

COMPARATIVE ANALYSIS OF BULLARD MINE RETURNS ON ORE PRODUCTION
AND COSTS.

(Based on Shipment Lot #30 which closely approximates the average analysis of ore as per sampling.)

Gold figured @ \$35.00 per oz., Silver @ 71¢ per oz., Copper @ 10¢ per pound.

Analysis of Ore (lot 30) H₂O , Au. = 0.22 oz., Ag. = 0.38 Oz.
Cu. = 2.49%.

Gross value of ore per ton = \$12.95

(Mill recovery estimated at 90% of all gross values.)

	Actual figures while shipping crude ore per ton.	Estimated figures with 50 ton mill operating at mine. Per ton
Net payments to Co. by smelter and/or mint	\$ 7.52	\$ 10.80 *
DEDUCT:		
Cost of mining & development (about)	3.50	2.75
Cost of haulage to Railroad	1.04	
Cost of freight to smelter & market- ing product.	2.46	0.20
Cost of milling ore	----	2.00
Royalty to owner	0.75	1.08
Management, taxes, overhead & inci- dentals (about)	.50	0.47
Total cost	8.25	6.50
Net profit to Co.	<u>Per ton</u> 0.73 (loss)	4.30
Net operating gain by installation of mill	5.03	
Less amortization of of capital	<u>1.03</u>	
Net gain to Co.	4.00	

* The gold bullion will be sold to the mint at Gov't. price for gold & silver less a small charge for refining. The smelters would purchase the cement copper with a deduction from market price of about 2¢ per lb.

Assuming that a total tonnage of 100,000 of similar grade should be shipped or milled, the total loss through shipment would be \$73,000 while the profit through milling would be \$330,000 after repaying the cost of the mill and accessory equipment.

Each 1¢ increase in the price of copper will add about 50¢ per ton to the net value of the ore.

J. M. Colvocoresses

Comparative Analysis Bullard Mine Returns on Ore Production & Costs. Based on Shipment #30

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\$	7.52	10.80 ^(*)

Net payments to Co by smelter and/or mine

7.00

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2.75

3.50

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1.04

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2.0

2.46

0.20

" " milling ore

2.00

—

2.00

Royalty to owner

70

0.75

1.08

Management, taxes, overhead & incidentals (about)

40

.50

0.47

Total cost.

6.00

8.25

6.50

Net profit to Co.

Per ton.

(loss)

0.73

4.30

Net gain (minus operating mill)

5.03

Less amortization of capital

1.03

Net gain to Co.

4.00

Assuming a total tonnage of 100,000 ^{of similar grade should} be shipped or milled

the total loss thru shipment would be \$73,000 while

the profit thru milling would be \$330,000 after repaying the cost of the mill & accessory equipment.

(*) The gold bullion will be sold to the bank at bid price, less a small charge for refining. The smelter would purchase the refined copper with a deduction from market price of about 2¢ per lb.

Each 1¢ increase in the price of copper will add about 50¢ per ton to the net value of the ore

Ex. F

EXTRACTS FROM LETTERS OF J. V. McCONNELL TO G. M. COLVOCORESSES

September 6th, 1938.

"Dear Sir:

. I have from time to time depleted this file but believe there is enough data to give you a very fair idea of the property. My sample work represented a total of 287 samples all told from all veins. The old maps will show positions where these samples were taken as far as the map goes which covers all openings at that time on the main Bullard workings. (1931).

My samples are all in ounces so the difference in gold prices then and now will make no difference. This sample job for Tigre Co. was made by R. T. Mishler, Mr. Thompson and I and sample was under my supervision all the way through. This work covered a period of over 6 weeks all told, was quite thorough indeed as to values, tonnage and etc. everything was sampled except the incline shaft on the Rattler Claim which was full of water for considerable depth and after sampling to this point it was decided ill advised to unwater this at that time."

J. V. McConnell

September 14th, 1938.

"Dear Sir:

. I find from some notes I have that our final judgment on Bullard Mine we reduced the very probable ore to 20,000 tons and with an average value as follows: Au. 0.182 ozs., Ag. 0.58 ozs. and Cu. 2.23%. This was after the re-check, and after all of us had sampled more or less. The possible ore we left as 25,000, that being as good a guess as we could make.

Another item I find is a caution notice to carefully check gold values at greatest depths obtainable against the values obtained at or near the surface area. We found there was a variation of about 0.03 ozs. in favor of ore within say 5 feet to 8 feet of the surface against the same openings at depth, which of course varied with different openings. This last item was taken into consideration in assuming the above averages and from all samples taken. This condition appeared to prevail in most openings. Another fact established was the higher the copper values the higher the gold values. And another point we were considering was selective mining of the higher grade ores as a last resort in case a milling operation were not possible to work out. On the subject of Mill however Mr. Mishler finally decided that a mill would handle the situation by leaching the copper values and then extraction of the gold. This I believe he finally decided was by far the best recovery possible. Metallurgy tests were mostly made at the Tigre Mill at El Tigre, Mexico. Others, however, I believe were made by recognized laboratories and possibly I can find out who made these tests.

September 21st, 1938

"Dear Sir:

I had expected to be able to get you the data I could gather up on the Bullard Mine last week. I attempted to place my assays on an old map and find this map did not contain all openings so therefore have made a list of the preliminary samples taken and have tried to locate them by description to where you can easily check them. I might say the sample as given here in this preliminary were fully substantiated with later samples and the results in the finished work was practically the same as I give them to you here.

About the only changes that were made was the lowering of estimated tonnage of the very probable ores from 25,000 tons to 20,000 tons. The reason for this was, it appeared that as the ore bodies were opened up further in the hill, there appeared to be a more crushed condition or broken up condition of the ore, also where the ore is broken in nearly every case values are considerably lower than when not broken or mixed up. Again the extent of the various local fault zones of the ore body could not be determined without more development work and we were unable to make satisfactory terms for such work.

The incline shaft at the East or Northeast was not unwatered for the same reason unfavorable terms. I do not have enough notes and data that I have been able to find to make you a new map which covers all ore at the Home group, this was a completed assay map and represented over 250 samples.

This list of samples I am sending you were in most cases the sections were cut at 10 foot intervals, and later on were filled in between making the assay map show 5 foot intervals both on outcroppings and openings.

The average value conclusions we came to for the more positive ores and the estimated 20,000 tons as per my letter of September 14th, 1938. Of Au. 0.182 ozs. Ag. 0.58 ozs. and Cu. 2.23% was determined by a general average of all samples that were taken and was made after all sample work was completed. All composite samples were later on run individually for each cut, but the final results changed the picture very little as a whole. Again in arriving at this average conclusion for values, the fact was taken into consideration that with depth from surface exposures of the ore body there was a consistent falling off of values as depth was attained and this had to be taken into consideration. Whether this condition will prevail as greater depths are obtained of course only work can prove. It should however be considered.

In my list of samples enclosed I have given you only the samples I have that I can definitely locate, without my maps, these locations are positive and I could show you where each and every one was cut. Starting at the No. 1. or Blacksmith shaft I do not think you will have any trouble in locating each opening as I have described them for you."

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. So far I do not appear to have the data on the Quail Nest group of the Bullard property, but if my memory does not fail me we had some very nice samples up there and over good widths. It was more free of copper and better gold values as I remember the same. I do know both Mr. Mishler and I thought it well worth doing some work on.

As I remember this we had from say 3 feet to as much as 5 or 6 feet of average \$18.00 to \$20.00 gold up there the vein was quite flat but not more so than the main Bullard vein and when those samples were taken gold was still \$20.00 per oz. so if that ore is still there it might well be worth looking into at this time."

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RE BULLARD MINE

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DISTRICT	PROPERTIES	LOCATION	OWNERS & OPERATORS	DATE VISITED
Harcuvar Mountains	Bullard	30 m. S.W. Congress Jet., by fair road. 9 M. north Aguilá by trail. Elevation 2250 to 5200. Pierce Mining District. 28 claims, 10 patented.	John C. Bullard, resident on ground. Idle.	1917 Oct. 14.

NOTES

Bullard Peak, on which mine is located, has andesitic breccia at base, overlain by angite andesite, with small seams of calcite. In the angite andesite is a fissure dipping about 35 degrees S. E., filled with brecciated silicified material carrying gold, and copper in form of chrysocolla, malachite and a little chalcocite. There are exposures of more or less ore all around the Peak. A line joining the exposures on the Homestake, Sweepstake, Washington and Rattler claims, would have the form of an ellipse about 2000 ft long and 800 feet wide. In the flat below the base of the Peak are other exposures of gold and copper ore, apparently separate from the main ore body. The main fissure has an average width of about 4 feet, but probably not more than half of this width is good ore. A sample across 2 feet as an indicator, assayed (H278). Bullard claims an average value of \$8.00 in gold and 3 to 6% copper for an estimated tonnage of 100,000, based on an average thickness of 4 feet. There are many open cuts, inclines and crosscuts on the property, the greatest depth of ore exposed being about 300 feet. The patent notes of 12 claims mention 19 shafts, 3 tunnels with approaches, 8 open cuts, 3 crosscuts and one level. The property has been sampled by Mr Stockder and Julius Kruttschnitt for the A. S. & R. Co., Will L. Clark for the United Verde, and many other parties. According to Bullard, the average analysis shows about 70% Insol, 6% Lime and 9% Iron, so it would not be very desirable for the Humboldt converters. The price asked for the property, \$600,000.00, appears unreasonable.

* Cu. 2.62%; Insol. 70.6%; Fe 4.1%; Au 0.2 oz;
Ag. Trace.

J. H. Hollumb
Parker

E.C.

BULLARD

District: Harecuvar Mountains

Location: 30 miles S.W. Congress Junction by fair road.
9 miles north Aguila by trail. Elevation 2250
to 3200'. Pierce Mining District. 28 claims,
10 patented.

Owners &
Operators: John C. Bullard, resident on ground. Idle.

Dated Visited: October 14th, 1917.

Notes:

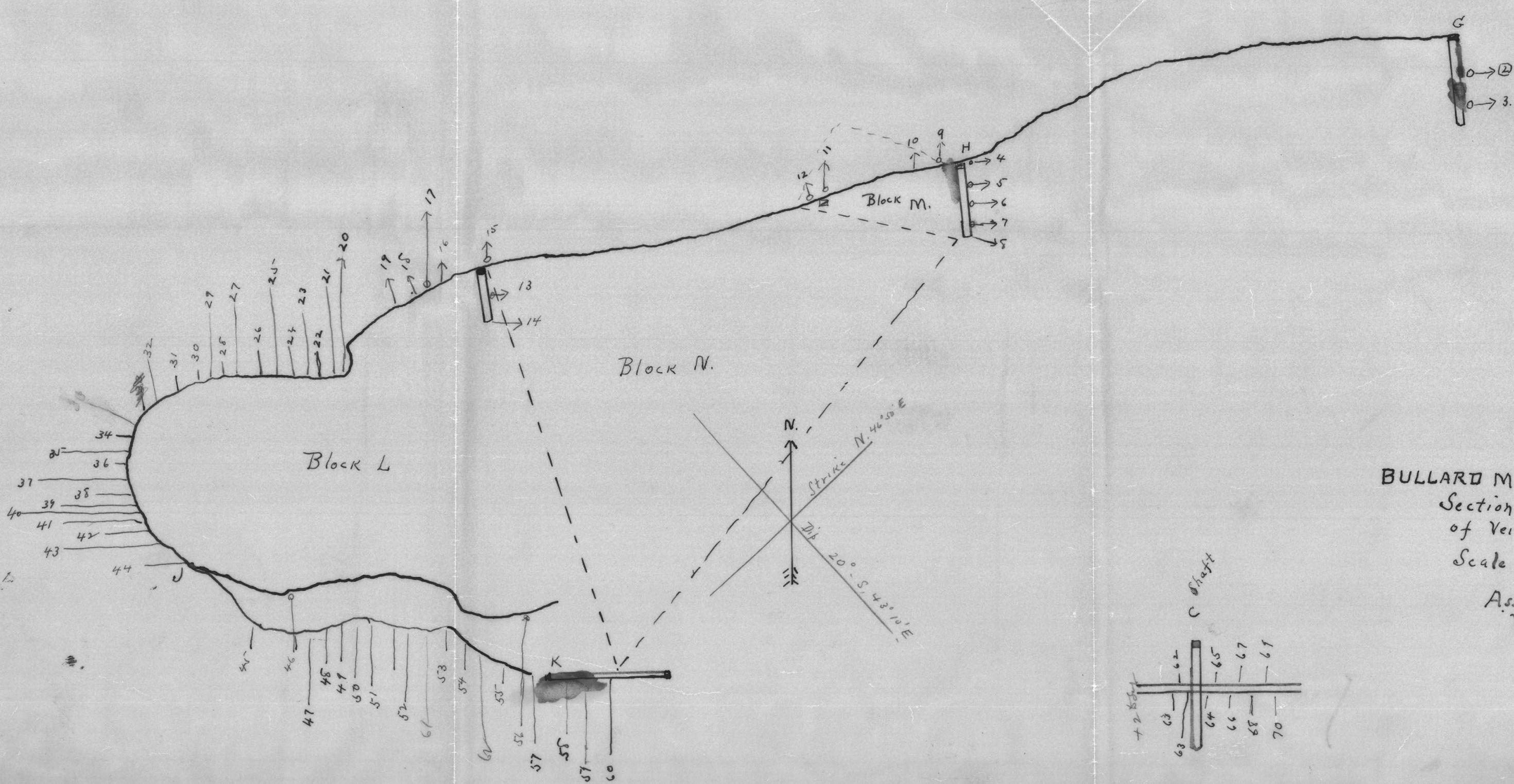
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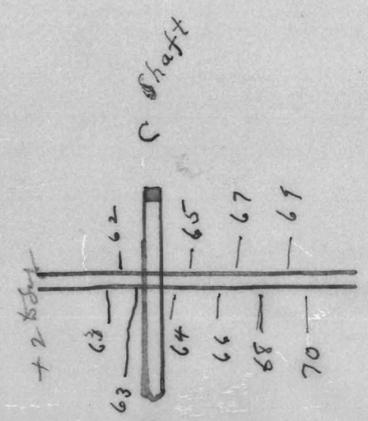
L. F. S. Holland

Oct. 14, 1917.



BULLARD MINE
 Section on Plane
 of Vein
 Scale 100' = 1"

Assays. Width.
 Value of Gold
 % of Copper



Leifer

October 18th, 1939

Notes re BULLARD MINE

Shipments and Smelter Contract and General Policy.

(a) Truck haulage to Railroad.

The present rate of \$1.00 per ton seems favorable when the truckmen have to load the trucks with ore hand-shovelled from a dump but when, -as is now the case at the C. tunnel,- the trucks can be loaded from a chute or bin I think that a reduction of some 25% per ton would be in order and suggest that this be requested.

(b) Railway Freight.

The rate from Aguila to Hayden is fairly well in line with other rates for hauls of similar distances, but in view of the probability that a substantial tonnage will move at regular intervals some reduction may be secured and I think that you have done wisely to apply for same. Since this must be a joint rate of Santa Fe and Southern Pacific Railroads some little delay may be experienced in getting any action.

Under similar conditions I have found that the railroads are much more favorably disposed to grant such a request if the shipper will agree to raise the minimum weight of a carload to 40 or better yet to 50 tons and I believe that you should have a very good chance of securing a 25% reduction from present rates if the minimum carload were fixed at 50 tons (100,000#).

Except for the fact that this will delay the receipt of settlements to some extent it is a real advantage to the shipper and smelter as well as the railroads, for it means fewer lots to be sampled and perhaps umpired.

A freight saving of 60% per ton on ore valued at from \$10.00 to \$15.00 would mean a substantial reduction in your costs.

(c) Smelter Contract.

Now that the treatment charge has been reduced from \$2.50 to \$1.50 per ton you really have an exceptionally good contract and one of the best of which I have any knowledge. I do not believe that any further reduction in this toll charge can be expected or should be requested.

The payment for all gold contained is made at the rate of \$32.31825 per oz., which is equivalent to 92.338% of the government price of \$35.00 per oz. This is a usual arrangement but in some cases the smelters will pay to their regular shippers as much as 93% of the government price, i. e. \$32.55 per ounce.

On the average grade of your shipping ore this would only mean a gain of 10 to 12¢ per ton and therefore I suggest that any request for such a change should be deferred until later when you may perhaps be in a position to guarantee the smelter 500 tons or more per month.

The payment for silver provides for a deduction of 0.5 oz. from the assay and payment for 90% of the balance at government price now 71.1 ¢ per oz. Since most of your shipments carry less than 0.5 oz. of silver you have been getting very little payment for this metal.

Actually a smelter recovers or should recover over 90% of all of the silver in the furnace charge, but it is always customary to make a minimum deduction which represents a part of the legitimate profit of the smelter. For steady shippers the minimum deduction should not be over 0.3 oz. and if this change could be made you would gain from 5 to 12¢ per ton. This concession might also be left for future discussion.

In paying for copper the smelter deducts 0.4% (8# per ton) and pays for 95% of the balance at the E. and M.J. Quotation, less 2.5725 per lb. The deduction from the market price represents the charge for converting, freight, and refining on the copper bullion.

Some years ago this deduction was usually only 2.5¢ but I presume that present conditions may justify the slightly higher figure.

The slag loss figured at 8# is fair, but I think that 100% instead of 95% of the balance of the copper should be paid for. On ore carrying 2% copper/^{this}would mean a gain of some 15¢ per ton while on 5% ore the gain would be nearly 50¢ per ton and close to \$1.00 on 10% ore. Inasmuch as you will probably ship quite a lot of ore that will carry 3% copper or better this change might prove to be quite important and a concession in this regard should be requested either now or at a later date as may seem expedient.

To sum up- it seems to me that the possible and reasonably expected reductions on shipping and marketing charges are as follows:

PER TON OF ORE			
	Present charge	Reduced Charge	Gain to Shipper
Freight to Railroad	\$1.00	\$0.75	\$0.25
R. R. freight to smelter (on average grade ore)	2.40	1.80	0.60
Smelter toll charge	1.50	1.50	0.00
Deduction on payment for gold (0.40 oz. ore assumed)	1.07	0.98	0.09
Deduction on payment for silver 0.5 oz. ore assumed	0.35	0.23	0.12
Deduction on payment for copper excluding slag loss, 3.00% ore assumed, (5% of excess over 8#			
TOTAL	6.58	5.26	1.32

On monthly shipments of 500 tons the total saving listed above would thus amount to over \$650.00, which is well worth working for and for comparison with previous costs one should add another \$500 to represent the reduction in smelter toll charge which you have already obtained.

I can see no reasonable expectation of further economy in shipping and marketing charges until you can erect and operate your own concentrator and even then it will probably pay to ship the higher grade ore,--with gross value of say over \$20.00 per ton--crude to the smelter.

In connection with all the above I think it well to mention that the Engineering and Mining Journal in accordance with which you are paid nearly always quotes the price of copper at from 1/4 to 1/2 cent below the price which is given in the daily papers and these last quotations are apt to be very misleading. Of course each one of your settlement sheets should be carefully checked against the contract for mistakes are sometimes made even in the best regulated offices and shippers should protect themselves by attention to all of these details including the payments of freight rate and royalty and in so far as possible by checking the moisture determinations on their shipments where there is a special chance for loss. A personal visit to the smelter is often well worth while.

Mining.

There are certain economies in your mining practice which suggest themselves to any experienced person visiting your property but most of these can only be accomplished after you have gone to some preliminary/^{development}expense and installed additional equipment. Until I have had an opportunity to make further studies in this matter I prefer not to attempt any detailed comment on the mining except

-5-

to say that I think it is of paramount importance not to break any ore until the same has been sampled and the assays made available to your Mine Superintendent so that he can judge for himself whether this particular ore will pay to mine and ship. Considering the present treatment and transportation charges and assuming a mining cost of \$4.00 per ton, the total costs deductions and charges including royalty to owner, overhead and taxes, haulage and freight on moisture, slag loss, etc., as well as those charges listed above must amount to very nearly \$14.00 per ton with ore assaying 0.4 oz. gold, 0.5 oz. silver, and 3.00% copper.

