



CONTACT INFORMATION
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January 28, 1948

Mr. C. C. Thompson
Bouse, Arizona

RE: Harqua Hala *mining file*

Dear Mr. Thompson:

Was pleased to receive your letter of January 20 and take this opportunity to wish you a happy and prosperous New Year.

I have carefully noted the contents of your letter also the blue print of mining claims which you enclosed showing the three unpatented claims of which you are now the owner and on one of which is located the Quinn Shaft.

I have discussed this matter at some length with Mr. Donald Martin, president of the company which owns the old Harqua Hala Mine, and we both agree that it would be very interesting to have some further exploration and development work carried on in that vicinity.

I have been told on several occasions that a vein of high grade gold ore was encountered at or near the bottom of the Quinn Shaft, but I have never been able to obtain any detailed information regarding this discovery nor to learn why active mining operations were not continued.

If high grade ore could be uncovered merely ^{by} the reopening of the old shaft and the vein could be followed with some production of ore as well as development, it would obviously be much to your advantage and also very likely to the advantage of the owners of the old Harqua Hala Bonanza who would be very glad to see this work undertaken and to cooperate in any way that did not involve actual financial assistance.

If you have in mind any responsible people who would be likely to undertake this work or any other similar exploration in the vicinity of the Harqua Hala Mine, I shall be very glad to give you any further information regarding the property which is in my possession, but I believe that you personally have very complete data.

Personal regards.

Yours very truly,

GMC:IM

Gmc

C/C. to Ronald Martin

January 22, 1948

Mr. Donald M. Martin
44 North First Avenue
Phoenix, Arizona

RE: Harqua Hala

Dear Mr. Martin:

Enclosed herewith is copy of a letter which I received yesterday from our old friend, Chris Thompson. I have not yet attempted to study over the file and reports on the mine in connection with his suggestion, but off hand I am not much impressed by his suggestion in reference to the faulting of the orebody at Harqua Hala and in any event it would appear that a considerable amount of underground exploration or drilling would be required in order to substantiate or disprove his theory.

I have never been able to go down the Quinn Shaft to which he refers, but I was told that some good ore had been found near the bottom of this shaft although there was little or no evidence as to whether it was connected with the main orebodies that were mined on your property.

If Thompson can arrange with any individual or corporation to carry out the necessary exploration and development work on the claims which he says that he now owns, it might, of course, be advantageous to your company as well as to him and I presume you would be glad to give him any cooperation or encouragement that did not involve an expenditure on your part.

Personally, I have not been able to arrange for any recent investigations of low grade gold mines in view of the price at which the government insists on purchasing this metal and the tremendous increase in operating costs that have developed during the past few years, but perhaps Thompson would be more fortunate.

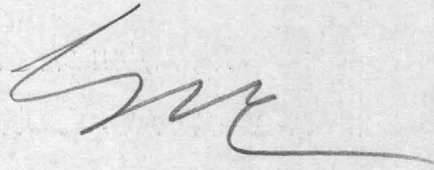
The blueprint which he sent me shows the Harqua Hala No. 1, 2 and 3 lying directly west of the Grandview and Gold Hill and the Quinn Shaft is located a very short distance west of the southwest corner of the Gold Hill Claim. Shall be glad to have you call me on the phone or advise me as to your wishes before I communicate with Thompson unless you prefer to write him direct on this matter.

Page #2

I take this opportunity to wish to you and Walter, also to both of your families a very happy and prosperous New Year.

Sincerely,

GMC:IM
Enclosure

A handwritten signature in dark ink, appearing to be 'L. M.' or similar, written in a cursive style.

Copy of letter

Harqua Hala

Bouse, Arizona
January 20, 1948

C. 1/28.
148

Mr. G. M. Colvocoresses
1102 Luhrs Tower
Phoenix, Arizona

Dear Mr. Colvocoresses:

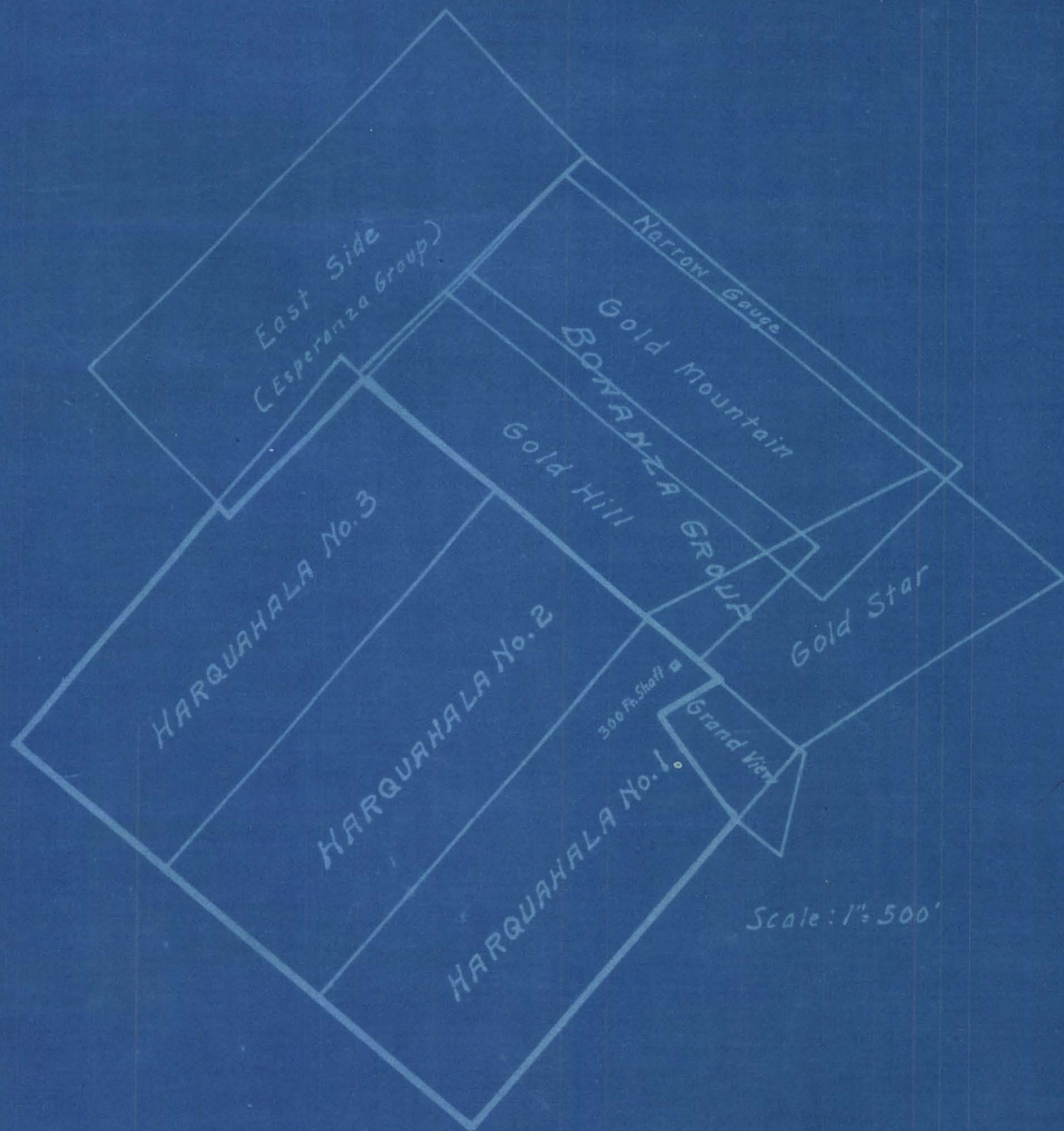
Believing that the faulted segment of the Harqua Hala Bonanza orebody had its origin in the area covered by the Harquahala Nos. 1, 2 and 3 lodes shown on the herewith inclosed small scale sketch and that it should be possible to find the downward extension of this phenominal orebody within the boundaries of the said 3 lode claims, the only place it can possibly be, and where it necessarily must be, I am writing you this letter to let you know that I am now the owner of these 3 claims and that it is my belief that a party can be found to do the necessary development work to revive this famous property and make it a producer of such magnitude and richness as to make the orebody that was found and exhausted in the faulted segment seem small in comparison.

Please note that there is a 300 ft. shaft on the Harquahala No. 1 lode. This shaft was sunk by Barney Quinn who for years was superintendent of the bonanza mine and owner of the ground I now have. While this shaft appears to be located about 200 to 300 ft. too far to the east to intersect the original orebody I am reliably informed that a small vein carrying low gold values was found at or near the bottom of the shaft. To my mind further development of this little vein may bring results of the rosier kind. Think it over.

Yours very truly,

C. P. Humphreys

? Jan 20.
G. M. C.



Scale: 1" = 500'



EXTRACT FROM LETTER TO CAPT. R. W. HUNT FROM R. N. DICKMAN

Harqua Hala, Ariz.
July 17, 1915.

Captain R. W. Hunt,

My dear Sir:

.....
The work has reached the stage where it is going to be necessary to sink on Level VI. and that means that we will have to run the Air Compressor daily in order to pump the water from below level VI. Also, when the time comes, it can be used to hoist from below Level VI.

Number one vein North on Level VI. has become very flat, so that to keep in it the drift had to turn east. Here I have recommended that they keep the ore in the drift and now make an upraise at the north end, which will give us an idea as to its position between Level VI. and IV. This will determine work also perhaps on Level IV. north.

Vein No. 2 on Level VI. is both a disappointment and a surprise, for in the old workings on Level IV. it was productive all along for 200 feet. Ultimately we must make a few blind upraises from IV. before finally getting to the

Sincerely yours,

R. N. Dickman.

EXTRACT FROM LETTER TO CAPT. R. W. HUNT FROM R. N. DICKMAN

Harqua Hala, Arizona
April 17, 1916.

My dear Sir:-

.....
Since my last visit in August 1915 the work has proceeded below the sixth level, nothing having been done below that level at that time. My former reports have included development up to that point. On this visit, I have reviewed my former work to an extent sufficient to affirm former ore values, and I have examined the new work. On the latter, I have taken samples sufficient in size and number to satisfy myself that the daily sampling has been substantially correct. In point of thoroughness, in fact, these daily samples are entitled to more weight than my own taken in corroboration.

The best demonstration is in the Mill results combined with the tailing assays, though these results are perhaps a trifle lower than would be attained in stoping from the levels, since in the development work it has been impossible not to mix the ore with undue porportion of waste.

ABOVE THE FOURTH LEVEL to the north there is no doubt some ore to be gained both from No. 2 vein as well as from No. 1 vein.

At the present time a stope started at point "A" is showing high values, \$41.34 to \$210.00. This ore is of about two feet width and there is no development between this point and the surface more than 200 feet above.

BETWEEN LEVELS FOUR AND SIX the former Mill run showed a value of \$9.50 per ton with \$7.28 recovery and tailings of \$2.22

sulphide ore at this point shows \$37.20 and \$44.60 gold value. This same ore body has now been cut to the west of level 8 where it shows 16 feet in width of an average value of \$13.23 (R.N.D.).

The unfortunate part of present development at this point is that only a small part of the value is in FREE GOLD and the Mill saves but a small portion of the value. The ore is being piled on surface and none stoped. This ore when sent to the Mill on April 12th showed heads of \$16.00 and tailing value of \$10.40, there being no concentration apparatus in the Mill.

In course of mining a small amount of high grade sulphide will be encountered and will be saved and shipped for smelting. No calculation of the amount is yet possible.

I hesitate to estimate the ORE ABOVE THE SEVENTH level since no raises have been made and the vein is irregular. I should surmise that when it can be taken out the ground should yield 2500 tons of the value shown in the last Mill Run, viz. \$7.88 per ton of which \$5.79 would be recovered with \$2.09 in tails. If confined to the ground south of the incline the yield will be higher and the ore near the shaft cheaply mined. Until this incline is abandoned as a hoisting shaft much of the ore is not available.

BETWEEN THE SEVENTH AND EIGHTH levels the shaft or incline is not in ore. The vein has apparently straightened at this point as will be seen best from the larger new sectional map. While it is not PROVEN that the crack followed on level 8 is the same with that of level 7 on the whole length, it is very near to the new sulphide ore body, though not as yet

Stoping has just been commenced on Level 4 and at several points in the incline raise between 4 and 6. There is no reason to modify the former estimates on tonnage and value except perhaps to lessen the tonnage and perhaps raise the value, if stoped as at present in the higher grade locations and where the vein is of size to furnish cheaply stoped ore. My estimate was 2500 tons of \$8.00 gross.

Since my visit of August 1915 all the work below level 6 has been done and consists of the incline and the development of levels SEVEN AND EIGHT.

THE INCLINE follows the ore from level 6 to level 7 with a width of 4 to 5 feet on level 6 and from 1 to 3 feet along the incline.

The average shows about 2 feet with a value of \$8.85 per ton.

LEVEL SEVEN to the north follows an ore body lying rather flat and of assay value \$5.08 per ton. The ore is narrow.

To the south for a distance of 120 feet the vein averages about 3 feet in width and \$14.95 gold value. After an interval of about 40 feet in which the ore is narrow and the value low, there is encountered what seems to be the most important showing of the lower workings. For a distance of 45 feet the ore is of a width from 3 to 10 feet and shows an average value of \$12.90 per ton gold with sulphides carrying copper. Check sample \$13.66.

A winze on the ore shows a full face at 15 feet depth of a value of \$31.20 per ton gold.

This ore body is again cut 30 feet below by a drift

operation it will probably pay to stope, but under present conditions it would not yield tonnage sufficient to pay the cost of pumping and hoisting with present equipment. I make no estimate of this vein on this level.

THE SOUTH SULPHIDE ORE BODY on this level is by far the most important discovery as yet made in your work on the Bonanza Mine. Development has not proceeded far enough to prove any definite tonnage, but an ore body 45 feet long on level 7 with a width of 10 feet at that point, a width of 12 feet in the intermediate level and of 16 feet on level 8 must prove of considerable size. It will be MOST UNFORTUNATE if development cannot be now continued both along the level and still DEEPER. Aside from the high grade ore the body seems to have a value of about \$12.00 per ton in gold and the concentrates will have commercial copper value. When the body is a little further developed a test should be made of an average sample for concentration by tables and flotation with assay of concentration product.

.
CONCLUSIONS:

The limit of ore which can be advisably treated at all by amalgamation alone seems to be reached on level 7, and prevents any present use or profit from the sulphide body now being opened on level 8, which is of utmost importance, as well as the first ore body of large size recently encountered. I do not consider it probable that all expenditures can be met from mill product under present conditions, though a substantial part may be made from now on. None the less, even if there were no revenue whatever, I think that the discovery

of the discovery of additional free milling bodies capable of paying for the mine under present contract and on this lower ore depends the outcome of the enterprise. The cost of this lower work will run from \$2000 to \$3000 per month above the expenditures in addition to the present milling and mining expense, which should of itself yield some profit.

I consider that the conditions as now existing well warrant proceeding with vigor.

Very truly yours,

(Signed) R. N. Dickman.

THE STATE'S
GREATEST NEWSPAPER

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Arizona M

Arizona Days and Ways

Famed Harquahala Gold
Mine Yields Millions;
Historic Merger Told

Sunday, Jun

ne 6, 1948

Sunday, June 6, 1948

EX TH A:

Phoenix, Arizona

Sunday, June 6, 1948

WESTERN PRECIPITATION CORPORATION

Pioneers in Dust and Fume Control

MAIN OFFICES
1016 WEST NINTH ST.
LOS ANGELES

DISTRICT OFFICES
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1016 WEST NINTH STREET
LOS ANGELES, CALIFORNIA

January 3, 1941

CABLE ADDRESS
"PRECIP"
WESTERN UNION CODE
TELEPHONE TRINITY 2611

Mr. George M. Colvocoresses
1102 Luhrs Tower
Phoenix, Arizona

Dear Colvo:

The report which we received on Mr. MacLoon from a private inspection service is not very favorable. Incidentally, we learned his correct name is Louis Owen MacLoon and not Louis G. MacLoon, as given in your letter. We are certain this is the same individual because his business address is 3327 West Pico and he is engaged in the promotion of mines.

Originally this gentleman was an actor on the New York stage. In 1923 when he married Lillian Albertson he left the stage and went into the production of plays, both in New York and Los Angeles. While he was successful financially, apparently the credit should go to his wife rather than to him, because when she divorced him he began to go down-hill rapidly and soon dropped out of the picture, in so far as the stage was concerned.

Since 1934 he has been engaged in promoting advertising, oil and mining ventures. Several years ago he promoted wild-cat oil wells in the Del Rey District near Los Angeles, but the venture failed and everyone concerned lost all that was put into the deal.

He is now operating under the name of "Prothero Investment Company" which is only a fictitious trade name as it is not incorporated or registered.

MacLoon has been in hot water almost constantly in recent years and a number of judgements have been brought against him. His bank accounts were attached also and as a result he has no account with any of the local banks at the present time.

The search made disclosed he has no real property and his total net worth is estimated to be about \$3,000.00.

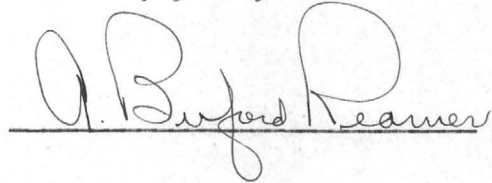
January 3, 1941

-2- Mr. Colvocoresses

In view of MacLoon's reputation, or lack of reputation, and financial standing, it is very questionable whether or not you would want to continue your negotiations with him. I am sorry to give you this unfavorable information.

If there is any further assistance we can give you, please let us know.

Sincerely yours,

A handwritten signature in cursive script, reading "A. Buford Reamer", is written over a horizontal line.

ABReamer jw

P.S.- The firm that gave us the above information cautioned us not to quote them directly as that would involve you and our company in a libel suit in the event MacLoon learned of the information contained in this correspondence.

ABR

WESTERN PRECIPITATION CORPORATION

Pioneers in Dust and Fume Control

MAIN OFFICES
1016 WEST NINTH ST.
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MONTREAL

December 27, 1940

CABLE ADDRESS
"PRECIP"
WESTERN UNION CODE
TELEPHONE TRINITY 2611

Mr. G. M. Colvocoresses
1102 Luhrs Tower
Phoenix, Arizona

Dear Colvo:

I hoped to have some information on Mr. MacLoon about whom you inquired before this time but for some reason or other our credit agency has been unable to get a report on him. Our bank is now making an inquiry through its private service and they expect to have some information by the first of the week.

Mr. MacLoon is not even listed in the telephone book but apparently he operates under the Prothero Investment Company and we shall get a report on this company as well as on Mr. MacLoon personally.

We, too, are sorry business has not brought you to Los Angeles more often and we all thought of you when we had our annual Christmas party last Tuesday afternoon. We had a lot of fun and I am sure you would have enjoyed being with us.

Business has been reasonably good with us but like everyone else we will have a hard time to conserve what profits we can make because of the large taxes we have to pay. In this we have something to look forward to since it is already evident that tax returns will be much higher in the future. From all indications, we shall be working for the government instead of our stockholders and this takes a lot of the fun out of life.

I shall write you again as soon as I hear from the bank and in the meantime please accept our best wishes for a very happy holiday season.

Sincerely,

A. Buford Reamer

ABReamer/vg

May 21, 1945

Mr. Fletcher Merrill,
Patagonia, Arizona

Dear Fletcher:

This is to acknowledge receipt of Mr. Martin's letter of the fifteenth and it would seem to me that his attitude is such that there should be no difficulty in working out a formal contract, but I believe we should all get together and discuss the matter further, with the idea of giving the owners something much better than they are asking for and, at the same time giving us something that is workable, and I wish to have you consider the following observations:

1. This mine has been butchered and high-graded by several sets of lessors. The huge cave-in is abundant evidence that this is true of one lessor. I don't think it is fair to the property and its possibilities to high grade. Too much of that has been done in the past and there is left, for anyone to see, a low grade showing.

2. As I visualize it, there is a probability of making a great gold mine out of this property. There is an area following the oval shape of the exposed mineralization of more than 2000 feet easterly and westerly, and some 1500 feet northerly and southerly, and a proven depth of several hundred feet. If this ore body is thoroughly prospected by drilling, I would hope to develop 10,000,000 tons within a depth of 400 feet, which would be proportionately increased as the proven depth increased. I don't think the property can be properly proven or developed with less than 5000 feet of drilling, and it is altogether possible that twice this much drilling might be necessary, including lateral as well as vertical testing. I would hope, from what I have learned about the property and what I see, to develop enough ore to justify a 1000 tons mill. And what I think the owners have a right to insist upon is, that the mine be adequately developed as to its possibilities, and I am willing to undertake that kind of development, with the provision that at least \$25,000 be spent in development work the first year. I think we could complete the core drilling within six months, however, after the War Production Board restrictions are removed.

3. Having in mind that the proper thing to do is to undertake to develop and prove up the entire property for a large tonnage, it is altogether probable that the entire mass, when proven, would be found to be low grade and too low grade to be profitable, except with a very large operation. I would have no objection to a 15% royalty if that were expected to apply on the type of operations that would once more simply high-grade the property, as they have done in the past, leaving the balance of the mass always of less average value per ton.

But, contemplating the type of development work that would prove up a large tonnage of low-grade ore, I think 15% is unworkable and I

wish to suggest consideration of a royalty scale graduated as to values, so that no matter how low grade, there would be inducement to develop and operate the property on a large scale.

