CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
3550 N. Central Ave, 2nd floor
Phoenix, AZ, 85012
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

The following file is part of the Walter E. Heinrichs, Jr. Mining Collection

ACCESS STATEMENT

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

CONSTRAINTS STATEMENT

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of "fair use."

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

QUALITY STATEMENT

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

UNIVERSITY OF ARIZONA
Tucson

College of Mines
Arizona Bureau of Mines

Copy
February 12, 1942

METALLURGICAL TEST

Ore No. 612

The sample of this ore was submitted for test by Mr. John Greenwood of Tucson from the Gould Mine of the Copper Bell claims located approximately fifteen miles west of Tucson, with the request that a method of treatment be determined. The Arizona Bureau of Mines has no information relative to the tonnage of ore available in this mine, nor of the average grade of ore.

The sample was a heavy pyritic ore containing copper chiefly as chalcopyrite in a siliceous gangue, the analysis was as follows:

% Copper	%Iron
4.8	25.6

Liberation of the sulphide minerals from each other and from the gangue was practically complete at 100-mesh.

Test No. 612A, grinding to approximately 100-mesh and using six pounds of lime per ton of ore was not successful, due to insufficient pyrite depression.

Test No. 612B, with the same grind and ten pounds of lime per ton of ore was made as presented on following page and gave these results;

SUMMARY:

The results of the tests show that an ore of this character a copper extraction of 96.4 per cent may be expected in a concentrate containing 28.8 per cent of copper. At some sacrifice in extraction, this grade could probably be raised if it were desired. Grind should be to approximately 100-mesh. In addition to 10 lbs. of lime per ton, the only reagents required are 0.08 lb. of Ethyl Xanthate (z3) and 0.05 lb. of Dupont frother.
Total flotation time was 13 minutes.

The Arizona Bureau of Mines

By: E. H. Crabtree, Jr.
Metallurgist.

Test No. 612B

	Wt. Grams	Dilution Water:Solids	Time-Min.	Reagents lbs. per ton/ore Lime	z	Frother
Grind	510	0.75/1	30	10.0	3	
1st Flotation		3/1	3	-	0.02	0.05
2nd "		"	5	-	0.02	-
3rd "		"	5	-	0.04	-

pH of tails 8.6
Free CaO in tails 0.1 pound per ton of water
Screen analysis of tails: 612% plus 100 mesh

Products

	Wt. Grams.100	Tons in tons feed	% Copper	% of total Copper
Conc.No. 1	58.6	11.5	30.8	75.5
Conc.No.2	15.2	3.0	27.0	17.3
Conc. No. 3	6.1	1.2	13.8	3.6
Tails	428.0	84.3	0.21	3.6
Calc. Heads	507.9	100.0	4.69	100.0
Assayed Heads		100.0	4.80	100.0

Compositing the above three concentrates into one concentrate, the products will be as follows:

	Tons in 100 Tons of Mill Feed	%Copper	%of Total Copper
Assayed Head	100	4.80	100.0
Calculated Heads	100	4.69	100.0
Copper Conc.	15.7	28.8	96.4
Tails	84.3	0.21	3.6

Copper Bell (Gould) September 25, 1942

Tucson George A. Bellam

Production Possibilities Survey

This property is situated in the Tucson Min.Dist. about 11 miles north west of Tucson. It is owned by John Greenwood, Mgr., 40 E. 13th St., Tucson Martin Waer, Elmer Dow and Abel Weinberg. There is a good road into the property which is on the edge of the Tucson Park area. Ample water is available for all mining purposes.

Ore occurs as intrusions in limestone, values in copper as chalcocite with some bornite, Although no notable operations have been conducted for about 40 years, some 500,000 lbs. of copper have been produced in the past shipments going to Globe and Sasco smelters, where this siliceous flux was desired.

Development consists of a 350' shaft with tunnel opening on 100' level drifting and x-cuts on 200' and 300' levels; winze near shaft in tunnel also opening lower levels; and exposures of two parallel veins which have not been developed. There is water just below the tunnel level the 100.

The owners wish to apply for a preliminary development loan. They have been confronted with a problem in this regard, since the old shaft is badly caved and it might not be practical to rehabilitate it. In 1940 about 100 tons of ore was taken out on the tunnel level next to the shaft. All of the timbering came in and considerable work will be involved in repairing it above the water, while it is reported caved below also. The owners were figuring on a new shaft at the tunnel portal to open the lower levels. However, the winze is in good condition and will enable access to all parts of the workings. I recommended that they merely apply for an unwatering loan, say it will cost $1000 or $1500 to unwater, and upon access and sampling future development may be decided upon.

The present reserves, estimated at about 100,000 tons, average about 4% copper. Yesterday I was informed by Campbell who had sampled the property in the past, that 25,000 tons of at least 4% copper ore can be taken out above the water at present. This, together with estimates of production contained in the Henderson report may be rather optimistic, as were the plans for a mill on the property. However, after spending sometime in the workings, I believe substantial tonnage, say of 3½% Cu content, to the amount of 25 tons per day of good milling ore could be sent to the Jacobs mill. Although Greenwood states that he faces no particular problems, he will undoubtedly run up against the usual labor and equipment shortages for larger operation. He has three or four men available for the proposed unwatering and repair work now, and can readily get one or two additional men for the smaller operation, in addition to two of his partners, one of whom is a good miner. Greenwood himself has had considerable mining experience. He can readily get together a crew of ten and for the immediate present--within the next six months. I believe a small operation is justified.

Geo. A. Bellam

C O P Y

Tombstone
Arizona
July 3rd,
1922.

Mrs. M. C. Wakefield
Tucson, Ariz.

Dear Mrs. Wakefield:-

I have your nice letter of the 2nd, and your excuses for not sending me the copy of option on the Gould Mines is all right, when your Stenographer returns I shall be pleased to receive same.

From all accounts it has & is very hot just now in Tucson, & and Phoenix it must be dreadfull.

Personally I want to ask you if you can not take over my interest in the Gould Mines just for a very small amount. I would then be satisfied & at this time it would help us out very much. We are having pretty hard times now days & my Wife is keeping a few Boarders to help out for the time being, other wise I would certainly hold on to my interest as I have great faith in the property.

I have seen Mr. Kemp since you were here & his opinion of the property is certainly good.

I f you could give Mrs. Gray for me FIVE Hundred Dollars I would turn over my entire interest to you & draw out entirely. I am saying this to you personally, & I know Mr. Solimon would be pleased to have us make a little deal of this kind. One way & an other I have put pu quite a good deal on the Gould mines & have made many trips at my own expense. Kindly let me hear from you by return mail.

Very Sincerely

TUCSON WAREHOUSE & TRANSFER CO., INC.

26-28-30 North Scott Street
Tucson, Arizona

July 2, 1922

Mr. Douglas Grey,
Tombstone, Arizona.

Dear Mr. Grey:

I regret that I have been so dilatory in sending you the copy of option on the Gould Mines. It is not that the matter was forgotton, but each time I have gone to my bank box I have neglected to get out the document so that I might have our stenographer make a copy.

She is at present away on her vacation and I would like to wait until her return. However, I have been so careless in this matter that if you wish, I can make this copy myself, if you will let me hear from you again.

I think the date of the last option given is December 21, 1921.

With kind personal regards, I remain,

Yours truly,

(signed) Mary Cameron Wakefield

APPROXIMATE COST OF SMELTING PLANT 150 TONS DAILY CAPACITY.

Excavation of site	$1000.00
Smelter building & ore bins lumber	4000.00
Labor	2500.00
Oil engine	3000.00
Furnace	5000.00
Blower	2250.00
Blake Crusher	750.00
Pumps, pipe line & tanks	1500.00
Forehearths, slag pots, etc.	1200.00
Smoke stack & flue	2000.00
3 sets Weighing machines	1500.00
Tools for operating	350.00
Pipes, fittings, valves, etc.	500.00
Sand, lime, cement & bricks	400.00
Assay office & office buildings	1000.00
Construction labor erection of plant and other incidentals such as salaries.	5000.00
	$31,950.00

C O P Y

Tucson, Arizona,
March 6, 1922.

Mr. Douglas Gray

Tombstone, Arizona

Dear Sir:

We are the owners of all of the issued stock of the Amole Mines Company, except qualifying shares issued to the directors. You desire an option upon one-third of such stock which, in consideration of the sum of one dollar to us in hand paid, and other valuable considerations, we hereby give and grant upon the following terms; Within nine months you are to pay to us the sum of $964.00....., whereupon we will cause said stock to be transferred to you, provided that in addition to said sum of $964.00...., you repay to us one-third of any and all moneys which we may, from and after this date, and prior to the exercise of this option have expended in and about and because of said property. This option is personal to you and may be exercised by no one else, and in the event of your death it shall at once cease and determine.

Dated this 6th day of March, 1922.

(signed) .....M..C..Wakefield.....
(signed) Chas. F. Soluma
Solimon

C O P Y

Mr. Douglas Grey:

The Gould Mine has an ore body opened up that has been estimated to contain 150,000 tons of ore carrying about 3% Copper. In the bottom workings sulphide ore was opened up which assayed 14% Copper and some ten tons of this ore was laying in the 150 foot level in the year 1921.

There is no question but that good large tonnage of ore carrying up to 10% Coppercan be developed on the Gould property.

The mining and smelting of the Gould ore can be done at a cost of about $4.00 per ton.

Yours truly,

Incorporate for 1,000,000 shares, par value $1.00

500,000 in Treasury--
100,000 @ 50¢ per hundred--$50,000.00
400,000 Sanders D. Grey--@ 25¢
Can take in 3rd party if necessary--$100,000.00

Cost of Mine--$10,000.00
Cash in 60 da. 1,000.00
Building cabins 1,000.00
Fixing road 1,000.00

$30,000.00 already spent on mine development

17 miles from Tucson
5,000 tons and over shipped to smelter at Globe--
D. E. Said

To Incorporate $200.00 cash
Stock books 50.00

University of Arizona
Arizona Bureau of Mines
Ore Testing Service

March 15, 1945

Mr. H. C. Ertal
Route 1, Box 980
Tucson, Arizona

Dear Mr. Ertal: Re: Ore No. 960

The sample of copper ore submitted by you March 6 has been tested by flotation for the recovery of copper. The Arizona Bureau of Mines has no knowledge of the tonnage of material which the sample represents.

The material was crushed to minus one-quarter inch and one-half was then crushed through rolls to minus 10-mesh. From this 10-mesh material head and test samples were cut.

TEST B

The ore was ground in laboratory ball mill for 30 minutes and floated with 6 lb. of lime per ton added to the ball mill, and 0.05 pounds of potassium xanthate and 0.05 frother B-23 per ton. These reagents were conditioned for three minutes. The concentrate was removed for five minutes and the middling for seven minutes. Results of this test are given in following table.

	Tons per 100 tons Heads	Copper %	Silver ozs per ton	Gold ozs per ton	Distribution of copper %
Head	100.00	2.88	0.13	Tr	
Calculated Head		2.87	0.1324		
Concentrate	9.9	28.02	0.4	Tr	96.7
Middling	1.7	1.86	0.2		1.1
Tailing	88.4	0.07	0.10		2.2

Screen test of tailing:

	Weight, percent
Plus 100-mesh	0.5
Minus 100 plus 200-mesh	9.0
Minus 200-mesh	90.5

Test C

In test C a sample was ground in laboratory ball mill for 20 minutes with the same reagent as test B except one-tenth pound of pine oil per ton of ore was used instead of frother B-23. The copper concentrate was floated for twelve minutes and then 0.05 pounds of reagent 208 was added and concentrate taken off which contained mostly pyrite. The following table gives the results of this test:

	Tons per 100 Tons Heads	Copper %	Silver oz. per ton	Gold ozs per ton	Distribution of copper Per cent
Head	100.0	2.88	0.13	Trace	
Calculated Head		2.85			
Copper Conc.	12.08	23.03	0.4		97.30
Pyrite Conc.	14.08	.23	0.6		1.10
Tailing	73.7	.06	0.1		1.60

Screen test of tailing:

	Weight, percent
Plus 100-mesh	3.0
Minus 100 plus 200-mesh	26.5
Minus 200-mesh	68.5

Conclusion

The copper in this sample can be recovered by flotation by grinding to 90 percent minus 200-mesh. This grind gave 96.7 percent extraction. A coarser grind, 68.5 percent minus 200 gave a concentrate, including the middling, of 97.3 percent but with a lower copper content per ton of concentrate. The grade in Test C could be increased by cleaning the concentrate.

G. H. Reseveare
Metallurgist

C O P Y

Walter W. Wishon
Mining Engineer
Los Angeles, Calif.
7-6-1908

To-
S. H. Gould
President and General Manager
Gould Copper Mining Company.

Sir:

I have the honor to hand you the following report on your property with maps and cross sections to define and illustrate it.

