

If the shaft is to the 1200 and there can be any assurance that the level will be pushed rapidly to the north, your suggestion might be the best one.

As you know, I have two things definitely in mind for the Walker, one is the 900 drift north on the Piute, and the other the determination of the behaviour of the north orebody below the 1000 where it now shows to the best advantage in 1017 drift. As far as I am concerned, the important thing is speed but I want my ideas to be whatever will fit best with operating conditions.

Very truly yours,

Reno H. Sales
RENO H. SALES

RHS:F

279'
Vertically below
100
349
Bottom of shaft

ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department

RENO H. SALES, Chief Geologist

M. H. GIDEL, Asst. Chief Geologist



New York, N. Y.
December 23, 1938.

AIR MAIL

Mr. Tom Lyon,
820 Kearns Building,
Salt Lake City, Utah.

Dear Tom:

From Dugan's letter to Weed I take it that it is not clear what I had in mind when I wrote that we approved the hanging wall crosscut on the 1000 ft. level of the Walker mine.

It seemed to us, after careful consideration, that Droubay's suggestion of diamond drilling downward from the 1000 ft. level was the quickest way to learn something of the behaviour of the north orebody in depth. It seemed to us too long a time to wait until the 1100 ft. level could be driven northerly to the position of the proposed crosscut on the 1000. It appeared best, therefore, to get the down drilling from the 1000 suggested by Droubay started as quickly as possible.

While I think the down drilling from the proposed 1100 level crosscut may be desirable later, I hesitate to load that much expense on the mine at this time, furthermore, if the holes proposed from the 1000 level do not find better ore conditions in that part of the mine, it is extremely doubtful if it will be worth while drilling in that low grade portion of the vein below 706 shaft.

Mr. Weed is writing Dugan with reference to buying a drill for the mine. Since we will have to contract the deep holes now being considered, I think it would be much better to lay out everything in the nature of short holes that we could possibly want done and turn such work over to the contractor. I am sure the Walker mine will never have enough current drilling work to justify the expense of its own drilling outfit.

Very truly yours,

RENO H. SALES

RHS:F

CC: Mr. C. E. Weed.

ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department
RENO H. SALES, Chief Geologist
M. H. GIDEL, Asst. Chief Geologist



AIR MAIL

New York, N. Y.
December 17, 1938.

Mr. Tom Lyon,
820 Kearns Building,
Salt Lake City, Utah.

Dear Tom:

We have considered the Walker Mine development proposals. For the present, we approve the hanging wall crosscut on the 1000 foot level to be driven from 1017 Drift at a point just to the north of coordinate 15800 and as indicated on Droubay's map in green color.

We think this work should be started immediately.

As to other development proposed by Droubay, this matter will be given further consideration. For the present, however, we do not approve of the work on or from the 1100 foot level as outlined by Droubay.

Very truly yours,

RENO H. SALES

RHS:F
CC: Mr. C. E. Weed.

INTER-DEPARTMENTAL CORRESPONDENCE

MINING DEPARTMENT

INTERNATIONAL SMELTING AND REFINING COMPANY

818 KEARNS BUILDING

SALT LAKE CITY, UTAH

SUBJECT:

December 19, 1938

AIR MAIL - SPECIAL DELIVERY

Mr. C. E. Weed, General Manager of Mines,
Anaconda Copper Mining Company,
25 Broadway, Room 1726,
New York City.

Dear Sir:

Tom Lyon received a letter today from Reno Sales regarding Walker development.

Mr. Sales said that both of you had approved the hanging wall crosscut, on the 1000 foot level to be driven from 1017 D, at a point just to the north of coordinate 15,800, and as indicated on Droubay's map in green color.

We also said that you did not approve the work on or from the 1100 foot level as outlined by Droubay.

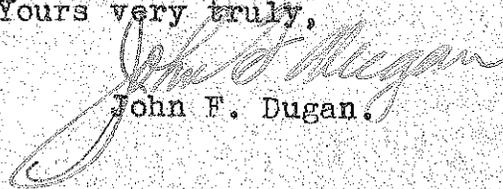
The crosscut just north of the 15,800 coordinate was laid out primarily for a diamond drill setup to prospect the downward projection of the ore body.

Mr. Lyon and myself are in somewhat of a quandry, as Mr. Sales did not say in his letter whether or not you intended to do any drilling.

If no drilling is contemplated, there is no use crosscutting at this particular point.

Will you please advise.

Yours very truly,


John F. Dugan.

JFD:H
CC: TL.

Original to you by airmail.

MINING DEPARTMENT

INTERNATIONAL SMELTING AND REFINING COMPANY

818 KEARNS BUILDING

SALT LAKE CITY, UTAH

SUBJECT:

December 17, 1938

AIR MAIL

Mr. C. E. Weed, General Manager of Mines,
Anaconda Copper Mining Company,
25 Broadway,
New York City.

WALKER MINING COMPANY

Dear Sir:

Enclosed is a copy of letter received from Mr. L. F. Bayer to which is attached a report from Mr. S. K. Droubay, Mine Geologist, showing the possibilities of using a small diamond drill for short hole prospecting work.

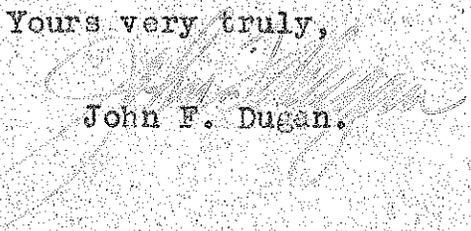
Mr. Droubay's report lists 39 possible holes to drill, or a total of 11,700 feet of drilling.