I suggest: A royalty of 5% on values of \$5.00 per ton, or less; 7½% on ore from \$5.00 to \$10.00 per ton in value; 10% on ores between \$10.00 to \$15.00 per ton in value; and 15% on ores running over \$15.00 in value. Many times more low-grade ore could be commercially mined and milled than has ever been produced in any previous operation.

As I understand it, the purchase price would be \$250,000 and the royalty payments would apply against the payment of the purchase price. I think, under the circumstances, that is very reasonable. The \$3,000 payment is also an evidence of intention to be fair since, if we get the property we would have to spend a lot of money carrying out our plans. If the contract embraced the royalty figures I have suggested, I think the property would pay out the purchase price much more quickly, in fact more quickly than the owners would want the income to pay taxes on.

I am expecting to be in Phoenix within the next few days, probably this week, and will call on Mr. Martin, if he is in town.

Meantime I will appreciate your comments on the suggestions I have made.

With regards to you all, I am

Yours very truly,

J. H. Byrd.

JHB/S

June 12th, 1944

Mr. E. D. Morton
Eagle-Picher Mining & Smelting Co.
P. O. Box 1268
Tucson, Arizona

Re: Harqua Hala *file*

Dear Morton:

Noting the post-script on your letter of June 10th in reference to the above, I have checked over my file and herewith enclose a list of all of the maps which are in my possession. Since No. 1 appears to be the only map to which you might possibly have reference I am sending you the blue print which as you will note is in very poor condition and which I do not believe would prove very useful to Mr. Wilson but in that respect you can use your own judgment.

I have telephoned Mr. Martin to ask if he has any better or more extensive topographic map of the region, and he does not think that such is the case, nor do I recall ever having seen such a map. However, Martin very kindly looked up his Harqua Hala file in the vault and found a tracing which shows more of the topography than the old blue print, although as you will note it was made in 1934 and it may or may not be very accurate.

I am also enclosing this tracing from which you can have a print made if you so desire, and which please return later since I promised to send it back to Mr. Martin.

Yours very truly,

GMC/b
Enclosures 3

Wra
Lyb returned

Following is a list of the Maps in my Marqua Hala File:

- (1) Badly damaged blue print showing surface with contours of Bonanza property, location of structures and outlines (dotted) of some of the underground workings. June 1892.
- (2) Plan of underground workings to 7th level of Bonanza Mine, with location of surface structures, but no topography. August 1894.
- (3) Patent Survey Map -- Bonanza Claim.
- (4) Patent Survey Map -- Golden Eagle.
- (5) Combined claim map of all claims in the two groups.
- (6) Assay map of all workings, Bonanza Mine. 1916
- (7) Assay map (small scale) of 4th, 5th and 6th levels Bonanza Mine. 1916.
- (8) Sketches of Golden Eagle workings in plan and section.
- (9) Tracing of underground work and ore bodies of Bonanza Mine (small scale)--probably made in 1916.

RE: HARQUA HALA MINE

THE FOLLOWING REPORTS DELIVERED TO MR. MORTON - 8-2-41

Report R. N. Dickman, May 4, 1914
Letter R. N. Dickman, April 17, 1916
Report Frederic W. Norton, 1916 ?
Report T. E. Farish, January 29, 1916
Report E. J. Olson, 1915
Report W. Tovote, 1917
Preliminary Report G. M. Colvocoresses, May 2, 1940

THE FOLLOWING MAPS DELIVERED TO MR. MORTON - 8-2-41

Map, Harqua Hala, Bonanza, Golden Eagle Claims
Map, plan of Bonanza mine
Map, Harqua Hala assays - small
Claim map Bonanza and Golden Eagle
Johnson negative
Map underground workings and assay reports - Harqua Hala
Very old surface map Bonanza mine (poor condition)

AMERICAN SMELTING AND REFINING CO.
MINING DEPARTMENT OF THE SOUTHWEST
P. O. BOX 2229
TUCSON, ARIZONA

W. H. LOERPABEL
MANAGER

March 28, 1941

C3/31.
41

REGISTERED

Mr. G.H.Colvocoresses
1102 Luhrs Tower
Phoenix, Arizona

Dear Mr. Colvocoresses:

HARQUA HALA MINE -
YUMA COUNTY, ARIZONA

Attached hereto is the various information which you mentioned in your letter of November 18th, and sent to me as requested in my letter to you of January 10th.

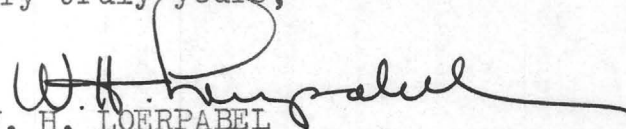
Mr. Stephens and I have given further study to this property but we fear that on the whole it does not look sufficiently attractive to interest this Company.

I wish to thank you, however, for allowing us to examine all this data, and hope that you have not been inconvenienced by the length of time we have kept it.

Very truly yours,

encls:

- ✓ Report R.N.Dickman, May 4, 1914
- ✓ Letter R.N.Dickman, Apr 17, 1916
- ✓ Report Frederic W.Norton, 1916 ?
- ✓ Report T.E.Farish, Jan 29, 1916
- ✓ Report E.J.Olson, 1915
- ✓ Report W.Tovote, 1917
- ✓ Preliminary report G.M.Colvocoresses, May 2, 1940
- ✓ Map, Harqua Hala, Bonanza, Golden Eagle claims
- ✓ Map, plan of Bonanza mine
- ✓ Map, Harqua Hala assays - small
- ✓ Claim map Bonanza and Golden Eagle
- ✓ Johnson negative
- ✓ Map underground workings and assay reports - Harqua Hala - large
- ✓ Very old surface map Bonanza mine (poor condition)


W. H. LOERPABEL
Manager

file 19f3 -
Coffee Copy

NOTES RE HARQUA HALA MINE

July 20, 1939

X In connection with past and recent investigation of this property owned by the ^{Bonanza}~~Bonanza~~ and Golden Eagle Mining Company, - (for a long time inactive), I have obtained and examined the following documents:-

Howland Bancroft in U. S. G. S. Bulletin #451, about 1909

Report by C. E. Mills, 1892

Report by T. E. Farish, 1906

Report by E. J. Olsen, about 1915

Report and letters of R. N. Dickman 1914, '15 & '16.

Report by Fred W. Norton, about 1915

Report by W. Tovote, about 1917

Claim maps and surveys

Sketches of section and plan of Golden Eagle Workings

Survey map of Bonanza Workings

Assay map of large portion of Bonanza Workings

Copies of all the above excepting the sketch plan of the Golden Eagle are in my possession and I have also looked over a number of assay and shipment records belonging to the owners.

X I personally visited and hastily examined the mine in February 1917 and during the summer of 193⁴~~3~~, when interested in the treatment of a portion of the tailings, I took occasion to inspect practically all of the then accessible workings and took a few samples at various points but I have never made any thorough

examination or sampling of the mine and I have never visited the underground workings of the Golden Eagle.

Much of the information in the old reports is confusing by reason of the fact that different designations were given at different periods to the veins and stopes and maps which originally accompanied them are lacking so that they could only be intelligently read in conjunction with a careful inspection of the workings and their identification on the ground and *from the* available maps particularly to determine just what bodies of ore have been stoped out since the reports were written and what new ones have been developed.

This property is located 7 miles south of Salome, Yuma County, Arizona and consists of the Bonanza Group of 5 patented claims and the Golden Eagle group of 4 patented claims lying about 1 mile to the northeast. Both of these groups are owned by the Martins of Phoenix but between and around them are a number of other claims belonging to other parties and in visualizing any large scale future operations it would be advisable to option all of this land as could probably be done at very small expense.

The Bonanza and Golden Eagle Mines have been worked at intervals since 1888 and have produced upwards of \$4,000,000 worth of gold at the old price.

A somewhat complicated geology indicates that the gold associated with a little silver, much iron and some copper sul-

phide was probably deposited by deep seated solutions rising from or with the intrusive dikes of andesite porphyry; forming replacement ore bodies in faults, contacts and shear zones also impregnating as a disseminated deposit the intruded rocks which consist of pre-Cambrian granite or gneiss overlain by Cambrian quartzite and shale and by slightly younger limestone and dolomite. Nearly all of the known higher grade oxidized ore in the upper levels has long since been mined but the extent and value of the deeper sulphides has been only slightly developed and the quantity and quality of the disseminated or brecciated ore is practically unknown. The future value of the property seems to depend upon these two uncertain factors although much of the mineralized territory has not yet been explored and there is always a chance that new shoots of high grade might be discovered by extensive development which was repeatedly advocated by the examining engineers but never actually put into effect.

The general strike of the Iron or #2 vein seems to indicate that it or at least the mineralized zone of which it forms a part extends continuously from the Bonanza to the Golden Eagle group, about 5000' and perhaps much further at either end but between these two workings there is a broad erosion valley filled with sand and gravel and below this the rock formations have never been explored.

The width of pay ore mined in the Bonanza is stated to have been as much as 60' in places and the width of the disseminated

ore has apparently never been tested but judging from the maps it may be as much as 600' although no such assumption is justified except as a possibility.

The vertical depth of the Bonanza Workings is 350' and of the Golden Eagle 400' and neither mine has been bottomed of ore although the oxides had largely given place to sulphides at a depth of about 300' and one engineer estimated that the permanent water level should be found at 750'.

A mineralized area 5000' x 600' by 300' (allowing for the surface depression under the wash) would represent some seventy million tons all of which could doubtless be mined by open pit methods.

The grade of this material is an unknown quantity and must so remain until a great deal of money has been judiciously expended. The one attempt to secure data on this point was so entirely mismanaged that no credence can be placed upon the reported results which were said by the management to have shown that some 3,000,000 tons of \$3.50 ore had been left in the immediate vicinity of the old Bonanza workings, while two other parties placed the average of the sampled area at \$2.00 and at \$1.27 per ton.

Based on the very fragmentary data which is at present available, it is my personal opinion there is no reasonable probability of finding anything like 70,000,000 tons of ore that will average better than \$2.00 per ton which I should fix as a commercial minimum but I do think that,- including the Bonanza and Golden

Eagle Groups and the unexplored area between them,- there is a fair expectation of finding a sufficiently large body of this or slightly higher grade to make this operation a very profitable venture and I feel fully justified in calling attention to the Harqua Hala as a mine which should at least be further investigated with object ^{of} securing ~~much~~ more data tending to show just how good this chance may be.

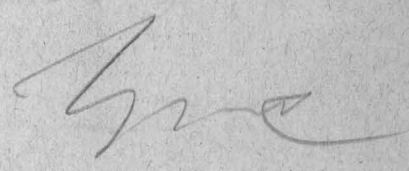
As to the available water supply there is also considerable doubt. The water which might be obtained from the wells at Harrisburg, which are connected by pipe line to the mine is variously estimated at from 200,000 gals. per day up to a much higher figure. The amount of water which seeps into the present mine workings is negligible but there appears to be a probability that if these workings are extended to a depth of from 700 to 900 ft. below the surface a heavy underground flow would be encountered which would augment the Harrisburg supply to a sufficient extent to permit the operation of a large mill but just how large cannot be forecast until more data is obtained.

S. M. Colver

June 20th, 1945

Re: Harqua Hala Contract

Referring to our conversation of this morning and Agreement to Lease and Option the Harqua Hala property, I call your attention to the fact that the Federal Government has given notice that the restrictions on gold mining will be lifted to a large extent on July 1st of this year, and I hope that Mr. Byrd will agree to consider that date as being the one to which reference is made in Articles III. and IV. of the Lease and Option Agreement.

A handwritten signature in dark ink, appearing to be 'H. M. C.', is located on the right side of the page, below the typed text.

*Agreement
J. L. F. signed by me*

March 20th, 1940

Mr. Walter Martin,
Phoenix,
Arizona.

Re: Harqua Hala

file

Dear Mr. Martin:

Confirming our verbal conversations and arrangement, it is understood that I will prepare a presentation report with maps, etc., on the Harqua Hala Bonanza and Golden Eagle Mines particularly with reference to the possibility of developing and operating a large low grade deposit of gold ore and that I will make such further investigations as may be necessary in this respect and bring this report and other information regarding the property to the attention of responsible mining companies who would be in a position to develop and operate the mine in a proper manner.

I should plan, as we discussed, to take this up with one particular company in the first instance and should I find that there is no chance to do business with them, I would then follow the same procedure with other similar concerns several of whom I know to be at present in the market for promising low grade gold mines.

My fee for services as mentioned above is \$100.00 receipt of which is hereby acknowledged and this will include services and all expenses connected with the presentations as mentioned.

While I do not wish or intend to ask for any definite commission in the event that business should actually result on a satisfactory basis, it is understood that in such event some subsequent arrangement would be in order whereby I should be further compensated either for such additional professional work as might be required to protect your interests or on some percentage of purchase price or profits realized from operating the property.

Mr. Walter Martin

-2-

March 20th, 1940

Kindly signify your acceptance of this agreement by signing under the word "accepted" on carbon copy of this letter.

Assuring you that I will give my best efforts to this matter as time and conditions permit and that I shall always be glad to furnish you with advice or other similar cooperation, I remain

Yours very truly,

E. H. Colver

GMC:MF

Accepted:

HOWE SOUND COMPANY

730 FIFTH AVENUE

NEW YORK

SUBSIDIARY COMPANIES

Britannia Mining & Smelting Co., Ltd.
Britannia Beach, B. C. Canada

Cia. Industrial El Potosi, S. A.
Chihuahua, Chih., Mexico

El Potosi Mining Co.
Chihuahua, Chih., Mexico

Chelan Division,
Holden, Washington, U. S. A.

EXPLORATION DEPARTMENT

977 Windsor Street
Salt Lake City, Utah
November 17, 1940

Mr. George M. Colvocoresses, E.M.
1102 Luhrs Tower
Phoenix, Arizona

re: The Harquahala mine,
Ellsworth district,
Yuma County, Arizona.

Dear Sir:

Thank you for your letter of the 4th sent to the
New York office. I have now carefully reviewed all
of the data available to me and regret to advise you
that the Company would not be interested in making an
examination of the property.

Very truly yours,

George C. Selfridge

George C. Selfridge

cc-HHS

NOTE RE HARQUA HALA

6/21/40

Call from Geo. C. Selfridge
977 Windsor Street
Salt Lake City, Utah

Field Engineer for Howe Sound Co. and in answer to my letter to them.

He said that Harqua Hala had been examined in '34 or '35 by S. J. Claussen (deceased) and Eton for his company and they had turned it down but he did not know on what basis.

We went over some reports and maps and he will give the matter consideration and may examine in the autumn when he returns from trip to Montana and Alaska. Advised Martin of this visit.

HARQUA HALA MINE

RETURNED TO MR. COLVOCORESSES:

Report R.N. Dickman, May 4, 1914
Letter, R.N. Dickman, Apr.17, 1916
Portion of Report by Frederic W. Norton, 1916?
Report by T.E. Farish, Jan.29, 1906
Copy of Report by E.J. Olson, 1915?
Report by W. Tovote, 1917
Preliminary Report by G.M. Colvocoresses, May 2, 1940.

Map, Harqua Hala Bonanza, Underground workings
Map, T.4N.-R.13 W. Unsurveyed, Ellsworth Mining Disct.
Map, Harqua Hala Assays, small
Bonanza & Golden Eagle, Mining Claims
Plan of Bonanza
Johnson negative
✓ Very old surface map, Bonanza Mine.

August 17th, 1939

Mr. E. D. Morton, Manager
Eagle-Picher Mining & Smelting Company
Box 1268
Tucson, Arizona

Dear Morton:

Re: Harqua Hala

I am sending you herewith two copies of the preliminary report on the Harqua Hala Mine and two blueprints of the claims showing the relative location of the old workings and low grade ore zones.

I employed Thompson to help me with this investigation which was started on the 11th and I found his knowledge of considerable value in going through the underground workings and over the surface. Also, I examined all of the data and maps in his office at Bouse and obtained some of the maps but I did not take a complete record of his assays as the identifications of the samples were not sufficiently complete to make this of any value except as I have mentioned it in the report.

I have obtained some other maps from the owners and practically all of the records which are in their possession and have carefully gone over these in preparing the report.

I sincerely hope that you will feel that this information is worth the \$250.00 as per our verbal discussion and that you will arrange to go out for a personal inspection of the mine at some time in the near future. On such a trip I will accompany you without any additional charge.

If you decide to proceed further in this investigation I will also gladly arrange to work over a lot of the old mine maps and sketches some of which resemble Chinese puzzles and I will try to prepare some new maps which would be reasonably up to date and might be serviceable in the further examination of the mine.

I have never discussed any terms with the owners who merely understand that I am merely making a preliminary investigation on behalf of a responsible mining concern but I was told that Elliott and Stratton had an option to purchase for \$40,000 and made some payments on account and I believe that Hodgson had a lease on a royalty basis. At my request, Martin has written to Hodgson asking him to give more details of the procedure which lead him to form an unfavorable opinion of the property and I will fully advise you in this respect. I should

Mr. E. D. Morton

-2-

August 17th, 1939

have given more weight to Hodgson's unfavorable conclusion except for the fact that he apparently made a very limited examination of portions of the workings and never obtained or examined copies of any of the old reports or maps. I was told by Thompson that Hodgson became interested in this property through the statements of a man named Rhodehamel who had previously held the option which was turned over to Elliott and Stratton on the basis of perfectly absurd representations as to the value and tonnage of the remaining ore. I know Rhodehamel to be absolutely unreliable and if Hodgson made his examination in expectation of checking Rhodehamel's figures, it is not surprising that he experienced a keen disappointment.

I hope that you had a very pleasant vacation in the White Mountains and also visited the Iron King when passing through Humboldt. I am sorry that I was not in my office when you telephoned on your return trip to Tucson but I shall look forward to seeing you in the near future and remain with best personal regards.

Sincerely,

GMC:MF
Enc. 4

P. S. I believe that I have already given you copies of all of the more important old reports as listed with my notes of July 20th. I have extra copies which are also at your disposal if you desire them.

G.M.C.

Harqua *Flux Mine file*
October 14th, 1944

Mr. E. D. Morton
Eagle-Picher Mining & Smelting Company
P. O. Box 1268
Tucson, Arizona

Dear Morton:

I was glad to receive your letter of October 11th with copy of your letter to Donald Martin of the Harqua Hala property. Martin did not tell me the name of the party who had approached him, but I expect that you are right in surmising that this was A. R. Byrd, whom I do not know personally, but I have frequently heard of his activities. He was quite successful in turning over the Flux Mine to the American Smelting and Refining Company, and that has proved to be a pretty fair investment all around. But I doubt if Martin will be disposed to deal with any one for the Harqua Hala unless he has first determined that they are very responsible financially and have excellent financial backing, and I believe that there will be little question as to his agreeing to your suggestions in the hope that at a later date Eagle-Picher may proceed somewhat further with their investigation.

I spent yesterday very pleasantly with Hernon as he was anxious to get personally acquainted with the water situation and we visited all of the local wells. Also I introduced him to Brooks at the Holmes Ranch and to Billingsley. The latter is apparently satisfied to let matters ride until we are in a position to resume negotiations. Of course this is a rather dangerous situation, and I hope that it may be satisfactorily cleared up within the course of a few weeks time.

Hernon had no idea as to when Mr. Fowler might be coming out this way, but promised to advise me as soon as he received such information. I understand from your letter that other officials of your company are not likely to be here before the 10th of November.

I judge that Hernon and his assistants were making good progress with their work at the Mine, altho they have a pretty big job ahead of them.

With personal regards,

Sincerely,

GMC/b

[Signature]

EAGLE-PICHER



THE EAGLE-PICHER MINING & SMELTING CO.
GENERAL OFFICES • JOPLIN, MISSOURI

MINING • CONCENTRATING • SMELTING AND REFINING OF ZINC AND LEAD

WESTERN OPERATIONS
73 NORTH COURT STREET
TUCSON, ARIZONA

October 11th, 1944

Mr. G. M. Colvocoresses
1102 Luhrs Tower
Phoenix, Arizona

Dear Mr. Colvo:

This will acknowledge receipt of your letter of the 9th and the enclosed copy of the court order confirming the option granted us on the Congress Mine. By your letter of the 10th I see that you and Mr. Hernon have gotten together, and everything is probably lined out for his work. He can keep you better posted on the movements of Mr. Fowler than we can, I expect, and I know he will.

As for the other officials, our latest advice is that they will be out somewhere toward the 10th to 15th of November. We will keep you posted upon their movements as time progresses.

I wish to thank you for your information regarding Mr. Martin of the Harqua Hala, and I am enclosing copy of a letter which was sent him this morning. The party that was inquiring of him for Harqua Hala I am quite sure is Mr. A. R. Byrd of Tucson, whom you probably know as a local promoter. He has been inquiring around Tucson regarding the Harqua Hala, the King of Arizona, Congress, etc., and became rather discouraged when he learned that we apparently had all of them tied up.

Yours sincerely,

EAGLE-PICHER MINING & SMELTING COMPANY

E. W. Martin

E. D. MORTON
IW

Enclosure

A 10/14 44

EAGLE-PICHER MINING & SMELTING COMPANY

TUCSON, ARIZONA

October 11th, 1944
P. O. Box 1268

October 11th, 1944

Mr. Donald M. Martin
Bonanza & Golden Eagle Mining Co.
44 North First Avenue
Phoenix, Arizona

Dear Mr. Martin:

I have a letter from Mr. Colvocoresses telling me of your phone call to him last Monday inquiring whether we still have any interest in the Harqua Hala property and the tailings, as you had other parties that were inquiring regarding your holdings there.