LOCATION, AREA, ETC.

The Mining estate of the Gould Copper Mining Company lies in almost a solid body, without any intervening claims, in a general rectangular form, in the Tucson Mining District, Pima County, Ariz., distant about eleven miles west of Tucson, the county seat and trading point.

The elevation is approximately 3,400 feet above sea level and ranges from 400 to 1000 feet above surrounding valley.

The area embraced in the property is approximately 210 acres all fully surveyed, as per topographical map herewith.

GEOLOGY

The geology is of the usual type of Arizona contact copper ore deposits, consisting of interbedded magnesium, limestone, highly metamorphosed, in contact with granite-porphyry, on the north side of the property, along with the crest of the mountain uplift. This contact series has been fissured, faulted or intruded and partially overflowed by the out-pourings of the quartz-porphyrites, resulting in the "garnetization"of the sedimentary rocks and their mineralization in the form of loades or reefs, which occur in approximately parallel lines along and near the planes of contact. Epidote also occurs with the garnet; in fact, both are common associates of copper in the southwest.

The great mountain uplift of about 1000 feet vertical has broken the interbedded limestone formation, as shown by the bedding planes of the remaining mass, which, although mineralized to a marked degree as shown by its decomposed epidote reefs, yet it shows none of the huge garnet outcrops, lode-like in character, which appear in great lenticular masses here and there along their strike, as in that of the great mountain uplift.

It is in this area of greatest activity that three large mineralized reefs, or veins, traverse the property for its entire length of about 4800 feet, as shown on map herewith. On the west end of the property these reefs approach each other where, on the Sierra Arriba claim the epidote garnet mass becomes extremely large in consequence, and the copper mineralization of greater value than usually found elsewhere, noted on the surface, although all the reefs are copper bearing and have the semblance of regular lodes.

MINERALOGY

The copper ore is found in the form of sulphide, usually chalcopyrite, disseminated in the midst of the garnet, in grains, stringers and often in nodular masses, associated with much iron sulphide, lime spar and some quartz. In some instances the chalcopyrite has yielded to the secondary mineral, bornite, which is found scattered here and there throughout the great mass, thereby bringing the copper percentage up to a mark that allows of great widths in these huge lodes to be mined and smelted at a profit. This is also due to the ratio of predominating gangue materials being so largely basic in nature as to admit of fluxing silicious ores, in which the veins of the surrounding country abound.

DEVELOPMENT

The veins have an east-west strike and dip northerly into the mountain at an angle of about 60 degrees from the horizontal.

The chief development consists of a working shaft with manway, 360 feet in depth, on Copper Mine Claim No. 5, with cross-cuts and drifts on the 100 foot level, and the 300 foot level, as permap showing horizontal and vertical projections herewith. There is also a winze from the 100 foot level to the 300 foot level, and a cross-cut shown on map south from shaft on the 200 foot level, which showed much iron pytite assaying about one and one half percent copper, but it produced so much water that a pump would be required, hence it was bulkheaded to stop the flow.

About 600 feet east of the main shaft and 60 feet lower, on Copper Mine No. 1 claim, there is an 50 foot shaft on the same vein of the main working shaft. This shaft is all in ore. About 700 feet northerly from this 50 ft. shaft, and on the second parallel vein, on Copper Mine Claim is a cross-cut tunnel 70 feet in length which, although but an apex cross-cut, is all in ore. The croppings here and immediately to the east are huge. From this 70 foot cross-cut and from the 50 foot shaft already mentioned, 30 tons of ore was selected and shipped to the El Paso Smelter which sampled 8.6% copper, 5.0 silver and $1.50 gold, per ton. About 90 feet vertically below the 70 foot cross-cut tunnel, above mentioned, a tunnel of like length is now being driven to cross-cut the ledge, but it has not yet entered the ledge.

On the Invincible Claim is a 10 foot shaft, sunk on the western extremity of avery large garnet outcrop, which shows very fine pyrite, much resembling marcasite, especially throughout the gangue at and neat the bottom of the shaft, and assaying about 1½% copper.

On the Sierra Arriba Claim is a 10 foot shaft and a 20 foot tunnel; on the Greenwich Claim is a 20 foot shaft, The Sierra Arriba claim and the Invincible Claim have the most wonderful cropping of the entire property, both as to size and quality, although other large lenses also appear at intervals along each of the veins, but the mineralization appears better in the veins nearest the granite porphyry contact and also as they approach each other in the western extremity of the property.

It is therefore, my judgment that the main 360 foot working shaft before-mentioned has been sunk upon the leanest vein thereof, being the third and possible the fourth vein from the granite prophyry contact, yet, at a depth of 50 foot ore was encountered which had evidently leached and reconcentrated, as it assayed 17% copper. At a depth of 113 feet and known as the 100 foot level, the shaft sunk vertically, encountered the foot-wall and a cross-cut at the horizon proved a width of 30 feet of ore. A drift westerly upon it shows ore of good commercial value, its entire length of 75 feet. The face at that point is 20 feet wide with neither wall showing. East from the shaft the orebody goves way to massive iron pyrite in a very soft gangue and a little further east the vein is faulted. which has been cross-cut and evidently a new body is found just coming into the present face, This ore is believed to be the same as that encountered in bottom of the 50 foot shaft to the east.

The cross-cut on the 200 foot level shows the ore body to be about 50 feet in width which has been drifted upon westerly about 60 feet. The copper value appears to be less on this particular portion of the 200 foot level than that on the 100 foot level, but in the east drift an upraise, as well as the winze for 50 feet in depth, shows quite high grade ore. As shown on map herewith, the winze is sunk on the ore to the 250 foot level at which point the ore dips out of the winze as it there changes vertically to the 300 foot level in order to use it for a chute. Two drifts have been started westerly from the winze, about the 250 foot level, both showing high grade ore, which tends to prove that the large mass of low grade ore encounteded to the west on the sill floor of the 200 foot level is due entirely to a "horse" or a much harder vein material which was more difficult for the ore nearing solution to penetrate. While the value of the "horse" or vast mass of harder vein material on the 200 foot level, will probably not average more than 2% copper, yet the ore disclosed in the upraise and the winze will average fully 5% copper.

It is quite a difficult matter to obtain a fair sample of the ore bodies without actually mining, hence I have taken as an average the entire ore bodies so far opened, the average assays as found by the Old Dominion Smelter as Globe, Arizona, in sampling the 100 tons of ore shipped just as mined to them and with instructions from the smelter people to keep the ore as low as possible in copper, but on the other hand, as high in basic elements and sulphur as possible, as they desired it for flux and matt fall chiefly.

This average analysis is; Copper 3.2%; Silica 26.0%; Iron 25.1%; Aluminum 1.26%; Lime (CaO) 13.2%; Sulphur 19.0%. The gold and silver values being below their scale of %1.00 gold and 2.0 silver, no record of these values was given. However, from numerous assays taken while the ore was being shipped, it is safe to say that ore of this low copper grade will, average about $.60 gold and 1.5 oz. silver per ton.

Owing to the great demand for ore of this character, that company now offers for this ore $0.08 per unit for the Iron, Lime and Sulphur percentages, or 57.3 unites.

Total at 8 cents - - - - - - - - - - - - - - -	-$4.58	
Copper on electrolytic assay less 2½¢ from N. Y. Electrolytic quotations $2.00 per unit - -	6.40	$10.98
From which deduct 10¢ per unit for silica percentage above 20%, 6 units - - - - - - - - - - - - - - -	.60	
Smelting charge, Nil. Railway charge for freight - - -	2.00	2.60
Leaving a net smelter value of - - - - - - - - - - - - - -		8.38
From which deduct; Wagon haul of $3.00 and cost of mining which in orebodies of this magnitude will be from $1.00 to $2.00 per ton total- - - - - - - - - - - - - -		5.00
		$ 3.38

It is therefore apparent that the erection of a smelting plant upon the property is imperative, and therefore a smelter site has been provided by the Company at the foot of the mountain, about three-fourths of a mile distant from the main working shaft, which is admirably adapted for that purpose.

The ore is best adapted for treatment in the blast furnace type of not less that 500 tons units. In the first smelting the average ore of say 3.0% copper value will produce about 17.0% matte; the second smelting about 50% matte; and by using the semi-pyritic process, as now used at the Washoe Smelting Plant of the Anaconda Company of Montana, ore of this character can be treated with less that 3% coke on the charge. By providing from 96% to 98% copper, which may be cast direct in cathode form for shipment to the refinery.

As before stated, the fluxing quality of this ore is such that the silicious ores of the surrounding district can be treated therewith. These are now paying a smelting charge at El Paso from $10.00 to $12.00 per ton. By fluxing these ores to their limit and charging El Paso rates, the ores of the Gould Copper Mining Co., can be both mined and smelted without cost as to its own ores, and in addition save to the seller of silicious ores the minimum freight haul of $2.00 per ton to the El Paso Plant. The entire surrounding country is known to be rich in silicious ores and the erection of this plant would greatly stimulate theirpresent output.

Looking westerly from the Gould Copper Company's property one can see the new Sasco Smelter with its two units of 350 tons each and its adjacent mining property, the Silver Bell, which now has depth of 1200 ft

During the development of and while building a reduction plant on the Gould property, the Sasco Smelter could be utilized to great advantage, by building a spur track of about 12 miles from the west end of the property to the main line of the Southern Pacific Railway, which would give all rail connections with the smelter with a freight charge of probably 50¢ per ton. As stated before, this west end of the Gould property not only has a wonderful surface showing of copper, but it canbe tunneled to great advantage and the entire system of veins economically worked therefrom.

The geological condition of the Gould and Silverbell properties are similar in many respects, except that of the Silverbell is more crushed and broken, yet their orebodies, like that of the Gould property, carried low copper percentages in their upper horizons, but this value had gradually enhanced as depth was attained.

As mined and smelted in the large way, it is quite probable that ore of this character, especially when used for fluxing, can be found profitable with values as low as 1½% copper and it is believed by the writer that much of the large mass of croppings, especially on the westward extremities of the veins of the Gould property will be found to show that percentage and that immediately below such croppings a good commercial grade ore will be found, in fact, in the three visits that I have made to the property, I have found considerable very high grade ore as a float from an ore body evidently covered, lying above the highest veins and just north of the huge outcrop as shown on the map on the Invincible and Esperanzo Claims, and probably at or near the granite-porphyry contact.

ECONOMIC CONSIDERATIONS

The conditions attendant upon operation are in every way favorable for cheap mining and reduction. The topography is such that the ore can be delivered by tramway at the smelter side at the foot of the mountain, later to be succeeded by tunnels. The mine furnishes an abundance of water for the proposed smelter, in fact, will yield considerable water and thereafter can be utilized to irrigate the fertile valley adjacent.

An electric power plant can be erected on the Railway and operated very cheaply, using fuel oil and the power generated conveyed to both smelter and mine. There is a good wagon road from the railroad at Tucson to the mine, now 17 miles, which can be shortened, over which machinery can be hauled at nominal cost. The smelter site is a gentle sloping tract, admirable suited for the purpose, being intersected by a deep gulch which furnished excellent dumping ground for slag for years to come.

The general plan of development and operations admits of a very cheap cost of handling the ore from the mine to the finished product, the estimated available commercial ore aggregates a total of about 100,000 tons, and a supply of 1000 tons or more per day is well within the range of early attainment. A tunnel driven from the smelter site would cut the first vein of the series at about 400 feet level, and second at about 700 ft level and the third at about 1000 ft. level. Thus it may be seen what extensive development may be prosecuted without requiring any ore whatever to be hoisted.

Any self fluxing ore enables economies which greatly cheapen the cost of treatment, but when these qualities are such that they are also enabled to treat a large proportion of silicious ores with a high treatment charge for same, the flushing qualities assume an approximate value in these ores equal to the total copper, silver and gold content, hence the blister copper for this property and proposed smelting plant should be marketed as low as that of any plan in Arizona, in fact, it may be stated that the problem before the Gould Copper Mining Company is not of ore development entirely, but largely one of operating, being confined to a study of the necessary equipment and best method of handling.

Owing to the extensive nature of the ore bodies and the large tonnage which can be produced, I am of the unqualified opinion that the property of the Gould Copper Mining Company should rank well with the large producers when once under full operation.

Respectfully submitted,

(Signed) W. W. Wishon.

Los Angeles, California
July 6th, 1908

COPY

Amole Dist 3

COPY

Gould & Mile wide
Tucson Mts.

TO WHOM IT MAY CONCERN:

THIS IS TO CERTIFY, That I have examined the titles to the following groups of Mining claims, all situated in the Amole Mining District, Pima County, Arizona, as follows, to-wit:

(1) The COPPER KING Group, so-called, consisting of the following claims: Columbia, Copper King, San Fernando, San Miguel, Copper Crown, Margarita, Copper Top, Cimmaron, Alta, San Francisco, St. Louis, St. Paul, Buena Vista, Washington, Copper Queen, Copper Bell Mining Claims, and Copper King and Copper Crown Millsites.