Therefore it is poor business practice to break and ship any ore which has a gross value of less than \$15.00 per ton and this value should be increased by at least \$2.00 or \$5.00 if an adequate profit is to be earned by the operating company.

For the present I think that your work should be concentrated and confined largely to those sections of the vein you are working or where where/the assay maps prepared by the engineers of the El Tigre Company, the A. S. & R., and your own men show that the higher grade of ore occurs.

The natural conditions at the Ballard Mine where the ore is found in narrow veins with a comparatively flat angle of dip, will never permit really cheap mining but a carefully planned and efficiently executed program will certainly pay for itself in short order with a probable reduction from previous costs of this operation of from 50¢ to \$1.00 per ton.

Yours very truly,

Bullard map 19

Stomatal (old pond)
100' dia

Substr. 2' h. - $\text{Cov } 4\%$
 $\text{Cov } 12.00$

at h. end

dir for h. 70°E

near south end 120'

shft.

V. stem h 20°W

width $4\frac{1}{2}'$

$\text{Cov } 14.40$

$\text{Cov } 8.70\%$

Connecter, on S. side

stem end - h. 10'

shft. h $1.5'$ $\text{Cov} = 5.00$

$\text{Cov } 3\%$

Gas Beer:

Along roadside starts for
N. S. 50' high, W 7'

near N end. Cu 11.00
Cu. 7%

South end of line, W 3'
Cu 10.00
Cu = 5%

Removal. 4' W

near N end. strike N.W. S.E.
high 10', W 7' wide
Cu 10%

2nd run. 4' W

3. N W 3'

South run. strike N₁₀°E
10' high W 6' Cu 6.00 Cu 3%

Arizona

- One W side 2' high
Stk h 45 & at S end 2'
high + adit running east to
E-W. run & shaft 8' deep
no way

Arizadher Arizona run

- on east side run h W-S-E
+ 10' shaft on each side of
run center. water 3' &
20' low

International

- Big run run h 45-
& at S end 0-40' high
run with 40,000 ton of it

a light ledge + stands being
lithal w. 42'

Cu ² 7.00

Cu 2%

Nevada, 2 rem h. 5.

no assy.

Butte in W 20° E

Butte 6' in 5.00

Cu 3%

Producer 3 v. st. h.

45. center bottle 2', Cu

= 9% assy.

last rem. 4.00

last rem. 9%

Blue p. 2.5V 2005
Sept 50, 2' 6"

4 carbons 2' wide

3% to 10% copper

Carbon: ~~low to high~~

low to high

Chandler, low to high

100%
extends north into Sellers

in Chandler 10' deep. Cu 7.00

Cu 5%

in Sellers. water 6', low

35.00 2 gold 100%

Smiths Run, strike N 20° W

Sept 35, 1' 5' & 3% Cu

at 11 km north to 6', Area 5.00
Cu = 47

~~Augustine~~ ~~Bygn~~
was 20' up 75' up
edge 50' wa Cu 37

North Lytonia h.c. a c
side strike h.c. - S. slope
35', w 2' of an 4.00

3 many down w side
of all strike h.c. - S.W

Nepoleia, strike h.c.
edge 60' w 8'
Cu 37

Stellen. Small town

(old cap.) station W
20° W, on 2° - 4°.

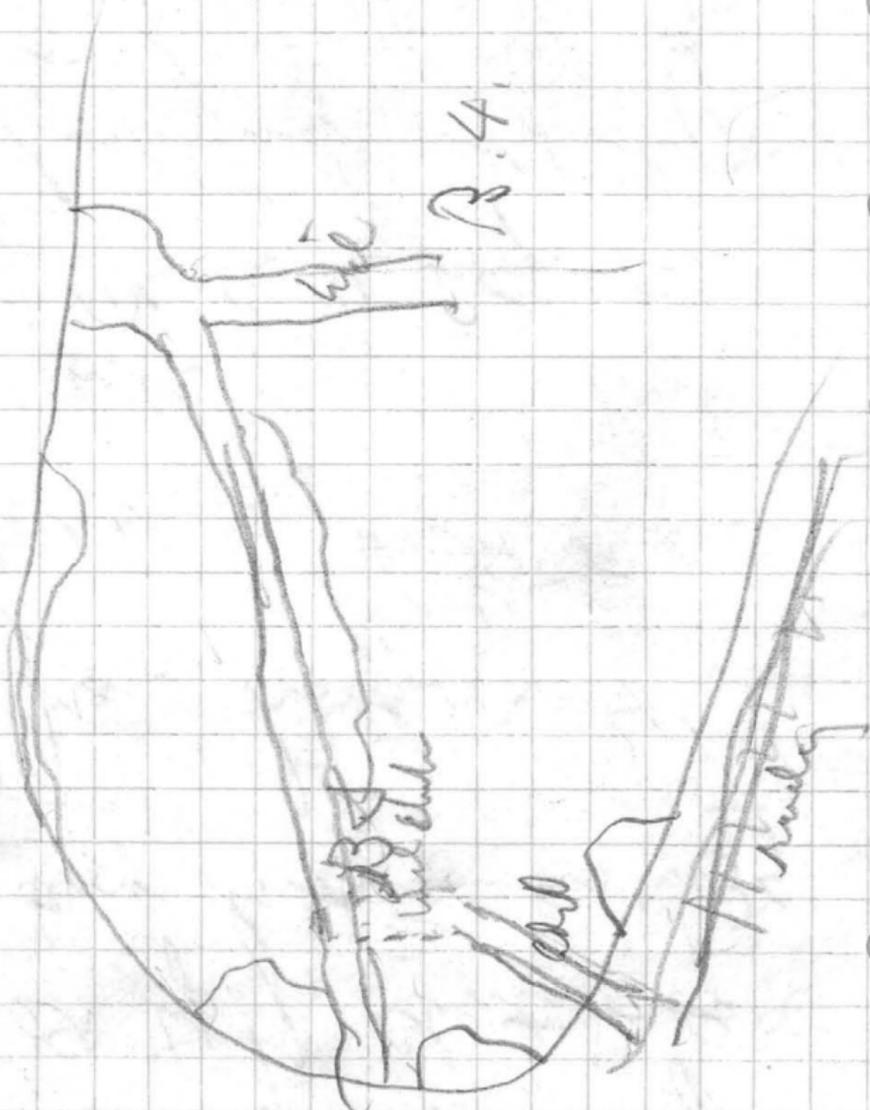
Line

North station. Card side
Station N.-S. slope 75°
V, 12' under

Gas meter 7', on
6.00, on 3%

Main gas of North station
& Portland, station
W 20° E., W 3'
on 3.00, on 5%

Janitor (top of stairs)
& stairs > 4'



took up 2003 case

I looked up
~~something~~

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From U.S.G.S. Bulletin 45-1.

FISSURE VEINS IN ANDESITE. by Howard Bancroft

1911

The deposit at Bullard Peak is the only one of this type which was examined. It occupies a simple fissure in augite-andesite. The vein varies in width from a few inches to 4 feet. The ore is chrysocolla, with which occurs some malachite, a little copper glance, and a small amount of cuprite. Quartz and calcite form the gangue. Some hematite was noted. The deposit is of Tertiary age.

BULLARD PEAK VICINITY

Location and Development:

The peak which is known throughout this part of Arizona as "Bullard's" is a small knob projecting about 300 feet above the desert. It is separated from the main mass of the Harcuvar Range by a shallow wash, which on the north seems to have followed the line of contact between the older underlying pre-Cambrian rocks and the comparatively young lava, of which a small remnant forms Bullard Peak.

This locality is in the Ellsworth or Harcuvar Mining District, on the extreme eastern border of the area under reconnaissance and is nearly 10 miles in a direct line a little east of north of Golden, where no railroad station is maintained. The town nearest Bullard's is Wenden, 21 miles southwest in an air line and about 25 miles by wagon road. Near Bullard Peak a company once known as the Yuma Copper Company* operated for a short time a small smelter and worked ore from prospects near by.

* Not to be confused with a company of the same name now operating north of Vicksburg.

Water is obtained from a well a short distance north-east. The prospects are located in the peak, near the top.

Various shallow inclined shafts have been sunk, and some drifting has been done. The property was idle when examined, and hence much information was not available. No machinery is installed and the work in the past has been done entirely by hand.

Geology:

The oldest rocks in the vicinity are of the pre-Cambrian granite gneiss schist complex, which forms the Harcuvar Range east of the peak called by that name. The dip southeast at angles varying from 15° to 30° and are overlain near their contact with the surrounding desert by the material which forms Bullard Peak. The base of this peak is a conglomerate about 75 or 100 feet thick, composed of fragments of various sorts, principally andesitic. On top of this is about the same thickness of tuff, and this is capped by a few feet of bluish-green and brown augite andesite, which in the field somewhat resembles basalt. Examination of thin sections fails to reveal any olivine, although the rocks may once have contained some. In this rock occur the ore deposits.

Ore Deposit:

The deposit occupies a simple fissure in augite andesite. This vein has a dip of about 45° in a southerly direction and varies in width from 18 inches up to 4 feet, the ore course having an average width of 6 inches, ranging up to 12 inches in places. Quartz and calcite form the gangue, the latter occurring

also in small stringers traversing the andesite in all directions. Some hematite was noted and epidote is present in places in the country rock. The principal ore mineral is chrysocolla, and with this occurs some malachite, a little copper glance, and a small showing of cuprite. The vein shows brecciation and subsequent cementation by siliceous material. The ore has probably been derived from chalcopyrite, and the deposit is clearly of Tertiary age.

(Letterhead)

AMERICAN SMELTING & REFINING COMPANY

P. O. Box 2229

Tucson, Arizona

January 21, 1943

Mr. J. P. Smith, President
Bullard Gold Mines, Inc.
404 Heard Building
Phoenix, Arizona

Dear Sir:

I understand that you are endeavoring to reopen the Bullard Mine, and we shall be glad to have you resume shipments to our Hayden Smelter. This gold-copper siliceous ore is desirable in our operation and helps to smelt the low silica copper ores which are unsatisfactory as converter flux.

If you start operation again, we can offer you a market for 500 to 1000 tons per month of siliceous fluxing ore under the same settlement terms applied on former shipments, or possibly improve these terms to some extent. This offer is made subject to your acceptance and resumption of operation within a period of ninety days from this date.

Yours very truly,

BRENT N. RICKARD.

February 19, 1943

Mr. J. P. Smith, General Manager
Bullard Gold Mines, Inc.
404 Heard Building
Phoenix, Arizona

Re: Bullard Mine

Dear Smith:

Excuse delay in forwarding you copy of letter from Rickard of the A. S. & R. Also I have made a copy of his pencil note which was attached to same.

This letter does not change the situation in respect to data prepared in order to obtain a Government loan but I think you can feel assured that a more favorable smelting rate will be granted if and when the property gets into production.

Let me know as soon as you hear anything further from the Government people and please be assured that I will do everything possible to help along with your application.

Sincerely,

A handwritten signature in dark ink, appearing to be 'W.C.', written in a cursive style.

GMC:cg

AMERICAN SMELTING AND REFINING COMPANY

SOUTHWESTERN ORE PURCHASING DEPARTMENT

810 VALLEY BANK BUILDING

P. O. BOX 2229

TUCSON, ARIZONA

February 3, 1943

BRENT N. RICKARD
MANAGER

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

BULLARD MINE, PIERCE MINING DISTRICT
YAVAPAI COUNTY, ARIZONA

Dear Mr. Colvocoresses:

I understand that there is a possibility of resuming operation of the Bullard Mine, in which event our smelter at Hayden, Arizona, under present conditions can offer a market for 500 to 1,000 tons per month of siliceous fluxing ore on purchase terms similar to our special schedule of July 1, 1940, with base charge \$2.50 per ton for values to \$15 per ton plus 10% of the excess over \$15 to a maximum base charge of \$5.00 per ton. A considerable tonnage of ore was shipped by Bullard Mines, Inc. under these terms.

If conditions permit and we are still in need of siliceous ore at the time shipments are resumed, it is possible that we could improve these terms. For example, on July 28, 1942, I offered Mr. R.B. Van Buskirk, Lessee at the Bullard Mine, a base charge of \$1.75 per ton for values to \$7.50 per ton. How long we could continue to apply such a rate would depend entirely upon our intake of siliceous fluxing ore.

I can assure you that as long as our Hayden Smelter is operating at present capacity the Bullard Mine siliceous ore will be acceptable and we will make the best rate possible. It is impossible for me to make a definite commitment at this time with no knowledge of what tonnage will be produced or when shipments will commence. You must understand that the terms I mention above depend upon resumption of operation with a reasonable period of time, say, ninety days. Otherwise it will be necessary to give the matter further consideration when the mine is ready to produce and shipments start.

Yours very truly,

Brent N. Rickard

BRENT N. RICKARD

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LEASE AND OPTION

This agreement made and entered into this 4th day of August, 1938, by and between R. W. BULLARD of Congress Junction, Arizona, party of the first part and hereinafter called the "Lessor", and Robt. M. Merrill and Florence A. Merrill of the Town of Wickenburg, Arizona, party of the second part and hereinafter called the "Lessees",

WITNESSETH:

First. The Lessor owns 27 patented mining claims in the Pierce Mining District of Yavapai County, Arizona, names as follows:

STATE, ARIZONA, DEMOCRAT, LOST BEAN, CONNECTION, STONEWALL, Lode mining claims, the U. S. patent for which is No. 043160, (Phoenix),

also,

BUTTE, NEVADA, JAY BIRD, VENICE, NAPOLEON, NEWBORN, CHANCELLOR, SOUTH WING, AUGUSTUS, SHULLA, NORTH EXTENSION, Lode mining claims, the U. S. Patent for which is No. Phoenix 043161.

also,

STELLAR, EMILY, NORTH STAR, RATTLER, HOME STAKE, SWEEP STAKE, WASHINGTON, PRODUCER, INTERNATIONAL, AVALANCHE, Lode mining claims,

the U. S. patent for which is No. 47162 and recorded in the office of the County Recorder of Yavapai County, Arizona, in Book 82 of Deeds, Pages 223, and 232,

also,

INTERVENER, Lode mining claims, unpatented, and recorded in the office of the County Recorder of Yavapai County, Arizona in Book 44 of Mines, Page 120,

also,

Certain water rights, and water, reserved to John C. Bullard, now deceased, in that certain deed of record in the office of the County Recorder of Yavapai County, Arizona, in Book 83 of Deeds at Page 260.

Second. In consideration of the sum of Ten Dollars (\$10.00) paid to the Lessor by the Lessees, together with other good and valuable consideration, the receipt of which is hereby acknowledged, the Lessor grants to the Lessees and the Lessees accept from the Lessor, the sole and exclusive right and option to mine and explore and to purchase the said mining claims as listed in first paragraph, together with water rights also mentioned, for the time and for the price and upon the terms and conditions herein stated.

Third. The Lessor grants to the Lessees the sole and exclusive and immediate possession of said mining claims, for the purpose of exploration and mining, and water rights, and the sole and exclusive option for six months (6) from the date hereof within which to explore the said mining claims and water-rights and within which to determine whether or not the Lessees will purchase the same for the price and upon the terms and conditions herein stated.

Fourth. This Lease and Option and all rights hereunder shall continue in full force and effect for a period of twenty (20) years, and thereafter, so long as gold or other metals are produced from the premises in sufficient quantity to pay to the Lessor the minimum royalty hereinafter specified, or such minimum royalty is paid by Lessees irrespective of the production, unless sooner terminated in some manner specified by the terms of this lease.

Fifth. The Lessees will pay for all labor done or material furnished in the exploration, operation and mining of said mining claims and will save the said mining claims free and harmless from any claim for any material furnished or labor done or performed on said mining claims.

Sixth. The Lessees agree that they will record, post and keep posted throughout the term of the Lease and Option the notice of non-liability provided for by Section 2029, Revised Code of

Arizona 1928, Civil Code, and all acts amending or supplementing the same.

Seventh. Should the Lessees at any time at or before the expiration of six months from the date hereof decide that they will exercise the option to purchase said mining claims, then they will give written notice of their decision to the Lessor, and will, except as hereinafter provided, purchase said mining claims for the price and upon the terms and conditions hereinafter stated.

Eighth. The purchase price of said mining claims is the sum of Seven Hundred, Fifty Thousand Dollars (\$750,000.00), and the Lessees shall pay to the Lessor as rent and royalty under the terms of this agreement, or Lease and Option, ten percent (10%) of the proceeds from the sale of all gold, copper or other precious metals recovered from the property, which said rents or royalties shall be based on the net smelter, mint or other returns, less only the cost of transportation and insurance, which said rent or royalty shall apply on the purchase price.

a. On January 1, 1939, the Lessees agree to pay to the Lessor as an advance on royalty payments, the sum of Two Hundred Dollars (\$200) and the sum of Two Hundred Dollars (\$200) to be paid to the Lessor on the first day of each and every month thereafter. The \$200.00 monthly payments of advance royalties are to be deducted from the Ten percent (10%) of

smelter returns to be made to the Lessor, when said royalties shall arrive at a point when $2\frac{1}{2}$ times the amount of the advance royalties shall be the monthly royalties paid to the Lessor and then such royalty advances shall be deducted on a basis of \$200.00 per month until the full amount of the advance royalties have been paid.

Ninth. Said royalty payments shall continue until the full sum of Seven Hundred, Fifty Thousand Dollars (\$750,000.00), without interest, has been paid. And it is agreed by the Lessees that by June 30, 1940 there will be a minimum royalty paid to the Lessor of not less than \$500.00 per month and the same amount for each and every month thereafter.

Tenth. All payments to be made for the Lessor shall be made at the First National Bank of Arizona at Phoenix, Arizona, Head Office, and the duplicate deposit receipt of said bank shall be due and sufficient evidence and receipt of any and all payments made by the Lessees to the Lessor.

Eleventh. The term "net recovery" as herein used means the net mint or smelter returns less cost of transportation and insurance.

Twelfth. Until the full purchase price has been paid pursuant to the terms hereof, the Lessor shall have the right to maintain on the premises a representative who shall be given full access to all productive mining operations of the Lessees at

all times, and the representative of the Lessees will give written notice of all shipments to the representative of the Lessor at Congress Junction, Arizona. Also, the Lessor will be furnished with a duplicate copy of each smelter or mint return during this period of time.

Thirteenth. In the event the representative of the Lessees should desire to cease operations and surrender possession of said mining claims to the Lessor, all machinery and equipment installed on the property on or before February 1, 1939, and belonging to those other than the Lessor, may be removed within a period of three months from the date of the decision to cease operations and shall relieve both parties of all obligations.

Fourteenth. Within sixty days (60) from the date hereof the Lessor will deposit with the First National Bank of Arizona at Phoenix, Arizona, Head Office, or some escrow agent mutually agreed upon, a good and sufficient warranty deed for the 27 patented mining claims and a quit-claim deed for the one unpatented mining claim; also title to any water rights which the Lessor may have which can be used for the working of this property, transferring and conveying to the Lessees the said mining claims and water rights, said deed or deeds shall be delivered by the escrow agent to the Lessees upon receipt for the account of the Lessor of the full purchase price of said mining claims as herein provided.

Fifteenth. Should the Lessees or their authorized representative decide to cease operations, they will deliver to the Lessor all maps and mining data showing the location of all prospect holes, shafts and tunnels together with whatever assay information there may be in regard to said prospect holes, shafts and tunnels.

Sixteenth. This Lease and Option and all rights acquired by the Lessees hereunder may be assigned, transferred or conveyed at any time and from time to time, without the consent of the Lessor, but upon the consent of the Lessor being obtained, the Lessees shall be relieved from all obligations arising after such assignment.

Seventeenth. The Lessees or their authorized representatives agree to pay the taxes, as they become due, as required by law, on the 27 patented claims and to do the annual assessment work on the one unpatented mining claim and water rights, on and after January 1, 1939, and while in possession of the property.

Eighteenth. It is further understood and agreed that no interest shall be paid on the deferred balance of the purchase price provided for herein, and that Lessees shall have the privilege of paying the entire purchase price of balance thereof at any time during the term of this agreement and shall thereupon be entitled to the deed and bill of sale covering the mining claims.