If, as Mr. Droubay suggests, diamond drilling is substituted for crosscutting the walls in 1017 and 904-B, it would keep one small drill busy and effect quite a saving in development expenditures, as much crosscutting would be eliminated.

If you remember, you suggested that we could determine the width of the various ore bodies by diamond drilling the walls with a small outfit while we were driving the raises. You thought this would be cheaper than the present method of crosscutting.

We think a small diamond drill will pay for itself within a short time.

Yours very truly,


John F. Dugan.

JFD:H
CC:JOE
TL ✓

MINING DEPARTMENT

INTERNATIONAL SMELTING AND REFINING COMPANY

818 KEARNS BUILDING

SALT LAKE CITY, UTAH

SUBJECT:

December 10, 1938

Mr. C. E. Weed, General Manager of Mines,
Anaconda Copper Mining Company,
25 Broadway,
New York City.

Dear Sir:

I have read my copy of Mr. Sales' letter to you concerning future development at the Walker Mine.

The following development data will prove of interest.

	<u>Money</u>	<u>Lin. Feet</u>
1937	\$143,863.43	7,550
1936	<u>87,188.83</u>	<u>5,558</u>
Increase 1937	\$ 56,674.60	1,992
	or	or
	65%	35.8%

You will note the increase in development work during (first 10 months) year 1937 as compared with year 1936.

In discussing the development program in the order listed by Mr. Sales:

LOWER LEVEL DEVELOPMENT WORK:

1. The 1100 foot level is under water at present, and will have to be pumped out.

Preparations are now under way to begin pumping, and should start about December 15th.

Prior to the last shutdown we were cutting skip chutes preparatory to starting the lower level. These will have to be completed, and when finished drifting will be immediately started, and pushed rapidly.

Dec. 10, 1938

Lower level development work could also be supplemented with diamond drilling from 1017 DN, which could be contracted.

900 LEVEL PIUTE OREBODY:

2. This level is also under water at present.

Owing to the slow arrival of an electric cable for the shaft, pumping has been delayed. However, equipment is now being installed and pumping should commence about the middle of the month. When the level is free of water drifting will be started immediately north and south of the shaft, and pushed with all possible speed.

In the meantime, we have been drifting north on the 800 Piute. This work has been stopped on account of inability to handle both ore and waste. However, any further work on this level will only be a duplication of the work below.

1017 DRIFT NORTH:

3. This drift will be started as soon as the water is pumped below the skip chutes in 706 shaft, so they can be used, which will be the latter part of this month.

Instead of crosscutting at intervals, east and west from 1017 North to prospect the walls, this work could be done much cheaper by diamond drilling.

800 PIUTE NORTH:

4. The 800 DN on the Piute, as previously mentioned, has been stopped.

Stope preparations are under way above the level, and mining has been started.

800 DRIFT SOUTH-PIUTE:

This was the first drift started after the development work was approved last August. The ore, so far developed, has been of good grade, and the ore reserves materially increased.

607 Drift South (I think Mr. Sales means 619 DS):

5. This drift has already been started, and will be kept going until the footwall branch has been thoroughly prospected.

Mr. Weed - 3

Dec. 10, 1938.

For short range development work diamond drilling with a small machine would be much cheaper than driving crosscuts, as it will save handling waste, eliminate hoisting, etc.

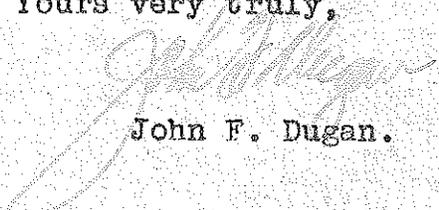
The work could be contracted for about \$1.50 to \$1.75 per foot, depending on the footage, or we could buy our own machine and do the work ourselves.

Either way, the work will pay for itself within a few months.

Both Bayer and Droubay are very anxious to get a short range diamond drill development program under way, and are now preparing the setup for me.

I would recommend the diamond drilling as it will be much cheaper than crosscutting, and will eliminate much unnecessary work.

Yours very truly,


John F. Dugan.

JFD:H
CC: JOE
TL ✓

AIR MAIL

December 8, 1938

Mr. Reno H. Sales
Room 1726
25 Broadway
New York City, N. Y.

Subject:

WALKER MINE

Dear Reno:

I am in receipt of a letter dated December 5 from Droubay at the Walker mine, a copy of which has been sent to both you and Mr. Dugan. Mr. Dugan is home sick with a severe cold and I haven't had a chance to discuss the situation with him.

In the first part of Mr. Droubay's letter he calls our attention to a number of facts of which we have been aware for a long time, and as you and I both know the chances of prolonging the life of the Walker mine lie in two places - first, at depth below the Central and North ore bodies, and second, the possible continuation of the vein zone north of the Piute.

Development below the 700 level in the Central and North ore bodies has always been the most difficult for this department to keep going as the operators always had some very good reason why this downward development should not be done. During the last period of operation both Mr. Elton and I used every effort to get the winze down below the 1000 level and finally succeeded in getting it deep enough so that development work could be done both to the north and south. The downward projection of the south end of the stopes on the 1000 level is approximately 600 feet south of the shaft and continues for a distance of from 600 to 700 feet.