(2) The ORIENT Group, consisting of the following claims: Orient Nos. 1 to 14, inclusive, Mining Claims.

(3) The ESPERANZA Group, consisting of the following claims: Esperanza Nos. 1 to 12 inclusive, Mining Claims.

(4) The COPPER MOUNTAIN GROUP, consisting of the following claims: Copper Mountain Nos. 1 to 6, inclusive, Mining claims.

(5) The ORO FINA Placer Group, consisting of the following claims: Oro Fina Nos. 1 and 2 Placer Mining Claims.

The title of the Copper King Group is vested in Elena de Pellon, Louis Pellon, Pedro M. Pellon, Concha McCrillas, Anita Pellon, Charles Pellon, Teresa Pellon, the latter two being minors and represented by Elena Pellon, guardian, and Isabel Waer and L. Martin Waer. Conveyances have been executed by all of said persons to Mile Wide Copper Company and placed in escrow in the Consolidated National Bank of Tucson, the guardian being authorized by Superior Court.

The title of the Orient Group is vested in M. Waer. Conveyance has been executed by him to C. P. Reiniger and J. H. King, and placed in escrow in said bank. Also conveyance from C. P. Reiniger and J. H. King to Mile Wide Copper Company attached to the foregoing escrow.

The title of the Esperanza Group is in J. U. Mettler, Conveyance has been executed by him to Charles P. Reiniger and J. H. King and placed in the Consolidated National Bank of Tucson. Also attached to said escrow is conveyance executed by said Reiniger and King to Mile Wide Copper Company.

The title of the Copper Mountain Group is in Martin Waer, Jr. and John Latz. Conveyance has been executed by them to C. P. Reiniger and J. H. King, and placed in escrow in the Consolidated National Bank. Attached to said escrow is conveyance from Reiniger and King to Mile Wide Copper Company.

Title to the Oro Fina Claims is in L. Martin Waer, Isabel Waer, Henry Waer, Herman Waer, M. Waer, L. Waer, J. Ide, and Caroline Ide. Deed has been executed by all of them to Mile Wide Copper Company and placed in escrow in the Consolidated National Bank, with conveyance of Copper King Group, and deed will be delivered at the same time the deed to said Copper King Group is delivered.

S. L. Kingan

Tucson, Arizona
November 17, 1916

S T A T E M E N T
O F
THE COPPER KING GROUP OF COPPER, SILVER AND GOLD MINES.

Located and situated in the Amole Mining District, on the West Slope of the Tucson Mountains facing the Silver Bell Mines and Mining District, in Pima County, Arizona, about 12 miles in a westerly direction from Tucson. The group consists of 16 mining claims, 600 feet in width and 1500 feet in length, together with a five acre mill site and water right belonging to said group of mining claims, which is called the Copper King and Copper Crown Mill Site.

The names of said claims are as follows:

Columbia	St. Paul
San Luis	San Francisco
Copper Top	Alta
Cimarron	Margarita
Copper Crown	Copper King
Copper Queen	Copper Bell
San Fernado	Washington
Buena Vista	San Miguel

Copper King and Copper Crown
Mill Site and Water Right

The general course of the veins is from the easterly to the westerly being about 20 degrees north of east and 20 degrees south of west.

The formation in which these veins or deposits occur is limestone, porphyry and quartzite, heavily charged and capped with iron, the width of veins on surface being from 15 to 250 feet, The nature of the ore is an iron sulphide, carrying copper, silver and gold. The ore from the different parts of the workings gave a return at the smelter of 18 3/10 percent in copper, $1.70 in gold and 4, ½ ozs. in silver. The next lot shipped from the Copper King shaft or works, which was taken as it came from a large body of ore to the amount of 16 tons gave 11, 7/10 per cent in copper, $1.30 gold and 4, ½ ozs. silver. The former shipment was 22 tons partly assorted ore.

The general samplings of those different claims and workings averages 7 per cent copper, $1.80 in gold and 5, ½ ozs. in silver. I consider this latter a general average of the different and larger workings. The general ore, which is in large quantities, is a free smelting ore and carries a large per cent of iron, sulphur and lime, and makes a self-fluxing ore for smelting purposes. From this mine there has been some 360 tons of ore shipped that averaged 9% copper, $1.50 in gold and $3.50 in silver per ton.

THE COPPER KING: Has one shaft 78 feet deep about in the center of the vein and a cross-cut towards the south 75 feet and a drift along the vein towards the hanging wall, or supposed hanging wall, 310 feet in length and a winze sunk on the supposed hanging wall, but discovered to be in about the center of the ore body, at the end of the cross-cut 25 feet deep with a high grade of yellow and chalcocite and ruby copper and black sulphides, assay values going as high as 37 per cent copper. Another winze sunk down to 30 feet deep in solid sulphides and averaging 14, 1/2 per cent in copper, $1.00 in gold and 4, 1/2 ozs. in silver.

It is demonstrated that as depth is obtained the ore increases in quantity and values. The width cannot be ascertained at the bottom as it has not been cross-cut the full width of the same. At this place on the surface the

vein measures 200 feet in width by tape line. At present a new shaft has been sunk to connect with the old under-ground workings, but is not now deep enough to reach the high grade ore. The present development shows it is leading to enormous big ore bodies, rich in copper, gold and silver.

There is now being installed compressor for air or machine drills and a large hoist with automatic dumper.

THE MARGARITA: Shaft 100 feet in depth and a cross-cut 26 feet towards the south at a depth of 55 feet and a drift towards the east 135 feet. In the drift a winze is sunk 28 feet deep and drift 30 feet, supposed to be the footwall on the vein, and all in ore, then a cross-cut towards the south 20 feet towards the hanging wall, which is lime spar and iron, as the lime overlys the ore bodies. At this place the width of the ore body is 22 feet as far as cross-cut and towards the north, do not know the extent or width. The samples taken from these workings assayed 8.2 per cent copper, $2.30 ingold and 5, 1/2 ozs. in silver. Have taken samples from this claim of native copper that went as high as 78 per cent. This ore is very heavy material of a sulphide or ixidized iron, and a very fine smelting ore. There are a number of other smaller workings from 10 to 20 ft in depth and all have a showing of good ore. Width of surface croppings capped with iron and carbonate of copper is 150 feet in width. And from these workings a large quantity of ore has been shipped to smelter. At present development work is being done. Machinery about to be put on.

THE SAN FRANCISCO: Both on the same strike as the Copper King and the
and Margarita. Workings on these claims range from 10 to 20 feet,
BUENA VISTA to show extent of ore bodies.

THE ST. PAUL: Is a parallel vein or lode of the Copper King towards the north on which there is not very much work done, carrying yellow sulphide of copper with gold and silver, capped with iron for more than 150 feet in width, and heavily charged with epidote of lime and the surface croppings show over 300 feet in width and has a dip towards the Copper King ore body.

THE CIMARRON: Being on the same vein or lode as the Columbia, Copper Bell and Copper Top, has one shaft 22 feet deep and a number of other workings on vein, all in good ore, and gives assay values 14, 3/10 per cent copper, $7.00 in gold, 4 ozs. in silver. This ore has been tested for the purpose of obtaining a shipping ore. The actual width of vein cannot be ascertained, as no cross cut has been made. Workings show in some places gold which goes as high as $25.00 per ton.

THE COLUMBIA Veins running same as the Cimarron. Has one shaft 12 feet deep and several open cuts, ranging from 12 to 25 feet deep; one tunnel 100 feet run for the purpose of cros-cutting the vein or ore body. The surface is capped heavily with hematite and oxidized iron. There is in these workings a green malachite black oxide and yellow pyrites of copper. The ore from these workings gave assay value of 23 per cent copper, $4.00 in gcld and 6 1/2 ozs. in silver. The width of vein has not yet been ascertained as no cross-cut has been made. vein capped on surface with hematite and oxidized iron and carbonate of copper. The width of the surface capping extending over 50 feet. This vein or ore body lies about 1000 feet north of the Copper King and having a dip towards the Copper King vein.

THE COPPER CROWN: Being on same vein as the San Luis, Copper Queen and San Miguel. It has one tunnel 63 feet in length and one cross-cut of 12 feet on end of this tunnel, and another tunnel of 170 feet run for the purpose of cross-cutting the vein or ore body from thelower base. There are several shafts from 10 to 25 feet deep all in good ore. The ore cut by the tunnel to the width of three feet averages 18 per cent copper, $2.80 in gold and 8, 1/2 ozs. in silver. The width of vein cannot be estimated as it has not been fully cross cut. It has been fully demonstrated that as depth is obtained the ore increases in value and quantity. Surface croppings show width of vein from 60 to 100 feet.

The balance of the claims the workings range from 10 to 30 feet deep in shafts, open cuts and small tunnels to discover the ore.

The course of these lodes or veins is from the easterly to the westerly, with a variation of 20 degrees north of east and 20 degrees south of west. The Copper King has a dip towards the south on an angle of about 80 degrees. The St. Paul and Columbia running parallel on the north and dip towards the Copper King at an angle of about 40 degrees and, in my opinion, it is only a question of time and depth when they will join together and form one large ore body. All the rest of the veins or ore bodies lying north of the Copper King vein are dipping towards it, there being five veins or ore bodies.

WATER: Can be had as shown by map at Mill site or Water Right as there is living water all the year round for domestic purposes and will supply several thousand people and animals. By sinking a well fifty or sixty feet and cross cutting the canyon, water can be had or obtained for any sized plant or machinery.

WAGON ROAD: A good suitable wagon or automobile truck road leading to the mines at present 16 miles and to the nearest R. R. station on the Southern Pacific, only 8 miles.

Facilities for working are excellent.

This mineral zone extends from the westerly towards the easterly, eight miles in length and three miles in width, and this group of mines is right in the heart of this great mineral zone.

I see no reason why the Copper King Group and other groups in this locality, by proper development, will not make large producers, they being in the centre of this great mineral belt, and in my opinion, will in time rival the Copper King of Bisbee and the United Verde of Jerome, as I visited both of them when there were mere prospects, and other properties which are now large producers, as I have seen them all for the past 35 years and when they were nothing but prospects. This property has all the earmarks of making a producer that will figure up in the millions as well as the Copper Queen of Bisbee and the United Verde of Jerome.

The following group of mining claims, consisting of 12 full claims and known as the

ESPERANZA GROUP

lies on the south and parallel to the Copper King Group of Mines and adjoins the Copper Mountain Group of mines on the west, and have a good showing of copper, gold and silver ore.

THE ORIENT GROUP OF MINING CLAIMS

adjoins the Copper King Group on the east and, as shown on map, which has one shaft 118 feet deep, one tunnel of 90 feet, and other workings ranging from 10 to 20 feet deep and most of them showing a good grade of copper, gold and silver ore, with cappings of iron on the surface of the same nature as the Copper King Group, some assaying 86 oz. in silver, gold $3.50 and 18.7 per cent copper.

This group has four parallel veins ranging from 15 to 100 feet in width, same nature and same zone as the Copper King. These mines will become very valuable by proper development and make large producers and the ores are excellent for smelting, being only about 7 miles from S.P. railroad and the Santa Cruz river. Good wagon or automobile truck road leading right onto the ground.

COPPER MOUNTAIN GROUP OF MINING CLAIMS

Consists of six claims, being the extension of Esperanza Group, as shown on map, and runs parallel on the south side of the Orient and in Colsolidation therewith. The workings consist of one tunnel 320 feet in length and one winze in said tunnel 52 feet deep and a drift 30 feet in said tunnel and a number of other workings ranging from 10 to 30 feet in depth. The veins or ore bodies are heavily capped with iron and lime, and the ores extracted from same averages 4.5 per cent in copper, $2.00 in gold, and 6.5 ozs. in silver, which is an excellent ore for smelting or concentration. Some of the ores running as high as 32 per cent in copper. This property can supply a large tonnage of good paying ore in the way of copper, gold and silver, and has excellent facilities for working and operating, as its mineralization is very extensive in length and width.

THE MINE:

The work in the mine has been persistently pushed with one objective-depth and development. The outcrops of the Copper King group were less promising than in any other part of the property, but the Copper King had

1st An andesite lime contact
2nd An extensive zone of alteration and leaching
3rd Ample evidence of slipping, and
4th A slight copper stain

It had no large iron gossans, so common on other parts of the property, and so characteristic of copper deposits. It had nothing visible to warrant expenditure, except that every physical condition was ideal, and, if copper was there at all, it would be as a large deposit. To the layman it looked like a long chance, but to the mining man, its conditions were almost too good to be true, and the developments have confirmed this belief.