We have no immediate plans or ideas in mind for work that we would like to carry on there. But we had had the thought, ever since the work we did there a couple of years ago, that when conditions for gold mining became more favorable and we were allowed to get out and operate untrammelled by regulations and restrictions, we would like to go back and have a good look at the mine itself. And if the examination results fitted in with our plans at that time, we were in hopes that we would be able to arrange with you to undertake prospecting and development of the property. However, I must admit that our present plans and outlook for the future are so hazy that I do not feel that I can ask you to hold the property for us in event you have someone who is interested and will really do some development and exploration work.

Most of us have a feeling that after the war is over and we get back onto what we feel is more like a normal condition that gold mining will be in good standing again, and we will want to do our share of it. But many things could happen that would discourage us from undertaking much work for some little time.

We appreciate your calling and apprising us that you have other inquiries and giving us first call, and we will certainly keep Harqua Hala in mind as soon as we are able to look far into the gold mining field.

Yours very truly,

EAGLE-PICHER MINING & SMELTING COMPANY

E. D. MORTON
IW

cc: Mr. Colvocoresses ✓

Harqua Hala Mine file
maps
A 7/3 '46

Silver City, N. M.
June 29, 1946

Mr. G. M. Colvocoresses
Luhrs Tower
Phoenix, Arizona

Dear Sir:

I am returning the two maps (assay plan and surface contour) that Mr. O'Neill and I borrowed from you a few weeks ago when we were in Phoenix. These maps were very valuable to us, as they greatly speeded our work at the Harqua Hala.

If you are in Silver City at any time we would enjoy a visit from you.

Very truly yours,

K. C. Richmond

K. C. Richmond

KCR/tfo

June 28th, 1945

STATEMENT OF ACCOUNT

Bonanza & Golden Eagle Mining Company

to

G. M. Colvocoresses

To preparation and revision of Lease and Option
to J. H. Byrd and Non-Liability Notices . . \$75.00.

Received Payment:

in full 6/28

Wm. C. Jones E. B.

OK

Mr. E. D. Morton
May 4th, 1944
Page 2

actually exists, and substantial exploration and development,--largely by drilling,--would be required in order to confirm or refute this opinion.

I hardly think that the average grade of the possible ore body would be sufficiently rich to permit profitable treatment under existing conditions, but if the price of gold should later be advanced to as much as \$45.00 or \$50.00 per ounce, I believe that this situation would be altered and from that point of view the required expenditure for exploration might seem to be an attractive speculative investment.

Yours very truly,

A handwritten signature, likely of the sender, is written in dark ink. It appears to be a stylized name, possibly "S. J. ...", with a long horizontal stroke at the end.

GMC/b

June 6th, 1945

MEMO FOR MR. DONALD M. MARTIN

Re: Harque Hala Contract

The terms proposed by Mr. Byrd seem to be fair and reasonable, except for the fact that he is asking you to tie up your property for an indefinite period of time and for no positive consideration.

The future of gold mining is not dependent upon the lifting of the Government restrictions which is quite certain to occur either by V.J. Day, or probably before, but the important point will be the probable price of gold as this may be established by international action in line with the tentative proposals made at Bretton Woods.

If it should become apparent or highly probable that the price of gold to producers would be advanced to say \$40.00 or \$50.00 per ounce there would undoubtedly be great interest shown in the purchase of gold properties and you might have excellent opportunities to dispose of your mine to very responsible people, but under the terms of this Agreement your hands would be entirely tied until three months after the date when the Government had lifted the restrictions on gold mining, and meantime you would have no assurance that Mr. Byrd would pay the \$3000.00 or any other sum of money. Actually, Mr. Byrd is a promoter and if he can obtain this money from other parties he will probably make such payments, but I do not think that it is fair for him to expect you to take that chance, and as an alternative to the terms which he has proposed (unless you have definitely agreed to these) I suggest that Byrd should pay in cash the sum of \$100.00 upon the execution of this Option and Lease Agreement, and an additional \$100.00 during each month while the Agreement is in force until three months after the restrictions on gold mining have been lifted when payments already made as above could be credited against the proposed payment of \$3000.00. I appreciate that Byrd may not be willing to accept these terms, but as the Agreement stands at present it appears to me to be far too one-sided, and I believe you will be inclined to agree after giving this matter due consideration.

The changes which I suggest could all be embodied in a revision of Article I and Article IV. of the attached Agreement, in the first case by merely changing the consideration from \$1.00 to \$100.00 (which of course should actually be collected).

as per proposed revision attached

V
Memo for Mr. Donald M. Martin
June 6th. 1945
Page 2

In Article IV.. clause (a) should read as follows:--

Cyph (a) During the interval of time beginning with the date of this agreement and ending 90 days after the Federal Government has removed the present restrictions on equipment and operation of gold mines. the second party shall pay to first party the sum of \$100.00 at the close of each period of 30 days and 90 days after the aforesaid restrictions have been removed second party shall pay to first party the sum of \$3000.00 less all payments already made as above and in accordance with the terms of Article I.

There are several provisions in this document which I have inserted on my own responsibility as being usual in such agreements. and to which I do not believe that Byrd will object and the arrangement for reserving water for possible use at the Golden Eagle Mine as outlined at the top of page 3 may be omitted or altered if you so desire.

After you have looked over the document I suggest that we arrange for another conference especially to discuss changes in respect to cash and monthly payments as it would be much better to embody these in the first draft of the contract which you will send to Mr. Byrd. unless you feel that you have already committed yourself to the terms which he proposed or that it would be inadvisable to attempt to alter these along the lines which I have suggested.

Byrd

BYRD MINING OPERATIONS

MAIN OFFICE
TUCSON, ARIZONA
P. O. BOX 5226
TELEPHONE 2032

May 3, 1946

Mr. George M. Colvocoresses
1102 Luhrs Tower
Phoenix, Arizona

Harqua Hala file

Dear Mr. Colvocoresses:

Your letter of April 25. We got some information regarding some sampling of the Rio del Monte, and it didn't look as good as Mr. Camden's report. For the present we have decided not to go further into it.

Anyway, I wish to thank you very much for your thoughtfulness.

Through a mix-up that was probably my fault, I missed Dr. Schmitt when he was over here a few days ago and lost, I think, as a consequence some time in getting him on the Harqua Hala property. He now says that he will try to get on the property next month. I will do my best to get him there as quickly as possible. I would like to have him or Dr. O'Neill, his assistant, talk with you.

Again thanking you, I am with regards

Yours very truly,

J. H. Byrd

J. H. Byrd

JHB:el

*Note to Richmond & Hall came thru
on June 12th & I saw them. They came
again June 21 & 22 & 23 & 24*

July 3, 1946

Mr. K. C. Richmond
C/o Harrison Schmitt
Silver City, New Mexico

RE: Harqua Hala

File

Dear Mr. Richmond:

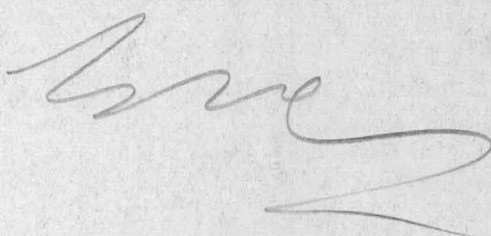
I acknowledge yours of June 29 with which you returned the two maps of the Harqua Hala Mine and I am pleased to know that these were of value to you in making your examination of the property.

I hardly expect to be in Silver City at any time in the near future but trust that you and Mr. O'Neale may again be passing through Phoenix when I shall hope to have the pleasure of seeing you, and I regret that I was not in my office on the occasion of your last visit.

If there is any information relative to the mine which I could give you by letter in the meantime, I should always be glad to do so.

Yours very truly,

GMC:DM

A large, stylized handwritten signature, likely of the sender, is written in dark ink.

May 4th, 1944

Mr. E. D. Morton
Eagle-Picher Mining & Smelting Company
P. O. Box 1268
Tucson, Arizona

Re: Harqua Hala Mine

Dear Morton:

Referring to our conversation on the 2nd Instant, I yesterday had occasion to see Donald M. Martin, President of the Bonanza and Golden Eagle Mining Company and I mentioned to him that your company might be interested in the Harqua Hala property at some future time and would appreciate his giving you an opportunity to do business before dealing with any other parties.

Martin said that up to date they had not been approached by any other concern seeking to lease or purchase the Harqua Hala Mine and that he would most assuredly be only too glad to give you first opportunity to acquire that property or to compete with any other party who might approach them with any proposition.

I have looked up my file and note that the lease to Winters expired on March 31st of this year, and in accordance with correspondence with Martin in June of 1943 I understand that you were paying a rental of \$25.00 per month after that date, but presumably discontinued this at the end of March. The agreement with Winters did not provide for any renewal of the lease nor for any option to purchase the property since nothing of this kind was contemplated when Winters decided to treat the tailings in April, 1941. I am wondering if you and other officials of your company would feel that this was an opportune time to discuss the possible purchase of the property and negotiate for an option. I did not make any suggestion of this nature to Martin since neither you nor Mr. Potter had expressed any such intention, but if the enthusiasm for gold mining continues to increase it might perhaps be well to obtain a firm commitment from the Bonanza and Golden Eagle Mining Company at this date rather than later.

My own impression of this property, as set forth in previous correspondence and in conversation with you and Mr. Potter a couple of months ago, is that it may contain a large body of low grade gold ore which could be mined and milled at a comparatively low cost per ton, but there is no assurance that any such ore body

Statement herewith was not made up as exhibiting by itself the probabilities or expectations as to mining & milling results; but as a record in some detail, of how certain funds were expended.

Labor expenditure was considerably less than would be the case in a regular mining operation - rates of pay at the highest being per hour - & hoist men 50¢, miners 48¢, muckers 38¢. Certain other costs would be higher also. Greater part of tonnage milled was surface material. Considerable of underground material milled was in a broken down state in the workings.

On the other hand, as to returns, a very large proportion of material milled, surface particularly, but underground also, was not ore - just rock.

Rich

8-15-39

Arizona Highways, pictorial journal of art and travel, is being sent to you with the compliments of

Subscription begins with the JAN 1946 issue.

Operating Statement
 showing result of exploratory and determinative operations
 on property of Argona Gold Mining Co.
 for the 12 months period Apr 1, to July 1, 1936.

<i>Cost</i> On Production: (Extraction)		953505
Labor	414670	
Explosives	53336	
Gasoline	41219	
Smelter Supplies	26499	
Power	18098	
Rental of Equipment	28334	
Sampling & Assaying	22794	
Workmen's Compensation Insurance	37686	
Hospital Expenses	13139	
Supplies & General Expenses	161865	
Depreciation	135867	

On Production: (Milling)		857544
Mill Operations:	384174	
Sampling & Assaying	17952	
Workmen's Compensation Insurance	20031	
Hospital Expenses	13140	
Supplies & General Expenses	168776	
Depreciation	253471	

Freight 6276.63 @ 2.88	1811049
------------------------	---------

Returns.

On Milling Returns:	725798	
Analyses and Concentrate on Land:	75000	
(Estimate)		800798

Net Cost of foregoing operation:	1010251
	1811049

EXTRACT FROM LETTER TO CAPT. R. W. HUNT FROM R. N. DICKMAN

Harqua Hala, Arizona
April 17, 1916.

My dear Sir:-

.....
Since my last visit in August 1915 the work has proceeded below the sixth level, nothing having been done below that level at that time. My former reports have included development up to that point. On this visit, I have reviewed my former work to an extent sufficient to affirm former ore values, and I have examined the new work. On the latter, I have taken samples sufficient in size and number to satisfy myself that the daily sampling has been substantially correct. In point of thoroughness, in fact, these daily samples are entitled to more weight than my own taken in corroboration.

The best demonstration is in the Mill results combined with the tailing assays, though these results are perhaps a trifle lower than would be attained in stoping from the levels, since in the development work it has been impossible not to mix the ore with undue porportion of waste.

ABOVE THE FOURTH LEVEL to the north there is no doubt some ore to be gained both from No. 2 vein as well as from No. 1 vein.

At the present time a stope started at point "A" is showing high values, \$41.34 to \$210.00. This ore is of about two feet width and there is no development between this point and the surface more than 200 feet above.

BETWEEN LEVELS FOUR AND SIX the former Mill run showed a value of \$9.50 per ton with \$7.28 recovery and tailings of \$2.22.

None of this ground has been mined in the interval until now.

Stoping has just been commenced on Level 4 and at several points in the incline raise between 4 and 6. There is no reason to modify the former estimates on tonnage and value except perhaps to lessen the tonnage and perhaps raise the value, if stoped as at present in the higher grade locations and where the vein is of size to furnish cheaply stoped ore. My estimate was 2500 tons of \$8.00 gross.

Since my visit of August 1915 all the work below level 6 has been done and consists of the incline and the development of levels SEVEN AND EIGHT.

THE INCLINE follows the ore from level 6 to level 7 with a width of 4 to 5 feet on level 6 and from 1 to 3 feet along the incline.

The average shows about 2 feet with a value of \$8.85 per ton.

LEVEL SEVEN to the north follows an ore body lying rather flat and of assay value \$5.08 per ton. The ore is narrow.

To the south for a distance of 120 feet the vein averages about 3 feet in width and \$14.95 gold value. After an interval of about 40 feet in which the ore is narrow and the value low, there is encountered what seems to be the most important showing of the lower workings. For a distance of 45 feet the ore is of a width from 3 to 10 feet and shows an average value of \$12.90 per ton gold with sulphides carrying copper. Check sample \$13.66.

A winze on the ore shows a full face at 15 feet depth of a value of \$31.20 per ton gold.

This ore body is again cut 30 feet below by a drift from the connecting upraise (not in ore) where it shows a width of 10 feet and an average gold value of \$8.90. Selected

sulphide ore at this point shows \$37.20 and \$44.60 gold value. This same ore body has now been cut to the west of level 8 where it shows 16 feet in width of an average value of \$13.23 (R.N.D.).

The unfortunate part of present development at this point is that only a small part of the value is in FREE GOLD and the Mill saves but a small portion of the value. The ore is being piled on surface and none stoped. This ore when sent to the Mill on April 12th showed heads of \$16.00 and tailing value of \$10.40, there being no concentration apparatus in the Mill.

In course of mining a small amount of high grade sulphide will be encountered and will be saved and shipped for smelting. No calculation of the amount is yet possible.

I hesitate to estimate the ORE ABOVE THE SEVENTH level since no raises have been made and the vein is irregular. I should surmise that when it can be taken out the ground should yield 2500 tons of the value shown in the last Mill Run, viz. \$7.88 per ton of which \$5.79 would be recovered with \$2.09 in tails. If confined to the ground south of the incline the yield will be higher and the ore near the shaft cheaply mined. Until this incline is abandoned as a hoisting shaft much of the ore is not available.

BETWEEN THE SEVENTH AND EIGHTH levels the shaft or incline is not in ore. The vein has apparently straightened at this point as will be seen best from the larger new sectional map. While it is not PROVEN that the crack followed on level 8 is the same with that of level 7 on the whole length, it is very near to the new sulphide ore body, though not as yet identified as a part of it.

The vein itself on level 8 is narrow but persistent and of good grade. When it can be mined as a part of a larger

operation it will probably pay to stope, but under present conditions it would not yield tonnage sufficient to pay the cost of pumping and hoisting with present equipment. I make no estimate of this vein on this level.

THE SOUTH SULPHIDE ORE BODY on this level is by far the most important discovery as yet made in your work on the Bonanza Mine. Development has not proceeded far enough to prove any definite tonnage, but an ore body 45 feet long on level 7 with a width of 10 feet at that point, a width of 12 feet in the intermediate level and of 16 feet on level 8 must prove of considerable size. It will be MOST UNFORTUNATE if development cannot be now continued both along the level and still DEEPER. Aside from the high grade ore the body seems to have a value of about \$12.00 per ton in gold and the concentrates will have commercial copper value. When the body is a little further developed a test should be made of an average sample for concentration by tables and flotation with assay of concentration product.

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CONCLUSIONS:

The limit of ore which can be advisably treated at all by amalgamation alone seems to be reached on level 7, and prevents any present use or profit from the sulphide body now being opened on level 8, which is of utmost importance, as well as the first ore body of large size recently encountered. I do not consider it probable that all expenditures can be met from mill product under present conditions, though a substantial part may be made from now on. None the less, even if there were no revenue whatever, I think that the discovery warrants vigorous development to a deeper level by following and developing this ore body. There is no great probability

of the discovery of additional free milling bodies capable of paying for the mine under present contract and on this lower ore depends the outcome of the enterprise. The cost of this lower work will run from \$2000 to \$3000 per month above the expenditures in addition to the present milling and mining expense, which should of itself yield some profit.

I consider that the conditions as now existing well warrant proceeding with vigor.

Very truly yours,

(Signed) R. N. Dickman.

EXTRACT FROM LETTER TO CAPT. R. W. HUNT FROM R. N. DICKMAN

Harqua Hala, Ariz.
April 13, 1915.

My dear Sir:-

.....
Examination now shows plainly that the discovery in Level IV was almost at an "apex" of TWO fractures, or veins, both of which were ore bearing in the old workings above. These are now termed "Vein No. 1", which lies and pitches to the west, and lies conformable to the fractures of the quartzites above and the granitic country rock below, and "Vein No. 2", which cuts across these bedding planes and also cuts "Vein No. 1", as shown in the vertical section.

In the old workings above, "Vein No. 1" either itself or else similar breaks, have furnished the big stopes, Bonanza, Castle Garden, etc. pitching on their floors always to the west with the bedding planes of the enclosing rocks.

Vein or fracture No. 2 has been the site of the so-called iron veins with lower grade material and more or less porphyritic nature at times.

The ore milled was all taken from the work on Level IV and solely from the drifts, raise and winze, a total of about 190 feet on ore of various classes and amounting to 212 tons. Its average hence taking 15 cubic feet in place as one ton, is about 1.11 tons per lineal foot, which would account for an average of approximately 2.4 feet average feet in width saved as ore. As will be noted on the tracing, the ore widths varied from a mere seam to the full width of the drift.

Taking bullion yield, plus tailing losses, the ore showed about \$9.50 gross value of which \$7.50 was recovered on the plates. The milling cost shows almost exactly \$1.00 per ton for labor and fuel to which must be added supplies and

and wear and tear. This included the operation of the pipe line and pumps.

It will be noted that on Level IV north veins 1 and 2 ran along together for a short distance and then crossed. Along this junction good value was encountered. Beyond this lower grade was encountered.

The raise on Vein No. 2, east Level IV., showed good values and broke into the extreme north workings of the mine above this level. On the level itself the values were in the main low, as well as in the winze, which reaches to Level VI.

On Level VI. Vein No. 1 shows from a seam to 3 feet in width with varying assays, as shown from \$1.15 to \$16.00 with an average to date of \$4.85 per ton.

Vein No. 2 has thus far shown no high or even medium grade ore though frequently very favorable in appearance. On the south it has now penetrated into the quartzite, but without any increase in value. On the north it is likewise low grade.

Ore in sight. It will be plain from the map that any estimate of ore is not warranted by conditions of development. The development is practically confined to the levels with exception of one raise on No. 2 and one winze on No. 1. At the same time there is no doubt that several times the amount taken from the levels would be gained by stoping, and in so doing the ore would be cleaner and the grade somewhat higher.

Development Advisable. In the order of importance the following development is to be recommended, proceeding with substantially the present force and monthly expense.

1. Raise on Vein No. 1, Level VI. This is essential for actual ore development and since it will be largely on ore, will open the ground for stoping.

2. Drive north on Vein No. 1, Level VI. While there is now but a seam, this work is essential if the property is

to at all enlarge. It is in line with dip, strike and rake of the ore chutes above. Ultimately this drift should encounter another junction with Vein No. 2 as on Level IV., if directions continue as on that level.

3. Drive north on Vein No. 1, Level IV for same development reasons.

4. Sink a winze on Vein No. 1, Level VI preferable after driving north on same and at a northerly point if vein recovers width and value.

At a later time it will be advisable to drive north on Vein No. 2, but this may well await results on Vein No. 1, since all work on Vein No. 2, Level VI, is in low grade material. Likewise a winze will be advisable at some point such as set down as "proposed winze 2." east on Level VI.

IN GENERAL there is no appearance as yet of sulphide ores and it is certain that the present free and oxidized ores will continue to the level of ground waters. There is no available data for saying how much deeper this level may be.

As to the results on Level VI compared with our hopes, it must be frankly stated that on Vein No. 2 they are very disappointing, but the work thus far prosecuted has been warranted in light of what had to be done to reach it at all.

On Vein No. 1 our hopes have not been realized, though we have encountered ore which will yield a profit on stoping when opened by the raise, and there is a possibility at least of opening an ore body in the 100 feet incline between the two levels, in which we have every reason to expect high grade ore, at least occasionally, under the conditions of Level IV.

.....

Very truly yours,

R. N. Dickman.

COPY OF REPORT BY R. N. DICKMAN

Hargua Hala, Arizona
May 4, 1914.

The President and Directors of the Yuma-Warrior Mining Co.

GENTLEMEN:

.....

Present Conditions

The Shaft has been sunk 100 feet, a good station installed and the formation crosscut for 37 feet east and 61 feet west, without result as to the finding of the ore. Practically all this work is in the diabase of the country rock, and no continuance of the quartzite or the sulphide ore body has been encountered.