Regarding the diamond drilling program, the drilling necessary to establish the ore bodies below the 1000 level will involve considerable time

2- Mr. Reno H. Sales

December 8, 1938

in addition to the expense. I believe that the time element is probably the most important in the operations at the Walker mine and that in order to keep the tonnage up to capacity, it will be necessary to develop ore very rapidly from now on. I am afraid that if drilling is done before the 1200 level is driven that a great deal of time will be lost. It appears to me that the ore body exposed on the 1000 should reach the 1200 level, although this is not an established fact. However, the 1200 drift can be driven to the north and reach the ore body probably in 600 feet. If the ore body exists on the 1200 and is drifted on, the material coming from the development work should be good enough for ore which would eliminate the necessity of handling waste from this level. As I see it, the first 600 feet will probably be the most costly and difficult to drive. This work should be started at once and pushed as rapidly as possible. The work to the north of the Flute should also be pushed as rapidly as possible. If drilling is contemplated, I believe that the 1200 level would be the level from which drilling to greater depth should be done.

Kildale and I have gone over the situation and we both feel that the 1200 level should be driven before any drilling campaign is started.

Regarding the extension of the 713 ore body to the 1000 level, I have always been very dubious about the existence of this ore body on the 1000 level; that is, I do not anticipate any ore of great importance at this location, and I believe that if necessary we should suspend operations on the 1000 level looking for this ore body and drive the 1200 level instead.

TL:P
cc: Mr. Dugan
Mr. Bayer

Very truly yours,

WALKER MINING COMPANY

WALKERMINE

PLUMAS COUNTY, CALIFORNIA

December 5, 1938

L. F. BAYER, MANAGER

Mr. Tom Lyon
Chief Geologist, Intl. Smelting & Refining Co.
818 Kearns Building
Salt Lake City, Utah

Dear Tom:

The question of future ore for the Walker Mine has been discussed a good many times by all who are directly or indirectly concerned with the company. Now that the Piute Orebody above the 700 haulage level is nearly exhausted of available ore it is important, especially from an operating viewpoint, that serious consideration be given to this problem.

Although we list over 4,000,000 tons gross ore in our reserve statement as of November 1, 1937, and over 1,000,000 tons available ore in the monthly statement of June 1, 1938, it is questionable how much of this can be produced fast enough to keep the mill up to a desirable capacity.

Mr. Bayer and myself have talked the situation over a good many times and have checked the physical properties of each ore block separately. Being more or less directly responsible here on the property, we have tried to get an estimate of how far ahead the mill can be kept running at a satisfactory tonnage. Unless we have a generous downward extension of the 712 Orebody and a decided rake south to our Piute Orebody with depth, it means that we can measure the life of the mine. It will also mean that daily production tonnages will gradually become more difficult to obtain.

In the past there were the numerous large stopes of the Central and North Orebodies from which tonnages could be kept up, and the richer ore from the South and 712 Orebodies to hold up the grade. As these were depleted above the 700 level, the choice spots below were mined out and, up until about 1931, mill heads could be kept above 1.5% copper. About this time there was a decided drop in the grade of production. However, cheap mining costs in the large stopes, especially in the upper levels of Piute, which came in later, made it possible to keep running at a profit. Piute produced at about 1% copper, and with a better grade ore distributed throughout the rest of the mine, an approximate 1.25% copper head was kept during the year 1937.

We are now, for the first time, faced with the problem of supplying the majority of our production from below the 700 haulage level. The lower levels of Piute contain large tonnages of ore, but the vein is so flat that a slower method of mining must be used. Hoisting facilities are such that it is questionable whether we can, with production from these lower levels, replace the 600 to 800 tons per day that formerly came from above.

The Main Orebody becomes more narrow with depth, and the majority of the vein below the 800 level is messed up with the No. 1 hanging wall fault. With the exception of a few stopes that are being operated now, most of the more desirable blocks of ground have been produced.

This means that in the very near future all of our production will come from stopes that are not only lower in grade, but must be mined under more adverse conditions than was done in the past. Even by supplementing this with as much pillar robbing as possible, it will be expensive to maintain a desirable production figure. We are feeling the effects of this even now.

The only way to remedy the condition that is rapidly approaching is to be assured of enough ore below the 700 level to warrant spending money on adequate haulage and hoisting facilities. If this is not proven in the next few months with large tonnages under 712 Orebody and in the lower south end of the Piute Orebody, the next best chance will be to find it north of Piute, or below the 1000 level in the Main Orebody. If these prove unsuccessful we may be forced to lay out a plan whereby we take all that we can get from the mine and get out.

In talking over the question of exploration work below the 1000 foot level with Mr. Bayer we feel that, from a money viewpoint, as well as gathering advance information, a long hole diamond drill program, substituted for the near-future resumption of operations in sinking 1080A Winze and exploring along the 1200 foot level, would be much to the advantage of the company. To my knowledge this drilling can be contracted with holes up to 1200 feet in length at a total cost to us of less than \$1.80 per foot, on a basis of a 5,000 foot minimum contract.

By spending about \$17,000 on this drill program we could, within a few months' time, find out whether the vein exists on our 1200 and approximately 1600 foot levels. To gain this information by additional sinking of 1082A Winze and extending laterals north 1300 feet and south 300 feet along the 1200 and 1600 foot levels, and doing the necessary crosscutting, would cost us in the neighborhood of \$190,000. The \$17,000 would be worthwhile insurance on the larger amount.

In checking over the records of past diamond drilling carried out on properties of the Walker Mining Company, it is seen that this work has played an important part in the finding of ore, and has saved a great deal of expense by eliminating exploratory work that otherwise would have been done. In no case did a drill hole penetrate a later developed orebody without giving indications that the orebody existed. No holes have given inaccurate results.