Nineteenth. In the event the Lessees give notice of their exercise of said option, as heretofore provided, then, unless

and until this agreement shall be terminated as heretofore provided, they shall retain the sole and exclusive possession of the said mining claims and shall mine the same in such manner as in their sole discretion they may deem proper and for the best interests of the parties hereto.

Twentieth. The sole remedy of the Lessor in the event of default of Lessees shall be to terminate this agreement and retake the property herein described, save and except personal property placed thereon by Lessees, and Lessor shall retain all monies paid under the terms of this agreement as liquidated damages.

Twenty-one. This agreement shall be binding on the heirs, administrators, successors and assigns of the respective parties hereto.

Twenty-two. Time is of the essence of this agreement and of every part thereof..

IN WITNESS WHEREOF, the Lessor and the Lessees have hereunto set their hands and seals on the day and year first above written and in the presence of each other..

(Signed) R. W. Bullard
Lessor

(Signed) R. M. Merrill

(Signed) Florence A. Merrill
Lessees

State of Arizona)
) SS
County of Maricopa)

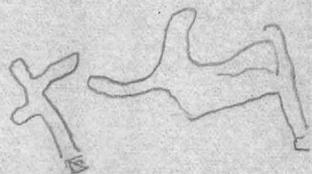
The foregoing instrument was acknowledged before me,
a Notary Public, by R. W. Bullard, on the 5th day of August
A.D. 1938.

(Signed) Genevieve M. Hutchinson
Notary Public

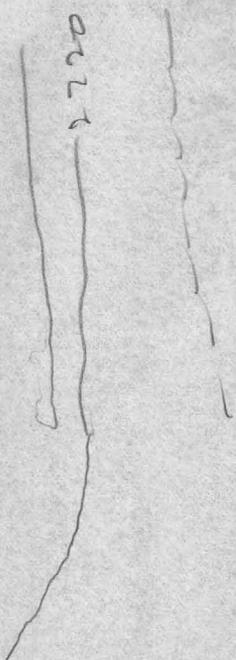
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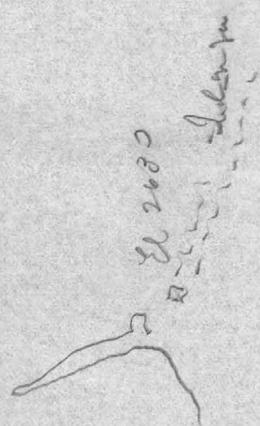
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June 10/13

Home



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October 1939

REPORT ON BULLARD MINE

J. P. Smith, President
Bullard Gold Mines Co.
Heard Building
Phoenix, Arizona

Dear Sir:

Gentlemen

I beg to submit the following report on the Bullard Mine together with Appendix and Exhibit A to which last reference is made in the body of this report and in the Appendix.

PROPERTY, LOCATION, AND GENERAL CONDITIONS.

The property now held by your company under lease from the owner with option to purchase consists of twenty-seven patented and one unpatented lode mining claims, about 560 acres, located in the Pierce Mining District, Yavapai County, Arizona.

The main workings are reached by nine miles of good desert road from Aguila, a small town on the Parker Cutoff Branch of the Santa Fe Railroad. The elevation is from 3000 to 3300 feet above sea level and the surface is barren, rough and rocky with very scant vegetation and no timber.

The claims lie on and around Bullard Peak, which is a 300' hill south of the eastern end of the Harcuvar Range of Mountains.

Domestic water is obtainable from shallow wells sunk in the washes both north and south of Bullard Peak, but any

supply adequate for milling purposes would have to be obtained from wells sunk in the valley south of the claims. It is reported that an ample supply could thus be obtained some four miles from the mine and pumped from a depth of 300 feet below the surface, say 400' below the probable location of a mill.

The climate while hot in summer is entirely suitable for both surface and underground operations at all seasons of the year, the mean annual rainfall is about nine inches, snow is rare but during the winter nights a temperature of five to ten degrees below freezing is fairly common.

^{In normal times the}
The labor supply is plentiful by reason of the nearness of the property to various other mining districts and the Salt River Valley.

All supplies must be hauled from the railroad at ^{Agua} ~~Salome~~ or trucked directly from Phoenix, 85 miles distant.

No electrical power is available locally, although this condition may change at some future date.

GEOLOGY AND ORE OCCURRENCE.

The Harcuvar Range and vicinity are mostly composed of pre-Cambrian granite, gneiss, and schist, with some intrusions of porphyry.

At and near Bullard Peak these are overlain by conglomerate, andesite, tuff, limestone, quartzite, and basalt, in which are found the various ore bearing veins.

The main vein (Home Group deposit) lies between two phases of augite-andesite (probably ^{age} Tertiary) some of which closely resembles a basalt while the other veins are mostly found in similar andesite, conglomerate or limestone. A detailed

description of some of these is to be found in the attached exhibits, but ^{many} most of the veins have been prospected only near the surface or are developed by old shafts and workings which are not accessible at present.

All of the veins appear to be fault or contact fissures in which the ore is associated with a brecciated gangue of quartz, calcite, and hematite and occurs mainly in the form of copper silicate (chrysocolla) and to a lesser extent as copper carbonate and oxide while copper and iron sulphide appear to come in as depth is gained. The gold is free but in very fine particles, while the character of the small amount of silver does not appear to have been determined.

The ore appears to me to have originally been deposited as a sulphide by circulating solutions during the Tertiary period and later oxidised near the surface and sometimes to a considerable depth.

There is no basis for estimating the character of value of the ore below the present accessible and comparatively shallow workings, but it is my opinion that copper values will probably tend to increase and gold values to diminish and this is borne out by the observations of McConnell and by one of my samples of sulphide which is believed to have been mined at a depth of some 200' in the deepest of the old shafts. This assayed gold 0.08 oz., silver 0.7 oz., and copper 6.82%-- a gross value of ~~\$20.00~~ ^{25.80} per ton at present ^{prices} of these metals.

DEVELOPMENT:

The surface outcrop of the main or Home Group vein

is exposed on three sides of Bullard Peak. It has a dip of 30 to 45 degrees and has been followed down by trenches, cuts, adits, and shafts at numerous points and from many of these small tonnages of ore have been mined and shipped.

At the Quail's Nest three old and one recent shafts have opened up the vein to a maximum depth of 100' on the inclined and at the C. Tunnel considerable development has been done at a depth of 60 to 90^{feet}/below the surface.

The shafts near the old smelter site and the still older shafts on the Intervena Claim are said to have been sunk to depths of from 60 to 300 feet and at numerous other points shallower shafts or adits have opened up ore in some seven different veins while trenches and pits have been made on the outcrops of several others.

Altogether it appears that over ⁶3000 feet of development work has been done on this property since it was first discovered by John Bullard in 1868, but this has been so widely scattered and of such a desultory character that practically *very little* no ore can be classed as positive and only the tonnage which nature has largely developed on Bullard Peak and small tonnages at the Quail's Nest, C. Tunnel, and elsewhere can be classed as probable.

The very careful and accurate work of the competent engineers who examined the mine for the A. S. & R. and the El Tigre Companies resulted in conservative estimates of the tonnage and value of the probable ore in the Home Group and these I accept as absolutely reliable, for when two groups of engineers representing large mining companies check so closely as in the present case a further confirmation seems wholly

unnecessary and their procedure could not be repeated at a cost of less than \$3000.00. Since these reports were made a total of not more than 2000 tons of ore had been mined from the showings which they sampled and measured, all of which showings I have carefully inspected, although I have not personally done any systematic sampling.

Analysing these previous reports as well as those of other engineers I conclude that in the Home Group deposit there remains a developed probable tonnage of 22,000 and a further probable but less completely developed tonnage of 25,000. To this I feel justified in adding 3000 tons of ore at the Quail's Nest and 10,000 tons in the Tunnel C. Vein and various other veins on which a certain amount of accessible developments makes an estimate possible. We thus have a total of 60,000 tons of highly probable and reasonably probable ore of which the average assay, based on the A. S. & R., and El Tigre sampling, may be computed as gold 0.2 oz., silver 0.5 oz., copper 2.50%, thus having a gross value of \$13.60 per ton at present prices of metals.

For reasons which I shall give later in this report it seems proper to segregate the higher grade ore, which I shall term "shipping ore" from the lower grade or "milling ore" and in actual mining practice I believe that it will prove both possible and advantageous to mine and ship crude to the smelter some 12,000 tons of this reserve with an average value of \$20.00 per ton while the remaining 48,000 tons with average value of \$12.00 per ton should be treated in a local concentrator.

As to the additional tonnage and value of possible or expectant ore this is anybody's guess, but while the engineers

representing prospective purchasers of the property very properly confined their estimates to the partially developed ore in the Home Group only I have been much impressed with the attractive showings on other portions of the property, and I do not hesitate to express an opinion that at least an additional 40,000 tons of similar grade material can be developed and mined on these claims and should it prove that the width and values in the veins hold strong with depth there is every reason to expect that this figure will be greatly increased.

COSTS AND PROFITS.

Taking as a basis the average grade of the developed ore with gross value of \$13.60 per ton and your present charges for freight and trucking and contract with the Hayden Smelter (effective since the recent reduction in treatment charge) I am forced to conclude that your total charges, costs and deductions from this gross value now amount to very nearly \$14.00 per ton and that you are actually losing ^{money in} mining and shipping this grade of ore.

This statement is based on the following calculations:

Deductions and charges of smelter	Charges per ton
For 0.2 gold with gross value of \$7.00 per ton you are actually paid \$6.46.	\$0.64
For 0.50 oz. silver with gross value 35¢ you are actually paid nothing.	.35
For 50¢ copper with gross value \$6.25 you are actually paid \$3.96	2.29
The smelter toll charge is	1.50
The railroad freight of \$2.40 per wet ton is equivalent to about \$2.55 with allowance for average moisture.	2.55
You pay the trucker \$1.00 per wet ton, or say \$1.05 with allowance for moisture	1.05

Total transportation & smelting charges & deductions are thus	\$9.38

	Charge per ton
Your net returns for one ton of this ore with gross value of \$13.60 are \$5.22 on which you pay a royalty of 10% to owner.	\$0.52
To these costs and charges must be added your development and mining costs, which I have been given to understand will average about	4.00
and your overhead and Phoenix office expense, insurance, accounting, taxes, etc., which while you operate on the present small scale can hardly be less than	1.00
	<hr/>
Total of all expenses	\$13.90

In a separate memo I have recently suggested certain changes and economies including the reductions in trucking and freight charges which you already have in mind that may result in a reduction of about \$1.32 per ton in transportation and smelting costs, and I believe that an additional saving of at least \$1.00 can be made in the mining and general overhead after you have expended a certain amount of money for improvements and development at the mine, and increased your present rate of production, but I doubt if you will ever be able to reduce the total costs to less than \$11.50 per ton and believe that your future policy should be shaped on the assumption that your present costs are close to \$14.00 and that \$11.50 will be an ultimate minimum/shipping ore.

Therefore with due regard to the legitimate profits which every mining investment should return to the investors, and which it must return if that investment is to be reasonably profitable, I strongly recommend that every effort be made to mine and ship only the higher grade of ore which should in all cases have a gross value of over \$15.00 per ton and actually should approach, as I believe it can, an average of \$20.00 per ton.

METALLURGICAL TREATMENT

In view of the fact that only about 20% of the ore now partially developed or likely to be developed appears to have a sufficient value to permit profitable shipping it becomes most important to complete the study of the metallurgy of the ore, which was begun by the El Tigre, the Western Metallurgical Co. and others. A successful concentration of this ore at or near the mine should result in the recovery of over 90% of all values in gold, silver, and copper at a reasonable expense and put these metals either in the form of rich concentrates or in products that can be cheaply marketed without recourse to a smelter.

This is not a simple or easy problem for most of your copper is in the form of a silicate for which ordinary flotation is not suitable while the gold ~~and silver~~ will not leach with acid and the presence of copper rules out the cyanide process.

Since the gold appears to be free and a high recovery can be made by amalgamation it may prove best, as believed by the El Tigre Co., to first amalgamate the ore after suitable crushing and then to leach the copper from the tailings with subsequent precipitation on scrap iron or by electrolysis. An alternative plan might be to save a large percentage of the gold in jigs of the Denver or Pan American Type and still another procedure might be found in chloridizing volatilization which made an excellent recovery in the laboratory tests and has the advantage of being a dry process.

I am perfectly satisfied that modern metallurgical practice can satisfactorily solve this problem, but before any definite estimates or statements can be made a complete

series of tests should be carried on by competent metallurgists and these should be started just as soon as your finances will permit.

FUTURE DEVELOPMENT OF MINE.

Since it is evident that a substantial capital expenditure will have to be made to provide an efficient mining and milling plant, regardless of the method of concentration which may be adopted, I feel that it is of the utmost importance to first positively develop or put in sight a sufficient tonnage of pay ore to properly justify such an outlay and to accomplish this I recommend that a program of scientific mining exploration and development should be laid out and started as quickly as possible.

Fortunately the natural conditions are such that much of this work on the Home Group suggests itself and can be accomplished at comparatively small expense and with an attendant production of some ore, but I feel that several of the old shafts should also be examined and a certain amount of drifting and other work done to permit an estimate of partially developed ore in those sections of the property.

I think that an appropriation of at least \$25,000 should be made for this work through the expenditures of which I should hope that we would then be able to estimate at least 100,000 tons of average grade ore as positive or reasonably probable.

CAPITAL EXPENSE.

Under present conditions and until the development work has proved up a substantial tonnage of positive ore and the method of treatment has been definitely determined it would

obviously be premature to attempt any detailed estimate of the capital investment which will be required to place this property on the most efficient basis of operation, but the following tentative and liberal estimate is made on the basis of such facts as we now possess and the assumption that the development work suggested above will prove up a ^{total} reserve of 100,000 tons of ore of which about 20,000 can best be shipped crude to the smelter while 80,000 tons should be treated in a 75 ton concentrator.--Preliminary working capital to be

obtained as quickly as possible.	\$5000.00
Development fund	25000.00
Metallurgical experiments & tests	2000.00
Mining equipment essential for mining about 100 tons of ore per day and maintaining current development, also improvement to camp buildings, roads, etc.	30000.00
75 ton concentrating mill including water supply, etc.	63000.00
Working capital and incidentals	<u>25000.00</u>
	\$150,000.00

I have given considerable thought to the tonnage which can be most economically mined and milled and believe that the treatment plant should probably be best designed to handle about 75 tons per day. This could be so built that its capacity could later be increased to 100 tons at a comparatively small additional expense.

FUTURE OPERATING COSTS AND RETURNS:

During the period prior to the completion of the mill it is assumed that the returns from the shipments to the smelter will more than cover the costs of mining and shipping the high grade ore, but before the mill has been tuned up for steady operation it will be necessary to prepare the mine for

the larger output and also to accumulate a substantial reserve of broken ore in the stopes, for this purpose it will be necessary to draw on the working capital.

Once the mine and mill are in steady operation I anticipate that about 90 tons of ore will be broken daily, of which 15 tons of high grade will be shipped crude and the balance sent to the mill. On this basis I make the following tentative estimates of costs and returns, using present transportation and smelter charges, etc., in respect to the shipping material, although I believe that these can be reduced as previously suggested.

Costs and return on shipping ore--assumed to represent 15 tons per day with gross value \$20.00 per ton.

	Charges per ton.
General and overhead	\$0.50
Mining and sorting	4.00
Hauling and freight with allowance for moisture	3.60
Smelter toll charge	1.50
" deductions on assumed value	4.00
Royalty to owner	<u>1.10</u>
Total charges	\$14.70
Net profit to Company	5.30

Costs and return on milling ore with estimated gross value of \$12.00 per ton, 75 tons per day.

	Charges per ton
General and overhead	\$0.50
Mining & current development	3.00
Milling, including transportation to mill etc.	2.00
Marketing concentrates and/or bullion and copper precipitate.	1.00

Loss in milling, 10% of gross value	Charge per ton \$1.20
Royalty to owner	<u>.80</u>
Total charges & Deductions	\$8.50
Net profit to Company	3.50

On the above Basis the daily profit of the operations should be 15 x 5.30 and 75 x 3.50, equals \$342.00; or after making due time allowance for shut downs, repairs, etc. (which are included in the estimated costs) the net profit before deductions for depreciation, amortization, and income taxes should be close to \$9000.00 per month or say \$100,000 per annum.

Putting it in another way the mining and treatment of the 100,000 tons of ore mentioned above will be completed in less than four years, yielding a profit as above of about \$386,000, which would serve to return the original investment plus a profit of well over 100%.

The further profits that may be realized by the Bullard Co. must thereafter depend upon the tonnage and grade of new ore which may be discovered and developed during this period and thereafter, and in this regard I can only say that it is my opinion that ^{there} are excellent chances that additional pay ore will be found and in sufficient quantity to permit a continuance of profitable operations over many years to come.

The above report is written on the supposition that the recommended development and the further development carried on concurrently with the mining will definitely prove up a minimum of 100,000 tons of ore of the average grade now indicated.

This is, I believe, a justifiable assumption but it

is not yet a proven fact and should this preliminary work result in substantial disappointment all of my calculations will require revision and in all probability a smaller capital investment will be required and a smaller return can be expected.

Market prices for the metals are also factors of prime importance and my calculations are all made on the basis of present prices--gold @ \$35.00 per oz., silver @ \$.71 per oz., and copper @ 12.50¢ per lb. A continuation of the present price of gold seems to be well assured and the amount of silver in the ore is so small that even a drop to 40 cents would reduce the estimated profits by less than 15¢ per ton. However every fluctuation of 1¢ per lb. in the price of copper will increase or decrease the estimated profits by over 40¢ per ton and while I believe that there are good prospects that a satisfactory market will maintain during the next four or five years this cannot be guaranteed and can at best be assumed as only a reasonable probability.

Under these circumstances I believe that it would be prudent and proper financial policy to provide at the present time only about \$50,000 to cover the cost of the development, metallurgical tests and present requirements, also some expenditure for additional mining equipment, camp buildings, etc., and to arrange to secure the additional \$100,000 only if and when the development work has progressed to such an extent that the existence of the ore reserve which will properly justify the construction of the mill and larger scale operations has been definitely assured.

As things stand today I can very definitely recommend the investment of the first \$50,000.00 as an extremely

attractive mining venture, and I fully believe that within the course of the next six or eight months I shall be able to recommend the expenditure of the additional \$100,000 as an even more attractive and safer mining investment.

Yours very truly,

G. M. Colvocoresses

G. M. Colvocoresses

APPENDIX TO BULLARD REPORT.

I have examined the 20 year Lease and Option from R. W. Bullard under which the Bullard Gold Mines Co. are operating, the same being dated August 4th, 1938.

I understand that this instrument has been approved by competent attorneys and from the standpoint of a mine operator I consider it to be extremely fair and liberal to the Lessee.

The minimum monthly royalty payment which is now \$200.00 will be increased to \$500.00 in June of 1940 and while I hardly anticipate that your program of development will be completed and your mill in regular operation by that date such a condition should be reached very soon thereafter if the financial program which I have recommended can promptly be made effective. In any case the normal 10% royalty on regular increased shipments of high grade ore should then very nearly equal the larger minimum payments.

In reference to the Engineers' Reports which are attached as Exhibits A. to H. (inclusive) it appears likely that Norris and Durfee made their examinations for the owner or some one of his associates. I personally know nothing of either of these men but Durfee seems to have done a fairly thorough job, although his estimates of tonnage seem too large and his samples show erratic values, some of which were not checked by the later examinations.

Kruttschmidt, Stockder, Michler and McConnell are all men of ability and excellent reputation; their samples

and measurements were evidently taken with great care and their estimates and conclusions are decidedly conservative.

It is reliably reported that following these respective examinations both the A. S. & R. and the El Tigre Companies were willing and anxious to proceed further with negotiations and were disposed to make any reasonable deal with the owners. In this connection it must be remembered that at all times prior to 1935 the value of gold was only \$20.66 per oz. and a content of 0.2 oz. of gold was then worth only \$4.13 instead of \$7.00 as it is today. However the price of copper was generally higher than it is at present.