It was not anticipated that copper ore would be encountered at less than 200 feet depth, on account of the extent and completeness of surface leaching, and, in as mush as the copper, if present, would be in the form of a replacement of the lime, it was not expected to find it in a solid form, but rather in a desseminated form, and predictions would have been amply verified if ore running 6 to 8 per cent had been found. In the above two factors all expectations were more than surpassed. Ore in solid form, a complete replacement of the lime, running 20 per cent copper was encountered at less than 100 feet.

The new shaft, known as the No. 2 shaft, was purposely placed away from where ore was expected. It was placed 20 ft. from the hanging wall, inclined on the dip, but it was evident from the beginning that the leached zone was even much wider than this. At a depth of 95 feet white iron was encountered, containing but a trace of copper. The ore body entered on the hanging wall side and from then on through the next 20 feet the ore increased in both quantity and quality until the maximum was reached at about 115 feet, and has been maintained since. As an illustration, five assays taken one day, averaged about 13% copper, and but two days later, five assays went uniformly between 20 and 21 per cent.

No crosscutting has been done as yet, for the shaft has not reached sufficient depth for another working level, but the evidence is both sufficient and conclusive that the No. 2 shaft has encountered an immense body of high grade copper ore, higher grade than is mined in quantity in any mine in the state of Arizona except the United Verde Extension, the ore body of which is quite phenomenal.

GEOLOGY:--The general structure is very much the same as the other desert regions of Arizona, in its having a granite stock base, underlying some porphyritic, sedimentary and igneous rocks both acid and basic.

A series of intrusive dikes of an olive green andesite porphyry; Limestone; Rhyolite and Granite represents the Northern section. The Limestone near the dike is very much altered-as we ascend the mountain the evidence of Metamorphism increases, reaching its maximum near the outcrop of a gneiss rock which appears at an elevation of about 500 feet. above the camp. At about the same elevation there appears a porphyrytic dike that appears between the Gneiss and Granite, and below it one of the series of Olive Dikes before mentioned, the limestone is almost entirely changed, so much so, that the original rock is hardly recognizable.

One of the distinctive features of this section is the presence of the greenish dike named andesite prophyry following one another with such uniformity and the very conspicuous change in the texture. Mineralogical and chemical composition of the rocks as they approach the Gneiss and Granite.

The Southeastern section presents evidence of an organic movement somewhat different from the above section. The trend of the formation is not the same, nor as consistent and the variety of the rocks suggest a more recent and repeated dynamic disturbance of the original arrangement of the formation. Trap, Felsite, Quartz prophyry, Granite, and Diorites occur in numerous places associated with many contact minerals.

OCCURRENCE OF THE ORES:--The Mile Wide shaft is sunk near the one of the Andesite porphyry dikes, which has a general bearing of Northeast and Southwest in common with all the dikes North and South of the shaft. The ore is in the form of a Chalcopyrite oxidized at the surface. It is found in pockets near the contact of the limestone and dike.

At the present time I am disposed to believe that the ore is associated with the dike and found its present place by a process of selective precipitation in the limestone and environment. Ransome found a trace of copper in a diabase dike at Globe analyzed for Copper. Lindgren referring to Andesite rocks called Greenstone, presumes the Copper found in the veins in the vicinity was derived from the same Andesite rocks.

OPERATIONS:--All claims have been worked to some extent, some more than others. Considerable work has been at the Copper Mountain, Margarite and on different elevations along the slope of the Amole Mountains. The principal have, however, been where the present shaft is sunk. At this point advantage was taken of an old shaft from which some ore had been taken, and a connection made with the present new shaft.

The old shaft, which is sunk near the bed of a dry stream, was originally sunk to about 50 feet. more or bess. At 30 feet the contact was intersected and followed downwards. The present company commenced drilling at the 39 ft. level, and approximately proceeded as follows: S.E. about 19 feet, to where some oxidized and sulphide ores were found in a joint bearing N. 60 W. which after being followed about 12 ft. a winze was sunk thereon and some ore taken out from a pocket 23 ft. x 8 x 13 ft.,-this measurement includes the winze at the point of measurement. The joint bearing North 60 W. appearing near the top of the winze has evidently enriched the ground in this locality. For about 47 ft. on the same bearing the sides of the main joint is particularly well defined on the hanging wall and showing some movement.

The new shaft was intersected about 22 ft. further, being a total distance from the cross-cut of 130 ft. The new shaft was started about 78 ft. above the old shaft on the first level ground above the arroyo or stream (See photo).

From the first level (78 ft. from the top of the new shaft) to the second level is 112 ft. From the second level to the botom of the shaft 23.5.

In sinking the shaft between the two levels, ore was found at about the same level, perhaps somewhat lower than found in the winze and appeared intermittently to within 50 ft of the second level. At this point it disappeared in the foot wall.

At the bottom or second level two levels were being driven when I was there. One bearing No. 45 W. 13 Ft. North E. 15 ft. The other S. 12". 15 ft. Some fracturing bearing about North 44 E. and dipping south was apparent, also an olive color bearing substance was commencing to show in the south shaft bearing about N. 5 E.

A cross-cut was being started when I left for the purpose of cutting the ore passed through the shaft, and ere this it should have been intersected.

On the Copper Mountain a shallow shaft has been sunk, and a drift a few hundred feet long driven showing some ore in both shaft and drift. I have not been able to analyze the samples taken from here, but give an analysis given by Mr. Camphus.

ANALYSIS

Top tunnel workings	22.78% Copper
Orient workings	25.01% Copper
Copper King winze	12.09% Copper

At the Margarite a shaft has been sunk about 100 feet on the contact (see photo) and some ore taken out.

The openings on the side of the Amole Mountain consist of a drift and some open cuts. I would like to see this location further explored. I have not had the samples taken from here sampled.

CONCLUSION

I consider the Mile Wide presents a very legitimate opportunity for anyone desiring to invest in mining and willing to incur the usual mining risk.

SUMMARY

The Mile Wide formation shows a sequence of olivine dikes called Andesite and a much altered limestone having an inclination of about 60 degrees to the southeast, all having a general northwest trend.

The development of the Mile Wide has determined very conclusively that copper in the form of Chalcopyrite is found near the contact of the Andesite dike and limestone.

There are three locations on the property worthy of being proven, namely the Margarite, the Amole upper workings; and Copper King. I favor the prosecution of the work at the Mile Wide and consider the locations mentioned in the preceding paragraph as good selections for testing.

8

THE MILE WIDE, as I stated before, is a VERY LEGITIMATE MINING Enterprise. It presents MANY ATTRACTIVE FEATURES from a point of a mining investment, and I am pleased to report FAVORABLY on the property.

Respectfully submitted,

J. A. EDE

UNIVERSITY OF ARIZONA

Tucson
ARIZONA STATE BUREAU OF MINES

October 26, 1916

Mr. Charles P. Reiniger,
c/o Mile Wide Copper Company,
Tucson, Arizona.

Dear Mr. Reiniger:

Referring to yours of the 25th regarding the telegram from Mr. Giffen, I beg to advise as follows:

No. 1 shaft, ore came in at 45 feet, of unknown width, averaging about 6% copper. 55 feet, unknown width, averaging 12% copper; 35 feet, unknown width, averaging 12% copper.

In the winze, ore came in 95 feet below the surface, unknown width, averaging 8% copper; 105 ft. unknown width, averaging 20% copper; 115 ft., 125 ft., 145 ft., 155 ft., the same.

In all of the above when I speak of unknown width, I mean that the full width has not been determined. It would be impossible to deviate from the straightness of the shaft in order to determine the width of the ore body, and we shall not know that width until we have been able to cross cut from the north and south laterals.

Yours very truly,

CHARLES F. WILLIS.

CFW.H

THE MILE WIDE COPPER COMPANY

Sept. 1, 1916

to

Feb. 1, 1917

The progress of the Mile Wide during the past five months is more than gratifying; it was far beyond the most optimistic expectations.

On September 1st. the shaft No. 2 was in ore, but no width had been determined. Ore was encountered at 95 ft. on the hanging wall side and within five veet had extended entirely across the shaft. It proceeded to fill the shaft to a depth of 155 feet, and then went into the hanging wall again.

This ore was of a direct smelting, self-fluxing type, being chalcopyrite running heavy in lime, with much iron and manganese and little silica. The whole ore body as passed through, ran about 12 to 14% copper, but by selection shipments could be made running 21% copper.

It was impossible to follow the ore with the shaft, as a shaft must be straight, and so the shaft was sunk to 220 feet in depth, and after leaving 20 ft. for a sump to collect the water, a level was run on the 200.

Previous to cross-cutting, it was desired to know some-thing definite about the width of the deposit, the direction of the slips, etc. and in order to do this, the ore body was cross-cut about at the middle of the ore that was struck in the shaft,at the 125 ft. level. A little work here showed the deposit to be at least 22 ft. wide.

This work proved definitely where to go and in a very few days, the same ore body was encountered on the south drift of the 200 ft. level, and has been cross-cut to date to a width of 16 feet. The average value of this ore is probably as good as that encountered in the shaft, but it is not as spectacular in appearance, as it is more intimately mixed and does not contain as much massive chalcopyrite. This is characteristic, and as greater depth is reached, more eveness of value will follow.

It was proven; ore was found in the old shaft and a considerable quantity was extracted, but by this time it was handled twice underground, windlassed to the surface, packed on burro to the road, copper at a dollar a pound would not be enough. But the fact was proven to their satisfaction that the epidotized, chloritized, leached andesite lime contact made ore in depth.

Then, ever conservative and anxious to make every dollar do its work fully, another prospecting shaft was started upon the hill, where ample dumping ground was available and where it could be reached by a road, and a prospecting outfit of machinery installed consisting of a small hoist and a one drill compressor.

Confident of the ore that they could not see, it was decidedthat the new shaft be sunk at least twenty feet away from the place where the contact was mathematically figured to be. The ore should not, theoretically, be encountered in any solidity or quantity under 300 ft. depth, as it was planned to go that deep and then crosscut to the contact. (A shaft sunk on the contact would not be permanent, unless timbered very heavily and a crosscut would be cheaper than timber.)

But contrary to all geological reasoning and twenty feet away from where the contact should be, at 95 feet, iron pyrites, running 4% copper was found. The following day the muck showed 9% copper. The next day 14% copper was exposed and thereafter to the 155 ft. level, copper ore, averaging about 21% copper, filled the shaft. Coming in on the hanging wall and leaving on the hanging wall, indicated that the ore had bellied from the contact 20 feet away.

Even to the blindest, there was but little doubt that a mine was found. The company felt that a large ore body was encountered and warranted extensive development. Hence, machinery was ordered at once for six times the power and compressor capacity of the prospecting outfit.

Sinking was continued as rapidly as possible with the limited power and air capacity, and after going to 220 feet, a level was started at the 200. But as the desire of the company was to move surely and make no mistakes, it was decided to determine the exact depth of strike and width of the ore body first. Hence, going back to the 125 foot level, about the centre of the big ore body passed through in the shaft, a crosscut was started and among the things determined was that the width of the ore body was at least 22 feet.

Then, returning to the 200 level, mathematical calculations showed that by crosscutting only four feet to the east, the ore body should be hit. True enough, a little less than four feet were necessary to hit the ore body similar in character and value to that of the shaft. Crosscutting this body, the width was determined at 16 feet. Today drifting has just started along this ledge to get stoping ground ready for real mining and shipping. With ore in the old shaft, 200 ft. away from the new workings, ore in the new shaft proven from 95 ft. to 200 ft. in depth at least, with 22 ft. width at the 125 ft. level and at least 16 ft. in width on the 200 ft. level, it looks like a real mine, and with 14% to 20 % values, it looks like a very, very rich mine.

UNIVERSITY OF ARIZONA
Tucson

College of Mines
Arizona Bureau of Mines

Copy
February 12, 1942

METALLURGICAL TEST

Ore no. 612

The sample of this ore was submitted for test by Mr. John Greenwood of Tucson from the Gould Mine of the Copper Bell claims located approximately fifteen miles west of Tucson, with the request that a method treatment be determined. The Arizona Bureau of Mines has no information relative to the tonnage of ore available in this mine, nor of the average grade of ore.

The sample was a heavy pyritic ore, containing copper chiefly as chalcopyrite in a siliceous gangue, the analysis was as follows:

% Copper	% Iron
4.8	25.6

Liberation of the sulphide minerals from each other and from the gangue was practically complete at 100-mesh.

Test No. 612A, grinding to approximately 100-mesh and using six pounds of lime per tons of ore was not successful, due to insufficient pyrite depression.

Test No. 612B, with the same grind and tend pounds of lime per ton of ore was made as presented on following page and gave these results:

SUMMARY:

The results of the tests show that an ore of this character, a copper extraction of 96.4 percent may be expected in a concentrate, containing 28.8 percent of copper. At some sacrifice in extraction, this grade could probably be raised if it were desired. Grind should be to approximately 100-mesh. In addition to 10 lbs. of lime per ton, the only reagents required are 0.08 lb. of Ethyl Xanthate (z3) and 0.05 lb. of Dupont Frother. Total flotation time was 13 minutes.