The early surface holes Nos. 1 to 5 drilled through the upper part of the North Orebody and proved the extension of a known vein. Early tunnel holes Nos. 1 and 3 crosscut veins on which later work developed 750A stope and the stopes in the south end of the South Orebody. Surface hole G, drilled in 1926, located 17 feet of 4.12% copper ore, which resulted in the development of our 712 Orebody. Surface hole H cut the lower north end of the same orebody,

showing mineralized quartz up to 1.5% copper (estimated). In 1928 underground holes Nos. 15 and 16 drilled from the 712 orebody were responsible for developing the 705A hanging wall streak and the 517 footwall vein.

It may be said that out of the 34 holes drilled, totaling 17,223 feet, eleven gave positive results wherein actual veins were located. In addition to this there were many slightly mineralized zones located that will help guide future development, and much negative information that has saved many feet of drifting. The records of this drilling serve as a permanent and valuable guide for the company.

In considering the two solutions to the question of future ore for Walkermine the following basic cost estimates were compiled and may be used in estimating costs of exploration along or below the 1000 foot level.

Sinking 1082A Winze	\$100.00 per ft. (minimum)
Large-size x-cuts and laterals 7x9	20.00 " " "
Small x-cuts 5x7	15.00 " " "
Diamond drilling first 500 feet	1.50 " " "
" " 500 to 600 feet	1.60 " " "
" " 600 to 700 feet	1.70 " " "
" " 700 to 800 feet	1.80 " " "
" " 800 to 900 feet	1.90 " " "
" " 900 to 1000 feet	2.00 " " "
Diamond drilling, air, water and misc.	0.20 " "
Head room for drilling	150.00 per station

As crosscutting into the hanging wall is rather expensive, the cheapest way of proving up our vein below the 1000 level in our Main Orebody, would be to drill 6000 feet of drill holes from two common stations, involving 450 feet of 5x7 crosscutting. There would be a 300 foot crosscut out from the middle of our North Orebody, with two very steep 1000 foot holes and two flatter 500 foot holes fanned. The other four holes would be the same, drilled from a 150 foot extension of 1101 XCE. This is indicated as Set-up C on the maps, and is shown with green crayon. The exact strike and dip of such holes would have to be determined by additional sections. Such a drilling program would cost:

400 ft. crosscuts at \$15 per foot	\$6750
4000 ft. hole under 501 feet at \$1.50 ft.	6000
2000 ft. hole over 500 feet	3600
6000 ft. hole at 20¢ per ft. for air and misc.	1200
2 stations	300
	<u>\$17850</u>

Of course, more satisfactory positions for collaring holes could be obtained by additional crosscutting, as indicated on the maps. The long, steep holes could be substituted for more numerous short holes, or vice versa.

To drift along our 1200 level and obtain comparable information will cost:

Lateral north 1300 ft. at \$20	\$26000
Lateral south 300 ft. at \$20	6000
Crosscuts north and south 900 ft. at \$20	18000
Skip pockets on 1200 level	5000
	<u>\$55000</u>

The same figure may be used for exploration on our 1600 foot level if 500 feet of shaft sinking at \$100 per foot is added.

To explore 1200 foot level	\$55000
To explore 1600 foot level	55000
Sinking 1082A Winze	50000
	<u>\$160000</u>

The figures for drifting look rather high, but when waste disposal, pumping, and the congested condition of our hoisting facilities are taken into consideration they are not far off.

I trust that I have not been too presumptive in calling attention to a problem that should be solved.

Respectfully yours,

S. K. Droubay
S. K. Droubay

- cc-Mr. Sales
- cc-Mr. Dugan
- cc-Mr. Bayer

Salt Lake City, Utah

November 18, 1938

Mr. C. E. Weed
Room 1726
25 Broadway
New York City, N. Y.

Dear Sir:

I have discussed the Walker mine development situation with Lyon and Kildale. The following program is recommended with individual projects listed in order of their importance.

- 1- Explore the Walker vein zone northerly on the 1100 foot level. It is proposed that this work will be followed later by diamond drilling to test the vein at deeper levels.
- 2- From the Piute shaft extend the 900 level northerly into unexplored territory beneath the basalt covering. This project may mean upwards of a thousand feet of work, depending upon geological disclosures.
- 3- Continue 1017 drift northerly, supplemented by crosscutting to prospect the downward continuation of the 718 ore body.
- 4- Continue the 800 Piute drifts northerly and southerly as at present. Should the Piute vein be terminated by a fault in the face of the north drift, further consideration should be given before prospecting is undertaken to recover the faulted segment. The distance the 800 south drift is to be extended will naturally depend upon the behavior of the vein as to strength and mineral character.
- 5- Continue 607 drift southerly to prospect the footwall branch.

In my opinion it is extremely important that the suggested 1100 and 900 developments be pushed. What is most needed at the Walker is a demonstration of the downward continuation of the Walker vein ore, or the development of additional ore on the Piute vein to the north in unexplored territory. Unless one of these projects is successful, the Walker mine is going to be in a bad way in the not distant future. It is therefore of extreme importance that the 900 and 1100 projects be gotten under way at the earliest possible date and

2- Mr. C. E. Weed

November 18, 1938

continued to completion.

I will discuss these matters further with you upon my arrival in
New York.

Yours very truly,

RHS:P

cc: Mr. Kelley
Mr. Elton
Mr. Lyon
Mr. Dugan

Reno. H. Sales

ANACONDA COPPER MINING CO.

C O P Y

Aug. 17, 1938.