The shipments made by Long (Exhibit I) were selected ore such as I advocate shipping crude to the smelter. However his work may be described as "gutting the mine" and it left one small section of the property in poor condition for the present operators.

The grade of shipments made by the Bullard Co. has suffered by reason of the fact that no proper preparations were made in advance, that the grade of the ore was not determined before it was mined, and that there was no competent supervision over the miners. These faults have recently been partially corrected and the availability of a small working capital should make it possible to substantially increase the grade of all future shipments to the smelter from whom a very favorable treatment charge is now obtained.

Prior to actually commencing the development of your veins or even establishing a definite program for such work I consider it vitally important to make a large scale

topographical survey map of the best mineralized portions of the claims with 20' contour intervals. On this map there should be plotted the location, dip and strike of all of the principal veins, the pits and trenches along their outcrops and the shafts, tunnels, and other mine workings, and in so far as possible the assays of all samples taken during the previous investigations and your present work should be posted.

From such a map one will be able to judge the relative possibilities of the various ore showings and plan the subsequent development in such a manner as to prove up the maximum tonnage of ore at the least expense.

The cost of this survey and mapping has been included in my estimate for development and it will be very desirable to start it with the least possible delay.

J. H. Colman

Bullard Exhibits to accompany report of G. M. Colvocoresses
October, 1939.

Exhibit A. Copy of Report by E. C. Norris, January 10, 1901. (3)

Exhibit B. Copy of report by E. W. Durfee, no date, but probably prior to 1917; a copy of the assay map which accompanies the report is already in your possession. 0

✓ Exhibit C. Copy of report to me by L. F. S. Holland, October 14th, 1917. 3

✓ Exhibit D. Copy of report made to me by W. F. DeCamp, September 30th, 1919. 3

✓ Exhibit E. Copy of report by J. V. McConnell, made for El Tigre Co. April 18th, 1931, with description of samples taken. 3

✓ Exhibit F. Extracts from letters by J. V. McConnell to G. M. Colvocoresses. 3

✓ Exhibit G. Extract from letter by Brent N. Rickard, Manager of American Smelting, & Refining Co. in Tucson to G. M. C. 3

Exhibit H. Assay Maps of main workings (Home Group) prepared by Stockder and Kruttschmidt of A. S. & R., and confirmed by El Tigre Co. Engineers.

✓ Exhibit I. Record of Shipments from Bullard Mine by George Long, Lassen, in 1937. 3

✓ Exhibit J. Record of Shipments of Bullard Gold Mines. February to September 22nd, 1939. 3

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA
IN AND FOR THE COUNTY OF YAVAPAI

In the Matter of the Estate of RICHARD }
W. BULLARD, Deceased } No. 4369
ORDER

Upon reading and filing the verified petition of Mary Cannon, Executrix of the last will and testament of Richard W. Bullard, deceased, and having heard the evidence submitted by petitioner in support of said petition, it is

ORDERED, ADJUDGED AND DECREED that, as of the 5d day of July, 1942, the total purchase price under that certain lease and option dated August 4, 1938, between Richard W. Bullard (now deceased) and Bullard Gold Mines, Inc., a corporation, covering the following described mining claims situate in the Pierce Mining District, Yavapai County, Arizona, to-wit:

STATE, ARIZONA, DEMOCRAT, LAST BEAN, CONNECTION, STONEWALL, Lode mining claims, the U. S. Patent for which is No. 043160 Phoenix;

BUTTE, NEVADA, JAY BIRD, VENICE, NAPOLEON, NEWBORN, CHANCELLOR, SOUTH WING, AUGUSTUS, SULLA, NORTH EXTENSION, Lode mining claims, the U. S. Patent for which is No. Phoenix 043161;

STELLAR, EMILY, NORTH STAR, RATTLER, HOME STAKE, SWEEP STAKE, WASHINGTON, PRODUCER, INTERNATIONAL, AVALANCHE, Lode mining claims, the U. S. Patent for which is No. 47162, recorded in the office of the County Recorder of Yavapai County, Arizona, in Book 82 of Deeds, pages 223 and 232;

INTERVENER Lode mining claims, unpatented, and recorded in the office of the County Recorder of Yavapai County, Arizona in Book 44 of Mines, page 120;

Certain water rights and water reserved to John C. Bullard, now deceased, in that certain deed of record in the office of the County Recorder of Yavapai County, Arizona in Book 83 of Deeds at page 260.

be reduced to the sum of Two Hundred Thousand Dollars (\$200,000), and the monthly payments required under said lease and option be

reduced, as of the 3d day of July, 1942, to Three Hundred Dollars (\$300.00) until such time as 10% of the net returns as provided in said lease and option shall exceed Three Hundred Dollars (\$300.00) monthly, whereupon the minimum monthly payments shall be Five Hundred Dollars (\$500.00); and that all of the other terms and conditions of said lease and option shall remain unchanged.

DONE IN OPEN COURT this 28th day of July, 1942.

Richard Lemson
J U D G E

Filed: 2:50 O'clock P. M.
July 28, 1942
Kitty C. Aitken, Clerk
By: Emma Shull, Deputy

IN THE SUPERIOR COURT OF YAVAPAI COUNTY
State of Arizona

State of Arizona
County of Yavapai -- ss.

I, KITTY C. AITKEN, Clerk of the Superior Court of Yavapai County, State of Arizona, do hereby certify and attest the foregoing to be a full, true and correct copy of the:

ORDER of July 28, 1942, In the Matter of
the Estate of RICHARD W. BULLARD, Deceased
No. 4369

as the same appears of record in my office.

IN WITNESS WHEREOF, I have hereunto
set my hand and affixed the Seal of
said Superior Court at Prescott,
this 28th day of July, A. D., 1942.

KITTY C. AITKEN

Clerk, Superior Court

By: Emma Shall, Deputy

BULLARDActual & Estimated Returns based on three Typical Shipments

	A. Lot 5 (Low grade)	B. Lot 16 (Med. grade)	C. Lot 46. (High grade)
Gold	0.12	0.28	0.44
Silver	0.20	0.30	0.58
Copper	2.28	2.18	2.47
Gross value per ton	* 8.90	* 14.37	* 20.75
Total payments by smelter per ton	4.35	8.55	14.56
Deduct freight & royalty	2.50	3.35	3.96
Net payments to Company	1.85	5.20	10.60
Deduct estimated cost of mining, trucking & manage- ment.	4.00	4.00	4.00
Net profit to Company	----	1.20	6.60
Net loss to Company	2.15	----	----

If same ore should be milled on ground and mined in a scientific manner at rate of 50 tons per day:

Gross value	8.90	14.37	20.75
Recovered value, estimated @ 90%.	8.00	12.93	18.67
Deduct cost of milling & mar- keting, (estimated @ \$2.50) and royalty	3.30	3.80	4.37
Net payments to Company	4.70	9.13	14.30
Deduct cost of mining & management & transportation	3.00	3.00	3.00

	A. Lot 5. (Low grade)	B. Lot 16 (Med. grade)	C. Lot 46 (High grade)
Net profit to Company	1.70	6.13	11.30
Net gain to Company as compared with present practice.	3.85	4.93	4.70

Gold figured @ \$35.00 per oz.
 Silver @ 71¢.
 Copper @ 10¢.

Assuming B. to represent the average grade of ore in the mine the advantage of milling instead of shipping would be nearly \$5.00 per ton and the expected profit on this grade of ore would be \$6.00 per ton in round figures.

If the mine should first or later be sufficiently developed to permit operating a 100 ton mill, the mining and milling and other costs should be reduced by about \$1.00 per ton from the above estimate and the profit on this grade of ore would be about \$7.00 per ton.

R E P O R T

ON

THE BULLARD MINE

BY

G. M. Colvocoresses

October
1939

GEORGE M. COLVOCORESSES
MINING AND METALLURGICAL ENGINEER
1102 LUHRS TOWER
PHOENIX, ARIZONA

October, 1939

REPORT ON BULLARD MINE

Mr. J. P. Smith, President
Bullard Gold Mines Company
Heard Building
Phoenix, Arizona

Dear Sir:

I beg to submit the following report on the Bullard Mine together with Appendix and Exhibit A to which last reference is made in the body of this report and in the Appendix.

PROPERTY, LOCATION, AND GENERAL CONDITIONS:

The property now held by your company under lease from the owner with option to purchase consists of twenty-seven patented and one unpatented lode mining claims, about 560 acres, located in the Pierce Mining District, Yavapai County, Arizona.

The main workings are reached by nine miles of good desert road from Aguila, a small town on the Parker Cut-off Branch of the Santa Fe Railroad. The elevation is from 3000 to 3300 feet above sea level and the surface is barren, rough and rocky with very scant vegetation and no timber.

The claims lie on and around Bullard Peak, which is a 300' hill south of the eastern end of the Harcuvar Range of Mountains.

Domestic water is obtainable from shallow wells sunk in the washes both north and south of Bullard Peak, but any supply adequate for milling purposes would have to be obtained from wells sunk in the valley south of the claims. It is reported that an ample supply could thus be obtained some four miles from the mine and pumped from a depth of 300 feet below the surface, say 400' below the probable location of a mill.

The climate while hot in summer is entirely suitable for both surface and underground operations at all seasons of the year, the mean annual rainfall is about nine inches, snow is rare but during the winter nights a temperature of five to ten degrees below freezing is fairly common.

The labor supply is plentiful by reason of the nearness of the property to various other mining districts and the Salt River Valley.

All supplies must be hauled from the railroad at *Aguila* ~~Salome~~ or trucked directly from Phoenix, 85 miles distant.

No electrical power is available locally, although this condition may change at some future date.

GEOLOGY AND ORE OCCURRENCE:

The Harcuvar Range and vicinity are mostly composed of pre-Cambrian granite, gneiss, and schist, with some intrusions of porphyry.

At and near Bullard Peak these are overlain by conglomerate, andesite, tuff, limestone, quartzite, and basalt, in which are found the various ore bearing veins.

The main vein (Home Group deposit) lies between two phases of augite-andesite,- probably Tertiary,- some of which closely resembles a basalt while the other veins are mostly found in similar andesite, conglomerate or limestone. A detailed description of some of these is to be found in the attached exhibits, but most of the veins have been prospected only near the surface or are developed by old shafts and workings which are not accessible at present.

All of the veins appear to be fault or contact fissures in which the ore is associated with a brecciated gangue of quartz, calcite, and hematite and occurs mainly in the form of copper silicate (chrysocolla) and to a lesser extent as copper carbonate and oxide while copper and iron sulphide appear to come in as depth is gained. The gold is free but in very fine particles, while the character of the small amount of silver does not appear to have been determined.

The ore appears to me to have originally been deposited as a sulphide by circulating solutions during the Tertiary period and later oxidized near the surface and sometimes to a considerable depth.

There is no basis for estimating the character or value of the ore below the present accessible and compara-

tively shallow workings, but it is my opinion that copper values will probably tend to increase and gold values to diminish and this is borne out by the observations of McConnell and by one of my samples of sulphide which is believed to have been mined at a depth of some 200' in the deepest of the old shafts. This assayed gold 0.08 oz., silver 0.7 oz., and copper 6.62%--a gross value of \$20.00 per ton at present prices of these metals.

DEVELOPMENT:

The surface outcrop of the main or Home Group vein is exposed on three sides of Bullard Peak. It has a dip of 30 to 45 degrees and has been followed down by trenches, cuts, adits, and shafts at numerous points and from many of these small tonnages of ore have been mined and shipped.

At the Quail's Nest three old and one recent shafts have opened up the vein to a maximum depth of 100' on the incline and at the C. Tunnel considerable development has been done at a depth of 60 to 90 feet below the surface.

The shafts near the old smelter site and the still older shafts on the Intervena Claim are said to have been sunk to depths of from 60 to 300 feet and at numerous other points shallower shafts or adits have opened up ore in some seven different veins while trenches and pits have been made on the outcrops of several others.

Altogether it appears that over 5000 feet of development work has been done on this property since it was first discovered by John Bullard in 1868, but this has been so widely scattered and of such a desultory character that practically no ore can be classed as positive and only the tonnage which nature has largely developed on Bullard Peak and small tonnages at the Quail's Nest, C. Tunnel and elsewhere can be classed as probable.

The very careful and accurate work of the competent engineers who examined the mine for the A. S. & R. and the El Tigre Companies resulted in conservative estimates of the tonnage and value of the probable ore in the Home Group and these I accept as absolutely reliable, for when two groups of engineers representing large mining companies check so closely as in the present case a further confirmation seems wholly unnecessary and their procedure could not be repeated at a cost of less than \$3000.00. Since these reports were made a total of not more than 2000 tons of ore had been mined from the showings which they sampled and measured, all of which showings I have carefully inspected, although I have not personally done any systematic sampling.

Analyzing these previous reports as well as those of other engineers I conclude that in the Home Group deposit there remains a developed probable tonnage of 22,000 and a

further probable but less completely developed tonnage of 25,000. To this I feel justified in adding 3000 tons of ore at the Quail's Nest and 10,000 tons in the Tunnel C. Vein and various other veins on which a certain amount of accessible developments makes an estimate possible. We thus have a total of 60,000 tons of highly probable and reasonably probable ore of which the average assay, based on the A. S. & R., and El Tigre sampling, may be computed as gold 0.2 oz., silver 0.5 oz., copper 2.50%, thus having a gross value of \$13.60 per ton at present prices of metals.

For reasons which I shall give later in this report it seems proper to segregate the higher grade ore, which I shall term "shipping ore" from the lower grade or "milling ore" and in actual mining practice I believe that it will prove both possible and advantageous to mine and ship crude to the smelter some 12,000 tons of this reserve with an average value of \$20.00 per ton while the remaining 48,000 tons with average value of \$12.00 per ton should be treated in a local concentrator.

As to the additional tonnage and value of possible or expectant ore this is anybody's guess, but while the engineers representing prospective purchasers of the property very properly confined their estimates to the partially developed ore in the Home Group only I have been much impressed

with the attractive showings on other portions of the property, and I do not hesitate to express an opinion that at least an additional 40,000 tons of similar grade material can be developed and mined on these claims and should it prove that the width and values in the veins hold strong with depth there is every reason to expect that this figure will be greatly increased.

COSTS AND PROFITS:

Taking as a basis the average grade of the developed ore with gross value of \$13.60 per ton and your present charges for freight and trucking and contract with the Hayden Smelter (effective since the recent reduction in treatment charge), I am forced to conclude that your total charges, costs and deductions from this gross value now amount to very nearly \$14.00 per ton and that you are actually losing money in mining and shipping this grade of ore.

This statement is based on the following calculations:

<u>Deductions and charges of smelter</u>	<u>Charges per ton</u>
For 0.2 gold with gross value of \$7.00 per ton you are actually paid \$6.46	\$ 0.64
For 0.50 oz. silver with gross value 35¢ you are actually paid nothing.	.35
For 50# copper with gross value \$6.25 you are actually paid \$3.96	2.29
The smelter toll charge is:	1.50
The railroad freight of \$2.40 per wet ton is equivalent to about \$2.55 with allowance for average moisture.	2.55
You pay the trucker \$1.00 per wet ton, or say \$1.05 with allowance for moisture	<u>1.05</u>
Total transportation & smelting charges & deductions are thus	\$8.38

	<u>Charge per ton</u>
Your net returns for one ton of this ore with gross value of \$13.60 are \$5.22 on which you pay a royalty of 10% to owner.	\$ 0.52
To these costs and charges must be added your development and mining costs, which I have been given to understand will average about	4.00
and your overhead and Phoenix office expense, insurance, accounting, taxes, etc., which while you operate on the present small scale can hardly be less than	<u>1.00</u>
TOTAL OF ALL EXPENSES	\$13.90

In a separate memo I have recently suggested certain changes and economies including the reductions in trucking and freight charges which you already have in mind that may result in a reduction of about \$1.32 per ton in transportation and smelting costs, and I believe that an additional saving of at least \$1.00 can be made in the mining and general overhead after you have expended a certain amount of money for improvements and development at the mine, and increased your present rate of production, but I doubt if you will ever be able to reduce the total costs to less than \$11.50 per ton and believe that your future policy should be shaped on the assumption that your present costs are close to \$14.00 and that \$11.50 will be an ultimate minimum on shipping ore.

Therefore, with due regard to the legitimate profits which every mining investment should return to the investors, and which it must return if that investment is to be reasonably

profitable, I strongly recommend that every effort be made to mine and ship only the higher grade of ore which should in all cases have a gross value of over \$15.00 per ton and actually should approach, as I believe it can, an average of \$20.00 per ton.

METALLURGICAL TREATMENT:

In view of the fact that only about 20% of the ore now partially developed or likely to be developed appears to have a sufficient value to permit profitable shipping it becomes most important to complete the study of the metallurgy of the ore, which was begun by the El Tigre, the Western Metallurgical Company and others. A successful concentration of this ore at or near the mine should result in the recovery of over 90% of all values in gold, silver, and copper at a reasonable expense and put these metals either in the form of rich concentrates or in products that can be cheaply marketed without recourse to a smelter.

This is not a simple or easy problem for most of your copper is in the form of a silicate for which ordinary flotation is not suitable while the gold will not leach with acid and the presence of copper rules out the cyanide process.

Since the gold appears to be free and a high recovery can be made by amalgamation, it may prove best as believed by the El Tigre Company to first amalgamate the ore after suitable crushing and then to leach the copper from the tailings

with subsequent precipitation on scrap iron or by electrolysis. An alternative plan might be to save a large percentage of the gold in jigs of the Denver or Pan American type and still another procedure might be found in chloridizing volatilization which made an excellent recovery in the laboratory tests and has the advantage of being a dry process.

I am perfectly satisfied that modern metallurgical practice can satisfactorily solve this problem, but before any definite estimates or statements can be made a complete series of tests should be carried on by competent metallurgists and these should be started just as soon as your finances will permit.

FUTURE DEVELOPMENT OF MINE:

Since it is evident that a substantial capital expenditure will have to be made to provide an efficient mining and milling plant, regardless of the method of concentration which may be adopted, I feel that it is of the utmost importance to first positively develop or put in sight a sufficient tonnage of pay ore to properly justify such an outlay and to accomplish this I recommend that a program of scientific mining exploration and development should be laid out and started as quickly as possible.

Fortunately, the natural conditions are such that much of this work on the Home Group suggests itself and can

be accomplished at comparatively small expense and with an attendant production of some ore, but I feel that several of the old shafts should also be examined and a certain amount of drifting and other work done to permit an estimate of partially developed ore in those sections of the property.

I think that an appropriation of at least \$25,000 should be made for this work through the expenditures of which I should hope that we would then be able to estimate at least 100,000 tons of average grade ore as positive or reasonably probable.

CAPITAL EXPENSE:

Under present conditions and until the development work has proved up a substantial tonnage of positive ore and the method of treatment has been definitely determined, it would obviously be premature to attempt any detailed estimate of the capital investment which will be required to place this property on the most efficient basis of operation, but the following tentative and liberal estimate is made on the basis of such facts as we now possess and the assumption that the development work suggested above will prove up a total reserve of 100,000 tons of ore of which about 20,000 can best be shipped crude to the smelter while 80,000 tons should be treated in a 75 ton concentrator:

Preliminary working capital to be obtained as quickly as possible	\$ 5,000.00
Development fund	25,000.00
Metallurgical experiments & tests	2,000.00
Mining equipment essential for mining about 100 tons of ore per day and maintaining current development, also improvement to camp buildings, roads, etc.	30,000.00
75 ton concentrating mill including water supply, etc.	63,000.00
Working capital and incidentals	25,000.00
	<hr/>
	\$150,000.00

I have given considerable thought to the tonnage which can be most economically mined and milled and believe that the treatment plant should probably be best designed to handle about 75 tons per day. This could be so built that its capacity could later be increased to 100 tons at a comparatively small additional expense.

FUTURE OPERATING COSTS AND RETURNS:

During the period prior to the completion of the mill it is assumed that the returns from the shipments to the smelter will more than cover the costs of mining and shipping the high grade ore, but before the mill has been tuned up for steady operation it will be necessary to prepare the mine for the larger output and also to accumulate a substantial reserve of broken ore in the stopes, for this purpose it will be

necessary to draw on the working capital.