Raise from IV to III was not completed but a drift run to the west as shown and considerable exploration work done on crevices and in the lime. No ore has been shown by this work. It now appears that it will require about 100 feet of incline raise from a point marked "X" to connect with the ore in the winze above.

Drift and Raise Level III to I iron. as will be noted was not run direct, owing to lack of survey in the first instance and departure from the survey furnished later. Recent work however in proper direction has not encountered more than an indication of the iron vein 100 feet above, nor at this writing do indications seem promising.

The net result of all the work is that NO ADDITIONAL ORE has been added by all the work, and while there is as formerly stated a small amount of ore accessible in old stopes and along drift bottoms, it is not at all sufficient to warrant mill operations.

I have expressed the opinion that the future of this mine depended on future discoveries at deeper levels. The limited work on Level V has not disclosed anything encouraging, nor has the partially finished work recommended on the levels above.

Under the present financial condition of the company I have recommended closing down of the work.

The Sulphide Ore Body. It was originally advised (and funds allowed out of \$8000 surplus) that a milling test be made on this ore body. Having failed in this however a thorough sampling has been made, and the results are shown on the accompanying map of the IV Level.

25 samples show a general average of \$3.57 per ton. A concentration test shows a ratio of 9.61 into one with concentrates containing 1.50 oz. gold per ton or \$3.22 per original ton with tailings of \$.38 per ton gold value. The concentrates of \$31.00 per ton value will undergo a charge of about \$14.00 per ton for wagon haul, rail and treatment leaving \$17.00 per original ton net return on concentrates.

Applying this to 9.61 tons of ore leaves \$1.77 per ton for mining and milling, a sum which would hardly be sufficient for operation on material of this class alone.

Conclusion on Golden Eagle.

While I do not think that the work performed has exhausted the possibility of discovering additional ore bodies, and would under some circumstances advise at least the completion of the work as originally outlined, especially under the present economical and effective method of contract and low overhead cost, the recent discovery in the Bonanza offers a far better opportunity for development and a strong probability of opening of milling ore at minimum cost.

The Bonanza Mine.

Incident to what the writer had presumed to be the opening of ore on the Golden Eagle and to reduce overhead cost per foot, it was decided to run the drift around in solid diabase footwall ground and get beneath the old Bonanza stopes so

as to draw the fines from the crushed and caved ground, recognizing that while of low grade the cost of mining would be only that of loading, tramping and hoisting and milling.

In doing this from Level IV of the Bonanza, shown in BLUE on the map an ore body was encountered and the drift continued along the same for a distance of 32 feet or more. The work does not determine the extent nor direction of the ore body, but is none the less of such extent that it may apparently be taken to indicate an ore body of considerable extent judged by similar occurrences elsewhere in the mine. It is significant in being the first and only ore discovered in the diabase footwall of the bonanza and is in direct line of the south to north trend of all former ore bodies.

The shaft is completed to Level VI a depth of 55 feet vertically below this level IV and the maximum distance is 95 feet to a point below the center of this discovery. It is apparent that the amount of work will not be great in opening up the ore body if it proves of the extent to be hoped for.

After consultation with Mr. J. B. Martin and Mr. A. C. Massey we have decided that a maximum sum of \$5000 should suffice to explore this ore body and place same in shape with drifts and raises and the crosscut from Level VI to deliver ore to the mill.

Dismissing the expenditures at Golden Eagle as unfortunate, it is apparent that if this discovery had followed some success at that point and a considerable amount of exploration on Bonanza, it would have been considered satisfactory and in line with former plans. Such money as is raised for future work should certainly be devoted to this ore and the Golden Eagle work postponed until this has been proven of lasting value and revenue.

The samples taken are shown on the map and are here repeated:

<u>Feet</u>	<u>South Side</u>	<u>Feet</u>	<u>North Side</u>
0 to 5	\$1.65	5 to 10	\$ 12.81
5 to 10	42.55	10 to 15	2.06
10 to 15	1.65	15 to 20	1.24
15 to 20	1.24	20 to 25	1.65
20 to 25	1.24	25 to 31	1.65
25 to 31	6.61	31 to 37	7.02
31 to 37	6.61		
Average \$6.76			

Other mineralized material beyond to the east was sampled and results are recorded on the map.

On Level VI colored Purple a raise has been made on a newly discovered ore streak on which two feet of ore shows \$10.33 value and about 30 tons have been extracted in development work.

On the same Level VI at point marked Crosscut 6 is exposed an iron ore body about 4 feet wide standing vertically on which general sample for 25 feet shows \$4.13 which is worthy of development in a southerly direction in unworked ground.

Between Level IV and VI at a point about 40 feet below VI on the incline, a small streak perhaps connected with the new ore body shows \$43.40 gold value corresponding with the wall streak from 0 to 5 in the drift and in the diabase foot-wall.

The future of the Bonanza Mine lies in the development of deeper ore bodies in the diabase as will be seen from the cross-section B-B- and it is to be hoped that this new discovery will prove isgnificant of continuance in that direction.

Very truly yours,

(Signed) R. N. Dickman.

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Harqua Hala, Ariz.
April 13, 1915.

My dear Sir:-

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Taking bullion yield, plus tailing losses, the ore showed about \$9.50 gross value of which \$7.50 was recovered on the plates. The milling cost shows almost exactly \$1.00 per ton for labor and fuel to which must be added supplies and

and wear and tear. This included the operation of the pipe line and pumps.

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.....

Very truly yours,

R. N. Dickman.

EXTRACT FROM LETTER TO CAPT. R. W. HUNT FROM R. N. DICKMAN

Harqua Hala, Ariz.
July 17, 1915.

Captain R. W. Hunt,

My dear Sir:

.....
The work has reached the stage where it is going to be necessary to sink on Level VI. and that means that we will have to run the Air Compressor daily in order to pump the water from below level VI. Also, when the time comes, it can be used to hoist from below Level VI.

Number one vein North on Level VI. has become very flat, so that to keep in it the drift had to turn east. Here I have recommended that they keep the ore in the drift and now make an upraise at the north end, which will give us an idea as to its position between Level VI. and IV. This will determine work also perhaps on Level IV. north.

Vein No. 2 on Level VI. is both a disappointment and a surprise, for in the old workings on Level IV. it was productive all along for 200 feet. Ultimately we must make a few blind upraises from VI. before finally giving up that block of ground.

I think that it is safe now to assume that we will have somewhere in the neighborhood of 2500 tons of ore available when the mill is started of grade in the neighborhood of \$8.00 from assay results.

.....
Sincerely yours,

R. N. Dickman.

EXTRACT FROM LETTER TO MR. STEVENS FROM R. N. DICKMAN

Harqua Hala, Ariz.
July 17, 1915.

My dear Stevens:

.....
On Level VI. to make a long story very short, the vein is very flat and is dipping northwest in a bow-shaped body, so that the drift north has turned east and the ore is in the lower half of the drift and flat. We will now make another raise and see where it does lead to. The crosscut, which the map will show, is really on the flat vein; that is, it is gently inclined northwest and we must now sink on it.
.....

As ever,

Dickman.

COPY OF REPORT BY R. N. DICKMAN

Harqua Hala, Arizona

May 4, 1914.

The President and Directors of the Yuma-Warrior Mining Co.

GENTLEMEN:

.....

Present Conditions

The Shaft has been sunk 100 feet, a good station installed and the formation crosscut for 37 feet east and 61 feet west, without result as to the finding of the ore. Practically all this work is in the diabase of the country rock, and no continuance of the quartzite or the sulphide ore body has been encountered.

Raise from IV to III was not completed but a drift run to the west as shown and considerable exploration work done on crevices and in the lime. No ore has been shown by this work. It now appears that it will require about 100 feet of incline raise from a point marked "X" to connect with the ore in the winze above.

Drift and Raise Level III to I iron. as will be noted was not run direct, owing to lack of survey in the first instance and departure from the survey furnished later. Recent work however in proper direction has not encountered more than an indication of the iron vein 100 feet above, nor at this writing do indications seem promising.

The net result of all the work is that NO ADDITIONAL ORE has been added by all the work, and while there is as formerly stated a small amount of ore accessible in old stopes and along drift bottoms, it is not at all sufficient to warrant mill operations.

I have expressed the opinion that the future of this mine depended on future discoveries at deeper levels. The limited work on Level V has not disclosed anything encouraging, nor has the partially finished work recommended on the levels above.

Under the present financial condition of the company I have recommended closing down of the work.

The Sulphide Ore Body. It was originally advised (and funds allowed out of \$8000 surplus) that a milling test be made on this ore body. Having failed in this however a thorough sampling has been made, and the results are shown on the accompanying map of the IV Level.

25 samples show a general average of \$3.57 per ton. A concentration test shows a ratio of 9.61 into one with concentrates containing 1.50 oz. gold per ton or \$3.22 per original ton with tailings of \$.38 per ton gold value. The concentrates of \$31.00 per ton value will undergo a charge of about \$14.00 per ton for wagon haul, rail and treatment leaving \$17.00 per original ton net return on concentrates.

Applying this to 9.61 tons of ore leaves \$1.77 per ton for mining and milling, a sum which would hardly be sufficient for operation on material of this class alone.

Conclusion on Golden Eagle.

While I do not think that the work performed has exhausted the possibility of discovering additional ore bodies, and would under some circumstances advise at least the completion of the work as originally outlined, especially under the present economical and effective method of contract and low overhead cost, the recent discovery in the Bonanza offers a far better opportunity for development and a strong probability of opening of milling ore at minimum cost.

The Bonanza Mine.

Incident to what the writer had presumed to be the opening of ore on the Golden Eagle and to reduce overhead cost per foot, it was decided to run the drift around in solid diabase footwall ground and get beneath the old Bonanza stopes so

as to draw the fines from the crushed and caved ground, recognizing that while of low grade the cost of mining would be only that of loading, tramming and hoisting and milling.

In doing this from Level IV of the Bonanza, shown in BLUE on the map an ore body was encountered and the drift continued along the same for a distance of 32 feet or more. The work does not determine the extent nor direction of the ore body, but is none the less of such extent that it may apparently be taken to indicate an ore body of considerable extent judged by similar occurrences elsewhere in the mine. It is significant in being the first and only ore discovered in the diabase footwall of the bonanza and is in direct line of the south to north trend of all former ore bodies.

The shaft is completed to Level VI a depth of 55 feet vertically below this level IV and the maximum distance is 95 feet to a point below the center of this discovery. It is apparent that the amount of work will not be great in opening up the ore body if it proves of the extent to be hoped for.

After consultation with Mr. J. B. Martin and Mr. A. C. Massey we have decided that a maximum sum of \$5000 should suffice to explore this ore body and place same in shape with drifts and raises and the crosscut from Level VI to deliver ore to the mill.

Dismissing the expenditures at Golden Eagle as unfortunate, it is apparent that if this discovery had followed some success at that point add a considerable amount of exploration on Bonanza, it would have been considered satisfactory and in line with former plans. Such money as is raised for future work should certainly be devoted to this ore and the Golden Eagle work postponed until this has been proven of lasting value and revenue.

The samples taken are shown on the map and are here repeated:

<u>Feet</u>	<u>South Side</u>	<u>Feet</u>	<u>North Side</u>
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25 to 31	6.61	25 to 31	1.65
31 to 37	6.61	31 to 37	7.02

Average \$6.76

7 1/2 = 300

Other mineralized material beyond to the east was sampled and results are recorded on the map.

On Level VI colored Purple a raise has been made on a newly discovered ore streak on which two feet of ore shows \$10.33 value and about 30 tons have been extracted in development work.

On the same Level VI at point marked Crosscut 6 is exposed an iron ore body about 4 feet wide standing vertically on which general sample for 25 feet shows \$4.13 which is worthy of development in a southerly direction in unworked ground.

Between Level IV and VI at a point about 40 feet below VI on the incline, a small streak perhaps connected with the new ore body shows \$43.40 gold value corresponding with the wall streak from 0 to 5 in the drift and in the diabase foot-wall.

The future of the Bonanza Mine lies in the development of deeper ore bodies in the diabase as will be seen from the cross-section B-B- and it is to be hoped that this new discovery will prove significant of continuance in that direction.

Very truly yours,

(Signed) R. N. Dickman.

Also 1915

The Harqua Hala Bonanza & Golden Eagle properties are located in the Harqua Hala Mountains, Yuma County, Arizona, a distance of from 10 to 12 miles from Salome, the nearest R.R. point on the Santa Fe system.

BONANZA GROUP

The Bonanza group consists of six claims, Gold Mountain, Gold Mill, Gold Star, Grand View, Narrow Gauge and Summit, all of which are patented.

There are two veins on the Bonanza claim that can be easily traced, one known as the Iron Vein, running NE and SW., the other known as the Mill Vein, running N. & S. and crossing each other on top of the hill where a large blow out is apparent and also where the first shaft was sunk. The foot wall of the Iron Vein is porphyritic and the hanging wall quartzite. The mine was first opened by an incline shaft sunk on the Mill Vein only a short distance from its junction with the Iron Vein, but soon got in such condition from the stoping done too close to the shaft that it had to be abandoned and is now caved.

A new incline working shaft was sunk in the hanging wall opposite the junction of the two veins and goes down at an angle of 58 degrees pitching toward the vein. At a depth of 270 feet it has gone through the vein and is now in the foot wall, the shaft and vein pitching toward each other. The mine has been practically stoped out as far down as the 5th level and is in such a condition from caving that no one can make an accurate estimate of how much ore has been taken out or how much may be left. However, I managed to crawl through some of the old stopes, and could see that many tons of ore

have been extracted. In one place, known as the Castle Garden, the old stope shows a width of 80 feet and more and I am safe in saying 100 feet in length. A large amount of ore has been stoped out of a place known as the Dance Hall at a point where the two veins cross or come in contact with each other and at first glance one would say that the large bodies of ore found at this point were deposits and not well defined veins but the Iron Vein especially can be traced on the surface for miles.

I took eleven samples from different places in the different stopes, caves and pillars in the mine and got values as high as \$40.00 per ton and as low as 80¢ per ton. Out of the 11 samples I got an average of \$7.20 per ton.

The ore left in this worked over part of the mine cannot be taken out with profit through the present working shaft. A new shaft will have to be sunk in order to open up this mine. Little timber was used in mining the ore that has been removed. Underhand stoping has been done in taking out what has been mined, hence it did not take long to get deep enough in so large a vein to make the stope dangerous. When they could safely go down no further a new stope was started 30 or 40 feet further down and of course with the same result. Six of these levels have been opened up in this mine in making a depth of 270 feet incline. There is also evidence that the company owning this property before closing down caved in the surface of the mine. This cave shows on the surface for a length of 150 feet. As far as I could get down for water, the formation looks the same and the character of the ore is the same and I could see no evidence of its giving out. The only difference noticable is that the formation has straightened up and now runs steeper than nearer the surface. It is impossible to see much on the 6th or bottom level as the ground

commenced caving as soon as the water was taken out, rendering it dangerous to make careful examination there.

From the 6th level a winze has been sunk 70 feet deep said to be all in ore but I could not get into this winze as it was full of water. I could see that such a winze was there. I was told that from the bottom of this winze drifts have been run in both directions along the course of the vein. It was claimed that all this work showed ore of the same grade as that mined above, but I saw nothing of it myself nor did I find anyone who had been in this winze.

The samples I took from the old workings may not represent the full value of the ore that has been removed but do represent the value of the ore still in the old workings. I could see little or nothing of the character of the ore in the bottom of the 6th level or lowest level as the floor of this level was covered by the rock that had caved from above. A large stope has been made on this level, at least 20 feet wide but I could not see how long. The stope may have been more than 20 feet wide but owing to its caved condition I could not tell with any certainty its extent.

In going through some old letter books I saw in the office, I found a letter from the Governor of Arizona asking how much had been taken from the mine during the current year. I found the letter press copy of the answer to this letter, which stated that there had been taken from the mine from January 1 to June 10, \$140,000, but I could find no record of the amount of ore milled during this period.

Lessors are scrambling for the best ore in the mine at the present time. From a dump of ore they have lately taken out, containing about twenty tons, I took two grab samples which gave assays of \$297.50 and \$382.20 per ton.

If the ore continues down to the bottom of the winze and is practically the same in extent and value as that mined above, a profitable mine could easily be opened there, but as to what will be found in this winze I have no personal knowledge.

TAILING DUMP

There is a tailing dump below the mill and from measurements made by me I estimate that it contains 106,000 tons. From 38 samples taken from as many different places I got an average value of \$2.75 per ton.

I also estimate the cost of working same to be about \$1.00 per ton, not including plant. I believe these tailings can be worked at good profit by Cyaniding. On account of the great amount of slimes in these tailings, the agitation process should be used.

GOLDEN EAGLE GROUP

The Golden Eagle group consists of 4 claims: Golden Eagle, Golden Ark, Golden Belt and Occidental. The above claims are patented except the Occidental, which is held by location.

This mine is located about 1 mile from the Bonanza Mine and no doubt is a continuation of the so called Mill Vein; the general formation being the same and vein running north and south. This mine was first opened by a crosscut tunnel 280 feet long crossing the vein at a depth of 185 feet and going through 75 feet of vein matter.

Practically all the high grade ore is stoped out on this level but there is considerable low grade ore in place yet, that will assay \$5.00 per ton; a shaft was sunk on this level, on the vein, pitching 60 degrees East to a depth of 63 feet to a second level and drifts have been run from the shaft north and south. The drift to the south is 182 feet long.

I estimate the amount of ore in place here between the two levels at 2000 tons, taking the width at the drift only. No crosscut has been run on this level, hence no estimate of ore in sight could be made, except that shown by the drifts.

The drift North does not show up good until a point 47 feet in from shaft is reached but in a winze sunk at that point 10 feet deep I got some very good ore. From two samples in this winze where the ore is 3 feet wide I got values of \$7.80 and \$44.00.

At a point 13 feet above this second level a drift was run in to the north for some distance. I could not measure total length because the drift was filled with broken rock from an upraise made from this intermediate level but in ten feet from shaft good ore is shown 3 feet wide that can be seen for a length of 30 feet. This rock will go \$20.00 per ton. No crosscuts have been made from this drift. Could not see bottom of the mine as there are 40 feet of water in the bottom.

Out of 26 samples taken from the ore shown in all parts of this mine I made an average value of \$10.00 per ton. It is difficult to make a safe sample of this ore as there are many small vugs in the vein, around the walls of which many particles of free gold could be seen. These getting into the sample would show results higher than could be produced in mining the ore. Out of the 26 samples taken 4 of them showed higher than \$20 running from \$20.00 to \$41.00. In making the average I took half of the value shown in these four samples. From a dump of ore at this mine containing about 3000 tons I took 4 samples which showed an average value of \$8.00.

I feel safe in saying that there are 10,000 tons of ore in this mine that will average \$10.00 per ton that could be made ready for the mill in 3 months. Owing to the water in the

bottom of this mine I could not see the conditions there and so do not know whether the same values are found in the bottom. I was told by miners who had worked in the bottom that the vein is practically the same both in extent and value as higher up. I am also informed that all the work below the 1st level has been done by the leasors now working the mine.

The ore stoped out on the first or tunnel level was taken principally from the two walls, about five feet of ore having been mined both on the hanging and foot sides, about 65 feet of low grade material having been left between these two stopes. No crosscuts were made into the hanging wall on the second level. It is not demonstrated, therefore, that this vein of high grade ore exists below the 1st level on the hanging wall but it is only fair to suppose that there is a good grade of ore on the hanging wall in the second level that has not been opened up. However, I have not figures on this possibility in making estimate of ore in mine.

All the ore extracted from this mine has been milled at the Bonanza Mine and in Harrisburg and hauled in wagons, which of necessity make it expensive. Hence only the very best of the ore could be worked at a profit.

SAMPLES FROM TAILING PILE

No. 1 - \$2.00	No. 14 - \$3.30	No. 27 - \$2.30
" 2 - .40	" 15 - 4.10	" 28 - 2.50
" 3 - 1.50	" 16 - 4.10	" 29 - 2.20
" 4 - 2.30	" 17 - 2.20	" 30 - 2.10
" 5 - 2.90	" 18 - 4.80	" 31 - 1.30
" 6 - 2.30	" 19 - 1.40	" 32 - 2.40
" 7 - 1.30	" 20 - 2.00	" 33 - 1.50
" 8 - 5.00	" 21 - 2.80	" 34 - 1.70
" 9 - 7.30	" 22 - 3.40	" 35 - 2.40
" 10 - 4.40	" 23 - 1.90	" 36 - 2.00
" 11 - 6.90	" 24 - 3.50	" 37 - 1.60
" 12 - 2.80	" 25 - 1.50	" 38 - 1.60
" 13 - 2.70	" 26 - 1.40	

SAMPLES FROM GOLDEN EAGLE MINE

No. 1 - \$ 9.35	No. 10 - \$ 4.75	No. 19 - \$ 4.80
" 2 - 21.23	" 11 - 33.80	" 20 - 9.80
" 3 - 17.16	" 12 - 8.25	" 21 - 11.40
" 4 - 4.90	" 13 - 13.00	" 22 - 10.00
" 5 - 8.25	" 14 - 2.20	" 23 - 3.20
" 6 - 4.60	" 15 - 7.00	" 24 - 1.60
" 7 - 20.00	" 16 - 10.50	" 25 - 10.80
" 8 - 7.45	" 17 - 19.20	" 26 - 3.50
" 9 - 7.00	" 18 - 18.60	

SAMPLES FROM THE BONANZA MINE

No. 1 - \$.60	No. 5 - \$1.90	No. 9 - \$39.40
" 2 - .40	" 6 - .30	" 10 - 5.60
" 3 - .50	" 7 - 1.00	" 11 - 21.60

SAMPLES FROM GOLDEN EAGLE DUMP

No. 1 - \$16.60	No. 3 - \$ 4.80
No. 2 - 7.80	" 4 - 6.00

E. J. Olson.

EXTRACT FROM LETTER TO MR. STEVENS FROM R. N. DICKMAN

Harqua Hala, Ariz.
July 17, 1915.