Mr. C. E. Weed,
Manager of Mines,
Building.

Dear Sir:

The development recommendations for the Walker Mine decided upon yesterday in the conference at which you, Mr. Gidel and myself were present, are listed below in order of preference:

- (1) Eighth Level - Continue 818A Drift northerly on Piute Vein
- (2) Eighth Level - Continue 886 Drift south on Piute Vein.
- (3) Sixth Level - Continue 619 Drift southwest.
- (4) Third Level - Continue 363B Drift northwesterly on Main Vein.
This recommendation is subject to a further study of details and to conditions in 460 stope.
- (5) Seventh Level- Drift northerly on vein disclosed in 743 Crosscut.
- (6) Tenth Level - Continue 1017 Lateral 200 feet northwesterly on present course, then crosscut north 70° east through projection of 712 orebody.

Of the other recommendation in Gidel's memorandum of July 22nd, we eliminated the proposal to crosscut north 60° east from 712 Drift at a point 380 feet southeast of 706A Winze.

As to the remaining recommendations covered by Mr. Gidel's memorandum, these are to be carried out in order of convenience to the mine operation.

It is further suggested that at such time as the Ninth Level of the Piute is unwatered, Drift 904B North be extended in preference to the

ANACONDA COPPER MINING CO.

Mr. C. E. Weed

COPY

Aug. 17, 1938.

proposed footwall crosscut, as given in Gidel's memorandum.

Yours very truly,

RHS:KM

cc:Mr. T. Lyon ✓

RENO H. SALES

ANACONDA COPPER MINING COMPANY

RENO H. SALES, CHIEF GEOLOGIST
M. H. GIDEL, ASSISTANT CHIEF GEOLOGIST



BUTTE, MONTANA

GEOLOGICAL DEPARTMENT

Aug. 10, 1938.

Mr. Tom Lyon,
820 Kearns Bldg.,
Salt Lake City, Utah.

Dear Tom:

Mr. Gidel has handed me a memorandum dated July 22nd, covering certain recommendations for development in the Walker Mine.

I have gone over this list carefully and wish to make the following suggestions as to this program. I will take up the recommendations in order:

THIRD LEVEL.

I doubt the advisability of extending Drift 363-B northerly. It should not be done in any case without a thorough review of the information we now have on the 460 stope operation and on 363-B Drift itself. Unless 460 stope caved, I see no reason why it should not have continued up to above the Third Level. We should be reasonably sure that the 300 is not at or near the oxidized zone, in which case there might be little or no tonnage above that level. If a careful study of the record seems to justify the work, I will certainly approve it.

SIXTH LEVEL.

The continuation of 619 Drift southwesterly on the vein disclosed in 517-B Drift, is probably good prospecting. I have mapped 517-B Drift carefully and I seriously doubt whether the extension of 619 Drift will block out any ore. I got a very poor impression of that vein on the 500,

Mr. Tom Lyon--2

Aug. 10, 1938.

but there is a chance that the 600 will be better, and, if it does show up favorably, the workings should be continued out into new country as long as there is something worth while to follow.

In any case, should the 619 find ore, a raise will be necessary to the 500 before a stope can be started.

SEVENTH LEVEL.

As to that first recommendation, I do not see why it would not be better to drift northerly on the ore streak shown in the east crosscut. If the vein is worth anything, the ore recovered might help to pay the expense of development. From my knowledge of the geology, I do not have much hope that this piece of work will find enough ore for a stope.

I cannot approve the second recommendation, because a drill hole was run crosscutting this same ground at a point less than 150 feet north of the proposed crosscut location. It found no ore. Furthermore, 6 sub-level drift followed the ore from the south until it became too low grade to justify further drifting.

I cannot see much chance for success in the next recommendation, which is a crosscut easterly from 712, 400 feet north of 706-A Winze, but the reported ore showing in Drill Hole No. 8 may be better than I think it is.

I agree that 765-A Drift southeasterly on the east branch of the Piute Vein is good prospecting. A crosscut drill hole farther to the south did not show up anything worth while, but I think we should have a working out into that hangingwall country somewhere in the 765-A Drift, which will enable us to really learn what happens to the Piute zone going south.

I have little or no hope that your last recommendation for the Seventh Level will find anything worth drifting on, but it will settle for

Mr. Tom Lyon---3

Aug. 10, 1938.

all time whether or not there is a continuing branch northerly under the Piute workings.

EIGHTH LEVEL.

I agree that 818-A Drift should be continued northerly on the Piute Vein until the supposed fault is reached, and that if a cut-off is found the working should be extended through the fault. Because of the nearness of the oxidized zone, I cannot subscribe to a further search for the faulted end of the Piute Vein, if there be one, at the elevation of the 800. This exploratory work should be left for the 900, at which level, should the vein be found to extend northerly, we would be able to develop some tonnage, assuming the oxidized zone does not go lower than we anticipate. I feel that whatever we may do on the 800 north of the fault, we will have to duplicate anyhow at the 900.

TENTH LEVEL.

We are naturally forced to continue 1017 Lateral northerly with crosscuts at intervals, as suggested in your first recommendation for this level. I must say that the Tenth Level country thus far opened up in this 712 area has been extremely disappointing.

Your recommendation No. 2 for the Tenth Level is probably all right, but I do not see why a crosscut should be for more than 100 feet as a maximum.