Once the mine and mill are in steady operation I anticipate that about 90 tons of ore will be broken daily, of which 15 tons of high grade will be shipped crude and the balance sent to the mill. On this basis I make the following tentative estimates of costs and returns, using present transportation and smelter charges, etc., in respect to the shipping material, although I believe that these can be reduced as previously suggested.

Costs and return on shipping ore--assumed to represent 15 tons per day with gross value \$20.00 per ton.

	<u>Charges per ton</u>
General and overhead	\$ 0.50
Mining and sorting	4.00
Hauling and freight with allowance for moisture	3.60
Smelter toll charge	1.50
smelter deductions on assumed value . .	4.00
Royalty to owner	1.10
	<hr/>
TOTAL CHARGES	\$14.79
Net Profit to Company	5.30

Costs and return on milling ore with estimated gross value of \$12.00 per ton, 75 tons per day.

	<u>Charges per ton</u>
General and overhead	\$ 0.50
Mining & current development	3.00
Milling, including transportation to mill, etc.	2.00
Marketing concentrates and/or bullion and copper precipitate	1.00
Loss in milling, 10% of gross value . .	1.20
Royalty to owner	<u>.80</u>
Total charges and deductions	\$8.50
NET PROFIT TO COMPANY	\$3.50

On the above basis the daily profit of the operations should be 15 x \$5.30 and 75 x \$3.50 = \$342.00; or after making due time allowance for shut downs, repairs, etc. (which are included in the estimated costs) the net profit before deductions for depreciation, amortization, and income taxes should be close to \$9,000.00 per month or say \$100,000 per annum.

Putting it in another way the mining and treatment of the 100,000 tons of ore mentioned above will be completed in less than four years, yielding a profit as above of about \$386,000 which would serve to return the original investment plus a profit of well over 100%.

The further profits that may be realized by the Bullard Company must thereafter depend upon the tonnage and grade of new ore which may be discovered and developed during this period and thereafter, and in this regard I can only say that it is my opinion that there are excellent chances that additional pay ore will be found and in sufficient quantity to permit a continuance of profitable operations over many years to come.

The above report is written on the supposition that the recommended development and the further development carried on concurrently with the mining will definitely prove up a minimum of 100,000 tons of ore of the average grade now indicated.

This is, I believe, a justifiable assumption but it is not yet a proven fact and should this preliminary work result in substantial disappointment all of my calculations will require revision and in all probability a smaller capital investment will be required and a smaller return can be expected.

Market prices for the metals are also factors of prime importance and my calculations are all made on the basis of present prices,- gold @ \$35.00 per oz., silver @ \$.71 per oz., and copper @ 12.50¢ per lb. A continuation of the present price of gold seems to be well assured and the amount of silver in the ore is so small that even a drop to 40 cents

would reduce the estimated profits by less than 15¢ per ton. However, every fluctuation of 1¢ per lb. in the price of copper will increase or decrease the estimated profits by over 40¢ per ton and while I believe that there are good prospects that a satisfactory market will maintain during the next four or five years this cannot be guaranteed and can at best be assumed as only a reasonable probability.

Under these circumstances, I believe that it would be prudent and proper financial policy to provide at the present time only about \$50,000 to cover the cost of the development, metallurgical tests and present requirements, also some expenditure for additional mining equipment, camp buildings, etc., and to arrange to secure the additional \$100,000 only if and when the development work has progressed to such an extent that the existence of the ore reserve which will properly justify the construction of the mill and larger scale operations has been definitely assured.

As things stand today, I can very definitely recommend the investment of the first \$50,000.00 as an extremely attractive mining venture, and I fully believe that within the course of the next six or eight months I shall be able to recommend the expenditure of the additional \$100,000 as an even more attractive and safer mining investment.

Yours very truly,

G. M. Colvocoresses,

APPENDIX TO BULLARD REPORT

I have examined the 20 year Lease and Option from R. W. Bullard under which the Bullard Gold Mines Co. are operating, the same being dated August 4th, 1938.

I understand that this instrument has been approved by competent attorneys and from the standpoint of a mine operator I consider it to be extremely fair and liberal to the Lessee.

The minimum monthly royalty payment which is now \$200.00 will be increased to \$500.00 in June of 1940 and while I hardly anticipate that your program of development will be completed and your mill in regular operation by that date such a condition should be reached very soon thereafter if the financial program which I have recommended can promptly be made effective. In any case the normal 10% royalty on regular increased shipments of high grade ore should then very nearly equal the larger minimum payments.

In reference to the Engineers' Reports which are attached as Exhibits A. to H. (inclusive) it appears likely that Norris and Durfee made their examinations for the owner or some one of his associates. I personally know nothing of either of these men but Durfee seems to have done a fairly thorough job, although his estimates of tonnage seem too large and his samples show erratic values, some of which were not

checked by the later examinations.

Kruttschmidt, Stockder, Michler and McConnell are all men of ability and excellent reputation; their samples and measurements were evidently taken with great care and their estimates and conclusions are decidedly conservative.

It is reliably reported that following these respective examinations both the A. S. & R. and the El Tigre Companies were willing and anxious to proceed further with negotiations and were disposed to make any reasonable deal with the owners. In this connection it must be remembered that at all times prior to 1935 the value of gold was only \$20.66 per oz. and a content of 0.2 oz. of gold was then worth only \$4.13 instead of \$7.00 as it is today. However, the price of copper was generally higher than it is at present.

The shipments made by Long (Exhibit I) were selected ore such as I advocate shipping crude to the smelter. However, his work may be described as "gutting the mine" and it left one small section of the property in poor condition for the present operators.

The grade of shipments made by the Bullard Company has suffered by reason of the fact that no proper preparations were made in advance, that the grade of the ore was not determined before it was mined, and that there was no competent supervision over the miners. These faults have recently been partially corrected and the availability of a small working

capital should make it possible to substantially increase the grade of all future shipments to the smelter from whom a very favorable treatment charge is now obtained.

Prior to actually commencing the development of your veins or even establishing a definite program for such work, I consider it vitally important to make a large scale topographical survey map of the best mineralized portions of the claims with 20' contour intervals. On this map there should be plotted the location, dip and strike of all of the principal veins, the pits and trenches along their outcrops and the shafts, tunnels, and other mine workings, and in so far as possible the assays of all samples taken during the previous investigations and your present work should be posted.

From such a map one will be able to judge the relative possibilities of the various ore showings and plan the subsequent development in such a manner as to prove up the maximum tonnage of ore at the least expense.

The cost of this survey and mapping has been included in my estimate for development and it will be very desirable to start it with the least possible delay.

BULLARD EXHIBITS TO ACCOMPANY REPORT OF G. M. COLVOCORESSSES

October 1939.

- Exhibit A - Copy of Report by E. C. Norris, Jan. 10, 1901.
- Exhibit B - Copy of Report by E. W. Durfee, no date, but probably prior to 1917; a copy of the assay map which accompanies the report is already in your possession.
- Exhibit C - Copy of Report to me by L. F. S. Holland, October 14th, 1917.
- Exhibit D - Copy of report made to me by W. F. DeCamp, Sept. 30th, 1919.
- Exhibit E - Copy of report by J. V. McConnell, made for El Tigre Co., April 18th, 1931, with description of samples taken.
- Exhibit F - Extracts from letters by J. V. McConnell to G. M. Colvocoresses.
- Exhibit G - Extract from letter by Brent N. Rickard, Manager of American Smelting & Refining Co. in Tucson to G. M. Colvocoresses.
- Exhibit H - Assay maps of main workings (Home Group) prepared by Stockder and Kruttschmidt of A. S. & R., and confirmed by El Tigre Co. Engineers.
- Exhibit I - Record of shipments from Bullard Mine by George Long, in 1937.
- Exhibit J - Record of Shipments of Bullard Gold Mines. February to September 22nd, 1939.

E. F.

copied MF
4/23

RE BULLARD MINE

(Extracts from letters by J. V. McConnell to G. M. Colvocoresses)

September 6th, 1938

"Dear Mr. Colvocoresses:

I have from time to time depleted this file but believe there is enough data to give you a very fair idea of the property. My sample work represented a total of 287 samples all told from all veins. The old maps will show positions where these samples were taken as far as the map goes which covers all openings at that time on the main Bullard workings. (1931)

My samples are all in ounces so the difference in gold prices then and now will make no difference. This sample job for Tigre Co. was made by R. T. Mishler, Mr. Thompson and I and sample was under my supervision all the way through. This work covered a period of over 6 weeks all told. Was quite thorough indeed as to values, tonnage and etc. everything was sampled except the incline shaft on the Rattler Claim which was full of water for considerable depth and after sampling to this point it was decided ill advised to unwater this at that time."

(J. V. McConnell)

September 14th, 1938

"Dear Sir:

I find from some notes I have that our final judgment on Bullard Mine we reduced the very probable ore to 20,000 tons and with an average value as follows: Au. 0.182 ozs. Ag. 0.58 ozs. and Cu. 2.23%. This was after the re-check, and after all of us had sampled more or less. The possible ore we left as 25,000, that being as good a guess as we could make.

Another item I find is a caution notice to carefully check gold values at greatest depths obtainable against the values obtained at or near the surface area. We found there was a variation of about 0.03 ozs. in favor of ore within say 5 ft. to

8 feet of the surface against the same openings at depth, which of course varied with different openings. This last item was taken into consideration in assuming the above averages and from all samples taken. This condition appeared to prevail in most openings. Another fact established was the higher the copper values the higher the gold values. And another point we were considering was selective mining, of the higher grade ores as a last resort in case a milling operation were not possible to work out. On the subject of Mill however Mr. Mishler finally decided that a mill would handle the situation by leaching the copper values and then extraction of the gold. This I believe he finally decided was by far the best recovery possible. Metallurgy tests were mostly made at the Tigre Mill at El Tigre, Mexico. Others, however, I believe were made by recognized laboratories and possibly I can find out who made these tests."

(J. V. McConnell)

September 21st, 1938

"Dear Sir:

I had expected to be able to get you the data I could gather up on the Bullard Mine last week. I attempted to place my assays on an old map and find this map did not contain all openings so therefore have made a list of the preliminary samples taken and have tried to locate them by description to where you can easily check them. I might say the samples as given here in this preliminary were fully substantiated with later samples and the results in the finished work was practically the same as I give them to you here.

About the only changes that were made was the lowering of estimated tonnage of the very probable ores from 25,000 tons to 20,000 tons. The reason for this was, it appeared that as the ore bodies were opened up further in the hill, there appeared to be a more crushed condition or broken up condition of the ore,

also where the ore is broken in nearly every case are considerably lower than when not broken or mixed up. Again the extent of the various local fault zones of the ore body could not be determined without more development work and we were unable to make satisfactory terms for such work.

The incline shaft at the East or Northeast was not unwatered for the same reason unfavorable terms. I do not have enough notes and data that I have been able to find to make you a new map which covers all ore at the Home group, this was a completed assay map and represented over 250 samples.

This list of samples I am sending you were in most cases the sections were cut at 10 foot intervals, and later on were filled in between making the assay map show 5 foot intervals both on outcroppings and openings.

The average value conclusions we came to for the more positive ores and the estimated 20,000 tons as per my letter of Sept. 14th, 1938. Of Au. 0.182 ozs., Ag. 0.58 ozs. and Cu. 2.23% was determined by a general average of all samples that were taken and was made after all sample work was completed. All composite samples were later on run individually for each cut, but the final results changed the picture very little as a whole. Again in arriving at this average conclusion for values, the fact was taken into consideration that with depth from surface exposures of the ore body there was a consistent falling off of values as depth was attained and this had to be taken into consideration. Whether this condition will prevail as greater depths are obtained of course only work can prove. It should however be considered.

In my list of samples inclosed I have given you only the samples I have that I can definitely locate, without my maps, these locations are positive and I could show you where each and every one was cut. Starting at the No. 1 or Blacksmith shaft I do not think you will have any trouble in locating each opening as I have described them for you.

(J. V. McConnell)

October 19th, 1938

"Dear Mr. Colvocoresses:

So far I do not appear to have the data on the Quail Nest group of the Bullard property, but if my memory does not fail me we had some very nice samples up there and over good widths. It was more free of copper and better gold values as I remember the same. I do know both Mr. Mishler and I thought it well worth doing some work on.

As I remember this we had from say 3 feet to as much as 5 or 6 feet of average \$18. to \$20. gold up there. The vein was quite flat but not more so than the main Bullard vein and when those samples were taken gold was still \$20. per oz. so if that ore is still there it might well be worth looking into at this time."

(J. V. McConnell)

Ex. F

File

1012 North Kansas St,
El Paso, Texas,
Nov, 3 rd. 1938.

Mr. G. M. Calvocoresses,
1102 Luhrs Tower,
Phoenix, Ariz.

Re: Bullard Mine

Dear Mr. Calvocoresses:

Yours of the 31 st. inst. received with check inclosed for one hundred dollars, for which I thank you. I trust your associates will get some good out of this and I shall be glad at any time to give you any further help I may be able to supply.

The data sent you is somewhat fragmentary but I am sure will save a lot of work any way.

I will stop in Phoenix my first opportunity and shall be pleased to meet you personally. I am

Yours truly,

J. V. McConnell
J. V. McConnell.

Mr. Colvocoresses;

A 9/7.38

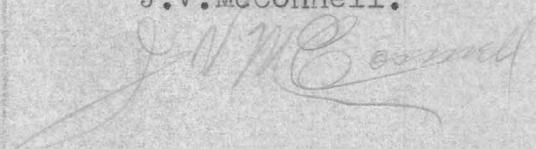
Should you wish this data on Bullard Mine and I dont have time to copy the same I will send you the original data and you can what of it copied you may wish.

If you will let me know your wishes before I have to leave I will take time to get you out the final findings which is not shown on this data I have for the reason the report was not completed at that time.

Also let me suggest if you are looking for a good gold property one with a very considerable tonnage of blocked or nearly blocked ore and with a lot of very possible ore, that you ask Howard Fields to show you the data he has on the Priestley property in the State of Washington. Fred Gibbs of Prescott or Humboldt has also seen this property quite recently and I think he believes like I do that there is a very fine operation there. Howard has my maps, report and etc on this. Also there is a fine property in Nevada now shipping quite a lot of 16.00 to \$20.00 ore that has all the ear marks of being a mine and values in both these are practically all gold at least Washington property is around 80 % gold values and Nevada property is all gold value. both are good.

I am not trying to butt in on your deal there but in case you and Dick Bullard dont get together these mines I mention are more than ordinary in my estimation and the Washington property especially has everything in the world for cheap mining including hydroelectric power now installed and plenty of water timber and etc. The unstopped backs run from 700 feet to as much as 1,400 feet average gold is around \$10. ton or better. some shipping around \$40. to \$60 ton gold and silver about 1 ton direct shipping to say 5 tons concentrati~~ng~~ ore. Mining widths are quite fair.

J.V. McConnell.



1012 North Kansas Street,
El Paso, Texas,
September, 6 th, 1938

A-9/19

38

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

Dear Sir:

On arrival here I have tried to look up the data on The Bullard Mine, out from Congres, Jct. Ariz. I find I have a preliminary report, several sheets of assays and an old property and assay map. Several pages of mine notes etc. My maps of various veins I find a note saying these had been sent to Mr. R.T. Mishler at a later date. On Metallurgy, Mr. Wasley of the Teigre Co. made considerable tests but I evidently have not that data on file. This work was done in 1931 for the Tigre Co.

I have from time to time depleted this file but believe there is enough data to give you a very fair idea of the property. My sample work represented a total of 287 samples all told from all veins. The old maps will show positions where these samples were taken as far as the map goes which covers all openings at that time on the main Bullard workings. (1931)

My samples are all in ounces so the difference in gold prices then and now will make no difference. This sample job for Tigre Co was made by R.T. Mishler, Mr. Thompson and I and sample was under my supervision all the way through. This work covered a period of over 6 weeks all told. was quite thorough indeed as to values, tonnage and etc. everything was sampled except the incline shaft on the Rattler Claim which was full of water for considerable depth. and after sampling to this point it was decided ill advised to unwater this at that time.

Our price was high being presented through a promoter to the Company for \$650,000 and afterwards reduced to \$500,000 by Bullard Brothers, and a workable deal could not be worked out at that time.

I was told that within the last year or so the property had been leased and considerable of the better grade gold ores mined out. This I do not know from personal knowledge.

If you want I will send you this data which no doubt would be of considerable assistance to you in forming an opinion of the property. These assays and total figures were checked carefully enough to be quite reliable and represent a true picture of the property at the time of the examination. What the picture is today of course I have no idea. I might say all our assays were for Gold, Silver and copper. and most of assays were by Hawley and Hawley, of Douglas Ariz. Possibly Frank Giroux of Mayer run some for me I don't remember as all the original sheets I have are H & H. sheets.

I hardly think it worth while to get this up to date in report form I believe with the old report, assays sheets and your own observations you can get with very little checking a very fine picture of the mine.

Yours truly,

J. V. McConnell

P.S. Will be here about a week, or so. then Calif again.

No. 2 G.M. C.

possible to work out. On the subject of Mill however Mr. Mishler finally decided that a mill would handle the situation by leaching the copper values and then extraction of the gold. This I believe he finally decided was by far the best recovery possible. Metallurgy tests were mostly made at the Tigre Mill at ElTigre, Mexico. others however I believe were made by recognized laboratories and possibly I can find out who made these tests.

Regarding what you pay for this information I will leave that to you if it is of benefit to you and your clients, pay me what you think its worth to you. Maps with assay locations will be sent you shortly. Trusting this may be of some use to you, I am

Yours very truly,

J.V. McConnell.

J.V. McConnell

EA FOAM BOND

1012 North Kansas Street
El Paso, Texas,
Sept, 14 th, 1938

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

Dear Sir:

Inclosed find a copy of my preliminary report to the Tigre Co. on the Bullard Mine. This report is somewhat muddled up from the fact that from time to time Mr Mishler wrote me asking me to be sure and cover certain phases of the property very definately hence the cause for repeating many items enumerated.

This examination began the fore part of April 1931 and extended well into or to the last of August 1938. This included re-checking of sample work, metallurgy, and itme spent in trying to work out a suitable contract.

I can say Both Mr. Mishler and I believed with a workable contract we could have made a mine at Bullard property, at least we were willing to try under proper conditions to do so.

Regarding the Metallurgy, I have nothing of any value to you on that subject. Let me suggest if you know Mr. Wasley and he is still with Tegre Co. he might be willing to give you details of his work on this ore. Mr. Mishler, personally did considerable work, I could no doubt get what information Mr. Mishler has on the subject for you if he has this with him in Mexico. or if you know Mr. M. his address is R.T. Mishler, Fresno , Zact. Mexico. C/O Fresno Co.

I will place my assays on an old map at my first opportunity to do so and send on into you, also what of the orignal assay sheets I have from Hawley and Hawley .You can in this way check these with what work your men have done.

I find from some notes I have that our final judgment on Bullard mine we reduced the the very probable ore to 20.000 tons and with an average value as follows Au. 0.182 ozs. Ag. 0.58 Ozs and Cu. 2.23 % This was after the re-check, and after all of us had sampled more or less. The possible ore we left as 25.000, that being as good a guess as we could make.

Another item I find is a caution notice to carefully check gold values at greatest depths obtainable agains the values obtained at or near the surface area. We found there was a variation of about 0.03 ozs in favor of ore within say 5 feet to 8 feet of the surface against the same openings at depth, which of course varied with different openings. This last item was taken into consideration in assuming the above averages and from all samples taken. This conditions appeared to prevail in most openings. Another fact established was the higher the copper values the higher the gold values. and another point we were considering was selective mining, of the higher grade ores as a last resort in case a milling operation were not

#2 G.M.C.

was cut. Starting at the No. I. or Blacksmith shaft I do not think you will have any trouble in locating each opening as I have described them for you.

I will continue my search for metallurgical data which I may be able to dig up, this however will be in the form of letters from Mr. R.T. Mishler and Mr. Wasley from time to time. This data had all been packed away as it was old and there are two more cases not yet opened in 1931 notes and reports. Mr. Mishler and I were in the field continuously during 1930 to 1932 and therefore I accumulated an immense amount of material as far as you goes and which had not been inspected for several years. Should I be able to find this metallurgical information I will send the same on to you.