My dear Stevens:

.
On Level VI. to make a long story very short, the vein is very flat and is dipping northwest in a bow-shaped body, so that the drift north has turned east and the ore is in the lower half of the drift and flat. We will now make another raise and see where it does lead to. The crosscut, which the map will show, is really on the flat vein; that is, it is gently inclined northwest and we must now sink on it.
.

As ever,
Dickman.

FIELD NOTES RE HARQUA HALA

August 11, 12, & 13, 1939

Visit with C. C. Thompson of Bouse.

The assay map of the Bonanza workings of which I have blue-print was made by Thompson in about 1914 and samples were taken along the veins.

Thompson thinks that there is a good block of sulphide ore left in the porphyry below the 6th and down to the 9th level. In this there are some very high grade shoots which should sweeten up the average grade.

The bottom of these ore shoots was cut off by a fault which dips to the north-east about 45° . He thinks this is a normal fault and that the original lower segment of the ore body should lie in the foot wall and might be found by exploring to the southwest from the long drift on the 6th level which runs over to the iron vein following the fault plane.

Elliott claimed to have found 9 million tons of \$9.00 ore which is ridiculous and not substantiated by the assays of samples made by Thompson.

GOLDEN EAGLE WORKINGS:

Wash at foot of hill is at 1700 ^{elr abn sea level} and adit level about 1750, collar of shaft about 1840.

No. 72 Co

Phoenix, Arizona,

Aug 14 39

CHAS. A. DIEHL

ARIZONA ASSAY OFFICE

Phone 3-4001

315 North First Street

P. O. Box 1148

This Certifies That samples submitted for assay by Mr. G. M. Colvocoresses contain as follows per ton of 2000 lbs. Avoir.

MARKS	SILVER		VALUE (Oz.)		GOLD		VALUE (Oz.)	TOTAL VALUE Of Gold and Silver			PERCENTAGE				REMARKS
	Ounces	Tenths			Ounces	Hundths									
H							\$35.00								
1					.12		\$4.20								
2					.09		\$3.15								
3					.03		\$1.05								
4					.06		\$2.10								
5					.20		\$7.00								
6					.04		\$1.40								
7					.05		\$1.75								
8					.16		\$5.60								

Charges \$ 8.00

Assayer Arizona Assay Office. *C.A.D.*

C^b

NOTE RE HARQUA HALA

4/25/40

Chaffee says that Tom Hamilton, formerly manager for Braden, told him that Braden had thoroughly investigated the Harqua Hala and believed that it contained some 5 million tons of ore which would average better than \$5.00 per ton. Said that Braden had complete maps and sample records but would not take over the mine because they were only looking for properties that could be worked on scale of 5000 tons or more per day.

Chaffee wants to take lease and option on Bonanza Mine and operate with drag line on the surface south of the main workings where Rhodehammel has told him that there is a big block of ore that will average \$6.00 - \$7.00 per ton and he proposes to test this in Rhodehammels flotation mill at Vicksburg and later make other milling arrangements.

Claims to have \$30,000 available for this work.

(Chaffee's statements are never likely to be reliable)

strike nearly north-south and dip 65° to east.

Water stands in sump of winze about 20' below the 3rd level which appears from the map to be the bottom of the mine 95' below the adit. But winze appears to go deeper to a 4th level. (Think map is all wrong)

The 3rd level is in porphyry with drifts to the north and south and some stoping along the veins over narrow width (5'). A little copper silicate and carbonate shows in the ore and considerable iron sulphide. Air was bad so did not fully explore.

The 2nd level is partly in quartzite and partly in porphyry, a few copper stains and considerable iron sulphide and oxide. Drift to south caved but to north open for some 200'. Walls of drift had been sampled at intervals, no cross-cuts to develop width of mineralized zone.

On 1st (adit) level drifts in quartzite for length of some 600' and mineralized zone between walls of veins which had been stoped might have maximum width of some 120' but best values in 60'. Rock between veins is hard and tight.

Maximum ore zone 600 x 120 x 200 depth say 14,400,000 cubic feet = 1,200,000 tons of ore. Might go deeper judging by sample from dump but not likely that total possible ore could be figured at over 1,000,000 tons and grade very doubtful.

Think that probable tonnage could not be figured at over 500,000 with grade \$2.50 per ton,- grade to be determined by sampling drifts and crosscuts and at cost of \$2000 and if this proved satisfactory horizontal drill holes from levels say 5000' = \$15,000.

Estimated cost preliminary investigation

\$ ¹⁰⁰⁰ ~~2500.00~~

" " final

¹⁰⁰⁰⁰ 17,500.00

Total

\$20,000.00

BONANZA WORKINGS:

Now best entered by new adit from tailing pile and down through stopes and drifts to 4th level where connect with shaft which bottoms on 6th level. Winze in good shape to 7th level on which water stands a few inches above the rails.

On 4th level near shaft and to south visited the Castle Garden Stope and east of this (in foot wall) the Bankers Stope.

Veins in upper workings dip to the north but in lower workings reverse and dip to the south.

Ore from 4th level and above was taken to shaft and put through Elliotts mill in '37.

The long drift on the 6th level which connects with the workings in the Iron Vein is now caved but air circulates through.

The Iron Vein is quite flat in parts and about 8' wide. Martin claimed that it would average \$7.00 value but Thompson says that \$3.50 - \$4.50 is more correct (my sample from dump was \$4.20).

Thompson thinks that the mineralized area surrounding and including the old stopes could pretty surely be mined and this might have a width of 60' and to 6th level a depth of 300' and say 500' length, say 800,000 tons less 100,000 tons mined = \$700,000 which Thompson thinks might run \$6.00 per ton but believe this is very doubtful.

Elliott had the Bonanza Mine bonded for \$40,000 and actually paid \$20,000 on account. Hodgson had the lease on a royalty basis.

Redall leased the Golden Eagle in '34, '35 and made some small shipments.

Thompson made many hundreds of assays for Martin and Stevens from 1913 to 1920 and his average of samples taken away from the veins was around \$6.00 and almost none of his samples ran less than \$2.00 per ton.

Sedgwick Sampled the Golden Eagle

c

COPY OF REPORT BY W. TOVOTE
Roos & Tovote
Consulting Mining Engineers
Tucson, Arizona

Probable date about
~~1913 to 1917.~~

1915 to 1916

Mr. H. William Stevens,
President Yuma-Warrior Mining Company,
Harqua Hala, Yuma County, Arizona.

Dear Sir:

According to your instructions I made a thorough examination of the HARQUA HALA Mine and also investigated the Golden Eagle mine of your company. My observations and deductions are embodied in the following report and accompanying maps.

SUMMARY:-

In Summing up my findings I wish to say, that I consider your mines as far from developed to capacity and that I would advise as well a thorough prospecting campaign, to test sections of your property, heretofore neglected, as the utilization of the large reserves in sight now. These are the ore in sight, both in the Harqua Hala as especially in the Golden Eagle mine and also the material stored up in old tailings on the surface and the gob and caved part of the old stopes underground.

To get the full benefit of everything a thorough remodeling of your mill should be undertaken and some development-work in the Golden Eagle. Mechanical appliances should be installed to handle tailings, gob and caved material at the minimum of expense. With these arrangements completed, which would require not less than \$30,000,- and not over \$50,000,- I expect the mine will be in a shape to pay dividends and supply besides the funds for an active development-campaign for new ore-shoots. It is unreasonable to assume that a belt of mineralization, like the one exposed in your property, should

contain large and exceptional rich ore-shoots only in the two extreme ends, where the ore happened to be exposed on the surface, and that the whole intervening length should be barren. Surface-prospecting here was not feasible, because a worn-down fault or vein zone is now buried under hundred feet and more of gravel.

In shafts sunk through these gravel-beds boulders of good ore have been found, which does seem to confirm my idea, derived from geological considerations, that the country East and toward the Eagle from the Harqua Hala mine is the most attractive prospective territory of your holdings.

The history of the mine is ^{at} prove that the richest and most profitable ore is close to the surface, and one new ore-body above the 300' level will probably pay more in dividends than a number of such ore-shoots in depth.

While your company has demonstrated the persistence of good ore below the quartzite, which for some time was considered the only favorable horizon for ore in this mine, and while there is absolutely no reason, why ore should not be followed down to great depth in the underlying granite, I would very strongly advise, that more attention be paid to lateral exploration and less to further deepening of the mine. This not only for the reason, that ore near the surface will prove richer and more easily treated than the deeper ore, but also because your recent work had to contend with intricate faulting and besides is approaching the boundaries of your property in this direction. Of course, the adjoining ground could probably be bought reasonably, but I do not see any cogent reasons for such a course at present, when so much of your own ground remains unexplored.

Respectfully submitted,

W. Tovote.

Y U M A - W A R R I O R M I N I N G Co.

REPORT by W. Tovote.

The Yuma-Warrior Mining Company is a stock-company, organized under the laws of the State of Arizona.

The capitalization is 3,500,000 shares.

H. William Stevens of Prescott, Arizona is President.

The company operates the properties of the former Harqua Hala Gold Mining Company, comprising principally the Harqua Hala or Bonanza mine and the Golden Eagle mine.

The company owns 19, partly fractional claims, seven of which are patented.

The Harqua Hala mine is opened to a vertical depth of 350' (three hundred and fifty feet) with nine levels, some of which are not accessible at present. The Golden Eagle mine is down 300' (three hundred feet) in five levels.

The property are located near the small town of Harqua Hala in Yuma County, Arizona, with Post-Office of the same name. This is about seven miles due South from Salome, the nearest railroad-point, a station on the Arizona & California R.R., branch of the Santa Fe. Fairly good and easy roads connect the mine with Salome and Wenden, Arizona.

Harqua Hala is situated in the extreme South-West end of the Harqua Hala Mts. at an elevation of approximately 1800'. The climate is the typical semi-desert climate of Southern or South-Western Arizona, rather hot in summertime, but delightful in the winter.

There is very little vegetation in this vicinity. Water rises in the Harqua Hala mine to about the 6th level - 200' below the surface - and to within 30' of the 3rd level in the Golden Eagle or about 180' below the surface.

The quantity of water making in the mines^{is} comparative-ly small and the principal water-supply for milling and domestic

purposes comes from Harrisburg, about 5 miles to the East, from where it is piped to the mines.

EQUIPMENT:

The Mines are well equipped with steam-power, hoisting and pumping machinery, compressor and all tools and necessities for operation. A 40 stamp-mill with plate-amalgamation in very good condition is at the Harqua Hala mine and the Golden Eagle mine is connected with it by an aerial tramway.

A cyanide plant, principally for the retreatment of tailings, has been erected south of the stamp-mill.

The amalgamation-process is not anymore adapted to the kind of ore, mined in recent years, and changes in the mill are imperative, if a good extraction is to be made. The installation of regrinding machines and a few tables, both sand and slime-tables, would probably be of decided advantage.

There are several dwellings, a store, boarding-house and an excellent managers residence on the ground.

Water is piped into the houses.

PAST PRODUCTION AND DEVELOPMENT:

The mines are credited with a production of over \$4,000,000 all from above the 300' level; Good sized ore-reserves have been developed during the last few years in the Harqua Hala and were left in the Golden Eagle mine.

The total amount of development work is in excess of 3 miles. The Golden Eagle ore is less adapted to amalgamation than the Bonanza ore and therefore the mine has been rather neglected. Very little additional work here should put in sight a very considerable tonnage of good grade.

In the Bonanza or Harqua Hala mine the ore in sight is only a small part of the available resources. The old stopes are filled with material, too low grade to mine in the

early days but from all information available, of economic grade at present. Furthermore the greater part of the old stopes collapsed several years ago and dragged down not only the roof and walls of the stopes, but also large pillars of high grade ore and ore left in the walls. Screenings from this caved material have been assayed and gave returns, as high as \$20 per ton and over. Material of this kind will of course not be the general average, but gob and screenings, that will average only \$4.00 should pay a handsome profit, as it could be delivered at the mill for about \$0.50 to \$0.75 per ton and milling could be done for not over \$1.25 per ton.

There is another advantage in handling this material as soon as feasible, and that is, that the ore left here is thoroughly oxidized and practically free of admixtures of base-metals, it should therefore give a good extraction in the mill, as it is today. The amount of material, stored in this way, figures up to about 200,000 tons, which should yield from 75,000 to 100,000 tons of screenings and sorted ore.

To clean out the mine, by removing caved material and gob, would have a very beneficial influence upon the property also because there is hardly any doubt, but that some ore-bodies have not been mined out, and stringers leading from the stoped out sections will lead to extensions of ore shoots, that have escaped the old-time miner. Proof for such possibilities has been furnished by the recent operations, which established a good-sized ore-shoot, closely connected with the old ore-bodies, from above the 4th level down to the 9th level.

But all the work around the original ore-body I consider really as of secondary importance because, if the mine has a great future it will be in ore-bodies, heretofore undiscovered.

Another very important quick-asset of the property are

the extensive tailings-dumps, reported to assay anywhere from \$4.00 to over \$20.00. These latter tailings are derived from milling Golden Eagle ore, which proved very refractory to the mill-method employed. The lower grade tailings constitute the bulk and are derived from Harqua Hala ore.

The tonnage in sight in the Harqua Hala mine in ore in place is very difficult to compute, but figures up at least to ^{10,000} 5000 tons of ^{7.2% better grade} \$10 grade or better. A far greater tonnage should be very easily developed in the Golden Eagle. ~~A far greater tonnage should be very easily developed in the Golden Eagle.~~

GEOLOGY:

The mines are along the North-flank of a spur of the Harqua Hala Mts., called the Little Harqua Halas; they are the extreme South-West extension of the main-range.

The Little Harqua Halas are in broad aspect an anti-clinal fold with a flat southern and a steep northern wing. The axis of the fold strikes approximately East-West.

The northern foothills, in which the mines occur, show intricate faulting and folding. The latter has been carried to such an extreme, as to leave certain wings of folds torn off and resting in reversed order of their original position upon other parts of the formation.

The principal formations are:

1. An old granitic rock, probably pre-Cambrian in age.
2. Quartzites and quartz-shales, tentatively considered as cambrian.
3. Limestones and lime-shales, ranging probably from the Cambrian into the Devonian.

Younger intrusive porphyries, approximately andesites in composition, can be traced in the investigated area and

material along the veins might have been derived from such dikes. It is very probable, but by no means established beyond a doubt, that such intrusions had an important bearing upon the mineralization.

While ore has been found in all three of the older rocks, the quartzite has been up to now the most favorable horizon; This is probably due to the fact, that the brittle quartzite has been more intricately fractured than the other more plastic rocks, and because the underlying granite acted as a barrier for descending solutions, causing strong enrichment in the contact-horizon between the quartzite and the granite. But as I said before, ore has been established in all three of the principal formations and further work might show ore bodies as big and rich, as those found in the quartzite, also in limestone or granite.

FRACTURE SYSTEMS:

There are two main-systems of fracturing, one in approximate East-West direction and intimately connected with the great folding-movement, the other approximately North-South and principally important as ore-bearing.

The true relation between the two is not very plain, except that the North-South veins are apparently displaced by the East-West faults. (But several facts indicate that this displacement is not a straight fault-movement. If such was the case, the displaced vein could easily be found beyond the fault-zone.) It seems that the folding was the first product of geological adjustment and that the North-South veins were consecutive to the first folding, relieving the stress produced by fracturing normal to the axes of folding. After the mineralization had been introduced in these traverse fissures, the folding movement received renewed impetus and the veins, formed

prior, were disrupted. I come to this conclusion mostly, because the ore-bodies and veins are such as usually are formed in strata, previously folded.

The strongest disruption along East-West lines is from all available indications post-mineral and there are no indications that any of them will prove primarily mineralized.

The North-South fissures or veins are divided into two groups, due to special conditions in the Harqua Hala mine.

The veins here are called No. 1 vein and No. 2 vein. Both are representative of a number of individual fissures. I do not believe, that the distinction is warranted in any reasons governing the origin of these veins. The distinction is made, because the No. 1 veins dip to the West in the Harqua Hala mine and the No. 2 veins to the East. No. 1 is the principal ore-carrier in this mine and seems slightly faulted by the No. 2 fissures. On the other hand the ore in the Golden Eagle mine occurs principally along a vein of Eastern dip, corresponding to the No. 2 veins of the Harqua Hala Mine. (Iron like)

No. 2 seems practically contemporaneous with No. 1 in origin. Both together indicate a minor folding movement, normal to the folding of the first order. Where displacement has taken place, No. 2 acts as a normal fault on No. 1, i.e. the footwall has moved upward relative to the hanging wall.

These areas of displacement are very important, because as well the quantity as the quality of the ore here is in excess of normal vein-sections.

While the increased size of the ore-shoots at these disturbed sections could be explained as simply a mechanical compression of a larger vein area into shorter space, the higher grade cannot be explained in the same way. The shape of the ore-shoots studied in detail, and the replacement of the wall rock do not substantiate the idea, that the large ore-bodies of

the intersection-zones are simply due to compression and point far more to the theory, that the No. 2 veins were active mineralizers. This is substantiated by ore found along them independent of No. 1 veins and by the Golden Eagle vein. This is rather an important point, because it seems to encourage further prospecting along the No. 2 veins, in spite of the fact, that the No. 2 vein, prospected on the 6th level did not show up well. My theory, if correct, would place all North-South fissures, irrespective of dip, in the prospective class, with intersection-lines as most favored areas.

The veins are not very sharp and well defined fissures, but a series of compound parallel fractures, which form individual ore-shoots along their course, sometimes paralleling each other, sometimes, especially in the intersection-zones, causing ore-bodies, which grow from one fissure across to the other. The average dip is around 45 degrees, but sudden straightening and extreme flattening occur frequently.

The ore-shoots in the Harqua Hala mine show a pronounced rake to the South, that means the ore will gradually shift to the South with increasing depth, but the present bottom level shows a sharp reversal of this rake and the ore continues strong to the North.

There are at least four roughly parallel No. 1 veins exposed at and near the surface in vicinity of the Glory-Hole, but some of these apparently dip into each other. On the 4th level only two distinct veins are known and below the 6th level only one single vein has been explored. This is not final proof that not more might ultimately be established in depth. The deepest work done on any No. 2 vein is on the 6th level. East of the Harqua Hala mine is a broad creek bed, under whose sand- and gravel- deposits the quartzite disappears near the cyanide

plant shows pronounced fracturing and increasing iron-stain and I consider it very likely that good veins are buried under these gravel-deposits. The gravel-covered area is about 2000' wide. Beyond to the East are the known ore-shoot of the Golden Crown and the Golden Eagle as well as the extension of the latter in the Cuff group. In this last place the mineralization is principally copper. Large tracts intervening between the aforementioned creek and the Cuff mine are not even superficially prospected.

Mr. John B. Martin has sunk a shaft in the creek-bottom to slightly over 100' depth; this shaft is in gravel all the way down, but some very good boulders of ore have been found in it, probably an indication that strong ore-bodies in the immediate vicinity have been attacked by erosion, and a decided encouragement for further prospecting. Any prospect work in this vicinity would probably be prosecuted to best advantage from this shaft, for the use of which arrangements could be made easily, I am sure.

At the same time work might be extended farther East on the 4th level, the workings of which extend farther East than any other level and where some favorable leads have been encountered. There is a very good chance that important clues might be established here, before this level penetrates from the solid rock into the gravel-deposits.

I believe there is also some chance of finding ore on the 4th Level near the Iron-Vein, South of the present workings, but I feel not sure enough of this to recommend the work, besides if any ore should be found here, it would probably be only in small quantities, a part of the ore-shoot, which has been stoped in the Iron-vein workings beyond the first fault.

THE ORE-SHOOTS:

The ore-shoots stoped until now are twofold.

First tabular ore-bodies in veins,

Second irregular ore-bodies approaching replacement deposits. The first are simply metalliferous deposits between parallel walls limiting an once open fissure and the mineralizing solutions passing through these fissures did not affect the enclosing walls to any considerable extent.

The second type has been far more important up to now and most of the ore as well as the richest ore has been mined from them. Here the mineralizing solutions were not confined by definite walls, but spread out into the adjoining country rock, dissolving it partly and depositing metallic minerals in place. These replacement deposits are very irregular in outline and form series of roughly lenticular chambers.

The ore very frequently extends from one fissure to an adjoining one and the feeding fractures are usually obliterated in the ore-masses, but can be traced beyond the main ore-bodies. Ore-bodies of this type are very hard to prospect and an almost inconspicuous stringer will abruptly widen to a great ore-body and just as rapidly contract again beyond.

Ore shoots of this type follow usually in layers above each other and every promising seam has to be followed.

CHARACTER OF THE ORE:

The ore originally found in the Harqua Hala mine was practically free of metallic material except iron-oxide.

The amount of iron varies with the country-rock. It is highest in limestone, less in the quartzite and least in the granite. The ore shows strong evidence of leaching and oxidation.

The gold in it is mostly free gold.