In addition to the above recommendations, I would like to suggest another, which perhaps comes more nearly under the head of general development. I think we should plan to either drill into the footwall

Mr. Tom Lyon---4

Aug. 10, 1938.

country under the above-mentioned 517-A and 619 drifts at the Tenth Level, or preferably extend 1055-B crosscut. This with the hopes that the southwest striking zone may have strength and that it might develop more favorably at greater depths. No doubt, the extension of 1017 Lateral plus the crosscuts therefrom, will keep the 1000 busy, but in such a case we should plan to do the drilling just suggested at any time we happen to have a diamond drill crew on the ground.

Yours very truly,

RHS:KM
cc: Messrs. Weed
Gidel
Dugan

Paul H. Sauer

INTERNATIONAL SMELTING AND REFINING CO.



GEOLOGICAL DEPARTMENT
KEARNS BUILDING

TOM LYON

SALT LAKE CITY, UTAH

August 24, 1937

Mr. Tom Lyon

Offices

Dear Sir:

Subject:

WALKER MINE*Development*

As per your instructions I visited the Walker mine during the first week of August. The following report summarizes the present conditions as regards development work and maintenance of ore reserves at this mine.

Development work at the Walker mine, which had been lagging behind the necessary amount of work for some time, has picked up during the last two months and for the months of June and July amounted to 1100 feet and 1348 feet per month respectively. As a result the month of July was the first month to show an increase in the available ore reserves between the first and last of the month. This was due to the pushing of development work on the 800 and 900 levels in the Piute ore body and to the completion of the 761 drift in the footwall vein of the north ore body. The above development program led to an increase in the available ore reserves of the Piute ore body and led to the addition of a large tonnage of ore (100,000 tons) in the footwall vein at the south end of the north ore body, west of blocks 820 and 920. The presence of a wide low-grade (1% copper, 0.05 oz. gold, 0.75 oz. silver) vein in this area has been proven and doubtless some large stopes with low mining costs, such as 720 stope, can be opened up here. These will serve to help replace the similar large low-grade stopes in the Piute ore body which have been providing a large part of the recent production from the mine but which will be largely exhausted within the next few months. The larger portion of the ore produced from the mine during the last two months has come from the

2- Mr. Tom Lyon

August 24, 1937

Piute ore body above the 700 level and from the North ore body below the 700 level. New stopes are being opened up in the latter area (920, 930 and 1040 stopes) to replace those being mined but, as mentioned above, in the Piute area above the 700 the reserves are being rather rapidly depleted. The total reserves of available ore as of August first amount to about 1,327,000 tons, according to Mr. Droubay's report, of which about 550,000 tons are located above the 700 level and 750,000 tons are below the main tunnel. At present time about one-third of the tonnage produced, or about 450 tons per day, are being hoisted from the lower levels. As the reserves of readily accessible ore above the 700 are depleted an increasingly large percentage of the production is going to have to be hoisted. This will require enlarged and improved hoisting facilities as the present capacity for hoisting ore to the 700 level is only about 750 tons per day.

The most important development projects now being carried on are the 1017 drift north, the 1082 winze below the 1100 level, and both the 800 and 900 level drifts in the Piute ore body. The 1017 drift north has just reached the downward projection of the 712 ore body, assuming a southerly rake to the south edge of the ore body. If the rake below the 700 is directly down the direction of dip however, the south end of the ore will still lie about 350 feet ahead of the face. The 1017 drift is now being driven on line and about 150 feet west of the projection of the hanging wall vein of the 712 ore body on the 700 level. No crosscutting to either the hanging wall or footwall faults has been done for a distance of 900 feet along the drift. 1043 crosscut still lacks about 75 feet of reaching the hanging wall fault and should be completed. The country rock of 1017 drift north of the north ore body has consisted of massive finely-crystalline hornfels with many spots of epidote and is similar to some of the rock found on the footwall of the ore bodies on the 700 level. 1043 crosscut east has passed out of the massive epidote hornfels however about 75 feet east of the hanging wall

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fault and in the face shows more schistose country rock with some scattered chalcopyrite. Thus it appears that the mineralization in this area may have followed the east fault zone to the east of the massive hornfels and further prospecting to the main hanging wall fault zone is most advisable. Diamond drill prospecting along the 1017 drift would give much quick and valuable information in this area between the north and 712 ore bodies and possibly save much expensive crosscutting here.

1082 winze shaft had reached a depth on August 5th of 106 feet below the 1100 level. It is planned to continue sinking to the 1200 level where sump and station will be cut. If the north and central ore bodies are found to extend down to this level this will be the next main haulage and operating level. However it is believed that before extensive exploration is carried on here it would be strongly advisable to develop the ore zone on the 1100 level. It now appears probable that the Piute ore body may have decreased in size and strength quite abruptly between the 800 and 900 levels and should the central and north ore bodies show similar changes below the 1000 level (which it is not predicted that they will do but which is quite possible) exploration and development work in the 1100 level, prior to exploration on the 1200 would be most advisable and might save considerable expense in carrying on the work at the lower elevations.

On the 1100 level the vein under the fault as exposed on the station shows a width of 25 feet averaging 0.98 per cent ore. The crosscut into the hanging wall was stopped at a distance of 70 feet beyond the fault but still shows some mineralization in the face. This crosscut should be driven further to determine if any of the lode still exists further in the hanging wall of the steep fault just east of the shaft.