The Arizona Bureau of Mines

By: E. H. Crabtree, Jr.
Metallurgist.

Test No. 612B

	Wt. Grams	Dilution Water:Solids	Time-Min.	Reagents Lbs. per ton/ore Lime	Z	Frother
Grind	510	0.75/1	30	10.0	3	
1st Flotation		3/1	3		0.02	0.05
2nd Flotation		3/1	5		0.02	
3rd Flotation		3/1	5		0.04	

pH of tails 8.6
Free CaO in tails 0.1 pound per ton of water
Screen analysis of tails: 612% plus 100 mesh.

PRODUCTS

	Wt Grams.	Tons in 100 Tons feed	%Copper	% of total Copper
Conc. No.1	58.6	11.5	30.8	75.5
Conc. No. 2	15.2	3.0	27.0	17.3
Conc. No.3	6.1	1.2	13.8	3.6
Tails	428.0	84.3	0.21	3.6
Calc. Heads	507.9	100.0	4.69	100.0
Assayed Heads		100.0	4.80	100.0

Compositing the above three concentrates into one concentrated, the products will be as follows:

	Tons in 100 tons of Mill Feed	% Copper	% Total Copper
Assayed Head	100	4.80	100.0
Calculated Heads	100	4.69	100.0
Copper Conc.	15.7	28.8	96.4
Tails	84.3	0.21	2.6

Copper Bell (Gould)

Tucson

September 25, 1942

George A. Bellam

Production Possibilities Survey

This property is situated in the Tucson Mining District about 11 miles northwest of Tucson. It is owned by John Greenwood, Mgr., 40 E. 13th St., Tucson, Martin Waer, Elmer Dow and Abel Weinberg. There is a good road into the property, which is on the edge of the Tucson Park area. Ample water is available for all mining purposes.

Ore occurs as intrusions in limestone, values in copper as chalcocite with some bornite. Although no notable operations have been conducted for about 40 years, some 500,00 lbs. of copper have been produced in the past shipments going to Globe and Sasco smelters, where this siliceous flux was desired.

Development consists of a 350' shaft with tunnel opening on 100' level drifting ans x-cuts on 200' level and 300' levels: winze near shaft in tunnel also opening lower levels: and exposures of two parallel veins which have not been developed. There is water just below the tunnel level of 100.

The owners wish to apply for a preliminary development loan. They have been confronted with a problem in this regard, since the old shaft is badly caved and it might not be practical to rehabilitate it. In 1940 about 100 tons of ore was taken out on the tunnel level next to the shaft. All of the timbering came in and considerable work will be involved in repairing it about the water, while it is reported caved below also. The owners were figuring on a new shaft at the tunnel portal to open the lower levels. However, the winze is in good condition and will enable access to all parts of the workings. I recommended that they merely apply for an unwatering loan, say it will cost $1000 or $1500 to unwater, and upon access and sampling, future development may be decided upon.

The present reserves, estimated at about 100,000 tons, average about 4% copper. Yesterday, I was informed by Campbel, who had sampled the property in the past, that 25,000 tons of at least 4% copper ore can be taken out above the water at present. This, together with estimates of production contained in the Henderson report may be rather optimistic, as were the plans for a mill on the property. However, after spending some time in the workings, I believe substantial tonnage, say of 3-1/2% copper content, to the amount of 25 tons per day of good milling ore could be sent to the Jacobs mill. Although Greenwood states that he faces no particular problems, he will undoubtedly run up against the usual labor and equipment shortages for larger operation. He has three or four men available for the proposed unwatering and repair work now, and can readily get one or two additional men for the smaller operation, in addition to two of his partners, one of whom is a good miner. Greenwood himself has had considerable mining experience. He can readily get together a crew of ten and for the immediate present -- within the next six months. I believe a small operation is justified.

Geo. A. Bellam

University of Arizona
Arizona Bureau of Mines
Ore Testing Service

March 15, 1945

Mr. H. C. Ertal
Route 1, Box 980
Tucson, Arizona

Dear Mr. Ertal: Re: Ore No. 960

The sample or copper ore submitted by you March 6 has been tested by flotation for the recovery of copper. The Arizona Bureau of Mines has no knowledge of the tonnage of material which the sample represents.

The material was crushed to minus one-quarter inch and on-half was then crushed through rolls to minus 10-mesh. From this 10-mesh material head and test samples were cut.

TEST B

The ore was ground in laboratory ball mill for 30 minutes and floated with 6 lb. of lime per ton added to the ball mill, and 0.05 pounds of potassium xanthate and 0.05 frothers B-23 per ton. These reagents were conditioned for three minutes. The concentrate was removed for five minutes and the middlings for seven minutes. Results of this test are given in following talbe.

	Tons per 100 tons Heads	Copper %	Silver ounces per ton	Gold ounces per ton	Distribution of copper %
Head	100.0	2.88	0.13	Tr	
Calculated Head		2.87	0.1324		
Concentrate	9.9	28.02	0.4	Tr	96.7
Middling	1.7	1.86	0.2		1.1
Tailing	88.4	0.07	0.10		2.2

Screen test of tailing:

		Weight, percent
	Plus 100-mesh	0.5
Minus 100	Plus 200-Mesh	9.0
Minus 200-mesh		90.5

Test C

In test C, a sample was ground in laboratory ball mill for 20 minutes with the same reagent as Test B, except one-tenth pound of pine oil per ton of ore was used instead of Frother B-23. The copper concentrate was floated for twelve minutes, and then 0.05 pounds of reagent 208 was added and concentrate taken off, which contained mostly pyrite. The following table gives the results of this test:

	Tons per 100 tons Heads	Copper %	Silver Ounces per ton	Gold ounces per ton	Distribution of copper percent
Head	100.0	2.88	0.13	Trace	
Calculated Head		2.85			
Copper Conc.	12.08	23.03	0.4		97.30
Pyrite Conc.	14.08	.23	0.6		1.10
Tailing	73.7	.06	0.1		1.60

Screen test of tailing:

		Weight, percent
	Plus 100-mesh	3.0
Minus 100	plus 200-mesh	26.5
Minus 200-mesh		68.5

CONCLUSION

The copper in this sample can be recovered by flotation by grinding to 90 percent minus 200-mesh. This grind gave 96.7 percent extration. A coarser grind, 68.5 percent minus 200 gave a concentrate, including the middling, of 97.3 percent but with a lower copper content per ton of concentrate. The grade in Test C could be increased by cleaning the concentrate.

G. H. Reserveare
Metallurgist

Incorporate for 1,000,000 shares, par value $1.00

500,000 in Treasury
100,000 @ $.50 per hundred -- $50,000.00
400,000 Sanders D. Grey -- @ $.25.
Can take in 3rd party if necessary -- $100,000.00

Cost of Mine - - $10,000.00
Cash in 60 days- 1,000.00
Building cabins - -1,000.00
Fixing road - - - -1,000.00

$30,000.00 already spent on mine development

17 miles from Tucson
5,000 tons and over shipped to smelter at Globe
D. E. Said

To incorporate $200.00 cash
Stock books 50.00

C O P Y

Mr. Douglas Grey:

The Gould Mine has an ore body opened up that has been estimated to contain 150,000 tons of ore carrying 3% copper. In the bottom workings sulphide ore was opened up which assayed 14% copper and some ten tons of this ore was laying in the 150 foot level in the year 1921.

There is no questions but that good, large tonnage of ore carrying up to 10% copper can be developed on the Gould Property.

The mining and smelting of the Gould ore can be done at a cost of about $4.00 per ton.

Yours truly,

Tucson, Arizona
March 6, 1922

Mr. Douglas Gray
Tombstone, Arizona

Dear Sir:

We are the owners of all of the issued stock of the Amole Mines Company, except qualifying shares issued to the directors. You desire an option upon one-third of such stock, which in consideration of the sum of one dollar to us in hand paid, and other valuable considerations, we hereby give and grant upon the following terms: Within nine months you are to pay to us the sum of $964.00, whereupon we will cause said stock to be transferred to you, provided that in addition to said sum of $964.00 you repay to us one-third of any and all moneys which we may, from and after this date, and prior to the exercise of this option, have expended in and about and because of said property. This option is personal to you and may be exercised by no one else, and in the event of your death, it shall at once cease and determine.

Dated this 6th day of March, 1922.

/s/ M. C. Wakefield
/s/ Chas. F. Solimon

APPROXIMATE COST OF SMELTING PLANT 150 L%) TONS DAILY CAPACITY

Excavation of site	$1000.00
Smelter building and ore bins lumber	4000.00
labor	2500.00
Oil Engine	3000.00
Furance	5000.00
Blower	2250.00
Blake Crusher	750.00
Pumps, pipeline and tanks	1500.00
Forehearths, slag pots, etc.	1200.00
Smoke stack and flue	2000.00
3 sets Weighing machines	1500.00
Tools for operating	350.00
Pipes, fittings, valves etc.	500.00
Sand, lime, cement & bricks	400.00
Assay office and office buildings	1000.00
Construction labor erection of plant and other incidentals such as salaries	5000.00
	31,950.00

Tombstone, Arizona
July 2nd, 1922.

Mr. William Kemp
Tucson, Arizona

My Dear Kemp: -

How are you getting along with the Gould mines? You promised to send me copy of the option you had on the property, I wanted very much to see it.
I would like to talk with you about this matter and perhaps we could make some kind of a deal that would be pleasing to you.
With kind regards, I am,

Yours very truly,

TUCSON WAREHOUSE & TRANSFER CO., INC.
26-28-30 N. Scott St., Tucson, Arizona July 2, 1922

Mr. Douglas Grey,
Tombstone, Arizona

Dear Mr. Grey:

I regret that I have been so dilatory in sending you the copy of option on the Gould Mines. It is not that the matter was forgotten, but each time I have gone to my bank box, I have neglected to get the document so that I might have our stenographer make a copy.

She is at present away on her vacation and I would like to wait until her return. However, I have been so careless in this matter that is you wish, I can make this copy myself, if you will let me hear from you again.

I think the date of the last option given is December 21, 1921.

With kind personal regards, I remain,

Yours truly,

/a/ Mary cameron Wakefield

C O P Y

Tombstone
Arizona
July 3rd,
1922

Mr. M. C. Wakefield
Tucson, Arizona

Dear Mrs. Wakefield: -

I have your nice letter of the 2nd, and your excuses for not sending me the copy of option on the Gould Mines is all right, when your Stenographer returns I shall be pleased to receive same.

From all acounts it has and is very hot just now in Tucson and Phoenix must be dreadful.

Personally, I want to ask you if you can not take over my interest in the Gould Mines for a very small amount. I would then be satisfied and at this time it would help us out very much. We are having pretty hard times no days and my Wife is keeping a few boarders to help out for the time being, other wise I would certainly hold on to my interest as I have great faith in the property.

I have seen Mr. Kemp since you were here and his opinion of the property is certainly good.

If you could give Mrs. Gray for Me FIVE Hundred dollars I would turn over my entire interest to you and draw out entirely. I am saying this to you personally, and I know Mr. Solimon would be pleased to have us make a little deal of this kind. One way and another I have put up quite a good deal on the Gould mines and have made many trips at my own expense. Kindly let me hear from you by return mail.

Very sincerely,

Walter W. Wishon
Mining Engineer
Los Angeles, California
7-6-1908

To-
S. H. Gould
President and General Manager
Gould Copper Mining Company

Sir:

I have the honor to hand you the following report on your property with maps and cross sections to define and illustrate it.

LOCATION, AREA, ETC.

The mining estate of the Gould Copper Mining Company lies in almost a solid body, without any intervening clai s, in a general rectangular form, in the Tucson Mining District, Pima County, Arizona, distant about eleven miles west of Tucson, the county seat and trading point.

The elevation is approximately 3,400 feet above sea level and ranges from 400 to 1000 feet above surrounding valley.

The area embraced in the property is approximately 210 acres, all fully surveyed, as per topographical map herewith.

GEOLOGY

The geology is of the usual type of Arizona contact copper ore deposits, consisting of interbedded magnesium, limestone, highly metamorphosed, in contact with granite porphyry, on the north side of the property, along with the crest of the mountain uplist. This contact series has been fissured, faulted or intruded, and partially overflowed by the outpourings of the quartz porphyrites, resulting in the "garnetization" of the sedimentary rocks and their mineralization in the form of loades or reefs, which occur in approximately parallel lines along and near the planes of contact. Epidote also occurs with the garnet, in fact, both are common associates of copper in the southwest.