The ore-body developed recently is slightly different. White kaolin, resembling decomposed porphyry, indicates the ore here and practically no quartz is found with it. The kaolinized material is stained reddish-brown by iron-oxide and green by copper-salts in streaks. Residual pyrite and pyrite replaced by chalcocite are found more and more frequent and the copper-values in the ore are often an important item.

Assays as high as 7% and even 12% have been made and the average of all the ore in sight now will show possibly 2% cu. (3)

Of course ore with such pronounced copper-contents is not easily worked by the cyanide-process, because the losses in cyanide would be too high.

Base-metals are possibly even more pronounced in the Golden Eagle ore, but here, I understand, the copper is not as prominent and in its place more pyrite is found in the lower levels.

From the ore seen it seems likely that the primary mineralization consists in metallic sulphides, principally pyrite with subordinate copper sulphides, which contain an admixture of gold. Oxidation attacked the sulphides and caused a secondary ~~enrichment~~ concentration of gold in its metallic form in the upper horizons. Below the oxidized zone an horizon of secondary copper-enrichment is locally developed, but this is probably nowhere of great extent. The average grade of the gold-ore is higher in the oxidized zone than in the sulphide zone, but high grade ore does occur in the sulphide also, generally in lesser amounts though.

The above considerations indicate that the chances for big and rich ore-bodies are coincident with the greatly disturbed zone of folded and crushed rocks, in which the ore has been followed until now. The veins will probably be established

finally South of the fault zone, but whether they will be attractive here, is another question. The same holds true regarding the sulphide-horizon. There is a possibility that a shallow zone of secondary sulphide-enrichment will be established, which might show very attractive values, but whether the primary sulphide-ore will be of a grade high enough in base metals to warrant costly development work, I doubt.

Further search should be directed principally in the areas North of the fault zone and in the oxidized zone.

The ore has practically no pronounced gangue-minerals and its derivation and genesis are not very plain. The only persistent indicator in the lower levels, is the streak of kaolinized material, which I mentioned before. This is more pronounced in the granite than in the quartzite and might have been derived simply from the decomposition of crushed granitic material, still the known occurrence of andesitic intrusions in the close vicinity and the scarcity of quartz-grains in the decomposed material leave the possibility open, that the ore-deposition is due to an andesitic intrusion.

In any case the primary ore-deposition was not a very long and protracted process, while the secondary reworking and re-concentration is extremely pronounced.

FUTURE OF THE MINE AND PROPOSED LINE OF DEVELOPMENT:

All the ore mined and developed in the Harqua Hala Mine up to now can be considered as derived from one single ore-body and its faulted extension. It is true the present ore-shoot is not directly connected with the original ore-body, as far as it has been established, but it is so small in comparison and so close to it, that it might as well be considered an off shoot of the great ore-body.

This ore-body has been followed down to the Gulch-Fault and while parts of it are not yet finally established, this will naturally be done by following out the ore known at present to its limits. It might be well to raise on the ore from the 8th level. Here the vein stands vertical and even dips reversed and there is a bare possibility, that a reversed dipping vein joins No. 1 vein above the 8th level. Of course, this possibility could be tested by crosscutting into the hanging from the 7th level, but the possibility is so uncertain and raising on the vein so much more satisfactory, that I would advise this course.

What I consider the extension of the Main No. 1 vein is exposed on the surface on the Grand View claim. It is prospected a little in a crosscut-tunnel and is here very wide. It passes slightly West of the "Shaft in the Gulch". I would advise to do some prospecting from this shaft, because it offers a good access to the vein and because an andesite-dike passes through this shaft, which might have a beneficial influence upon the vein.

This is the last chance for work on No. 1 vein in Southwesterly direction, which I can see on company's ground.

The possibilities to the East I have discussed before and in my opinion this is the most important part of the property to prospect. I recommend that most of the new work should be done in this direction.

The possibilities for new ore-bodies seem very good and one new ore-shoot will pay more than a dozen extension of the original ore-body.

But the first natural step in sound mining would be the utilization of the resources, bound up in Gob, caved stopes and tailings. An efficient handling of these resources should soon provide the funds for further development and I would hold

back all important work in the Harqua Hala mine, until money from this source begins to come in.

The present facilities for prospecting below the 6th level are not economic or efficient and if anything big should be found below this level, a new shaft must be sunk. I cannot see anything at present in the lower levels which would warrant the expense of a new shaft immediately.

It is regrettable that the Golden Eagle mine was partly under water during my visit. This mine gives the impression that very large ore-reserves could be made available with very little additional work. The average grade might be below that, formerly mined in the Harqua Hala, but with careful mining and a remodeling of the mill, I am sure the mine can be made to pay well. There is considerable high grade ore left here and Mr. Martin was able to show me some free gold in the bottom of the 3rd level drift. The vein here is far more regular than in the Harqua Hala and the ore-shoots are very wide. Two parallel veins have been established until now and there is an indication that a third vein might remain unprospected in the footwall. All the stopes visited seem to have a good deal of ore left in the walls and the operation here should be cheaper than in the Harqua Hala.

I would therefore recommend that the mine be unwatered immediately and a thorough sampling of the workings be undertaken. This will decide the easiest way of attack and work could be started here to advantage, while the remodeling of the mill is under way.

Of course handling of the ore from here will involve the operation of the tramway, but that seems to be in perfect condition and the cost per ton handled by it, should be a small item.

There is ore known also in the Golden Crown mine and

prospect work here might be advisable. I had no opportunity to examine this prospect this time, because the ladders in the shaft did not seem safe.

Only an extremely small fraction of the territory owned by the company has been prospected until now and the chances for highly remunerative operation are excellent. As soon as the company has decided on the course of future operation a final plan should be laid out, itemizing the amounts of money to be spent on the different ventures and every new development should be recorded and weighed as to its influence for further work. The lines indicated in this report seem to me sound policy and the best that could be proposed at present but new information might influence them considerably.

Taken as a whole I believe that the holdings of the Yuma-Warrior Mining Company are very attractive properties and that the future will prove that the mine is far from developed to capacity. A mine that was able to produce over \$4,000,000 from a small fraction of its territory and from above the 300' level should surely not be considered worked out, even if one of the original ore-shoots shows signs of exhaustion.

Geologically the problem is exceptionally complex, but the farther to the North-East the development progresses from the Harqua Hala mine, the less apparently the faulting in small intricate blocks becomes, and what disturbances might have affected the formation, seem to have acted on broader and bigger lines, promising regularity in large blocks.

To get away altogether from the disturbed area does not seem desirable to me, as I tried to explain before, because big and rich ore-shoots I expect only in the folded zone, but faulting in big blocks is better for operations, than a mosaic

of small fault-blocks, which break the vein every few feet and render prospecting costly and uncertain.

I would therefore advise, that you adopt an entirely new plan of development and follow it out consistently and do not doubt that if this is done, you will soon reap ample reward for your enterprise. The complex geological features though will necessitate very careful work and strict scientific supervision and forbid to make plans too far ahead of actual operation.

Respectfully submitted,

(Signed) W. Tovote

C

Properties in vicinity

of
Hanzwahalee

DEL MONTE MINE

8/15/39

An old group of patented claims along the road between Salome and the Harqua Hala Mine. Numerous out-croppings of white quartz. Sampled many years ago by the United Verde who thought it might serve as converter flux but they wanted \$8.00 value at old price of gold and their results were much lower. Harbauer did some sampling here at one time and says it is very low grade,- probably worthless.

HARQUA HALA NORTHERN

8/16/39

Unpatented claims owned by Mrs. Donaldson of Long Beach who merely keeps up the assessment work.

There is an outcrop of quartzite on a ridge and adit tunnels have been put in along seams of hematite,- similar to the Iron Vein at the Bonanza, also a shaft was sunk and considerable underground work was done by the former owner but he was never able to make any shipments except about 10 tons for a test to the mill at Harrisburg. Probably ran pretty low in values.

Think claims could be purchased at low price if desired. Doubtful if they will ever produce any ore unless the sulphide veins,- as found on the Golden Eagle,- should extend into them.

QUINN PROPERTY

8/16/39

Two claims and a fraction lying south and west of the Bonanza Claims and with shaft close to the line south of the vein on the Iron Vein.

Part of this property extends out between the Bonanza Claims and the Harqua Hala Extension.

Some values around \$6.00 or better have been found in Quinn's workings and this property might be worth acquiring as surface values on the Bonanza Claims have been found right up to the line.

See note on Shyft

HARQUA HALA EXTENSION

8/16/39

Owned and worked by Mr. and Mrs. Wm. J. Johnston,
since about 1925.

Lies south and southeast of Bonanza.

Basal rock is granite (porphyry) which dips in southerly
direction about 45° and above this in the quartzite there is a
zone of mineralization about 60 - 70' wide.

Above the quartzite is limestone.

Mine worked by a shaft with a lot of underground
drifting which is supposed to have followed stringers. Thompson
says that he has assayed many samples which ran from \$1.00 to
\$1.50.

This is not an extension of the Bonanza ore zone but
is entirely separate and perhaps parallel. Thompson thinks it
is no good and there has never been any production.

Johnstons ore zone (if any) strikes north and south
and dips to the east.

has value so far as shown

MUDERSBACH or Tough Nut Mine

Located ten miles south of Bouse.

Thompson says that there is quite a lot of low grade gold ore in this property and it might be worth an examination.

GMC.

8/16/39

SOCORRO MINE

South of Harrisburg.

Is owned by George Wiley of Salome and he has recently leased it to Hoofer (?) of San Diego who is now doing some development. McConnell of the El Tigre Co. made a thorough examination some years ago and took 1000 samples. It might be worth while to write to McConnell and get the data.

Wiley says that Hoofer claims to have a 40' ledge of \$11.00 ore but Wiley's own samples never indicated an average value higher than \$3.00.

G.M.C.

8/16/39

Harqua Hala Mine file

QUINN PROPERTY

8/16/39

Two claims and a fraction lying south and west of the Bonanza Claims and with shaft close to the line south of the vein on the Iron Vein.

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Some values around \$6.00 or better have been found in Quinn's workings and this property might be worth acquiring as surface values on the Bonanza Claims have been found right up to the line.

YUMA-WARRIOR MINING COMPANY

(HARQUA - HALA BONANZA)

(Portion of Report by Frederic W. Norton)

PROPERTY:

The properties consist of two groups, the Harqua Hala Bonanza group of five claims and the Golden Eagle group of four claims, all patented, and eleven adjoining unpatented claims covering a total area of approximately 365 acres of mineral ground, located in the Ellsworth Mining District in the foothills of the Harqua Hala range in Yuma County, Arizona, near the Yavapai County line. The title to a portion of these properties is vested in the Yuma-Warrior Mining Company by deed of record, and the balance of the properties are conveyed by deeds, which are deposited in escrow subject to compliance with conditions of escrow contracts.

The mines are connected by good wagon roads with Salome, six and one-half miles, a station on the Arizona & California branch of the Atchison, Topeka & Santa Fe railroad.

Ample water supply for both mill and camp is obtained from Granite Creek five miles away. There is no supply of big timber on the property. What is required can be easily obtained by direct rail transportation at low cost. All necessary supplies are brought in from Phoenix or Prescott by rail to Salome and from there to the mine by motor truck. Fuel oil is cheap and is used for the generation of power.

DEVELOPMENT:

The veins of the district, without exception, are STRONG, MASSIVE AND WELL-defined, varying in width from six to seventy feet with "pay-ore", where opened, from two to sixty feet. The steepness of their pitch and the elevation of the

outcroppings along the mountain side greatly facilitates the exploitation of many of the veins in an inexpensive manner. Even under the most impracticable, expensive and inefficient management which prosecuted the early development, the immensity of the ore deposition is readily apparent on every side.

THE BONANZA MINE:

The vein on this property is opened by levels from an inclined shaft. It varied from ten to seventy feet in width and was developed to a vertical depth of only 237 feet by the former owners. Although the surface had hardly been scratched, enormous quantities of oxidized gold ore were mined. It is said that over \$4,000,000 was obtained from the Bonanza vein above the 200 foot level.

Recent development work has proven the continuation of the rich oxidized ore of the Bonanza vein on the fourth, fifth, sixth, seventh and eighth levels to a vertical depth of 365 feet. On the seventh level a distinct showing of copper sulphide ore was encountered. On the eighth level and in the winze from the eighth to the ninth the copper tenor increased, still carrying high gold values. This is of profound importance. There is every indication now that when the water level is reached, a big body of copper sulphide ore will be found as is the usual experience in the Arizona vein mines. The water level should be found at an additional depth of 400 feet.

On the seventh level sampling the first sulphide showing gave the following assay value per ton over a considerable distance.

Gold, \$44.00; Silver 7.40 oz.; Copper 5.28 per cent.
Total val., \$75.68.

On the eighth level values were from \$13 to \$35 per ton in gold and four to five per cent. copper over a width of 16 feet. In the winze from the 8th to 9th levels the following assay value was obtained.

Gold, \$16.54; Silver 7.85 oz.; Copper 6.15 per cent.
Total value, \$52.68.

This section of the mine is by all odds the most promising. It is early yet to make an accurate statement of the quantity or quality of the total ore available inasmuch as the exact extent of the ore body is not yet accurately determined. An average assay of all the mill ore exposed and partially exposed between the fourth and ninth levels would, however, probably be around \$12 a ton. The volume is roughly estimated at 25,000 tons, but there is hardly any question but that greater development will make this preliminary estimate appear insignificant. This does not allow for ore shoots carrying abnormally rich blocks of oxidized ore. Gold values run over \$200 a ton in some sections on the fourth and sixth levels.

Reference was previously made to the "cave in" which eventually discouraged the English operators. This has left the so-called "Bonanza Cave," about 60 feet in width, over 400 feet long and approximately 150 feet in depth, estimated to contain roughly 300,000 tons of which probably 150,000 tons will be mill ore of an average value of \$6 a ton. There are no copper values for it consists entirely of the oxidized portion of the vein. This material can be sent to the mill at little expense as it is well broken in place. It will be tapped from the seventh level and mixed with the higher grade ore from the newer workings when milled.

THE GOLDEN EAGLE MINE:

This was well opened by the former owners to a depth of 400 feet by a main shaft on the vein and an adit tunnel. On this tunnel level the richest ore was "gophered" but what remains is now excellent mill rock. The vein is opened on the second, third and fourth levels in much the same manner, only

the highest grade ore being removed. A sulphide vein, with many of the same characteristics as the Bonanza vein, 33 feet in width, was cut on the fourth level. The shaft has been extended to the fifth level and a cross cut started to open this same vein. With very little additional development a substantial tonnage of mixed oxidized-sulphide ore will be available for treatment in the new mill. The size and general character of the Golden Eagle vein indicates great permanency for a considerable depth. The present workings have shown its existence and that is about all, in spite of the millions already recovered in former operations.

PRODUCTION:

While there are no complete records available of early production, it is reliably estimated that the Bonanza Mine produced in round figures \$4,000,000 within a vertical depth of only 200 feet. One more recent record shows 59,875.54 tons milled, giving a total bullion return of \$593,291.54 or an average mill recovery of \$9.90 a ton with tailings or discard showing values from \$10 to \$20 a ton. An estimate of \$25 a ton as the average value of the ore milled must be regarded as ultra-conservative. This would indicate a percentage recovery of from 40 to 50 per cent. With the concentrating and oil-flotation equipment added to the mill, recovery should be raised to 85 or 90 per cent.

Frederic W. Norton
of C. C. Medbery & Co., Inc.
42 Broadway - New York

EXTRACT FROM LETTER TO CAPT. R. W. HUNT FROM R. N. DICKMAN

Harqua Hala, Arizona
April 17, 1916.

My dear Sir:-

.....
Since my last visit in August 1915 the work has proceeded below the sixth level, nothing having been done below that level at that time. My former reports have included development up to that point. On this visit, I have reviewed my former work to an extent sufficient to affirm former ore values, and I have examined the new work. On the latter, I have taken samples sufficient in size and number to satisfy myself that the daily sampling has been substantially correct. In point of thoroughness, in fact, these daily samples are entitled to more weight than my own taken in corroboration.

The best demonstration is in the Mill results combined with the tailing assays, though these results are perhaps a trifle lower than would be attained in stoping from the levels, since in the development work it has been impossible not to mix the ore with undue porportion of waste.

ABOVE THE FOURTH LEVEL to the north there is no doubt some ore to be gained both from No. 2 vein as well as from No. 1 vein.

At the present time a stope started at point "A" is showing high values, \$41.34 to \$210.00. This ore is of about two feet width and there is no development between this point and the surface more than 200 feet above.

BETWEEN LEVELS FOUR AND SIX the former Mill run showed a value of \$9.50 per ton with \$7.28 recovery and tailings of \$2.22.

None of this ground has been mined in the interval until now.

Stoping has just been commenced on Level 4 and at several points in the incline raise between 4 and 6. There is no reason to modify the former estimates on tonnage and value except perhaps to lessen the tonnage and perhaps raise the value, if stoped as at present in the higher grade locations and where the vein is of size to furnish cheaply stoped ore. My estimate was 2500 tons of \$8.00 gross.

Since my visit of August 1915 all the work below level 6 has been done and consists of the incline and the development of levels SEVEN AND EIGHT.

THE INCLINE follows the ore from level 6 to level 7 with a width of 4 to 5 feet on level 6 and from 1 to 3 feet along the incline.

The average shows about 2 feet with a value of \$8.85 per ton.

LEVEL SEVEN to the north follows an ore body lying rather flat and of assay value \$5.08 per ton. The ore is narrow.

To the south for a distance of 120 feet the vein averages about 3 feet in width and \$14.95 gold value. After an interval of about 40 feet in which the ore is narrow and the value low, there is encountered what seems to be the most important showing of the lower workings. For a distance of 45 feet the ore is of a width from 3 to 10 feet and shows an average value of \$12.90 per ton gold with sulphides carrying copper. Check sample \$13.66.

A winze on the ore shows a full face at 15 feet depth of a value of \$31.20 per ton gold.

This ore body is again cut 30 feet below by a drift from the connecting upraise (not in ore) where it shows a width of 10 feet and an average gold value of \$8.90. Selected

sulphide ore at this point shows \$37.20 and \$44.60 gold value. This same ore body has now been cut to the west of level 8 where it shows 16 feet in width of an average value of \$13.23 (R.N.D.).

The unfortunate part of present development at this point is that only a small part of the value is in FREE GOLD and the Mill saves but a small portion of the value. The ore is being piled on surface and none stoped. This ore when sent to the Mill on April 12th showed heads of \$16.00 and tailing value of \$10.40, there being no concentration apparatus in the Mill.

In course of mining a small amount of high grade sulphide will be encountered and will be saved and shipped for smelting. No calculation of the amount is yet possible.

I hesitate to estimate the ORE ABOVE THE SEVENTH level since no raises have been made and the vein is irregular. I should surmise that when it can be taken out the ground should yield 2500 tons of the value shown in the last Mill Run, viz. \$7.88 per ton of which \$5.79 would be recovered with \$2.09 in tails. If confined to the ground south of the incline the yield will be higher and the ore near the shaft cheaply mined. Until this incline is abandoned as a hoisting shaft much of the ore is not available.

BETWEEN THE SEVENTH AND EIGHTH levels the shaft or incline is not in ore. The vein has apparently straightened at this point as will be seen best from the larger new sectional map. While it is not PROVEN that the crack followed on level 8 is the same with that of level 7 on the whole length, it is very near to the new sulphide ore body, though not as yet identified as a part of it.

The vein itself on level 8 is narrow but persistent and of good grade. When it can be mined as a part of a larger

operation it will probably pay to stope, but under present conditions it would not yield tonnage sufficient to pay the cost of pumping and hoisting with present equipment. I make no estimate of this vein on this level.

THE SOUTH SULPHIDE ORE BODY on this level is by far the most important discovery as yet made in your work on the Bonanza Mine. Development has not proceeded far enough to prove any definite tonnage, but an ore body 45 feet long on level 7 with a width of 10 feet at that point, a width of 12 feet in the intermediate level and of 16 feet on level 8 must prove of considerable size. It will be MOST UNFORTUNATE if development cannot be now continued both along the level and still DEEPER. Aside from the high grade ore the body seems to have a value of about \$12.00 per ton in gold and the concentrates will have commercial copper value. When the body is a little further developed a test should be made of an average sample for concentration by tables and flotation with assay of concentration product.

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CONCLUSIONS:

The limit of ore which can be advisably treated at all by amalgamation alone seems to be reached on level 7, and prevents any present use or profit from the sulphide body now being opened on level 8, which is of utmost importance, as well as the first ore body of large size recently encountered. I do not consider it probable that all expenditures can be met from mill product under present conditions, though a substantial part may be made from now on. None the less, even if there were no revenue whatever, I think that the discovery warrants vigorous development to a deeper level by following and developing this ore body. There is no great probability

of the discovery of additional free milling bodies capable of paying for the mine under present contract and on this lower ore depends the outcome of the enterprise. The cost of this lower work will run from \$2000 to \$3000 per month above the expenditures in addition to the present milling and mining expense, which should of itself yield some profit.

I consider that the conditions as now existing well warrant proceeding with vigor.

Very truly yours,

(Signed) R. N. Dickman.

Notes by G. M. Colvocoresses.

Examination of this mine recently made by Elliot for Francis A. Stratton, Mt. Vernon, N. Y., chairman of the Board of Westchester Light and Power Co. and a Director of the Chase National Bank. Over 4000 samples were taken on the surface and underground in the old workings and indicate a surface orebody which can be mined by glory hole representing over 110,000 tons of \$9.00 ore and underground, including the fills and pillars there are supposed to be 400,000 tons of \$24.00 ore.