I trust this may be of some benefit to you and as I stated in my letter of the 14 th. if this is of value to you in coming to a decision Re. Bullard Mine, you can pay me what you think it may be worth to you. Anything further I may be able to give you in the way of help, I will gladly do so. I am

Very truly yours,

J. V. McConnell
J.V. McConnell.

P.S. Pardon this work in getting this material out as I have had a high school student making the copies, therefore many mistakes will probably be found. Figures however I have checked over and compared and these I think you will find will check with your findings quite correctly. J.V.Mc.

P.S. 2. I do have an old map of Bullard Property Home group, and a map of the ore body of the Home group that Mr. Bullard gave us. This in the main is correct as to survey, but does not show enough openings to get my assays placed on the same. However if you have not these maps I will send them on to you, but you no doubt do have them from Dick Bullard.

J.V.Mc.

1012 N. Kansas Street,
El Paso, Texas,
Sept. 21 st, 1938

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

C. J. S. 9/23-3

Dear Sir:

I had expected to be able to get you the data I could gather up on the Bullard Mine last week. I attempted to place my assays on an old map and find this map did not contain all openings so therefore have made a list of the preliminary samples taken and have tried to locate them by description to where you can easily check them. I might say the sample as given here in this preliminary were fully substantiated with later samples and the results in the finished work was practically the same as I give them to you here.

About the only changes that were made was the lowering of estimated tonnage of the very probable ores from 25,000 tons to 20,000 tons. The reason for this was, it appeared that as the ore bodies were opened up further in the hill, there appeared to be a more crushed condition or broken up condition of the ore, also where the ore is broken in nearly every case values are considerably lower than when not broken or mixed up. Again the extent of the various local fault zones of the ore body could not be determined without more development work and we were unable to make satisfactory terms for such work.

C. J. S.
The incline shaft at the East or N. East was not unwatered for the same reason unfavorable terms. I do not have enough notes and data that I have been able to find to make you a new map which covers all ore at the Home group, this was a completed assay map and represented over 250 samples.

This list of samples I am sending you were in most cases the sections were cut at 10 foot intervals, and later on were filled in between making the assay map show 5 foot intervals both on outcroppings and openings.

The average value conclusions we came to for the more positive ores and the estimated 20,000 tons as per my letter of Sept. 14 th. 38. Of Au. 0.182 ozs. Ag. 0.58 ozs. and Cu. 2.23 % was determined by a general average of all sampled that were taken and was made after all sample work was completed. All composite samples were later on run individually for each cut, but the final results changed the picture very little as a whole. Again in arriving at this average conclusion for values, the fact was taken into consideration that with depth from surface exposures of the ore body there was a constant falling off of values as depth was attained and this had to be taken into consideration. Whether this condition will prevail as greater depths are obtained of course only work can prove. It should however be considered.

In my list of sample inclosed I given you only the samples I have that I can definitely locate, without my maps, these locations are positive and I could show you where each and every one

E. F.

1012 North Kansas Street,
El Paso, Texas,
October, 19 th, 1938.

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

Dear Mr. Colvocoresses:

I am mailing you under separate cover the old mine maps I had on the Bullard Mine to go with data sent you some time ago. I have been so busy I have not had time to hunt up further data on this and until such a time as we know you will wish this data or I get some more time I will not attempt to do so.

Just what further data I may have I really do not know. The files on this have been badly broken from time to time and no one has ever returned anything given them. I do believe however there is further data that might be of interest to one wishing to mine or develop the Bullard property. So far I do not appear to have the data on the Quail Nest group of the Bullard property, but if my memory does not fail me we had some very nice samples up there and over good widths. ~~That~~ was more free of copper and better gold values as I remember the same. I do know both Mr. Mishler and I thought it well worth doing some work on.

Copy

As I remember this we had from say 3 feet to as much as 5 or 6 feet of average \$18. to \$20. gold up there the vein was quite flat but not more so than the main Bullard vein and when those samples were taken gold was still \$20. per. oz. so if that ore is still there it might well be worth looking into at this time.

I shall appreciate your taking care of this data in case you do not use it as it may be of use to me some time in the future. I am sorry I can not find my maps which were much more complete than this old one and showed the openings to far better advantage and also the assay map was very complete.

You will note some sample No's in red on this old map. I started to put my samples on this but the openings and exact location of my samples I could not accurately place on this so did not try to complete the location of samples. Trust what data sent you will be of assistance to you, I am

Yours very truly,

J. V. McConnell
J.V. McConnell.

A - 5 ft high to B

Ballon, P A station

run up 71' @ 30°

depth 100 yds

total depth 92

Bar h. 42 EA

To old map

S. 25° E

dir. - 9' from B

dist 107

Prompt 18

h' 65 E

B, & L. B. 2. the level of 6'

B & B' + 6' = 53'

47' down slope

Incl 20° of Heavy

B to B 2,

h 30° W, 54'

B 2 - B 3

h 40° W

and 3/5 →

B 3 - B 4

24'

h 20° E

Be right with you

92 → on the 60

< 40°

~~→~~

Plucked & hung
cup to 5 sides of hall
was bad at + still

added side cups just

W of depth W 1 to

was 26 = 28 a

(class). or try will
demonstrate how to get 1 to
don't try to study of
1 and X will be reduced

keep v to further after
along, π a two days
to the work h.c. & can
be started ~ 1 female

keep ad just to be held
away, will to get new &
1 bird & gain 2 of
drying.

v get two, to &
later with other days
can be started then
1 full to gain >
back on 1 π &
to v to do > a
will provide

GEORGE M. COLVOCORESSAS
MINING AND METALLURGICAL ENGINEER
1102 LUHRS TOWER
PHOENIX, ARIZONA

*Review for Report -> built
Consolid in Sept 39*

September 22nd, 1938

REVISED STATEMENT RE BULLARD MINE

By G. M. Colvocoressas

- - - -

Preliminary examinations with partial sampling of this property were made for me in 1917 by L. F. S. Holland and in 1919 by W. Val DeCamp. Both of their reports were tentatively favorable and as a result, the Consolidated Arizona Smelting Company of which I was then General Manager tried to do business with the owner but found this impossible on any reasonable terms. Therefore, we did not make any complete investigation nor thorough sampling.

Aside from the reports of the two engineers mentioned I have copies of older reports by E. C. Norris and E. W. Durfee and I have seen other reports all of which were favorable. The report by Durfee is accompanied by survey and assay maps showing location and values of 70 samples on which he based his estimate of tonnage and grade of ore.

I have recently obtained a copy of a very complete report with assay maps which was made in 1931 by a most reliable engineer for a well known mining company. This examination required some four months work of this engineer and his assistants and involved the cutting of 287 milled samples at 5' intervals covering practically all important exposures in the main ore body, also a thorough examination of all other outcrops and development

work except for one incline shaft on the Rattler Claim which was not unwatered.

It is my firm opinion that this report may be considered as absolutely reliable and it is so complete that there would appear to be no reason for repeating at very substantial expense the detailed measurement and sampling although all of the data would require some revision in the light of recent changes in the prices of gold, silver and copper and improvements in metallurgical practice and transportation conditions; all of which will govern the calculation of costs and values and the general conclusions and recommendations.

I have personally visited this mine on two ^{three} occasions and gone over portions of the surface and accessible workings but have never taken any samples nor accurate measurements so that it must be understood that my statements as to grade and tonnage of ore are based upon the work of others which I believe to have been accurate and reliable.

The physical condition of the property is unchanged since 1931 except for the mining of several ^{hundred} tons of ore by ^(about 100 tons in 31) lessors in 1937.

Apparently, this was all taken from the north side of the hill and the ore was carefully hand sorted so that the record of shipments reflects a value much higher than the average run-of-mine.

The problem of obtaining sufficient local water for a mill has not been definitely solved and calls for further investigation. *note more stated*

LOCATION AND HISTORY:

The mine is located near the southern boundary of Yavapai County, Arizona, 30 miles westerly from Congress and 9 miles north from Aguile, a small town on the Parker Branch of the Santa Fe Railway from which it is reached by a good desert road twelve miles in length. The elevation is 3000-3300'. There are 27 patented and one unpatented claims forming a contiguous group and including all of the local mineralized area excepting for one claim which I am told can be acquired at small cost if it is desired to do so. Certain water rights on other lands are included with the Bullard Property.

The claims were staked, developed and patented many years ago by the late John C. Bullard and now belong to his brother R. W. Bullard of Congress Junction who has recently executed a 20 year lease on 10% royalty.

The developments aggregating some 5000' consist of a number of shafts, adit tunnels, open cuts, pits and stripping along the outcrops and from this work and a very little stoping a considerable tonnage of ore has been produced. In 1887, a small smelter was built near the mine and several years later a mill was erected but both have long since been scrapped and neither seems to have treated any substantial tonnage.

In 1919, Abbott and Bryan, lessees shipped at least 7 cars of ore with average value of \$18.25 per ton at present prices of gold and copper.

Subsequently, other lessees have produced at intervals and during 1937 several hundred tons of cobbled and sorted ore were

shipped and according to the settlement sheets,- which I was only able to glance over hurriedly,- the value of much of this material was in excess of \$50.00 per ton.

*(Geo. Engli
da.)*

GEOLOGY:

Sup 39-

Bullard Peak, some 300' in height, is a foot-hill near the east end of the Hareuvar Mountains which are composed of pre-Cambrian schist, granite and a granite-gneiss-schist complex. The base is an andesite having a thickness of 75 to 100'. Above this are found tuff, limestone and augite-andesite resembling basalt, representing the remnant of a lava flow. The veins occur as fissures in this latter rock which seems to have been faulted to some extent.

The width of the ore bearing veins varies from one to over 12 feet and the gangue is quartz and calcite with which are associated hematite, gold and copper as oryzocolla (silicate), malachite (carbonate) and occasionally a little chalcocite (sulphide). The vein shows brecciation and subsequent cementation by siliceous material and the deposit is of Tertiary age with the ore probably derived from oxidation of chalcopyrite which might therefore be expected to be found at greater depth. Silver occurs to the extent of 0.5 oz. to 1.5 oz. per ton.

The mineralization may represent two or more distinct periods and types but there seems to be a ^{very close} general relation between the content of gold and copper in various sections of the veins.

(?)

The strike of the rock strata is North 55° East, corresponding roughly to the strike of the principal vein, which

outcrops around the south, west and north slopes of Bullard Peak with an average dip of about 30° from the horizontal toward the south and southeast.

The values in gold cannot be judged by eye and the best looking copper ore is often confined to a width of one to two feet even where the vein material is 4' to 8' in width and most of the stoping has been done over a width of 3 to 4 feet. The tonnage of pay ore will largely depend upon the width of the gold values and in actual mining it will probably be economy to break much of the ground to a width of 4' although stopes when necessary can be narrowed to some extent.

MINING CONDITIONS:

Because of the flat slope of the vein much of the ore will have to be shovelled or scraped in the stopes and it would not be safe to figure cost of mining and development at less than \$3.00 per ton which should include such sorting as might be necessary and transportation of ore to the mill; the ground will stand well with posts and occasional pillars. Practically all of the ore which lies to the west and above the showing at C. Shaft on Barfee's map (a distance of over 1200' on the incline of the vein) could be trammed through edit tunnels and would require no hoisting, but a great deal of care should be used in laying out this work to insure the best economy in underground handling, tramping, etc.

Mine should probably be opened up from the southeast outcrops and in my opinion a logical procedure would be to confine the initial developments to the western portion of the hill

where the best grade of ore seems to occur and after installing a portable compressor and small mining plant to drift on the vein right thru the hill from K to I (distance about 500') thus proving fairly definitely the tonnage and value of the upper section of the ore body. A similar procedure could then be followed at lower elevation and further to the east serving to block out on four sides practically all of the ore which is indicated in the main body. The two adit tunnels would later serve as main haulage ways after raises had been put up at proper intervals and practically all of this development work should be in ore and therefore yield a substantial production.

ORE TREATMENT AND ESTIMATED COSTS:

Fairly extensive tests seem to have shown that the gold in this ore is free and that about 92% can be recovered by amalgamation while a similar percentage of the copper can be recovered by leaching.

The recovery of silver has not exceeded 50%. It would, therefore, appear that a combination amalgamation and leaching process would be best suited to this ore and the mine, once properly developed, should be capable of producing 100 tons per day.

The water problem requires further study since the installation of 10 miles or more of pipe-line from either Date Creek or Aguila would be a very heavy expense and the local water available is an unknown quantity. (wells. ?)

At the foot of the north slope there is a sizable dry wash running to the east and draining a considerable

catchment basin between the Bullard Peaks and the Harouver Range and the old camp was located here, now consisting of a few tumble-down shacks which were last occupied by the lessers in 1937. There is a very good well with a concrete collar and screen and the water stands some 15' below the surface and is reported to be of good quality and ample for domestic purposes.

The permanent water level is assumed to be around 300' below the base of Bullard Peak and Durfee mentions having been told that there was an ample flow at that depth in a well which had been drilled near the site of the old smelter. *(not correct)*

Water is found at similar depth in wells on the neighboring ranches and it is reasonable to expect that sufficient water could be pumped from one or more deep wells in this locality to fill the requirements of the mill.

COSTS AND PROFITS:

On the basis of mining and milling 100 tons of ore per day, the following tentative estimates seem justifiable:

Mining, including current development & sorting	\$3.00
Milling (including pumping)	2.00
Marketing expense on gold and copper produced	1.00
Royalty (say)	1.00
General expense & overhead	0.50
	<u>\$7.50</u>

Estimates of the average value of the ore developed or indicated vary to a considerable degree.

71.4 Taking the price of gold @ \$35.00 per oz., silver @ 64¢ per oz. and copper @ 10¢ per lb, the most conservative estimate which I have seen gives a gross value of \$11.24 per ton.

equal to a recoverable value of \$10.50 per ton. The higher estimates give gross values of \$15.00 to \$18.00 per ton while the weighted average of the samples taken as part of the most thorough examination of the mine shows a recoverable value of approximately \$12.50 per ton which may, I think, be fairly used in all preliminary calculations, and on this assumption we may expect a working profit of \$5.00 per ton. It then remains to determine whether or not the prospective tonnage of ore in this mine is sufficient to repay the capital expenditure involved in preliminary development and equipment and yield a satisfactory return to the investors.

Considering the location and character of the showings and present developments, all estimates of tonnage must merely represent probabilities. Various engineers have put this figure from a very conservative minimum of 50,000 to an optimistic maximum of 150,000 but several have been in substantial agreement in using 80,000 from which tonnage a working profit of \$400,000 might be realized. Of course, there are possibilities that a very much larger tonnage may eventually be developed but this should not be considered as affecting the present problem.

The total capital investment involved is also a variable depending largely on the water supply and also on the opportunities for securing good secondhand mining and milling machinery, roughly it may be expected to vary from \$100,000 to \$150,000.

CONCLUSION:

Since the net profit to be expected from even 50,000 tons of ore with present prices of metals should exceed the maximum capital investment by at least \$100,000 and considering the excellent chances for finding additional ore and obtaining an average price for copper in excess of 10¢ per lb., I am personally of the opinion that the purchase of the assignment of the Bullard Mine Lease on any reasonable terms offers a favorable opportunity to engage in a very attractive mining venture and on that basis I strongly recommend such purchase and the subsequent development and operation of the mine.

J. H. Colver

office copy

LIST OF BULLARD DOCUMENTS FOR SHIMMEL

- (1) Agreement of September 20th, 1939. (original)
- (2) Record of Payments made to date.
- (3) Letter from G. M. Colvocoresses to Ariz. Corporation Commission, dated September 20th, 1939. (carbon)
- (4) Letter from G. M. Colvocoresses to Bullard Gold Mines, Inc. dated October 31st, 1939. (carbon)
- (5) Letter from G. M. Colvocoresses to J. P. Smith. dated January 27th, 1940. (carbon)
- (6) Letter from G. M. Colvocoresses to Bullard Gold Mines, Inc. dated March 25th, 1940. (carbon)
- (7) Letter from Bullard Gold Mines, Inc. to G. M. Colvocoresses. dated March 28th, 1940. (original)
- (8) Letter from G. M. Colvocoresses to J. P. Smith. dated May 29th, 1940. (carbon)
- (9) Letter from G. M. Colvocoresses to D. W. Fountain. dated June 5th, 1940. (carbon)
- (10) Letter from G. M. Colvocoresses to Bullard Mines, Inc. dated June 12th, 1940. (carbon)
- (11) Letter from D. W. Fountain to G. M. Colvocoresses dated June 18th, 1940. (original)
- (12) Letter from G. M. Colvocoresses to D. W. Fountain dated June 21st, 1940. (carbon)
- (13) Receipt for payment of \$25.00. dated July 2nd, 1940. (carbon)
- (14) Letter from G. M. Colvocoresses to J. P. Smith. dated July 19th, 1940. (carbon)
- (15) Letter from G. M. Colvocoresses to Bullard Mines, Inc. dated July 23rd, 1940. (carbon)
- (16) Letter from G. M. Colvocoresses to J. P. Smith dated August 9th, 1940 (carbon)
- (17) Letter from G. M. Colvocoresses to J. P. Smith dated September 3rd, 1940 (carbon)

(1) Copy
September 20th, 1930

Bullard Gold Mines, Inc.
Phoenix,
Arizona.

Gentlemen:

Let this letter serve as an Agreement between us.

Confirming my verbal arrangement of this day with your Vice-President and General Manager, Mr. J. P. Smith, and his co-director, Mr. D. W. Fountain, I am handing you herewith a letter to the Corporation Commission which I trust may prove useful. I am also prepared to deliver to you a complete copy of my file on the Bullard Mine, including a revision of my own report which I shall make after further personal investigation of your property and including also all of the reports and assay maps made by other engineers especially those made for the El Tigre Mining Company.

As a consideration for the above it is understood and agreed that my fee is to be the sum of Five Hundred Dollars (\$500.00) payable as follows:-

On or before September 30th, 1939 the sum of Fifty Dollars (\$50.00);

On or before October 30th, 1939, the sum of Fifty Dollars (\$50.00);

And thereafter not less than \$100.00 per month until payment of this fee is completed.

The delivery of the reports, assay maps and other data mentioned above will be made upon the payment of the second Fifty Dollars stipulated in the preceeding paragraph but meantime I shall be glad to give the gist of this information to you or any parties whom you may refer to me.

Kindly signify your acceptance of the above agreement by signing under the word "accepted" on the duplicate copies of this letter.

Yours very truly,

GMC:MF

S/ G. M. Colvocoresses

Accepted:

S/ J. P. Smith, V.P. & Gen. Mgr.

2

RECORD OF PAYMENTS FROM BULLARD MINES COMPANY

RECEIVED BY G. M. COLVOCORESSES

On Account of Letter Agreement dated Sept. 20th, 1939

Sept. 30th, 1939	\$50.00
Nov. 7th, 1939	50.00
Nov. 28th, 1939	100.00
Feb. 13th, 1940	50.00
Mch. 28th, 1940	50.00
July 2nd, 1940	25.00
	<hr/>
Total	\$325.00
Balance due	175.00
	<hr/>
Total	\$500.00

Believe that I could properly claim interest on unpaid balance from end of February, 1940, when payment of the \$500.00 should have been completed.

Additional payment of \$25.00 made on July 30th as per receipt attached.

RECORD OF PAYMENTS FROM BULLARD MINES COMPANY

RECEIVED BY G. M. COLVOCORESSES

On Account of Letter Agreement dated Sept. 20th, 1939

Sept. 30th, 1939	\$50.00
Nov. 7th, 1939	50.00
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Mch. 28th, 1940	50.00
July 2nd, 1940	25.00
	<hr/>
Total . . .	\$325.00
Balance due	175.00
	<hr/>
Total . . .	\$500.00

Believe that I could properly claim interest on unpaid balance from end of February, 1940, when payment of the \$500.00 should have been completed.

copy of
3

C O P Y

September 20th, 1939

Arizona Corporation Commission
Capitol Building Annex
Phoenix, Arizona

Gentlemen:

I have been personally familiar with the Bullard Mine since 1917 and have made several examinations of this property, also obtaining data and reports including very complete assay maps from other engineers and officials of mining companies whom they represented.