On the lower levels in the Piute ore body the drifts north and south have opened up ore for a distance of over 600 feet. 886 drift south after passing through a low-grade area shows good ore again in the face. 887 drift north

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continues in ore, the last 30 feet showing an average assay of 2 per cent copper. 801A crosscut has proven a width of over 30 feet of ore in the block north of the Piute shaft and has enlarged the ore reserves in block 815 from 29,000 tons of 2 per cent copper ore to 40,000 tons of 1.4 per cent copper ore. On the 900 level, 904 drift north has shown only low-grade mineralization for 180 feet north of the shaft, but shows much stronger mineralization in the face and is now in good ore. On neither the 800 nor 900 drifts north is there as yet any indication of the ore cutting off against a footwall fault which swings northeasterly, as happens at the north end of the 700 level. 903B drift south continues in low-grade mineralization, 965 raise showing 15 feet of one per cent ore. Thus the general aspect of this development indicates the possibility that the Piute ore shoot may rake to the north, and if the north drifts on the 800 and 900 levels continue to develop ore the short north drift on the 1000 level should be extended northerly beyond the present 800 and 900 levels.

In addition to the work now being carried on as above mentioned there are several other areas which offer opportunities for the development of important blocks of ore and where development work should be carried on as soon as feasible. These include the 517 ore body in the footwall of the 712 ore body; the 710 ore body (at the south end of 712) above the 500 level or between 605D stope and the surface; and the south end of the south ore body between the 700 and 1000 levels, including both the footwall and hanging wall veins. All of these areas offer opportunities for the development of important tonnages of new ore. Detailed recommendations for all this work will be made out in the near future.

The geological work at the Walker mine is being well handled under the direction of Mr. Droubay, who is working in close corporation with, and giving much valuable advice to the operating department. The development headings are mapped nearly every day and the valuable stope sections are posted up as soon as the

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engineering measurements are available. Closer underground direction of the development headings by either the operating or geological departments is needed, however and closer check on the carrying out of geological recommendations is advisable. For the latter purpose the use of geological recommendation sheets is being resumed.

Respectfully submitted,



M. B. Kildale

MBK:P

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ANACONDA COPPER MINING COMPANY

RENO H. SALES, CHIEF GEOLOGIST
F. A. LINFORTH, ASSISTANT CHIEF GEOLOGIST



BUTTE, MONTANA

GEOLOGICAL DEPARTMENT

February 9, 1926.

Mr. Paul Billingsley,
c/o Walker Mining Co.,
Spring Garden, Calif.

Dear Paul:

Upon Mr. Daly's return from the Walker Mine we discussed the question of further prospecting. We both feel that the vein in the footwall of the main Walker vein should be tested by diamond drilling, preferably by two holes driven from the tunnel level at points 500 feet apart and about due westerly from the main oreshoot of the Walker vein.

We also have in mind some diamond drilling from the surface, particularly along the outcrop of the north end of the property. This work would of course have to wait until Summer.

We think a shaft or winze should be sunk to prospect the main oreshoot below the tunnel level, preferably at about 200 feet in depth.

For further prospecting of the south ore body and the ore body more recently opened up at the south end we think diamond drilling could be used at an advantage.

February 9, 1926.

Mr. Paul Billingsley -#2

Mr. Daly has already written a letter to Mr. Kelley making recommendations along the above lines and Mr. Kelley in reply has authorized this work.

Daly is very anxious that you give the Walker mine a good going over and make recommendations for prospecting work and in regard to the drill holes above mentioned he desires that you lay out definitely the points where these drill holes are to start and their courses. He is now arranging to have a diamond drill sent down from Butte and it will be ready for shipment within a few days, so that it is desirable that these points be selected by the time the drill is ready for operation.

Mr. Daly thinks the holes from the tunnel level to the footwall vein should be inclined slightly upward, so as to cut the vein at an elevation comparable to the 500 or 600 in order that the vein will be cut opposite the position of the best ore in the main oreshoot. I do not think this is material, but he feels rather strongly about it, so I think we should comply with his wishes in that respect.

As soon as you have completed your examination, please write me giving me your definite recommendations for further prospecting.

February 9, 1926.

Mr. Paul Billingsley -#3

From Mr. Daly's report on the conditions at the Walker I feel more than ever satisfied that the so called North ore body will not produce 2% ore or any where near it. It is evident that the higher grade ore occurs in irregular patches within the vein and that if mining is attempted along the lines originally contemplated, that is, to mine the vein as a whole, the grade will probably not average as high as 1-1/2%.

In writing me relative to your prospecting plan I think it advisable not to send copies of your letter to the Eastern office, but to send such copies to me or Mr. Daly. This will allow Daly to forward a copy of your letter to Mr. Kelley with whatever comment he desires to make. I think this is a better plan, from Mr. Daly's point of view.

Very truly yours,

Paul H. Sales

RHS/AF

August 19th, 1925.

Mr. Wm. Wraith, Vice President,
Room 1025, 25 Broadway,
New York, N. Y.

Dear Sir:-

I wish to acknowledge the receipt of your letter of August 12th, 1925., and the enclosure which is a copy of Mr. Reno Sales' letter to Mr. Thayer on the subject of development at the Walker Mine.

The proper location of shafts to develop the Walker Vein below the tunnel level was discussed at the time of Mr. Sales' visit and later I compared views with Mr. Lyons when he was at the mine. From these conferences, which confirm my opinion of what should be done, I feel we should follow at once three of the four suggestions offered in Mr. Sales' letter.

1: In the extreme north end development on the 600 level, I think we should continue Crosscut East No. 693 to prospect the ground lying in the hanging wall of our present work. A crosscut west would parallel Crosscut East No. 681 and would be of doubtful benefit until we extend our workings farther to the north. If no ore is found in Crosscut East No. 693 we should resume work on the present showing.