The great mountain uplist of about 1000 feet vertical, has broken the interbedded limestone formation, as shown by the bedding planes of the remaining mass, which, although mineralized to a marked degree as shown by its decomposed epidote reefs, yet it shows none of the huge garnet outcrops, lode-like in character, which appear in great lenticular masses here and there along their strike, as in that of the great mountain uplift.

It is in this area of greatest activity that three large mineralized reefs, or veins, traverse the property for its entire length of about 4800 feet, as shown on map herewith. On the west end of the property, these reefs approach each other where, on the Sierra Arriba claim, the epidote garnet mass becomes extremely large in consequence, and the copper mineralization of greater value than usually found elsewhere, noted on the surface, although all the reefs are copper bearing and have the semblance of regular lodes.

MINERALOGY

The copper ore is found in the form of sulphide, usually chalcopyrite, disseminated in the midst of the garnet, in grains, stringers and often in nodular masses, associated with much iron sulphide, lime spar and some quartz. In some instances, the chalcopyrite has yielded to the secondary mineral, bornite, which is found scattered here and there throughout the great mass, thereby bringing the copper percentage up to a mark that allows of great widths in these huge lodes to be mined and smelted at a profit. This is also due to the ratio of predominating gangue materials being so largely basic in nature, as to admit of fluxing silicious ores, in which the veins of the surrounding country abound.

DEVELOPMENT

The veins have an east-west strike and dip northerly into the mountain at an angle of about 60 degrees from the horizontal.

The chief development consists of a working shaft with manway, 360 feet in depth, on Copper Mine Claim No. 5, with cross-cuts and drifts on the 100 foot level, and the 300 foot level, as per map showing horizontal and vertical projections herewith. There is also a winze from the 100 foot level to the 300 foot level, and a cross-cut, shown on map, south from shaft on the 200 foot level, which showed much iron pyrite assaying about 1-1/2 percent copper, but it produced so much water that a pump was be requied, hence it was bulkheaded to stop the flow.

About 600 feet east of the main shaft and 60 feet lower, on Copper Mine No. 1 claim, there is a 50 foot shaft on the same vein of the main working shaft. This shaft is all in ore. About 700 feet northerly from this 50 foot shaft, and on the second parallel vein on Copper Mine Claim, in a cross-cut tunnel 70 feet in length which, although but an apex cross-cut, is all in ore. The croppings here, and immediately to the east, are huge. From this 60 foot cross-cut, and from the 50 foot shaft already mentioned, 30 tons of ore wase selected and shi ped to the El Paso Smelter, which sampled 8.6% copper, 5.0 silver and $1.50 gold per ton. About 90 feet vertically below the 70 foot cross-cut tunnel, above mentioned, a tunnel of like length is now being driven to cross-cut the ledge, but it has not yet entered the ledge.

On the Invincible Claim is a 10 foot shaft, sunk on the western extremity of a very large garnet outcrop, which shows very fine pyrite, much resembling marcasite, especially throughout the gangue at and near the bottom of the shaft, and assaying about 1-1/2% copper.

On the Sierra Arriba Claim is a 10 foot shaft and a 20 foot tunnel; on the Greenwich Claim is a 20 foot shaft. The Sierra Arriva claim and the Invincible Claim have the most wonderful cropping of the entire property, both as to size and quality, although other large lenses also appear at intervals along each of the veins, but the mineralization appears better in the veins nearest the granite porphyry contact and also as they approach each other in the western extremity of the property.

It is there by judgement that the main 360 foot working shaft before mentioned, has been sunk upon the leanest vein thereof, being yet, at a

depth of 50 foot ore was encountered, which had evidently leached and re-concentrated, as it assayed 17% copper. At a depth of 113 feet and known as the 100 foot level, the shaft sunk vertically, encountered the foot wall and a cross-cut at the horizon, proved a width of 30 feet of ore. A drift, westerly upon it, shows ore of good commercial value, its entire length of 75 feet. The face, at that point, is 20 feet wide with neither wall showing. East from the shaft the orebody gives way to massive iron pyrite in a very soft gangue, and a little further east, the vein is faulted, which has been cross-cut and evidently a new body is found just coming into the present face. This ore is believed to be the same as that encountered in bottom of the 50 foot shaft to the east.

The cross-cut on the 200 foot level shows the ore body to be about 50 feet in width, which has been drifted upon westerly about 60 feet. The copper value appears to be less on this particular portion of the 200 foot level, than that on the 100 foot level, but in the east drift an upraise, as well as the winze, for 50 feet in depth, shows quite high grade ore. As shown on the map herewith, the winze is sunk on the ore to the 250 foot level, at which point the ore deips out of the winze, as it there changes vertically to the 300 foot level in order to use it for a chute. Two drifts have been started westerly from the winze, about the 250 foot level, both showing high grade ore, which tends to prove that the large mass of low grade ore encountered to the west on the sill floor of the 200 foot level, is due entirely to a "horse" or a much harder vein material which was more difficult for the ore bearing solution to penetrate. While the value of the "horse" or vase mass of harder vein material on the 200 foot level, will probably not average more than 2% copper, yet the ore disclosed in the upraise and the winze, will average fully 5% copper.

It is quite a difficult matter to obtain a fair sample of the ore bodies without actual mining, hence, I have taken as an average, the entire ore bodies so far opened, the average assays as found by the Old Dominion Smelter at Globe, Arizona, in sampling the 100 tons of ore shipped just as mined to them, and with instructions from the smelter people to keep the ore as low as possible on copper, but on the other hand, as high in basic elements and sulphur as possible, as they desired it for flux and matte fall chiefly.

This average analysis is: Copper 3.2%; Silica 26.0%; iron 25.1%; Aluminum 1.26%; Lime (Ca) 13.2%; Sulphur 19.0%; The gold and silver values being below their scale of $1.00 gold and 2.0 silver, no record of those values was given. However, from numerous assays taken while the ore was being shipped, it is safe to say that ore of this copper grade will average about $.60 gold and 1.5 ounces silver perton.

Owing to the great demand for ore of this character, that company now offers, for this ore, $0.08 per unit for the iron, lime and sulphur percentages, or 57.3 unites. Total at 8 cents ---------- $4.58

Copper on electrolytic assay less 2-1/2 cents from New York. Electrolytic quotations $2.00 per unit - -	6.40	10.98
From which deduct 10 cents per until for silicia percentage above 20%, 6 unite - - - - - - - - - - - - - - -	.60	
Smelting charge, No. 1 Railway charge for freight - - - -	2.00	2.60
From which deduct: wagon haul of $3.00 and cost of mining which in ore bodies of this magnitude will be from $1.00 to $2.00 per ton total - - -		5.00
		$3.38

It is therefore apparent that the erection of a smelting plant upon the property is imperative, and therefore, a smelter site has been provided by the Company at the foot of the mountain, about 3/4ths of a mile distant from the main working shaft, which is admirably adapted for that purpose.

The ore is best adapted for treatment in the blast furnace type of not less than 500 tons units. In the first smelting, the average ore of, say 3.0% copper value, will produce about 17.0% matte, the second smelting about 50% matte, and by using the semi-pyritic process as now used at the Washoe Smelting Plant of the Anaconda Company of Montana, ore of this character can be treated with less than 3% coke on the charge. By providing from 96% to 98% copper, which may be case direct in cathode form, for shipment to the refinery.

As before stated, the fluxing quality of this ore is such that the silicious ores of the surrounding district can be treated therewith. These are now paying a smelting charge at El Paso from $10.00 to $12.00 per ton. By fluxing these ores to their limit, and charging El Paso rates, the ores of the Gould Copper Mining Co., can be both mined and smelted without cost as to its own ores, and in addition, save to the seller of silicious ores the minimum freight haul of $2.00 per ton to the El Paso Plant. The entire surrounding country is known to be rich in silicious ores and the erection of this plant would greatly stimulate their present output.

Looking westerly from the Gould Copper Company's property, one can see the new Sasco Smelter with its two units of 350 tons each and its adjacent mining property, the Silver Bell, which now has a depth of 1200 feet.

During the development of, and while building a reduction plant on the Gould property, the Sasco Smelter could be utilized to great advantage, by building a spur track of about 12 miles from the west end of the property to the main line of the Southern Pacific Railway, which would give all rail connections with the smelter, with a freight charge of probably 50 cents perton. As stated before, this west end of the Gould property not only has a wonderful surface showing of copper, but it can be tunneled to great advantage and the entire system of veins economically worked therefrom.

The geological condition of the Gould and Silver Bell properties are similar in many respects, except that of the Silver Bell is more crushed and broke, yet their orebodies, like that of the Gould property, carried low copper percentages in their upper horizons, but this value had gradually enhanced as depth was attained.

As mined and smelted in the large way, it is quite probable that ore of this character, especially when used for fluxing, can be found profitable with values as low as 1-1/2% copper, and it is believed by the writer, that much of the large mass of croppings, especially on the westward extremities of the veins of the Gould property, will be found to show that percentage and that immediately below such croppings a good commercial grade ore will be found. In fact, in the three visits that I have made to the property, I have found considerable very high grade ore, as a float from an ore body evidently covered, lying above the highest veins and just north of the huge outcrop, as shown on the map on the Invincible and Esperanzo claims, and probably at or near the granite-porphyry contact.

ECONOMIC CONSIDERATIONS

The conditions attendant upon operation are in every way favorable for

cheap mining and reduction. The topography is such that the ore can be delivered by tramway at the smelter side at the foot of the mountain, later to be succeeded by tunnels. The mine furnishes an abundance of water for the proposed smelter, in fact, will yield considerable water and thereafter can be utilized to irrigate the fertile valley adjacent.

An electric power plant can be erected on the Railway and operated very cheaply, using fuel oil and the power generated, conveyed to both smelter and mine. There is a good wagon road from the railroad at Tucson to the mine, now 17 miles, which can be shortened, over which machinery can be hauled at nominal cost. The smelter site is a gentle sloping tract, admirably suited for the purpose, being interesected by a deep gulch which furnishes excellent dumping ground for slag for years to come.

The general plan of development and operations admits of a very cheap cost of handling the ore from the mine to the finished product, the estimated available commercial ore aggregates a total of about 100,000 tons, and a supply of 1000 tons or more per day, is well within the range of early attainment. A tunnel driven at about 400 feet level, and a second at about 700 foot level and the third at about 1000 foot level. Thus it may be seen what extensive development may be persecuted without requiring any ore whatever to be hoisted.

Any self-fluxing ore enables economies which greatly cheapen the cost of treatment, but when these qualities are such that they are also enabled to treat a large proportion of silicious ores with a high treatment charge for same, the flushing qualities assume an approximate value in these ores equal to the total copper, silver and gold content, hence, the blister copper for this property and proposed smelting plant should be marketed as low as that of any plan in Arizona, in fact, it may be stated that the problem before the Gould Copper Mining Company is not of ore development entirely, but largely one of operating, being confined to a study of necessary equipment and best method of handling.

Owing to the extensive nature of the ore bodies, and the large tonnage which can be produced, I am of the unqualified opinion, that the property of the Gould Copper Mining Company should rank well with the large producers when once under full operation.

Respectfully, submitted,

/s/ W. W. Wishon

Los Angeles, California
July 6, 1908

TO WHOM IT MAY CONCERN:

THIS IS TO CERTIFY, That I have examined the titles to the following groups Mining claims, all situated in the Amole Mining District, Pima County, Arizona, as follows, to-wit:

(1) The COPPER KING Group. so-called, consisting of the following claims: Columbia, Copper King, San Fernando, San Miguel, Copper Crown, Margarita, Copper Top, Cimmaron, Alta, San Francisco, St. Louis. St. Paul, Buena Vista, Washington, Copper Queen, Copper Bell Mining Claims, and Copper King and Copper Crown Millsites.

(2) The ORIENT Group, consisting of the following claims: Orient Nos. 1 to 14, inclusive, Mining Claims.

(3) The ESPERANZA group, consisting of the following claims; Esperanza Nos. 1 to 12 inclusive, Mining Claims.

(4) The COPPER MOUNTAIN Group, consisting of the following claims: Copper Mountain Nos. 1 to 6, inclusive, Mining claims.

(5) The ORO FINA Placer Group, consisting of the following claims: Oro Fina Nos. 1 and 2 Placer Mining Claims.

The title of the Copper King Group is vested in Elena de Pellon, Louis Pellon, Pedro M. Pellon, Concha McCrillas, Anita Pellon, Charles Pellon, Teresa Pellon, the latter two being minors and represented by Elena Pellon, guardian, and Isabel Waer and L. Martin Waer. Conveyances have been executed by all of said persons to Mile Wide Copper Company and placed in escrow in the Consolidated National Bank of Tucson, the guardian being authorized by Superior Court.

The title of the Orient group is vested in M. Waer. Conveyance has been executed by him to C. P. Reiniger and J. H. King, and placed in escrow in said bank. Also conveyance from C. P. Reiniger and J. H. King to Mile Wide Copper Company attached to the foregoing escrow.