I am of the opinion that the Bullard Mine offers an exceptionally favorable opportunity for proper development and operation and gives every promise of becoming a substantial and profitable producer over a long period of years.

I am familiar with the terms of the Lease Agreement under which the Bullard Gold Mines, Inc. are now operating and believe this to be in all respects fair and liberal to the operators. Therefore, I can say very definitely that, in my judgment, this Company should be given every facility to secure subscriptions to its stock from any parties who may be disposed to make such an investment. Your cooperation in this matter will, I believe, be for the best interests of the mining industry in this state.

Yours very truly,

S/ G. M. Colvocoresses

GMC:MF

Original appraised value of \$17,000.00 approved by J.A. Wa
Agent Arizona Inheritance Tax Comm, in office of Robt Armstrong
August 19th, 1936.

REPORT ON THE BULLARD MINE

Pierce District Yavapai County

ARIZONA

**Phoenix, Arizona,
July 20th, 1936**

**A.L. Flagg,
Consulting Engineer.**

Phoenix, Arizona
July 20, 1936

REPORT ON THE BULLARD MINE

The Bullard mining property, consisting principally of patented mining claims, is situated in the southwest corner of Yavapai County, Arizona, in the Pierce Mining District. It is $12\frac{1}{2}$ miles northeast from Aguila, a station on the Parker Branch of the Santa Fe. The properties lie almost wholly in Sections 10 and 11, Township 8 North, Range 10 West.

The property is reached by very good roads from Congress (34 miles) or Aguila ($12\frac{1}{2}$ miles). Various points on the property are served by roads better than the average found about a mine.

There are no buildings or equipment of any considerable value on the property.

On the Steller Claim at the old camp site there is a shallow well which furnishes a limited amount of water for domestic purposes.

The most important part of the property lies in low, rugged hills, an isolated portion of the Harcuvar Range. A number of the claims are on the flats skirting these low hills. Presumably, underneath these hills is the pre-Cambrian granite-gneiss-schist complex, which makes up the main mass of the Harcuvar Mountains. Underlying the complex are the following formations: ?

(1) A heterogeneous mass of sub-angular fragmental rocks compacted into a conglomerate;

(2) Possibly a strata of volcanic tuff, indurated but not very thick; and

(3) A thin, basic lava flow, probably an andecite.

The most prominent, as well as the most extensively explored deposits, are in a rather poorly defined zone in the andecite, rarely showing two easily distinguishable walls.

Quartz and calcite occur, usually in stringers, not following any particular course. A somewhat spongy, silicious material, probably representing a final stage of injection of solutions, occurs as a cementing material and concentrated in small, irregular masses. Above and below this are chrysocolla and malachite, rare chalcocite, and some iron oxides, sometimes limited by a wall, but frequently extending into the country rock irregularly. This type of ore deposit has a NE-SW strike and a low dip average 20° SE.

Other mineral deposits appear to lie only partly within the basic lava and extend into the underlying formation. These occur as readily distinguishable veins with well-defined walls, having relatively steep dips and a general N-S strike. Quartz is the principal vein filling, in which there are varying amounts of oxidized copper and iron minerals. So far, none of these occurrences appear to have yielded any valuable ore. The one sample (No. 27) taken from a typical vein of this type does not indicate a metal content of commercial importance.

Many prospect holes of one sort or another are scattered over these claims. A number of the shafts were carried to depths below that usually reached by prospectors. However, it is unnecessary to catalog these prospect holes, as it is evident that very few of them disclose anything to justify their further extension. The profitable locations were selected and exploited by the Lessee. The mining operations conducted by the Lessee have disclosed little evidence to justify

the expectation of any large or very profitable operations of these claims.

An analysis of the smelter settlement sheets covering the shipments recently made by the Lessee shows that the Lessee shipped 958.24 tons, dry weight, to the smelter at Clarkdale, for which he was paid \$13,939.25, after freight and treatment charges had been deducted. This indicates an average value of the ore, after mining, sorting and smelting, of \$14.5466 per ton. From the amount received from the smelter, cost of mining, hauling and the royalty are to be deducted. The maximum gold content was 0.86 oz. in a 43.2 ton car. The maximum silver content was 0.80 oz. in two cars aggregating 80 tons. And the maximum copper content was 5.10% in the first car shipped, which contained 33.7 tons. If there could be any reasonable assurance of a considerable amount of such ore still available for mining, the outlook might be satisfactory from the "chlorider's" point of view, but it would not have much appeal as an investment.

The following-described samples, with the exception of Numbers 11, 12 and 26, were cut with moils and caught on canvas. The localities from which samples were taken are carefully marked by conspicuous metal tags, on which the sample number is stamped. Samples were assayed at the Arizona Testing Laboratories in Phoenix, Arizona.

Of the samples, Numbers 1 to 23, inclusive, were taken on the north side of Bullard Peak, principally from open cuts and underhand stopes as left by the Lessee.

The first six samples, taken in the most easterly stope within the principally developed area, indicate very clearly that there is no profitable ore left in the face of that stope. The highest assay result is on Sample No. 4, but the width is not great enough to admit mining at a profit, and the field evidence is that there is probably only a very small amount of this character ore left at this locality.

Samples No. 7 and 8 are from the next cut and stope easterly along the strike. Between the stope mentioned above and this locality there are no encouraging surface indications to induce prospecting. Sample No. 7 shows shipping grade, but the decrease in width and values easterly, and the rapid decrease in width westerly, indicate a very small amount of profitable ore (if any) left in this locality.

Photograph "A" was taken at approximately the location of Sample No. 8. Between the arrows, which indicate the rather poorly defined walls, is a width of 30 inches. From the top of the letter "A" to the point of the upper arrow, the seams are filled with oxidized copper minerals. Sample No. 8 shows a relatively high copper content.

Eastward along the line of outcrop no considerable amount of mineralization is noted until the open cut Plate V is reached. The highest assays were obtained in this cut, yet the old shaft in the center is said to have failed to show commercial values. At any rate, the shaft, depth unknown, is filled.

Sample No. 9, across 30 inches of vein in the west end of this cut, returned the highest gold values (1.02 oz.) of any sample taken, while Sample No. 10, across 50 inches at the opposite end of the cut,

gave the highest silver value (1.48 oz.) found on the property. A 6-inch streak of dark blue, chalky ore in the bottom at the center of the cut showed the highest copper (15.5%) value. Contrasted with attractive values is the field evidence of a probable short horizontal extent and the reported unprofitable values in the old shaft.

Photograph "B" was taken from the east end of the cut, looking toward the west end, where Sample 9 was taken. The letter "B" marks the foot-wall. From the point of the arrow in front of the letter to the arrow above, is a width of 4 feet. Iron oxide stains continue into the hanging-wall for 20 inches or more. The irregular nature of the deposit is indicated in the space between the letter "B" and the lower arrow, which shows a local swelling of the ore body.

The next stope east has a length of 35 feet and has been carried to an average depth of 10 feet below the original surface. The outcrop is said to have been at least 5 feet in width, which decreased in the dip-length of 10 feet to an average of 15 inches. Sample 12, an average of the material exposed in the length of the cut at the bottom, is not up to profitable shipping grade. The longest diameter of this ore body was 35 feet.

Samples No. 13 and 14 (see Plate VI) were taken at the margin of an underhand stope. Here, in a short distance along the dip, the ore narrows from 30 to 18 inches and the gold content decreases from 0.48 oz. to 0.10 oz, which is characteristic of these deposits. It should be noted that, to the south, the vein is clearly cut off by a S20E fault dipping 42° to the north, and that such prospecting as has been done on the other side of the fault failed to locate the ore.

The next point along the outcrop easterly to be explored has been prospected by an incline shaft 32 feet deep. Here, again, is illustrated the diminishing width of vein as depth is gained. Sample No. 15 was taken about 3 feet above the bottom of the shaft on the west side, across 30 inches of vein. The assay results indicate clearly that this material cannot be mined profitably.

Following the outcrop easterly a short distance, there is a shallow open cut close to an incline shaft 86.5 feet deep. These two points appear to mark the extremes of another small shoot. Sample No. 18 at the bottom of the shaft, across 24 inches of dense material, indicated a very low metal content. Halfway up the shaft, Sample No. 19, across 60 inches, showed better value. Samples 20 and 21, across 18 inches in the open cut to the west, show even better values, an example of the decrease in values with depth.

Photograph "C", taken in this open cut, which is approximately 50 feet west of the 86.5 foot shaft, shows the west face, where Sample No. 20 was taken. The upper arrow indicates a fairly well-defined hanging-wall. The bottom arrow shows the lowest limit of any mineralizing influence. The distance between the arrow points is approximately 3 feet.

About 60 feet easterly from the 86.5 shaft, another outcrop occurs which is very narrow and not considered attractive enough to explore further. Some 60 to 65 feet farther east, an unexplored quartz vein having a S26E strike and a dip 42° east crosses the strike of the other system.

The Rattler Shaft, about 130 feet deep, is the last work sampled on the north side of the hill. At the top and for a short distance below, the showing is wide, and small stopes indicate that some profitable ore has been taken out. Some small bunches of ore are left, which might be mined at a profit.

Sample 22, across 18 inches of vein in the shaft bottom, returned a very low content. Sample 23, across 42 inches in the bottom of a short drift-stope about 30 feet below the shaft collar, gave a little higher return in silver and copper, but low in gold.

Samples 16 and 17 were taken from old workings on the south side of the hill above the old power plant on the assumed lower extension of the bodies or veins outcropping on the other side of the hill. The mineralization appears to have spread out considerably at right angles to the dip and strike of the vein, but these two samples indicate that the material is unprofitable.

Samples 24 and 25 were taken on the Last Bean Claim, to the southwest. The first sample is taken across 36 inches of copper and iron stained material on the east side of a new, shallow, underhand stope, about 60 feet west of the No. 2 tunnel. The second sample was across 14 inches in the southwest corner of the same stope. At this point a few small grains of unaltered chalcopyrite were seen. Unaltered sulphides were found at no other point on the ground. The conditions in the rather extensive workings below, entered by an adit from the wash on the southeast, indicate that at no great depth,

values, and possibly widths, decrease to an unprofitable point. The lower portion of these workings is filled with gob, and above, the deposit is stoped out to the surface.

In the southwest corner of the State Claim, a sample was taken from the face of another shallow, underhand stope. The vein filling is almost entirely coarse, blocky calcite. The width is good-- 48 inches--but the values low (Sample 26), and the physical conditions here indicate, as in many other places, that the bottom of the profitable material had been reached.

The final sample, No. 27, was taken across 20 inches of vein, mostly quartz, about 50 feet from corner No. 3 of the Butte Claim. This vein has a strike N 53 E, and a very nearly perpendicular dip. Between the location of this sample and another shaft approximately 40 feet north, the vein is faulted to the east about 30 feet. The outcrop is conspicuous, showing more quartz than is usually seen about the property. This sample gave the lowest gold return of any taken, but showed a copper content of over 4%.

While there is not enough positive data available to definitely prove that the original theory of a continuous ore body extending through the hill from the north to the south side, of a thickness and metal content indicated in the outcrops, there is sufficient evidence to establish a reasonable doubt that such a situation exists. The present physical conditions indicate a narrowing to unprofitable width within a short distance on the projection of both strike and dip and faulting of undetermined extent at no great depth from the surface. Either of these conditions may exist separately, or may occur together.

This situation definitely renders invalid all estimates made as to tonnages predicated on a continuous body of ore extending through the hill, and the "quit-faces" left by the Lessee upset any estimates of value based on the samples taken along the outcrop before these small ore bodies were mined out.

Without entering a discussion of the genesis of the ore deposits, it has been demonstrated by the operations of the Lessee, and substantiated by sampling, that the metal content of the ore decreases to unprofitable quantities at no great distance below the surface. It is also very evident, as disclosed by these leasing operations, that the length of the ore shoots, measured at right angles to the dip, is never very great -- usually less than 100 feet. Short shoots of limited vertical extent, combined with a decrease in width and values, reduce mining operations to practically a "gambucino" or "chloriding" basis, a type of operation never very profitable.

The only conclusion to be drawn from the combination of conditions set out above is that, in all probability, the greater part of the profitable ore has already been removed and sold. Therefore, the property in its present state offers little, if any, prospect of becoming a profitable mine.

Respectfully submitted,


A. L. Flagg
A. L. Flagg
Consulting Engineer

ALF:AC -6

SAMPLES

<u>Number</u>	<u>Width (inches)</u>	<u>Gold (ounces)</u>	<u>Silver (ounces)</u>	<u>Copper (%)</u>
1	15	.20	1.08	.70
2	24	.08	.52	1.00
3	36	.08	1.48	1.50
4	18	.54	.86	7.80
5	60	.10	.50	2.55
6	48	.24	none	1.30
7	48	.48	.52	2.15
8	24	.94	.58	3.00
9	30	1.02	1.18	3.90
10	50	.08	1.48	1.85
11	6	.80	.20	15.50
12	15	.44	.44	2.05
13	30	.48	.76	3.60
14	18	.10	.10	1.00
15	30	.24	none	1.70
16	72	.08	.52	1.45
17	72	.06	.26	1.25
18	24	.04	.24	3.70
19	60	.14	.06	1.20
20	18	.36	Tr.	.90
21	18	.40	1.00	.60
22	18	.10	.30	.85
23	42	.08	.56	1.65
24	36	.36	.60	2.40
25	14	.26	.74	3.95
26	48	.32	.52	.85
27	20	.04	.66	4.15

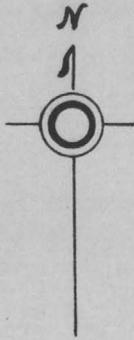
MAPS

I. Traced from the plat United States Mineral Survey No. 2467 in the office of the Cadastral Engineer, Phoenix, Arizona.

II. An enlargement of a portion of No. I.

III, IV, V and VI. Brunton Surveys of Recent Workings. Traverse between lettered stations paced. Scale: 1 inch = 20 feet. Opposite sample numbers is given width sampled in inches, ounces of gold, ounces of silver, and percent of copper. Location of photographs is indicated by "P", followed by letter designating photograph.

ALF:AC-6



BULLARD MINE I

CAMP

EMILY

STELLER

NORTH STAR

HOME STAKE

AREA RATTLER

PRODUCTIVE

PRINCIPAL

WASHINGTON

SWEEP STAKE

PRODUCER

AVALANCHE

INTERNATIONAL



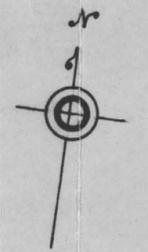
TRACED FROM
U.S. GEN. LAND OFFICE PLAT
U.S.M.S. N°2467

A.L.F. 7-15-1936



BULLARD MINE II

130' =
S-22
S-23



Disc.

PC
S-20
S-21

32'
S-15

30
30

F OF
S-12

Cor. 1
HOME STAKE

OB

P'AV

OC

OB
P'VE
OC

Cor. 3
S.S.

Cor. 4
W

Cor.
Ratter

LOCATION OF SAMPLES
PRINCIPAL PRODUCTIVE ZONE

SCALE 1"=100'

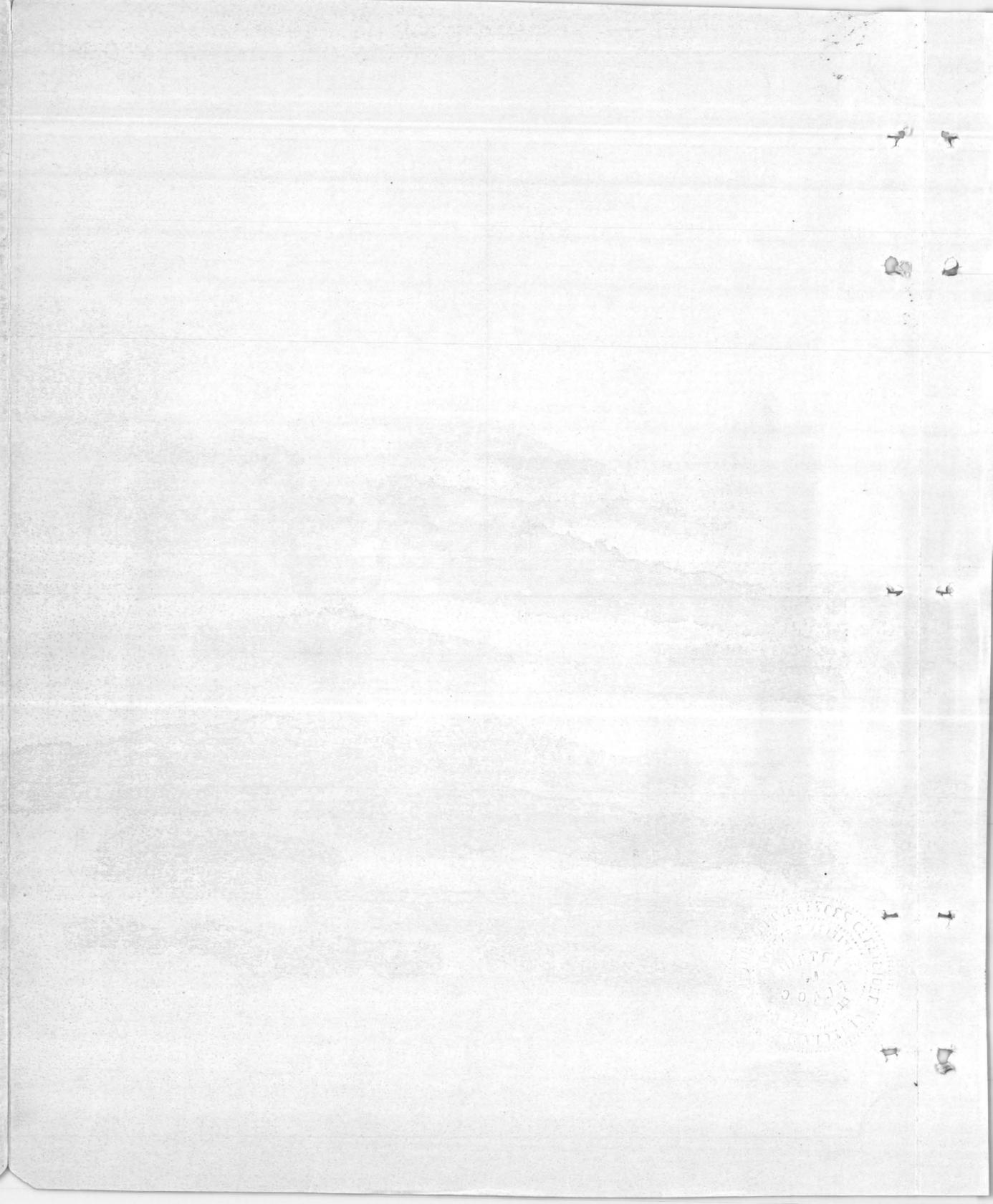
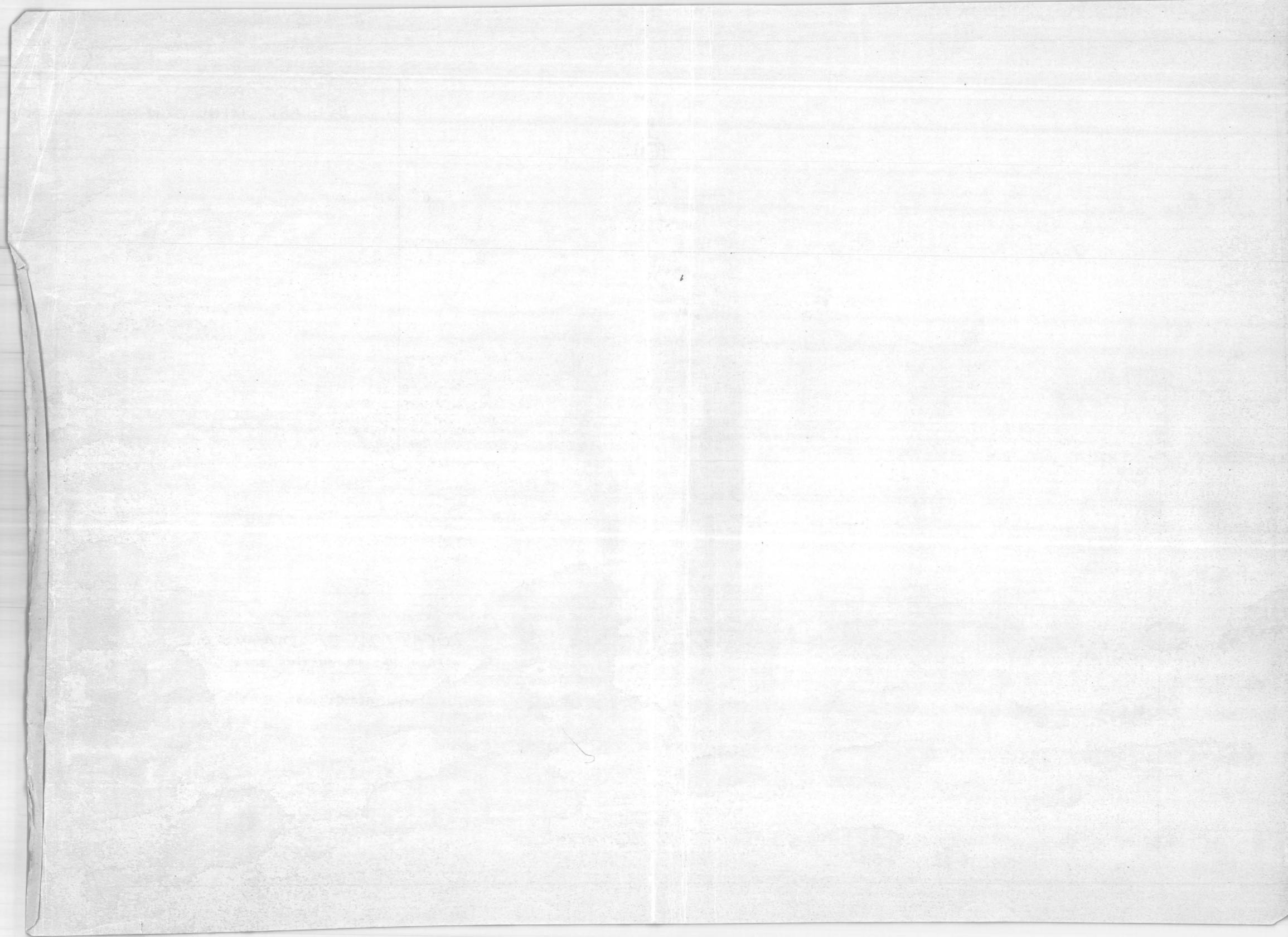


S-17
Disc.