Work in the north end has been suspended until side swiping is completed on the sixth level.

2: I will wait for recommendations from the Geological Department before again suggesting diamond drilling to prospect parallel veins.

3: Crosscut West No. 647e is now being advanced to cut the low grade vein shown in Crosscut West No. 734.

4: I am writing Mr. Lyons today asking for recommendations to sink a winze and shaft at points where I believe they will prove the vein, below the seventh level, with the least expenditure of time and money. The proposed shaft would be located 100 feet south of the present inclined shaft, the winze 370 feet south of the point of intersection of the main adit and the vein.

Cont.

Mr. Tunnell to Mr. Wraith, Page 2.

The south winze should not make very much water and can be carried in the vein. In locating the shaft it will be necessary as you suggest, to keep away from the fissure and I believe we should sink a vertical shaft in the foot wall of the vein.

Mr. Sales also advises that work should be pushed as rapidly as possible north of 767 Raise to develop the better grade ore shown in Drift North No. 657. We are opening this ore on the Sixth Level and will prepare stopes above the Sixth Level as I feel that by so doing we will increase our breakage in the North Ore Body in less time than by doing the work from the Seventh Level.

Work of drifting on the Sixth sub-level, north of 767 Raise, will be resumed as soon as possible.

Cross sections showing the proposed shaft and winze are attached.

Yours very truly,



Manager.

HRT:JT

Encls.

CC to Mr. B. B. Thayer,
CC to Mr. J. O. Elton,
CC to Mr. Tom Lyons.

August 12, 1925.

Mr. H. R. Tunnell,
Walker Mining Company,
Spring Garden,
Plumas County, Calif.

Dear Sir:-

Attached please find copy of a letter from Mr. Reno Sales, on the subject of development at the Walker Mine. You will note that Mr. Sales strongly presses upon the need of development work below the tunnel level at points that would be selected later and after a study of conditions.

I believe that such development work should be done. I think also that it should be done by shafts, drifts and cross cuts, rather than by diamond drilling, so I would suggest that this be given a study by yourself and Mr. Lyon, forwarding your recommendation at as early a date as possible. Before shaft sinking starts it will be necessary to catch up as much water as we possibly can above the tunnel level, sealing it off in such a way so that we will have as little water as possible to pump. This fissure does make a lot of water and we want to make it as dry as we possibly can in our shaft work. It would probably be advisable to sink the shaft in one of the walls to avoid water.

I would appreciate your advice on this subject and wish that you would talk it over with Mr. Lyon, giving me the benefit of your opinion.

Yours very truly,

(SOD) WM WRAITH

Wm Wraith/M
Enclosure:

CC: Mr. Lyon. ✓

July 1925.

Mr. B. B. Thayer,
35 Broadway,
New York, N.Y.

Dear Sir:-

I visited the Walker Mine on June 29th and 30th. There are a few suggestions relative to present developments, and also as to possible plans for the future.

Of the work now going on I advise that drift 600-A should be discontinued, as it is being extended into territory which showed no ore on the 600 level.

Also that work should be pushed as rapidly as possible north from 757 raise to develop the better grade ore shown in 667 drift. I think it is quite desirable that we make a strong effort to develop this better grade ore as rapidly as possible, because the main orebody grade is, not running as high as anticipated.

As to future developments, there are four possibilities in the way of development which might find ore, and I will consider these briefly.

1: The extreme north end development on the 600 level is not showing favorable results. It cannot be said with certainty that the present drift is following the main vein disclosed at the surface. Before proceeding much further north, unless the ore improves in the present drift, I think crosscuts should be run easterly and westerly to make sure that we are under the best outcrop shown.

2: There are one or more veins in the foot wall of the main Walker vein and parallel to it. This was disclosed in the old survey crosscut tunnel and also in the main adit tunnel and in one or more drill holes driven at a former time. These

► B.B.T.#2.

veins are low grade and I do not feel they present anything favorable as to ore prospects, and I think should be prospected only as a last resort.

There are no indications of veins either on the surface or underground, in the hanging wall of the Walker. Prospecting in that direction is therefore an entirely unknown territory. Possibly two diamond drill holes would determine the existence or non-existence of hanging wall veins.

3: It is confidently expected that the Walker vein will be cut off by the large body of granite disclosed in the main adit, but it is quite impossible to estimate how far south this cut-off may be found in the present main level drift on the 700. The vein is almost entirely pinched out at the present south face, but there is a stronger footwall south of the vein which, although low grade, has not been sufficiently prospected. This south section presents a fair possibility but the prospects are not especially encouraging.

4: In my judgment the most desirable thing to do is to sink on the main vein to determine its possibilities in depth. For this purpose a shaft or winze should be sunk at least 300 feet at a point approximately 100 feet south of the old inclined shaft. The southerly part of the orebody that is lying to the south of the point where the main adit intersects the vein should also be explored on deeper levels. It is a matter of operating judgment as to whether one winze or shaft would answer for the exploration of both the main orebody and the south orebody, or whether two winzes should be sunk for that purpose. Apparently there is a rather long stretch of barren

ground between these two ore shoots, and it might be cheaper and more satisfactory to sink two shafts or winzes.

I feel that it is quite urgent that in view of the ore showings in the mine at the present time one or more of these plans of development should be undertaken at an early date. In my own opinion the work of developing the 200 foot level below the main orebody should be the first work; as to the order in which these various pieces of work should be carried out subsequently, it is a matter to be determined from time to time.

Yours very truly,

(Signed) Reno. H. Sales