The title of the Esperanza Group is in J. U. Mettler, Conveyance has been executed by him to Charles P. Reiniger and J. H. King and placed in the Consolidated National Bank of Tucson. Also attached to said escrow is conveyance executed by said Reiniger and King to Mile Wide Copper Company.

The title of the Copper Mountain Group is in Martin Waer, Jr. and John Latz. Conveyance has been executed by them to C. P. Reiniger and J. H. King, and placed in escrow in the Consolidated National Bank. Attached to said escrow is conveyance from Reiniger and King to Mile Wide Copper Company.

Title to the Oro Fina Claims is in L. Martin Waer, Isabel Waer, Henry Waer, Herman Waer, M. Waer, L. Waer, J. Ide, and Caroline Ide. Deed has been executed by all of them to Mile Wide Copper Company and placed in escrow in the Consolidated National Bank, with conveyance of Copper King Group, and deed will be delivered at the same time the deed to said Copper King Group is delivered.

S. L. Kingan

Tucson, Arizona
November 17, 1916

S T A T E M E N T
O F
THE COPPER KING GROUP OF COPPER, SILVER AND GOLD MINES

Located and situated in the Amole Mining District, on the West slope of the Tucson Mountains facing the Silver Bell Mines and Mining District, in Pima County, Arizona, about 12 miles in a westerly direction from Tucson. The group consists of 16 mining claims, 600 feet in width and 1500 feet in length, together with a five acre mill site and water right belong to said group of mining claims, which is called the Copper King and Copper Crown Mill Site.

The names of said claims are as follows:

Columbia	St. Paul
San Luis	San Francisco
Copper Top	Alta
Cimarron	Margarita
Copper Crown	Copper King
Copper Queen	Copper Bell
San Fernado	Washington
Buena Vista	San Miguel

Copper King and Copper Crown
Mill Site and Water Right

The general course of the veins is from the easterly to the westerly being about 20 degrees north of east and 20 degrees south of west.

The formation in which these veins or deposits occur is limestone, porphyry and quartzite, heavily charged and capped with iron, the width of veins on surface being from 15 to 250 feet. The nature of the ore is an iron sulphide, carrying copper, silver and gold. The ore from the different parts of the workings gave a return at the smelter of 18 3/10 percent in copper, $1.70 in gold and 4-1/2 ounces in silver. The next lot shipped from the Copper King shaft or works, which was taken as it came from a large body of ore to the amount of 16 tons gave 11-7/10 percent in copper, $1.30 in gold and 4-1/2 ounces silver. The former shipment was 22 tons partly assorted ore.

The general samplings of those different claims,and workings averages 7 percent copper, $1.80 in gold and 5-1/2 ounces in silver. I consider this latter a general average of the different and larger workings. The general ore, which is in large quantities, is a free smelting ore and carries a large percent of iron, sulphur and lime, and makes a self-fluxing ore for smelting purposes. From this mine there has been some 360 tons of ore shipped that averaged 9% copper, $1.50 gold and $3.50 in silver per ton.

THE COPPER KING: Has one shaft 78 feet deep about in the center of the vein and a cross-cut towards the south 75 feet and a drift along the vein towards the hanging wall, or supposed hanging wall, 310 feet in length and winze sunk on the supposed hanging wall, but discovered to be in about the center of the ore body, at the end of the cross-cut 25 feet deep with a high grade of yellow and chalcocite and

ruby copper and black sulphides, assay values going as high as 37 percent copper. Another winze sunk down to 30 feet deep in solid sulphides and averaging 14-1/2 percent copper, $1.00 gold and 4-1/2 ounces silver.

It is demonstrated that as depth is obtained the ore increases in quantity and values. The width cannot be ascertained at the bottom, as it has not been cross-cut the full width of same. At this place on the surface, the vein measures 200 feet in width by tape line. At present a new shaft has been sunk to connect with the old underground workings, but is not now deep enough to reach the high grade ore. The present development shows it is leading to enormous, big ore bodies, rich in copper, gold and silver.

There is now being installed compressor for air or machine drills and a large hoist with automatic dumper.

THE MARGARITA: Shaft 100 feet in depth and a cross-cut 26 feet towards the south at a depth of 55 feet and a drift towards the east 135 feet. In the drift, a winze is sunk 28 feet deep and drift 30 feet, supposed to be the footwall on the vein, and all in ore, then a cross-cut towards the south 20 feet towards the hanging wall, which is lime spar and iron, as the lime overlies the ore bodies. At this place, the width of the ore body is 22 feet, as far as cross-cut, and towards the north, extent or width not known. The samples taken from these workings assayed 8.2 percent copper, $2.30 gold and 5-1/2 ounces silver. Have taken samples from this claim of native copper that went as high as 78 percent. This ore is very heavy material of a sulphide or oxidized iron, and a very fine smelting ore. There are a number of other smaller workings from 10 to 20 feet in depth and all have a showing of good ore. Width of surface croppings capped with iron and carbonate of copper is 150 feet in width. And from these workings a large quantity of ore has been shipped to smelter. At present, development work is being done. Machinery about to be put on.

THE SAN FRANCISCO AND BUENA VISTA: Both on the same strike as the Copper King and the Margarita. Workings on these claims range from 10 to 20 feet, to show extent of ore bodies.

THE ST. PAUL: Is a parallel vein or lode of the Copper King towards the north on which there is not very much work done, carrying yellow sulphide of copper with gold and silver, capped with iron for more than 150 feet in width, and heavily charged with epidote of lime and the surface croppings show over 300 feet in width and has a dip towards the Copper King ore body.

THE CIMARRON: Being on the same vein or lode as the Columbia, Copper Bell and Copper Top, has one shaft 22 feet deep and a number of other workings on vein, all in good ore, and gives assay values 14-3/10 percent copper, $7.00 in gold, 4 ounces silver. This ore has been tested for the purpose of obtaining a shipping ore. The actual width of veing cannot be ascertained, as no cross-cut has been made. Workings show in some places gold which goes as high as $25.00 per ton.

THE COLUMBIA: Veins running same as the Cimarron. Has one shaft 12 feet deep and several open cuts, ranging from 12 to 25 feet deep; one tunnell 100 feet, run for the purpose of cross-cutting the vein or ore body. The surface is capped heavily with hematite and oxidized iron. There is, in these workings, a green malachite, black ozide and yellow pyrites of copper. The ore from these workings gave assay value of 23 percent copper, $4.00 gold, and 6-1/2 ounches silver. The width of vein has not yet been ascertained, as no cross-cut has been made. Vein capped on surface with hematite and oxidized iron and carbonate of copper. The width of the surface capping extending over 50 feet. This vein or ore body lies about 1000 feet north of the Copper King and having a dip towards the Copper King vein.

THE COPPER CROWN: Being on same vein as the San luis, Copper Queen and San Miguel. It has one tunnel 63 feet in length and one cross-cut of 12 feet on end of this tunnel, and another tunnel of 170 feet run for the purpose of cross-cutting the vein or ore body from the lower base. There are several shafts from 10 to 25 feet deep, all in good ore. The ore cut by the tunnell to the width of 3 feet averages 18 percent copper, $2.80 gold, and 8-1/2 ounces silver. The width of vein cannot be estimated as it has not been fully cross-cut. It has been fully demonstrated that, as depth is obtained, the ore increases in value and quantity. Surface croppings show width of vein from 60 to 100 feet.

The balance of the claims; the workings range from 10 to 30 feet deep in shafts, open cuts and small tunnels to discover the ore.

The course of these lodes or veins is from the easterly to the westerly, with a variation of 20 degrees north of east and 20 degrees south of west. The Copper King has a dip towards the south on an angle of about 80 degrees. The St. Paul and Columbia running parallel on the north and dip towards the Copper King at an angle of about 40 degrees and, in my opinion, it is only a question of time and depth when they will join together and form one large ore body. All the rest of the veins or ore bodies lying north of the Copper King vein are dipping towards it, there being five veins or ore bodies.

WATER: Can be had as shown by map, at Mill site or Water Right as there is living water all year round for domestic purposes and will supply several thousand people and animals. By sinking a well fifty or sixty feet and cross-cutting the canyon, water can be had or obtained for any sized plant or machine.

WAGON ROAD: A good suitable wagon or automobile truck road leading to the mines at present, 16 miles and to the nearest R. R. station on the Southern Pacific, only 6 miles.

Facilities for working are excellent.

This mineral zone extends from the westerly toward the easterly, eight miles in length and three miles in width and this group of mines is right in the heart of this great mineral zone.

I see no reason why the Copper King Group and other groups in this locality, by proper development, will not make large producers, they being in the center of this great mineral belt, and in my opinion, will in time rival the Copper King of Bisbee and the United Verde of Jerome, as I visited both of them when they were mere prospects, and other properties which are now large producers, as I have seen them all for the past 35 years and when they were nothing but prospects. This property has all the earmarks of making a producer that will figure up in the millions as well as the Copper Queen of Bisbee and the United Verde of Jerome.

The following group of mining claims, consisting of 12 full claims and known as the

ESPERANZA GROUP: Lies on the south and parallel to the Copper King Group of Mines and adjoins the Copper Mountain Group of mines on the west, and have a good showing of copper, gold and silver ore.

THE ORIENT GROUP: Adjoins the Copper King Group on the east and, as shown on map, which has one shaft 118 feet deep, one tunnel of 90 feet, and other workings ranging from 10 to 20 feet deep and most of them showing a good grade of copper, gold and silver ore, with cappings of iron on the surface of the same nature as the Copper King Group, some assaying 86 ounces silver, gold $3.50 and 18.7 percent copper. This group has four parallel veins ranging from 15 to 100 feet in width, same nature and same zone as the Copper King. These mines will become very valuable by proper development and make large producers and the ores are excellent for smelting, being only about 7 miles from S. P. Railroad and the Santa Cruz river. Good wagon or automobile truck road leading right into the ground.

COPPER MOUNTAIN GROUP: Consists of six claims, being the extension of Espanza Group, as shown on map, and runs parallel on the south side of the Orient and in consolidation therewith. The workings consist of one tunnel 320 feet in length and one winze in said tunnel 52 feet deep and a drift 30 feet in said tunnel and a number of other workings ranging from 10 to 30 feet in depth. The veins or ore bodies are heavily capped with iron and lime, and the ore extracted from same averages 4.5 percent copper, $2.00 gold, and 6.5 ounces silver, which is an excellent ore for smelting or concentration. Some of the ores running as high as 32 percent copper. This property can supply a large tonnage of good paying ore in the way of copper, gold and silver, and has excellent facilities for working and operating, as its mineralization is very extensive in length and width.

THE MINE: The work in the mine has been persistently pushed with one objective - depth and development. The outcrops of the Copper King group were less promising than in any other part of the property, but the Copper King had: 1. An andesite lime contact. 2. An extensive zone of alteration and leaching. 3. Ample evidence of slipping. 4. A slight copper stain.

It had no large iron gossans, so common on other parts of the property and so characteristic of copper deposits. It had nothing visible to warrant expenditure, except that every physical condition was ideal and if copper was there atll it would be as a large deposit. To the layman

it looked like a long chance, but to the mining man, its conditions were almost too good to be true, and the developments have confirmed this belief.

It was not anticipated that copper ore would be encountered at less than 200 feet depth, on account of the extent and completeness of surface leaching, and, in as much as the copper, if present, would be in the form of a replacement of the lime, it was not expected to find it in a solid for, but rather in a desseminated form, and predictions would have been amply verified if ore running ~~%~~ 6 to 8 percent had been found. In the above two factors, all expectations were more than surpassed. Ore in solid form, a complete replacement of the lime running 20 percent copper was encountered at less than 100 feet.

The new shaft, known as the No. 2 shaft, was purposely placed away from where ore was expected. It was placed 20 feet from the hanging wall, inclined on the dip, but it was evident from the beginning that the leached zone was even much wider than this. At a depth of 95 feet, white iron was encountered, containing but a trace of copper. The ore body entered on the hanging wall side and from then on through the next 20 feet, the ore increased in both quantity and quality until the maximum was reached at about 115 feet, and has been maintained since. As an illustration, five assays taken one day averaged a bout 13% copper, and but two days later, five assays went uniformly between 20 and 21 percent.

No cross-cutting has been done as yet, for the shaft has not reached sufficient depth for another working level, but the evidence is both sufficient and conclusive that the No. 2 shaft has encountered an immense body of high grade copper ore, higher grade than is mined in quantity in any mine in the state of Except the United Verde Extension, the ore body of which is quite phenomenal.

GEOLOGY: The general structure is very much the same as the other desert regions of Arizona, in its having a granite stock base, underlying some prophyritic, sedimentary and igneous rocks, both acid and basic.