S-16

Disc.

AE



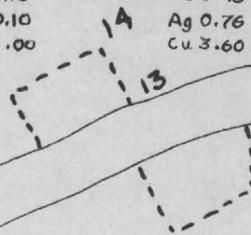
BULLARD MINE

VI



W 18"
Au 0.10
Ag 0.10
Cu 1.00

W 30"
Au 0.48
Ag 0.76
Cu 3.60



FAULT
52° E
1/42°

STOPE

90

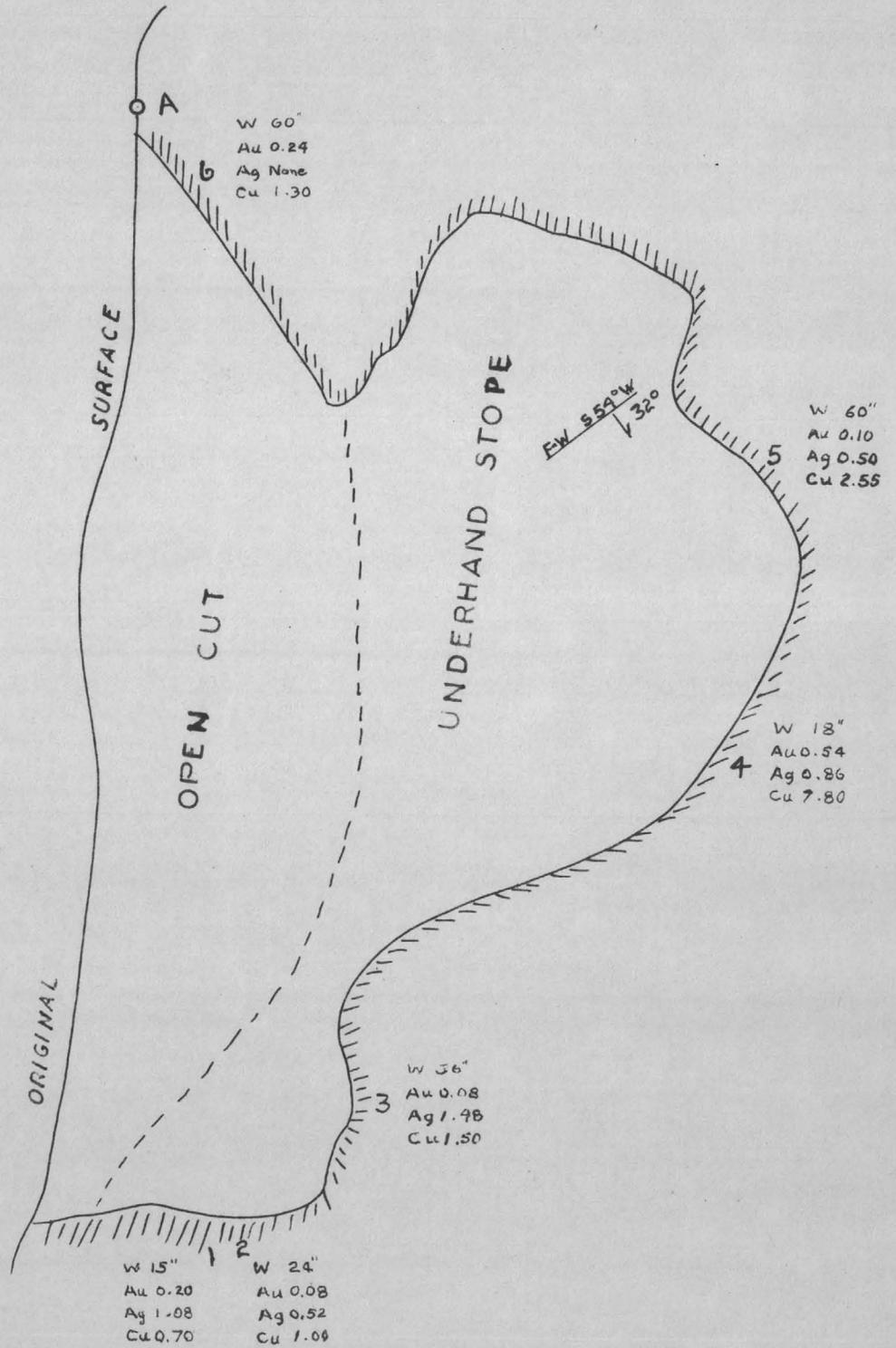


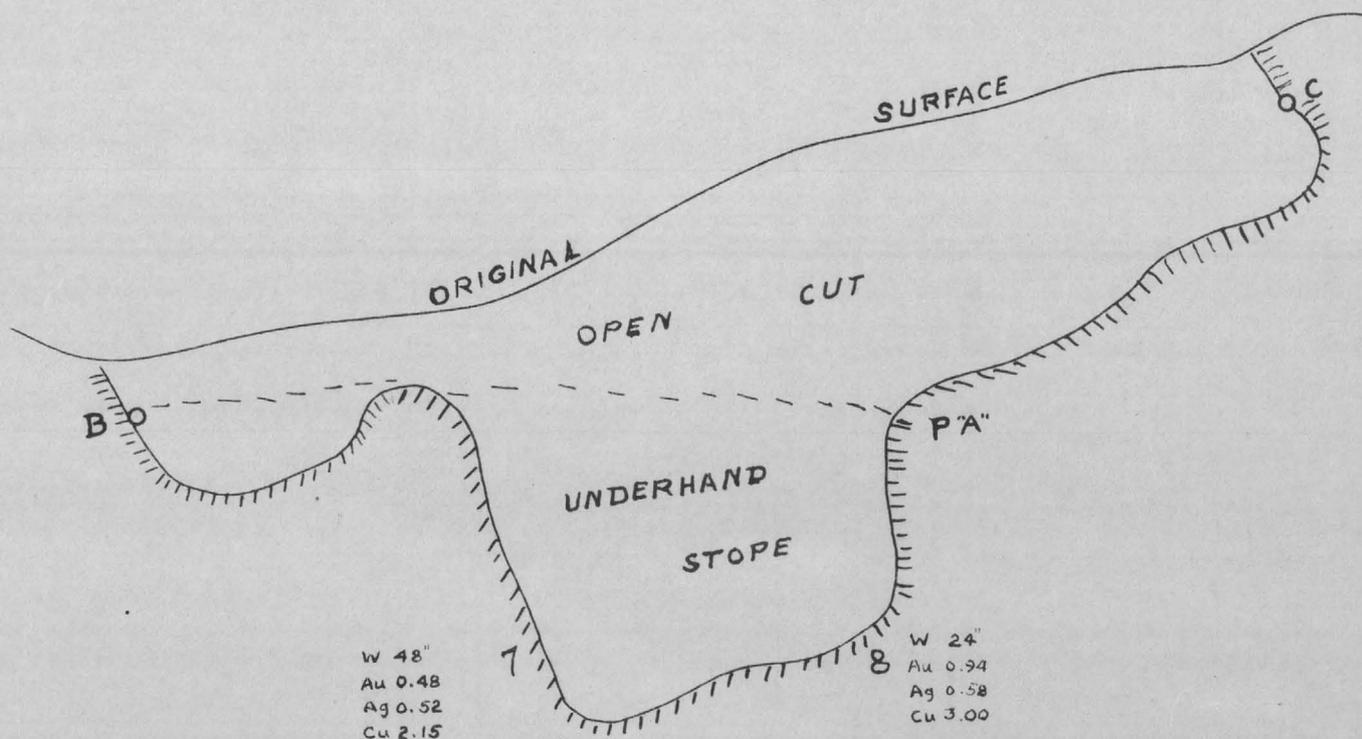
1911



BULLARD MINE

III



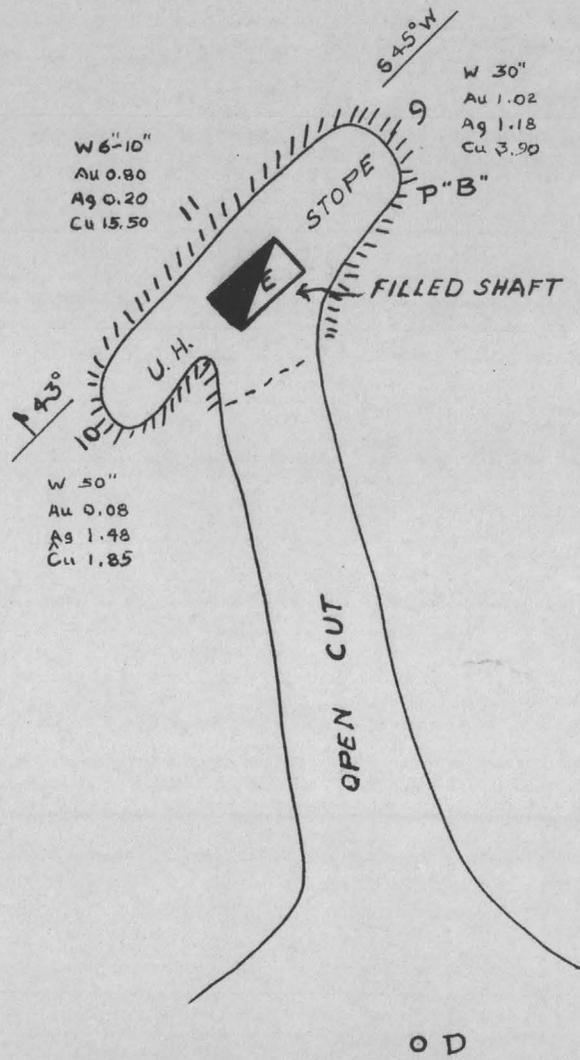


Wd. 15"
Au 0.20
Ag 1.08
Cu 0.70

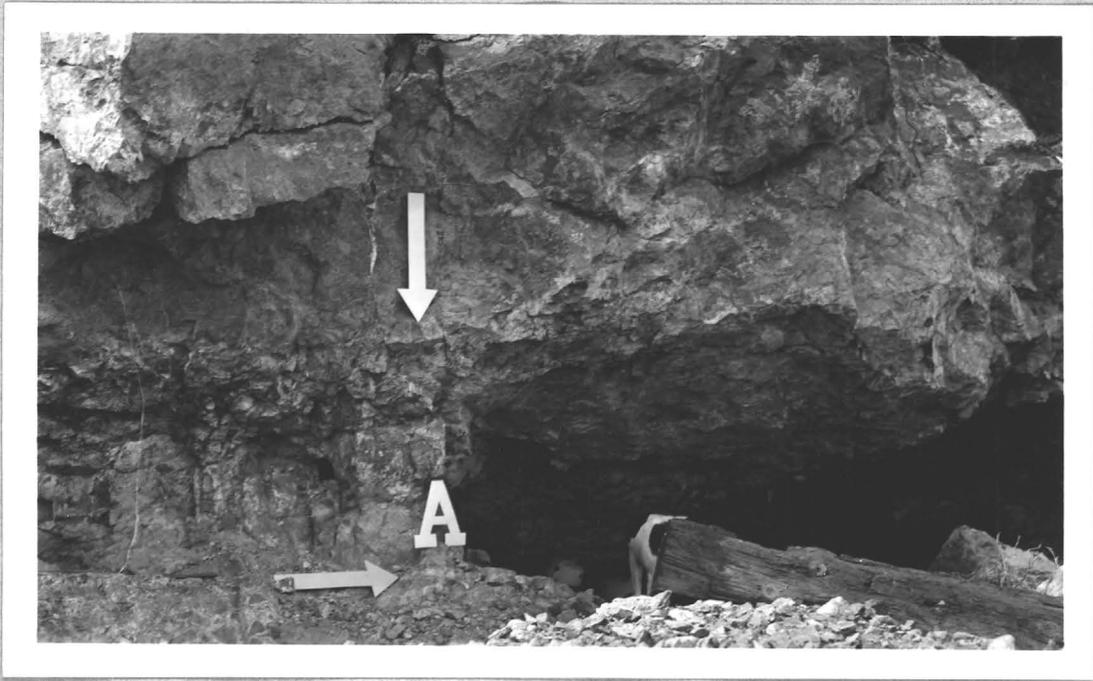


BULLARD MINE

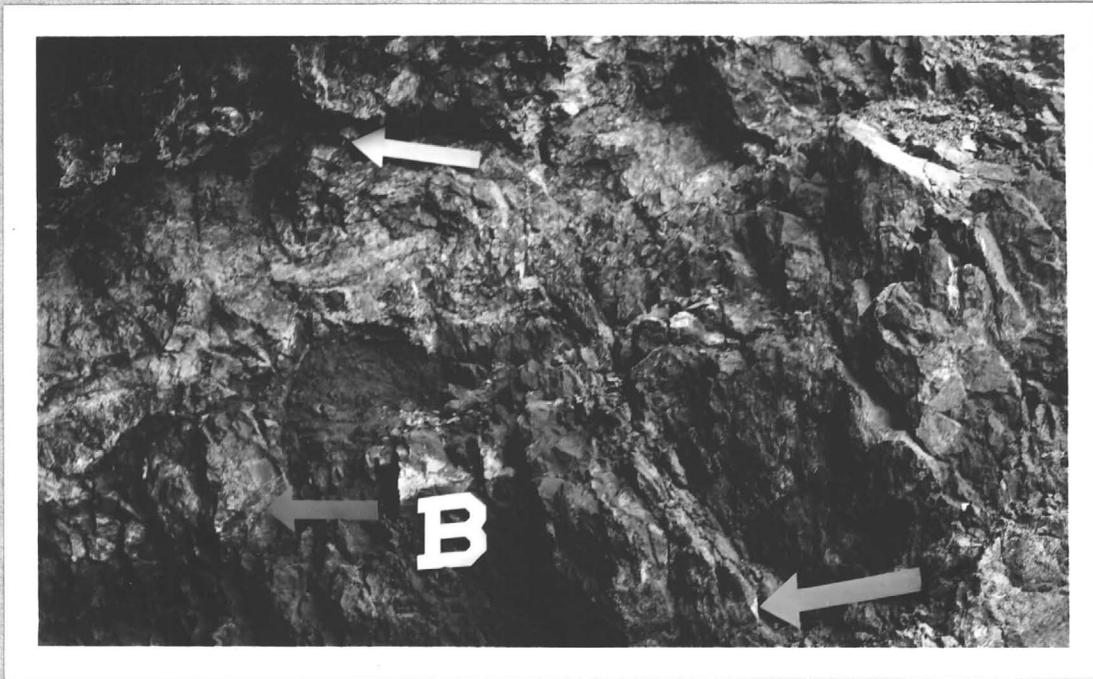
V



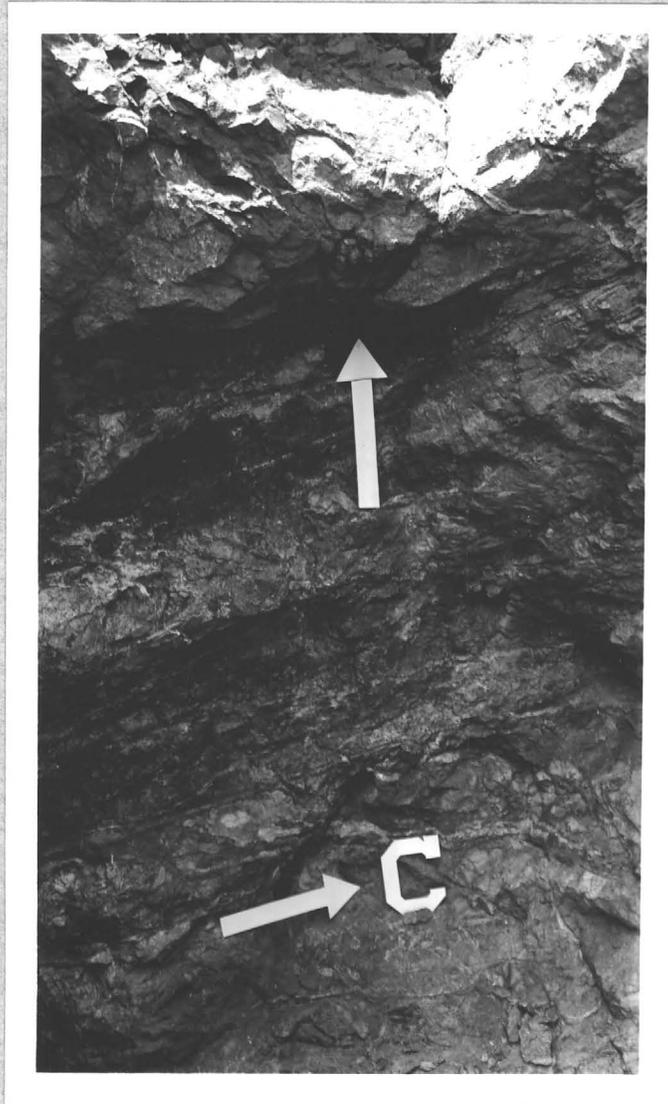
PHOTOGRAPH "A"



PHOTOGRAPH "B"



PHOTOGRAPH "C"



NOTE RE BULLARD MINE

2/3/39

Arthur Murphy says that J. Ben Ross bought out Merrill by paying him \$250. Does not know whether this was the entire consideration or only first payment. Presumably Ross is now paying Bullard the minimum royalty of \$200 per month.

Ross is said to have shipped the first car of ore a short time ago which is supposed to have run \$32.00 per ton, probably it was carefully sorted. Judging by the experience of Long and others it does not appear likely that Ross can make any money from mining and shipping crude ore.

Murphy does not know if any mill is planned nor who backed Ross in this venture nor whether the Bullard now forms part of the holdings of the Allied Mining and Smelting Co.