Elliott proposes to raise \$1,500,000 to purchase and equip mine and build a 1,000 ton mill and Stratton et al will put up \$750,000 and they have applied to the M. F. C. for loan of \$750,000 which is now being favorable considered and an Engineer is expected to make examination in the near future. Chris Thompson (Assayer and engineer) of Bouse was one of the engineers who did the recent sampling for Elliot.

(I think the values quoted are far too high.)

2/5/36

The M. F. C. told Elliott that he would have to put up \$15,000 to cover the check examinations and sampling of the mine by their engineer and Elliot refused or was unable to do this. The financing is now being done by the Stratton Syndicate and Payne and Payne (Louis B. Payne and Larry Multz) with office in the Chrysler Bldg., N. Y. These people have previously been mixed up in some shady mining deals and this looks like a stock promotion.

Elliott now claims that there is a great body of ore near the surface which will carry \$3.50 per ton but Chris Thompson who actually did the sampling says that his average was only \$1.27 per ton according to Dick Bunker.^{3/29/37} Conklin of A. O. Smith Co. recently examined and finds that the primary mineralization extends over a wide area and represents an immense tonnage but the average grade is very low and probably would not exceed 35¢ per ton.

It would seem to me that there might be a possibility

of working a substantial block of ground which would surround the old workings and include the higher grade ore left in the shear zones and so might average better than \$3.00 per ton but this matter would require careful investigation.

November, 1937.

This old mine was thoroughly described in U.S.G.S. Bulletin #451, entitled "Ore Deposits in Northern Yuma County, ~~Arizona~~ Arizona." Written by Howland Bancroft and published in 1911.

None of the recent attempts to operate have proved successful, but as noted above, I am of the opinion that it is worthy of further investigation by anyone who would be interested in operating a low grade mine since I think that there is a chance to find that a large block of ground would be sufficiently sweetened by the ends of the high grade shoots and stringers to bring up the average to \$3.00 or better per ton.

The owners advise me that the property is at present under option to parties who will hold it until the middle of January, 1938. If this option should then be cancelled, I think that the mine will merit some further consideration.

C

NOTES RE HARQUA HALA MINE

July 20, 1939

In connection with past and recent investigation of this property owned by the ^{Bonanza}~~Bonzna~~ and Golden Eagle Mining Company, - (for a long time inactive), I have obtained and examined the following documents:-

- Rfr* — Howland Bancroft in U. S. G. S. Bulletin #451, about 1909
- Report by C. E. Mills, 1892
- + Report by T. E. Farish, 1906
- Report by E. J. Olsen, about 1915
- Report and letters of R. N. Dickman 1914, '15 & '16.
- Report by Fred W. Norton, about 1915
- + Report by W. Tovote, about 1917
- + Claim maps and surveys
- Sketches of section and plan of Golden Eagle Workings
- Survey map of Bonanza Workings
- + Assay map of large portion of Bonanza Workings
- Copies of all the above excepting the sketch plan of

the Golden Eagle are in my possession and I have also looked over a number of assay and shipment records belonging to the owners.

I personally visited and hastily examined the mine in February 1917 and during the summer of 193⁴ when interested in the treatment of a portion of the tailings I took occasion to inspect practically all of the then accessible workings and took a few samples at various points but I have never made any thorough

examination or sampling of the mine and I have never visited the underground workings of the Golden Eagle.

Much of the information in the old reports is confusing by reason of the fact that different designations were given at different periods to the veins and stopes and maps which originally accompanied them are lacking so that they could only be intelligently read in conjunction with a careful inspection of the workings and their identification on the ground and *from the* available maps particularly to determine just what bodies of ore have been stoped out since the reports were written and what new ones have been developed.

This property is located 7 miles south of Salome, Yuma County, Arizona and consists of the Bonanza Group of 5 patented claims and the Golden Eagle group of 4 patented claims lying about 1 mile to the northeast. Both of these groups are owned by the Martins of Phoenix but between and around them are a number of other claims belonging to other parties and in visualizing any large scale future operations it would be advisable to option all of this land as could probably be done at very small expense.

The Bonanza and Golden Eagle Mines have been worked at intervals since 1888 and have produced upwards of \$4,000,000 worth of gold at the old price.

A somewhat complicated geology indicates that the gold associated with a little silver, much iron and some copper sul-

phide was probably deposited by deep seated solutions rising from or with the intrusive dikes of andesite porphyry; forming replacement ore bodies in faults, contacts and shear zones also impregnating as a disseminated deposit the intruded rocks which consist of pre-Cambrian granite or gneiss overlain by Cambrian quartzite and shale and by slightly younger limestone and dolomite. Nearly all of the known higher grade oxidized ore in the upper levels has long since been mined but the extent and value of the deeper sulphides has been only slightly developed and the quantity and quality of the disseminated or brecciated ore is practically unknown. The future value of the property seems to depend upon these two uncertain factors although much of the mineralized territory has not yet been explored and there is always a chance that new shoots of high grade might be discovered by extensive development which was repeatedly advocated by the examining engineers but never actually put into effect.

The general strike of the Iron or #2 vein seems to indicate that it or at least the mineralized zone of which it forms a part extends continuously from the Bonanza to the Golden Eagle group, about 5000' and perhaps much further at either end but between these two workings there is a broad erosion valley filled with sand and gravel and below this the rock formations have never been explored.

The width of pay ore mined in the Bonanza is stated to have been as much as 60' in places and the width of the disseminated

ore has apparently never been tested but judging from the maps it may be as much as 600' although no such assumption is justified except as a possibility.

The vertical depth of the Bonanza Workings is 350' and of the Golden Eagle 400' and neither mine has been bottomed of ore although the oxides had largely given place to sulphides at a depth of about 300' and one engineer estimated that the permanent water level should be found at 750'. *Many in fact*

3 A mineralized area 5000' x 600' by 300' (allowing for the surface depression under the wash) would represent some seventy million tons all of which could doubtless be mined by open pit methods.

The grade of this material is an unknown quantity and must so remain until a great deal of money has been judiciously expended. The one attempt to secure data on this point was so entirely mismanaged that no credence can be placed upon the reported results which were said by the management to have shown that some 3,000,000 tons of \$3.50 ore had been left in the immediate vicinity of the old Bonanza workings, while two other parties placed the average of the sampled area at \$2.00 and at \$1.27 per ton.

Based on the very fragmentary data which is at present available, it is my personal opinion there is no reasonable probability of finding anything like 70,000,000 tons of ore that will average better than \$2.00 per ton which I should fix as a commercial minimum but I do think that,- including the Bonanza and Golden

Eagle Groups and the unexplored area between them,- there is a fair expectation of finding a sufficiently large body of this or slightly higher grade to make this operation a very profitable venture and I feel fully justified in calling attention to the Harqua Hala as a mine which should at least be further investigated with object of securing much more data tending to show just how good this chance may be.

As to the available water supply there is also considerable doubt. The water which might be obtained from the wells at Harrisburg, which are connected by pipe line to the mine is variously estimated at from 200,000 gals. per day up to a much higher figure. The amount of water which seeps into the present mine workings is negligible but there appears to be a probability that if these workings are extended to a depth of from 700 to 900 ft. below the surface a heavy underground flow would be encountered which would augment the Harrisburg supply to a sufficient extent to permit the operation of a large mill but just how large cannot be forecast until more data is obtained.

L. M. Colman

GEORGE M. COLVOCORESSES
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May 2nd, 1940

PRELIMINARY REPORT ON HARQUA HALA MINE
(Bonanza and Golden Eagle)

LOCATION:

The Bonanza and Golden Eagle Groups comprise 9 patented and 3 unpatented claims or fractions, having an area of about 170 acres, also a 5 acres millsite at Harrisburg with water rights on Centennial Wash. These are owned by the Bonanza and Golden Eagle Mining Company, controlled by Walter and Donald Martin of Phoenix. The workings of the two mines are one mile apart but the two groups are almost connected by the North Pole and Tramway Claims. Some intervening and adjacent claims (unpatented) are known as the Harqua Hala Northern property and are owned by a Mrs. Donaldson of Long Beach, California. All the above are located in the Ellsworth Mining District, Yuma County, Arizona, eight miles south of Salome with which they are connected by a good desert road. The Santa Fe Railway (Parker Cut-Off Branch) and the paved U. S. Highway #70 pass through Salome which is 108 miles from Phoenix.

The accompanying claim map was prepared in part from the separate patent surveys of some of the claims but other claims were drawn in from a sketch made by a local engineer and their location may be only approximately correct.

The elevation at the mines is 1800 feet above sea

level and the climate is typical of the desert, very hot in summer and very dry, the average rainfall being recorded at about 8" per annum.

GEOLOGY AND ORE OCCURRENCE:

The basal rock in this vicinity appears to be a coarse-grained pre-Cambrian granite which has been impregnated with gold bearing iron pyrites and over this lies a series of sedimentary rocks including quartzite, limestone, shale and conglomerate. All of these rocks have been subjected to faulting and folding and shear zones have been formed in which there has been a deposition from solution and secondary concentration of the oxidized iron minerals, a little copper in places and gold associated with the iron and with gangue minerals which are mainly quartz, calcite and brecciated wall rock. At a vertical depth of less than 300', the conditions appear to change and although some of the sulphide veins found at greater depth have yielded limited quantities of fairly high grade ore, such occurrences,- so far as they have been developed,- appear to be comparatively small and scattered.

It has been suggested by certain geologists that a continuous ore zone might exist between the Bonanza and the Golden Eagle but here the quartzite in which the principal bodies of ore occur has been largely eroded away, except for the outcrop on the Harqua Hala Northern Claims. I therefore consider this as a possibility which may be left for future

consideration but I feel that present investigations should be confined to the chances of working the two showings as separate units.

The value of the primary ore in which there has been merely an impregnation of gold bearing pyrites has never been determined but there seems to be no reasonable ground to assume that it will be rich enough to work excepting in areas where there has been some local enrichment. Therefore, I believe that for the time being one should only consider the possibilities of mining the upper areas in the vicinity of the Bonanza and Golden Eagle workings where the shattered quartzite predominates.

In the mineralized area which is characterized by shear zones and more or less parallel fissures with varying dips and strikes, the country rock and the hanging wall is mainly quartzite overlain with limestone while the footwall is a granitic rock of coarse grained porphyritic texture which various engineers have called a "granite", "andesite", or "rhyolite", but which locally is simply termed "porphyry" which caption I shall follow.

The ore shoots in some cases appear to be confined to well defined and narrow veins between almost barren wall rock but the larger and richer deposits seem to be of a replacement type where the mineralized solutions have also impregnated the walls and often followed along fracture planes and slips from

one fissure to another at the same time dissolving out the more soluble constituents of the rock and replacing these with metallic minerals. The value of this low grade material was obviously insufficient to permit mining under old conditions or to attract any particular attention from previous operators and both its tonnage and value are still problematical and can only be inferred in a very tentative manner.

HISTORY:

The Bonanza and Golden Eagle Mines, operating at intervals since 1889, are credited with a total production of about \$4,000,000 at old price of gold, the average content of silver having been about one ounce to each ounce of gold on which basis the present value in silver is about 2% of the gold value and can be neglected although the percentage of silver in the sulphide ores is considerably higher.

The tonnage of ore produced has not been recorded and some of the very rich ore running better than 5 oz. gold per ton was shipped crude to a smelter and a small tonnage was milled at Harrisburg in the early days.

The great bulk of the production from the Bonanza and the Golden Eagle Mines was treated in the Bonanza Mills where the quantity of both amalgamation and cyanide tailings was carefully estimated prior to 1933 at slightly over 100,000 -tons from which it may be inferred that the total production of the two mines did not exceed 120,000 tons of ore.

The more recent attempts to operate this mine on a small scale have not proved profitable and while some lenses and shoots of \$8.00 and even \$10.00 ore (at present price of gold) are now found in the lower workings, yet such occurrences have proved to be small and their location is such as to make mining and haulage to surface expensive.

The high grade ore in the upper portions of the mine has long since been worked out and the future value of the property appears to me to rest entirely upon the possibility that between and around these high grade stopes there existed and still remains a much greater tonnage of comparatively low grade material which might be found to have a sufficient average value to permit cheap mining from an open pit and cheap treatment in a large cyanide mill to be erected at the mine.

ORE OCCURRENCE AND GENERAL MINERALIZATION:

The attached maps, Exhibits B & C, while not entirely up to date, show the general outlines of the underground work and the assay map (Exhibit D) gives information concerning the value of ore in the veins some of which has been mined since this map was made.

An examination of the accessible underground workings and the maps of the mines show that most of the old production came from a number of stopes scattered irregularly through the upper 200' of the mineralized zone in which there was probably

only one original vein in each of the mines broken up by faults and folding into several off-shoots and lenses.

The width of the stopes varied from a maximum of 60' to 3' or less and between the various ore shoots the shattered rock is seamed with bands of clay and iron oxide in which gold values nearly always seem to occur.

Some engineers have believed that the values in the Bonanza were cut off by one of the larger faults which was noted on the 6th level but I am doubtful on this point.

In the Golden Eagle ore zone there are two and sometimes three nearly parallel shoots of ore separated by from 60' to 100' of quartzite in the upper levels and porphyry in the lower levels while in the Bonanza workings four roughly parallel veins were found near the surface dipping into one another until only two of them have been recognized on the 4th level and only one on the 6th level.

Some distance to the east lies the so called iron vein where the gold is associated with hematite and a considerable quantity of \$25.00 ore (at old price) is said to have been mined but much of those workings were caved in prior to 1906 and but little is known of them today. In passing it may, however, be mentioned that there is a record of good values found in this vein from the Quinn Shaft which was sunk vertically for 306' at a point close to the line of the Bonanza Claims and in a winze below the bottom level the vein is said

to average about \$11.00 (at present price) over a width of 5' and a considerable length.

In all of the deeper workings of both the Bonanza and Golden Eagle mines sulphide ores came in with lower gold values but carrying a higher relative percentage of silver and with a substantial amount of copper. Because of general inaccessibility and metallurgical difficulties in treating this class of ore very little of it was extracted in either mine and I am reliably informed that several thousand tons remain particularly between the 7th and 9th levels in the Bonanza. This is said to average \$12.00 or better per ton.

The chances of developing additional reserves of similar material seem very fair and in connection with any new operations it would undoubtedly pay to continue further exploration to greater depth, and laterally in both directions along the mineralized zone. The report of Tovote should particularly be noted in this respect and I am informed that just prior to the closing down of the last operations in 1937 an entirely new shoot of good ore had been found on the 6th level and was suspected to continue upwards to the 5th level and beyond.

Although the search for high-grade ore conducted from 1913 to 1918 by the Yuma-Warrior Co. proved unsuccessful, yet I think that it would be a mistake to conclude that the possibilities of either the Bonanza or the Golden Eagle have been exhausted but I believe that such higher grade ore as may be

developed should only be considered as a sweetener for the bulk of the future production which may thus be brought up to an average of \$3.00 or more per ton.

LOW GRADE ORE RESERVES:

The geological conditions surrounding the replacement deposits in the upper workings of the mines and the physical aspects of the Bonanza workings naturally suggest the existence of a large mass of low grade ore that might be attractive under present working conditions and at the present price of gold, but a careful study of all available data throws very little light upon the problem.

Since the old production all came from the high grade shoots the grade of the mill heads has no significance while the one fairly complete assay map which I have found,- made by C. C. Thompson in about 1914,- records mainly the value of samples taken over narrow widths in or near the pay ore. However, there were a large number of samples carrying from \$2.00 to \$5.00 per ton (at present price) which came from exploration drifts and crosscuts and are suggestive as to the value of the wall rock.

Generally speaking, the reports of several engineers, who previously examined these mines, also give little pertinent information. High grade ore was all that interested them or the parties whom they represented, the exploration and development work was all planned to find such material and samples were

usually taken in the drifts and crosscuts only when the visual appearance indicated a point of enrichment. I have, however, culled out some interesting statements among which I mention the following:-

C. E. Mills in 1892 reports that much low grade material had been broken above the 4th level and sent to the waste dumps with average value around \$5.00 per ton (old price) and that many of his samples in wall rock gave similar values.

F. W. Norton says that the Bonanza cave-in which put a stop to the work of the English Co. in 1895 involved an area 400' in length, 60' in width and 150' in depth and the caved material represented 300,000 tons from which 50% could be screened out and would carry around \$6.00 per ton at old price. W. Tovote later refers to 200,000 tons of caved material and waste fills which he figures would average \$4.00 per ton at old price.

C. C. Thompson told me that he had assayed many hundred samples for the Yuma-Warrior Mines Co. from 1913 to 1918 and recalled that most of those taken off the ore ran from \$2.00 to \$6.00 at old price.

Mention is made of some similar values between the ore shoots in the Golden Eagle where the width of mineralized ground seemed to vary from 60 to 120'.

In 1935 a company headed by Elliott and Stratton took over the Bonanza Mine with the object of operating on a

large scale and in order to determine the value of the remaining ore, the surface in the vicinity of the outcrop and including the glory hole was divided into 20' squares and a sample, - supposed to be representative, - was cut from each square. I was shown by C. C. Thompson some 600 assays from the samples thus obtained and told by him that the total area of 240,000 square feet represented a rectangle with length (east-west) of 600' and width (north-south) of 400'. I am satisfied that the assaying of these samples was done by Thompson honestly and with reasonable accuracy but the methods of sampling seem to have been open to criticism and therefore the results may be unreliable. Of the 600 assays mentioned some 40 gave results of \$15.00 or better but casting these out entirely I averaged the remainder at about \$2.33 and the lowest assays were \$0.70 per ton.

The same company and others who were associated with them also took a great many samples in the underground workings of the mine and claimed that the average of these was in excess of \$5.00 per ton but I feel that this statement is of no value. Subsequently a considerable quantity of material was broken down in the vicinity of the glory-hole and together with some of the old caved rock and rock from the waste dump was sent to a test mill in 1937 and the record shows that the average grade of the 6277 tons treated was \$2.88 per ton.

Miles Carpenter who acted for a time as engineer for this company and had charge of much of the sampling has given

it as his opinion that there is a large tonnage of ore that will average better than \$2.00 per ton while C. C. Thompson who saw much of the sampling and did the assaying estimates that many hundreds of thousands of tons in the two mines should carry better than \$3.00 per ton.

In the spring of 1939 Captain J. P. Hodgson took a lease and option on the property and made a brief investigation accompanied by a geologist and an assistant and some samples were taken. Apparently, Captain Hodgson was also seeking a large low grade mine and convinced himself that he would not find it at Harqua Hala since he dropped his option and wrote to the owners that he did not consider the property attractive either for open pit or underground operations. Captain Hodgson's opinion should be given due consideration but it does not appear to have been based on any extensive sampling and I am informed that Hodgson never examined any of the old maps, reports or records which are in the possession of the owners.

In 1917 when I first visited the Bonanza Mine, it occurred to me that some of the low grade ore around the glory hole might pay to work and I took a few samples of which I now have no record but recall that they averaged less than \$2.00 per ton (old price) so that I gave the matter no further thought until 1934 when for a time I was interested in the re-treatment of the richer portion of the mill tailings. At that

time the mine was under option to parties who later turned it over to Elliott and Stratton and they were taking a number of samples in various portions of the workings but with the evident intention of reporting a ficticiously high grade through including a number of samples taken in the ends of the old stopes or in small pockets of higher grade material. Greatly doubting the statements which were made by these people, I had a few check samples taken for my own information and these indicated that there were sections away from the ore shoots which would run from \$3.00 to \$6.00 per ton at present price but no attempt was made to do this work in a systematic fashion or to calculate the tonnages which the various samples represented.

It should however be considered that there are still some ends of the old ore shoots and seams of higher grade material scattered at intervals throughout the mineralized zone and that these as well as any new ore discoveries would tend to sweeten up the average grade obtained in breaking down the entire mass.

On the occasion of two recent investigations in 1939, I took several large samples in various sections of the wall rock between the old stopes in the upper workings and from the broken ore left in the mine or put on the dumps. The arithmetical average of these samples was \$3.28 per ton and they should have been roughly representative of a very substantial tonnage of the mineralized area.

From all the above I am lead to conclude that a large body of \$3.00 to \$4.00 ore may remain at the Bonanza and Golden Eagle Mines and that this chance justifies a further and much more thorough investigation the scope of which can better be determined after it has progressed to a certain point.

The tonnage of such ore which may be found to exist is far too uncertain to permit even an approximate estimate for if values are confined to the immediate vicinity of the old stopes in the upper workings it will be so limited as to make the mine entirely unattractive whereas if the values will hold laterally between the Bonanza and the Iron Vein and carry down into the porphyry at both the Bonanza and Golden Eagle, the total may well run well into the millions but only further investigation can tell the story.

Fortunately, much of this information can be secured by sampling and measuring the ground which is already prospected by the open workings of the two mines or those which could be reopened at comparatively small expense and only providing the results of such a procedure were entirely favorable would I recommend the use of core drills or other means of sampling the intervening blocks of ore.

In an effort to arrive at some very approximate figures as to the possible tonnage, I have scaled off the several maps and sketches which the owners have furnished me but find that some of these are obviously inaccurate while others are so old as to have little value.

However, from such measurements as I can make plus my examination of the mine itself and assuming that an average value of \$3.00 per ton should be found only in the wall rock adjacent to and between the principal stopes in the Bonanza we have a rough rectangle 300' x 100' and assuming a depth of 200' to the 6th level this would approximate 400,000 tons after deducting 100,000 tons already mined.

If the values should be continuous between the Bonanza vein and the iron vein and extend to the boundary of the Gold Star Claim, the dimensions of the rectangle would exceed 600' x 400' and assuming a depth of 300', the possible tonnage reaches a figure of 5,000,000. Since it is my opinion that the superficial area of the ore body will tend to decrease with depth and it may prove to be funnel-shaped, I should reduce the above mentioned minimum to 300,000 tons and the maximum to say 4,000,000.

Applying a similar procedure to the Golden Eagle, I find a minimum of about 150,000 tons; a maximum of 1,500,000.

It is not intended to imply that I have as yet obtained sufficient data to in any way justify the assumption that even the minimum tonnage mentioned will actually assay \$3.00 or even \$2.00 per ton but I believe that there is a very definite suggestion that such is actually the case with possibilities ranging all the way up to the maximum figures, plus any new discoveries that may be made.

GENERAL CONDITIONS:

Mining Methods:

The physical conditions of both the Bonanza and Golden Eagle deposits are such as to lend themselves to cheap open-pit or glory hole mining for the recovery of all or a large part of the possible pay ore to a depth of some 300' below the outcrops on the hills,- no stripping would be required and the walls of the pits should stand extremely well.

An inclined haulage way or main hoisting shaft could carry all of the Bonanza ore directly to a mill just west of the pit while from a similar shaft or tunnel an aerial ropeway one mile in length could convey the Golden Eagle ore to the same mill.

Milling:

Modern cyanide practice should make an excellent recovery of gold and silver from all of the oxidized ore and all material mined in the upper 250' to 300' of the pits. If sufficient copper came in with depth it would probably be necessary to resort to a combination of flotation and cyanide but some revenue should then be derived from the copper in the concentrates.

An excellent site for a mill of 1000 tons or greater capacity is found on the hillside directly to the west of the proposed Bonanza pit but some additional ground must be acquired for proper storage of tailings.

The present camp buildings, with a few minor repairs, would comfortably house a crew of 15-20 men and assay office equipment can be installed in the excellent building recently erected for that purpose. For large scale testing work the mill erected by Elliott and Stratton could be reconditioned for amalgamation or altered and used for cyanide treatment with the installation of additional equipment.

Water Supply:

A 5 acre millsite claim at Harrisburg, is owned by the Bonanza and Golden Eagle Mining Company and here a well is sunk in Centennial Wash from which ample water was obtained for the old and recent operations.

August Nord, a reliable rancher, informed me that from his well nearby he had continuously pumped for irrigation as much as 400 gals. per minute with only a very slight lowering of the water table and he expressed a positive conviction that the Bonanza well, if properly enlarged, could yield over 1000 gals. per minute at all seasons of the year. Since the Centennial Wash drains an area of some 600 square miles, including McMullen Valley, the south slopes of the Harcuvar Mountains and the north slopes of the Harquahala Mountains, I believe that his estimate is reasonable and that the existence of an adequate water supply may be accepted as a fact subject to a further investigation of other water rights which might be infringed.

The pumps and engines have been removed from the well and the present pipe line is of 2-3/4" welded boiler tubing and would have to be replaced with a larger line for any substantial operations. The elevation of the well is about 1750'. The line has a length of about 6 miles rising some 300' in the first 4 miles to a saddle on which a reservoir (which I did not visit) is located on the Summit Claim and from which the water would run by gravity to the proposed site of a new mill at an elevation of 1800'. These relative elevations have been checked from contour maps and with my aneroid.

Power:

Previous work was conducted with steam power and more recently by Diesel engines and even under the latter conditions the cost of electric power (with oil hauled from Salome) was at least 1.5¢ per kw. hour but the U. S. Government electric power line from Parker Dam to Phoenix will pass within about 20 miles of the mine and I am reliably informed that a contract could be made to secure future power for substantially less than 1¢ per kw. hour.

Working Costs & Financial Returns:

While it would be premature to make anything more than a very rough and preliminary estimate of costs, the general conditions affecting this project seem to be favorable and to justify an expectation that Harqua Hala low grade ore could be

worked at a cost comparable to that which has been attained at some similar operations such as the Yellow Aster in California, the Beatty Mine in Canada and at other mines where mining and milling is done for less than \$1.50 per ton. Unless unforeseen metallurgical difficulties should reduce the percentage of extraction, the recovery may be safely figured at a minimum of 85% of the values or more probably close to 90%.

The total capital investment including preliminary sampling, purchase price of property, installation of mining equipment and erection of a mill, water supply, power lines, etc., will run to a large figure and can probably only be justified if it can be written off by a charge not exceeding 50¢ per ton of ore. If mining, milling and repayment of capital are tentatively estimated at \$1.50 per ton it appears that one should be assured of at least two million tons of \$3.00 ore to put this venture in the class of an attractive investment; or a correspondingly lesser tonnage of higher grade or larger tonnage of lower grade material.

I personally believe that there is a reasonable prospect that the Harqua Hala Mine will be found to measure up to such standards and the verification of this opinion can be made far more cheaply than in the case of an unworked prospect or many other old mines in which the workings are caved or largely inaccessible.

RECOMMENDATION:

If the data given in this report appears to make the proposition attractive, I first suggest that further inspection and investigation are in order and might reasonably be followed by the acquisition of an option to purchase the property which I am assured by the owners will be given on very reasonable terms and with no down payment whatever.

A small force of engineers with assistants might then be employed to carry on a limited amount of surveying and sampling which could be discontinued at any time or speeded up as their findings might dictate.

Future policy should obviously be guided by the results of their investigation which would be the first scientific work of this nature that has ever been done at the Harqua Hala Mine. I need hardly add that I have no financial interest whatever in this property and merely a pleasant personal acquaintance with the owners at whose request I have undertaken to present this property to any responsible company who may indicate their desire to engage in the development and operation of a large low grade gold mine.

Respectfully submitted,

E. M. Colverson

"GOLD DEPOSITS.

QUARTZ VEINS AND SHEAR ZONES IN GRANITE, GNEISS, SCHIST, AND
METAMORPHOSED SEDIMENTS.

In this type are included such veins as occur in the Hercules, the San Marcos, the Socorro, and in the Bonanza workings. The last two are somewhat similar in that they lie near the contact of the crystalline rocks and the sedimentary series; the Socorro, however, starts in coarse-grained granite and runs out into sedimentary rocks, while the Bonanza starts in sediments and runs into a crushed granitic rock. The Hercules and the San Marcos resemble each other to a marked degree, and both veins, so far as explored, lie entirely in crystalline gneissic rocks. There is no uniformity in the dip and the strike of these veins, the former varying from 26° to 60° , and the latter from east-west in the Socorro to north-south in the Bonanza.

The vein filling is primarily quartz and brecciated country rock, and the chief valuable ore has, in the past, been free milling gold. The pyrite of the deposits is oxidized above ground-water level (in general within 200' of the surface) and the free gold values are there concentrated. In this connection it is interesting to note the advantage a flatly dipping vein has over one with a steep pitch. For example, in figure 2, A'-B' represents a vein dipping 63° and shows the lineal extent downward in the zone of surficial oxidation and concentration of gold values as compared with the vein A-B, the same vertical distance above ground water level, but dipping only 30° . A"-B" is the length of the vein A'-B' laid off on the vein A-B.

The larger the shear zone the more porous the vein, and hence the greater the opportunity for the deposition of pyrite, and also the larger the quantity available for concentration by surficial oxidation. The Bonanza Mine affords a good example of large shear zones. The fact that in the past the principal values have been found in the zone of oxidation has led to the supposition that all of the rich parts of the vein would be above the present ground-water level, pyrite being found below. It should be remembered, however, that the present ground-water level may differ from that of earlier times; it may be lower or it may be higher. Therefore there is always the possibility, not necessarily the probability, of finding below the present ground-water level ore that has in the past been concentrated at the lower stand of this level.

In general the higher values in these veins occur in pockets, and even the quartz veins are frequently lenticular. It is believed that the veins were formed by mineralizing solutions accompanying the intrusion of the granite mass in the southwestern part of the Harqua Hala and the Harcuvar Ranges.

There are a few true fissure veins in gneiss, carrying gold as the principal ore. The Mail Pouch and the Mineral Zone No. 1 were the only ones examined by the writer and these have been described very briefly in another part of the report. The Guadalupe is reported to have been worked for its gold values; surface indications however, would throw it into the class of lead deposits in fissure veins.

QUARTZ-SIDERITE STRINGERS IN AMPHIBOLITE, SHALE AND LIMESTONE

The deposits of this type are found mainly in the southwestern part of the Harcuvar Range and represent irregular masses or gash veins of quartz which are frequently auriferous. The gold

values which are so often found in these veins may in part have resulted from superficial oxidation of the pyrite and concentration in place. As these veins are exposed by the erosion gold is concentrated in the placer deposits in the gulches which have been more or less successfully dry washed in the past. Figure 3 shows an ideal cross section of a few feet of strat in the Arizona Northern vicinity, where metamorphosed sediments contain intercalated amphibolite. Here the veins exposed on the surface are generally very small and lenticular and are easily picked out. In a short crosscut in the formation other lenses were exposed, and from this evidence and the general character of the formation the figure is drawn.

These veins contain also some galena and chalcopryrite. Galena has been found in the Harqua Hala vicinity, and it is possible that the Quadalupe vein is comparable in age to these deposits. It is thought that solutions accompanying the granite intrusion brought in the silica, the carbonates, and the metals and because of the kind of fissures here present for their deposition formed small gash veins rather than any other type.

THIN FILS OF GOLD DEPOSITED IN JOINT PLANES IN SHALE.

In several prospects within the area thin fils of gold deposited in joint planes in shale werenoted. The best-known local examples of this are probably in the Moro prospect, owned by the Clara Consolidated Company, and in the Blue Slate prospect, near the Little Butte. Evidently these deposits are the result of secondary deposition of gold, the original source of which is probably in the near vicinity. In general, deposits of this sort are apt to be of very low grade because of the extreme thinness of the gold flakes; and the saving of the gold is difficult."

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"QUARTZ KING PROPERTY***GENERAL DESCRIPTION

The Quartz King workings are located 5 miles northeast of Parker in an air line, and are made accessible by a good wagon road some 7 miles long between the two places. A store located on the main Colorado River is kept up by the management, and telephone connections with Parker are maintained. There are several houses near the new workings on the property, and these with a shaft house constitute the surface improvements. The following machinery is installed in the shaft house: One 60 h. p. hoist, one 60 h. p. compressor, and one small blower. In the crosscut from the bottom of the new shaft one drill was in operation on May 1, 1909. Distillate is used for fuel, and about 50 gallons are reported to be consumed daily, in operating the machinery. The property is being worked for gold and copper.

TOPOGRAPHY

The Deposits are located about $1\frac{1}{2}$ miles from Colorado River and about 250' above it on the southwestern slope of a long narrow ridge which extends almost down to the river. The camp is located near the head of a small ravine at an elevation of 500' and about 150' below the older and upper workings on the property. The hills are not very precipitous and the peculiar topography in the vicinity is entirely dependent upon the geological relationships.

GEOLOGY:

The rocks in the vicinity are amphibolitic and chloritic schists which are nearly vertical and strike northwest-southeast. Upon the eroded surface of these older rocks rest basalt and a clastic rock composed entirely of brecciated microline

feldspar and quartz fragments. The ore deposit occurs in a shear zone or fault plane in the amphibolitic and chloritic schists; which resemble in a very general way the schists seen in the vicinity of Bill Mack's, Osbourne's, and many other places; it has probably resulted from the metamorphism of argillaceous shales intruded by diabase or other basic rocks. Joint planes are common in the clastic rock found resting on the amphibolite near the upper workings, and the basalt seems to be very platy and to have been jointed in a more or less local fashion. The irregularity of the contact between the underlying amphibolite and the later sediments and igneous flows forms the most noticeable feature in both the topography and the geology of the vicinity.

THE ORE DEPOSIT AS EXPOSED BY WORKINGS.

UPPER WORKINGS. The Upper workings are located at an elevation of 700'. The vein, as observed at this place, appears to occupy a fault plane or a shear zone in the schists which strikes S. 20° to 30° E. in places and north-south in general. The dip is almost perpendicular, the inclination noted on the surface being to the southwest. Because of the nature of the deposit the gangue is principally sheared country rock which has been cemented in part by later deposition of quartz, showing brecciation due to subsequent movement. The ore minerals occurring with the quartz are malachite and chrysocollar with hematite. The deposit is not very extensive in width though quite persistent in length. The shaft here is reported to be 300' deep and to have 900' of laterals.

NEW SHAFT. Some 300' below the upper workings a new vertical shaft has been started. This penetrates the clastic rock throughout the 100' in depth which had been attained at the time the property was visited. At this level a crosscut had at that time been driven toward the supposed continuation of the vein and had cut 70 feet of the same sort of clastic material. "

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BONANZA MINE (HARQUA HALA)

HISTORY, LOCATION, AND DEVELOPMENT. report

HISTORY "According to the original prospect was located on November 14, 1888, by Messrs. Harry Wharton, Robert Stein, and Mike Sullivan. The property is said to have been sold in part to Messors Gray, Kirkland, and Corcoran, and in part to Mr. Hubbard, who bought out the other owners within a year. After taking a large sum from themine, Mr. Hubbard is said to have sold it to an English company in 1893. According to report Mr. Hubbard bid in the property at auction in 1898, and later sold it to the Bonanza and Golden Eagle Mining Co. The property was then leased to the Harqua Hala Mining Co. Later the property reverted to the Bonanza and Golden Eagle Mining Co. which now controls it. Lessees are said to have produced considerable gold between the time Mr. Hubbard first worked the property and its sale to the English Company. The total production of ore from the mine reaches \$3,631,000.

LOCATION. The Bonanza Mine is located at a place known as "Harqua Hala" in the extreme southwestern part of the Harquahala Mountains, near the base of Martin Peak, at an elevation of approximately 1,800 feet and is, in an air line, 8 miles almost due south of Salome. A fair wagon road connects the mine with Salome, from which point supplies are shipped in."

"DEVELOPMENT. A shaft inclined at an angle of approximately 60° and attaining a vertical depth of 205' below the collar, together with about 7,000 feet of levels, drifts, crosscuts, and winzes, constitute the principal development of the Bonanza Mine. Plate VI shows a plan of the property. The main stoped area is reached from levels 3, 4, and 5, and below this the remaining levels 6, and 7, consist of long crosscuts. A large "glory hole" shown in Plate V, A, is the result of the caving of one of the big stopes. Numerous other workings, which are mainly shallow shafts, have been started at different places on the property.

TOPOGRAPHY. The Bonanza Mine is located near the base of Martin Peak on its northeast side, and is a few feet above a wash, which drains south and east. The drainage is confined between two rather prominent ridges capped by peaks rising 600' or more above the wash, the ridges being separated from each other by about 2 miles. These peaks form the most prominent feature of the southwestern extension of the Harquahala Range and effectually conceal the workings of the Bonanza Mine from any but a northern view.

GEOLOGY: The basal rock in the vicinity, which is not exposed on the surface near the mine, is rather coarse grained and has the composition of a granite. It is highly impregnated with pyrite. Just north of the Golden Eagle, which is 1 mile a little east of north of the Bonanza, the contact between the sedimentary series and this granitic base rock may be seen. The contact apparently runs in a general northerly direction and probably could be found a short distance northwest of the Bonanza. The eroded surface of this granite rock appears to dip southeast.

The sedimentary rocks in which the deposit occurs have a few feet of reddish quartzitic grits for a base. Over this lie 100' or more of intercalated limestone and argillaceous shale, above which is a thin conglomerate, capped by several hundred feet of schists and gray limestone, including a small thickness of dark-gray dolomite and thin beds of conglomerate. The whole series has been tilted in various directions and the dip near the top of the section appears to vary from 20 to 60 degrees a little west of north. Marked divergences from this general direction were seen, and strata which dip southeast were noted near the base of the series. The presence of dolomite in this section is worthy of remark, little having been seen elsewhere in the area. A partial analysis by Chase Palmer, of the United States Geological Survey, of a specimen taken near the base of Martin Peak gave 22.94% CaO, 20.59% MgO, and a loss of 47.03% on ignition. Many of the dark brown limestones throughout the area, especially those in the vicinity of the Planet and Signal properties, resemble dolomites. Analysis, however, shows that they contain hardly any magnesia.

The whole series is intruded by dark colored basic dikes, and veinlets of quartz and calcite are found throughout the section.

ORE DEPOSIT.

At the present time (1909) there is not a great deal to see of the Bonanza ore deposit. Below the 5th level which is under water level (that being 170' below the collar of the shaft) most of the work has been of an exploratory nature, and above this the stopes, drifts, and other workings have all been in the oxidized zone. Consequently only the skeleton remains of the pay portions of the deposit, which has been largely worked out. As viewed underground the ore shoots seem to have occupied zones of shearing extending through the sedimentary series of intercalated limestone, shale and quartzite into the basal granitic formation. This is exposed in places in the lower workings on levels No. 6 and No. 7 and is a very coarse grained granitic looking rock, which has been severely crushed and fractured, and pyrite has been deposited along the brecciated zones, which are now filled with sericite, the latter presumably

resulting from the decomposition of formerly existing feldspars. Figure 15 shows the relation of the fault planes as exposed in the "Castle Garden stope." The two main ore shoots represent a continuous shear zone on the east, striking approximately north-south and dipping at an angle of about 45° W. into which runs a lesser fault from the west, the strike being parallel to that of the others, while the dip is 45° E. The ore shoot on the west, however, has been more productive. These two main veins vary in width from a few inches up to many feet, and it is in the zone of movement that the gold values have been concentrated. Soft hematite of a deep red color is omnipresent in the workings above water level and this with quartz, calcite, brecciated crushed country rock, and a little gypsum form the gangue minerals present in the croppings of the veins. Very rich pockets of gold are reported to have been found in various parts of the mine, and the writer was shown as good part of a large nugget, the original specimen having been reported to be worth \$10,000.00. This particular piece showed large bunches of gold intimately associated with quartz. The quantity of silver found in the ore is remarkably small, and there is hardly any evidence of copper in the oxidized zone. Small quantities of galena have been found replacing dolomite in a shallow shaft located 500' southwest of the mine.

FUTURE OF THE DEPOSIT On considering the fact that such a large production has been derived from the levels above the vertical depth of 170' together with the complete change of character of the veins below this depth, it seems reasonable to suppose that if there are any large ore shoots or pockets found in the future they will probably be above ground water level along the strike of the shear zones rather than in those portions of the planes of movement which are now below the zone of oxidation. It may, however, be found possible to work profitably the pyrite which occurs in the shear zones in the granitic rock below the sediments.

ORIGIN OF THE ORES. The gold values found in the workings above water level have probably resulted from concentration in the zone of oxidation of gold content of the pyrite, which seems to have been introduced into the granitic rock after its brecciation, and was no doubt likewise present in the shear zones crossing the sedimentary series."

Notes by G. M. Colvocoresses.

Examination of this mine recently made by Elliot for Francis A. Stratton, Mt. Vernon, N. Y., chairman of the Board of Westchester Light and Power Co. and a director of the Chase National Bank. Over 4000 samples were taken on the surface and underground in the old workings and indicate a surface orebody which can be mined by glory hole representing over 110,000 tons of \$9.00 ore and underground, including the fills and pillars there are supposed to be 400,000 tons of \$24.00 ore.

Elliott proposes to raise \$1,500,000 to purchase and equip mine and build a 1,000 ton mill and Stratton et al will put up \$750,000 and they have applied to the M. F. U. for loan of \$750,000 which is now being favorable considered and an Engineer is expected to make examination in the near future. Chris Thompson (Assayer and engineer) of House was one of the engineers who did the recent sampling for Elliot.

(I think the values quoted are far too high.)

2/5/36

The M. F. U. told Elliott that he would have to put up \$15,000 to cover the check examinations and sampling of the mine by their engineer and Elliot refused or was unable to do this. The financing is now being done by the Stratton Syndicate and Payne and Payne (Louis B. Payne and Larry Multz) with office in the Chrysler Bldg., N. Y. These people have previously been mixed up in some shady mining deals and this looks like a stock promotion.

Elliott now claims that there is a great body of ore near the surface which will carry \$3.50 per ton but Chris Thompson who actually did the sampling says that his average was only \$1.27 per ton according to Dick Bunker. / Conklin of A. O. Smith Co. recently examined and finds that the primary mineralization extends over a wide area and represents an immense tonnage but the average grade is very low and probably would not exceed 35¢ per ton. (no basis for this)

It would seem to me that there might be a possibility

of working a substantial block of ground which would surround the old workings and include the higher grade ore left in the shear zones and so might average better than \$3.00 per ton but this matter would require careful investigation.

November, 1937.

This old mine was thoroughly described in U.S.G.S. Bulletin #451, entitled "Ore Deposits in Northern Yuma County, ~~Arizona~~ Arizona." written by Howland Hancock and published in 1911.

None of the recent attempts to operate have proved successful, but as noted above, I am of the opinion that it is worthy of further investigation by anyone who would be interested in operating a low grade mine since I think that there is a chance to find that a large block of ground would be sufficiently sweetened by the ends of the high grade shoots and stringers to bring up the average to \$3.00 or better per ton.

The owners advise me that the property is at present under option to parties who will hold it until the middle of January, 1938. If this option should then be cancelled, I think that the mine will merit some further consideration.

THE
Bonanza
AND
Golden Eagle
Groups of Mines
SURFACE PLAN
750' to 1"