A series of intrusive dikes of an olive green andesite porphyry, Limestone, Rhyolite and Granite represents the Northern section. The limestone near the dike is very much altered - as we ascend the mountain, the evidence of metamorphism increases, reaching its maximum near the out-crop of a gneiss rock which appears at an elevation of about 500 feet above the camp. At about the same elevation, there appears a porphyrytic dike that appears between the gneiss and granite, and below it, one of the series of olive dikes, mentioned before, the limestone is almost entirely changed, so much so, that the original rocks are hardly recognizable.

One of the distinctive features of this section is the presence of the greenish dike named andesite porphyry following one another with such uniformity and the very conspicuous change in the texture. Mineralogical and chemical composition of the rocks, as they approach the gneiss and granite.

The southeastern section presents evidence of an organic movement some-what different from the above section. The trend of the formation is

not the same, nor as consistent, and the variety of the rocks suggest a more recent and repeated dynamic disturbance of the original arrangement of the formation, Trap, felsite, quartz porphyry, granite and diorites occur in numerous places associated with many contact minerals.

OCCURRENCE OF THE ORES: The Mile Wide shaft is sunk near the one of the andesite porphyry dikes which has a general bearing of Northeast and southwest, in commong will all the dikes north and south of the shaft. The ore is in the form of a chalcopyrite, oxidized at the surface. It is found in pockets near the contact of the limestone and dike.

At the present time, I am disposed to believe that the ore is associated with the dike and found its present place by a process of selective precipitation in the limestone and environment. Ransome found a trace of copper in a diabase dike at Globe analyzed for copper. Lindgren, referring to andesite rocks called greenstone, presumes the copper found in the veins in the vicinity was derived from the same andesite rocks.

OPERATIONS: All claims have been worked to some extent, some more than others. Considerable work has been at the Copper Mountain, Margarite and on different elevations along the slope of the Amole Mountains. The principal work, however, has been where the present shaft is sunk. At this point, advantage was taken of an old shaft, from which some ore had been taken, and a connection made with the present, new shaft.

The old shaft, which is sunk near the bed of a dry stream, was originally sunk to about 50 feet, more or less. At 30 feet, the contact was intersected and followed downward. The present company commenced drilling at the 39 foot leve, and approximately proceeded as follows: SE about 119 feet, to where some oxidized and sulphide ores were found in a joint bearing N 60 W, which , after bein followed about 12 feet, a winze was sunk thereon, and some ore taken out of a pocket 23 x 8 x 13 this measurement includes the winze at the point of measurement. The joint bearing N 60 W, appearing near the tope of the winze, has evidently enriched the ground in this locality. For about 47 feet on the same bearing, the sides of the main joint is particularly well-defined on the hanging wall and showing some movement.

The new shaft was intersected about 22 feet further, being a total distance from the cross-cut of 130 feet. The new shaft was started about 78 feet above the old shaft on the first level ground above the arroyo or stream (See Photo). From the first level (78 feet from the tope of the new shaft) to the second level is 112 feet. From the second level to the bottom of the shaft 23.5 feet. In sinking the shaft between the two levels, ore was found at about the same level, perhaps somewhat lower than found in the winze, and appeared intermittently to within 50 feet of the second level. At this point it disappeared in the foot wall.

At the bottom or second level, two levels were being driven when I was there. One bearing N 45 W 13 feet, NE 15 feet. The other, S 12 W 15 feet. Some fracturing bearing about N 44 E and dipping south was apparent, also an olive color bearing substance was commencing to show in the south shaft bearing about N 5 E.

A cross-cut was beeing started when I left, for the purpose of cutting the ore passed through the shaft, and ere this it should have been intersected.

On the Copper Mountain, a shallow shaft has been sunk, and a drfit a few hundred feet long driven, showing some ore in both shaft and drift. I have not been able to analyze the samples taken from here, but give an analysis given by Mr. Camphus.

ANALYSIS:

Top tunnel workings	22.78% Copper
Orient workings	25.01% Copper
Copper king winze	12.09% Copper

At the Margarite a shaft has been sunk about 100 feet on the contact (see photo), and some ore taken out.

The openings on the side of the Amole Mountain consists of a drift and some open cuts. I would like to see this location further explored. I have not had the samples taken from here assayed.

CONCLUSION:
I consider the Mile Wide presents a very legitimate opportunity for anyone desiring to invest in mining and willing to incur the usual mining risk.

SUMMARY: The Mile Wide formation shows a sequence of olivine dikes called andesite and a much altered limestone having an inclination of about 60 degrees to the southeast, all having a general northwest trend.

The development of the Mile Wide has determined very conclusively that copper in the form of chalcopyrite is found near the contact of the andesite dike and limestone.

There are three locations on the property worthy of being proven, namely the Margarite, the Amole upper workings, and the Copper King. I favor the prosecution of the work at the Mile Wide and consider the locations mentioned in the preceding paragraph as good selections for testing.

The MILE WIDE, as I stated before, is a VERY LEGITIMATE MINING enterprise It present MANY ATTRACTIVE FEATURES from a point of a mining investment, and I am pleased to report FAVORABLY on the property.

Respectfully submitted,

J. A. Ede

- -

UNIVERSITY OF ARIZONA

Tucson
ARIZONA STATE BUREAU OF MINES

October 26, 1916

Mr. Charles P. Reiniger,
c/o Mile Wide Copper Company
Tucson, Arizona

Dear Mr. Reiniger:

Referring to yours of the 25th regarding the telegram from Mr. Giffen, I beg to advise as follows:

No. 1 shaft, ore came in at 45 feet, of unknown depth, averaging about 6% copper. 55 feet, unknown depth, averaging 12% copper; 35 feet, unknown width, averaging 12% copper.

In the winze, ore came in 95 feet below the surface, unknown width, averaging 8% copper; 105 feet, unknown width, averaging 20% copper; 115 feet, 125 feet, 145 feet, 155 feet, the same.

In all of the above, when I speak of unknown width, I mean that the full width has not been determined. It would be impossible to deviate from the straightness of the shaft in order to determine the width of the ore body, and we shall not know that width until we have been able to cross-cut from the north and south laterals.

Very truly yours,

CHARLES F. WILLIS.

CFW.H

THE MILE WIDE COPPER COMPANY

September 1, 1916

to

February 1, 1917.

The progress of the Mile Wide during the past five months is more than gratifying, it was far beyond the most optimistic expectations.

On September 1st shaft no. 2 was in ore but no width had been determined. Ore was encountered at 95 feet on the hanging wall side and within 5 feet had extended entirely across the shaft. It proceeded to fill the shaft to a depth of 155 feet, and then went into the hanging wall again.

This ore was of direct, smelting, self-fluxing type, being chalcopyrite running heavy in lime, with much iron and manganese and little silicia. The whole ore body, as passed through, ran about 12 to 14% copper, but by selection shipments could be made running 21% copper.

It was impossible to follow the ore with the shaft, as a shaft must be straight, so the shaft was sunk to 220 feet in depth, and after leaving 20 feet for a sump to collect the water, a level was run on the 200.

Previous to cross-cutting, it was desired to know something definite about the width of the deposit, the direction of the slips, etc., and in order to do this, the ore body was cross-cut about at the middle of the ore that was struck in the shaft at the 125 foot level. A little work here showed the deposit to be at least 22 feet wide.

This work proved definitely where to go and in a very few days the same ore body was encountered on the south drift of the 200 foot level, and have been cross cut to date to a width of 16 feet. The average value of this ore is probably as good as that encountered in the shaft, but it is not as spectacular in appearance, as it is more intimately mixed and does not contain as much massive chalcopyrite. This is characteristic

and as greater depth is reached, more evenness of value will follow.

It was proven: ore was found in the old shaft and a considerable quantity was extracted, but by this time it was handled twice underground, windlassed to the surface, packed on burro to the road, copper at a dollar a pound was not enough. But the fact was proven to their satisfaction, that the epidotized, chloritized, leached andesite lime contact made ore in depth.

Then, ever conservative and anxious to make every dollar do its work fully, another prospecting shaft was started upon the hill, where ample dumping ground was available, and where it could be reached by a road, and a prospecting outfit of machinery installed consisting of a small hoist and a one drill compressor.

Confident of the ore that they could not see, it was decided that the new shaft be sunk at least twenty feet away from the place where the contact was mathematically figured to be. The ore should not, theoretically, be encountered in any solidity or quantity under 300 feet depth, as it was planned to go that deep and then crosscut to the contact. (A shaft sunk on the contact would not be permanent, unless timbered very heavily and a crosscut would be cheaper than timber.)

But contrary to all geological reasoning, and twenty feet away from where the contact should be, at 95 feet, iron pyrite, running 4% copper was found. The following day, the muck showed 9% copper. The next day 14% copper was exposed and thereafter, to the 155 feet level, copper ore, averaging about 21% copper filled the shaft. Coming in on the hanging wall, and leaving on the hanging, indicated that the ore had bellied from the contact 20 feet away.

Even to the blindest, there was but little doubt that a mine was found. The company felt that a large ore body was encountered and warranted extensive development. Hence, machinery was ordered at once for six times the power and compressor capacity of the prospecting outfit.

Sinking was continued as rapidly as possible, with the limited power and air capacity, and after going to 220 feet, a level was started at the 200. But as the desire of the company was to move surely and make no mistakes, it was decided to determine the exact depth of strike and width of the ore body first. Hence, going back to the 125 foot lever, about the center of the big ore body passed through in the shaft, a crosscut was started, and among the things determined, was that the width of the ore body was at least 22 feet.

Then turning to the 200 level, mathematical calculations showed that by crosscutting only four feet to the east, the ore body should be hit. True enough, a little less than four feet were necessary to hit the ore body, similar in character and value to that of the shaft. Crosscutting this body, the width was determined at 16 feet. Today, drifting has just started along this ledge to get stoping ground ready for real mining and shipping. With ore in the old shaft, 200 feet sway from the new workings, ore in the new shaft proven from 95 feet to 200 feet in depth at least, with 22 foot width at the 125 foot level and at least 16 feet in width on the 200 foot level, it looks like a real mine, and with 14% to 20% values, it looks like a very, very rich mine.

A GEOLOGIC RECONNAISSANCE REPORT ON

THE "MILE WIDE", "GOULD" MINE AREA OF THE TUCSON MOUNTAINS, AMOLE DISTRICT, PIMA COUNTY, ARIZONA

30 April and 1 May 1952

The Tucson Mountains are located two miles west of Tucson, Arizona. They extend for about twelve miles in a northwest direction. The Mile Wide - Gould Mine Area is located on the west slope of the Tucson Mountains, about ten miles northwest of Tucson.

The object of this reconnaissance was to determine if the mineral possibilities of this area warrant further geophysical investigation.

The important mines in the area are the Mile Wide and the Gould. At present, both mines are flooded. The only underground portion of the mines visited was the first and second levels of the Mile Wide Mine. The first level showed very little important mineralization, and the only information obtained was the strike and dip of the vein. Several large stopes were visited between the first and second levels. The mineral mined from these stopes was mostly chalcopyrite. The largest stope visited measures 100' x 30' x 20'. (See Plate 1) On the dump of the Mile Wide Mine, there were good showings of chalcopyrite mineralization.

The present owner of the Mile Wide and Gould Mines claims that there are considerable ore reserves in the flooded portion of the mines.

However, it seems that during the last World War and at present, with the high prices being paid for base metals, the owner would have taken advantage of such high metal prices and exploited his ore reserves.

It is the opinion of the writer that if such ore reserve actually existed, they would have been mined during periods of great demand for base metals.

Although no information was available on the underground workings of the Mile Wide or Gould Mines, the dumps would indicate that both mines contain several thousand feet of workings.

The mineral deposits in the Mile Wide-Gould Mine Area appear to be of the contact type. This is evidenced by the association of such contact metamorphic minerals as: garnet, magnetite and epidote. At the time of mineralization, the igneous stock now exposed was in the upper or fracture zone. This is shown by the fault and fissure filling type of deposits.

Plate 2-A (after B. S. Butler) shows the relationship between mineralization and depth of stock as compared to the present erosion surface. Plate 2-B shows a generalized cross-section of the Mile Wide-Gould Mine Area. It can be seen from this cross-section that the stock exposed in this area is medially truncated. This reduces the possibility of good extensive mineralization. However, the presence of adequate precipitants, such as H_2S gas and pyrrhotite at the time of mineralization could cause the premature precipitation of abundant sulfides in this high temperature zone.

It was noted, that where most mineralized fissure veins cropped out on the surface, gossans were formed. These gossans contain not only quartz and limonite, but also large amounts of magnetite. This condition was caused by the sulfides being leached out and carried away by meteoric waters. The magnetite and quartz being more stable were left in place. The presence of magnetitie in most outcrops is

detrimental to the use of the magnetometer. Such surface features will cause erroneous magnetic values.

There are three fault systems in the area. A major system trends east-west, a secondary system trends north-west and a minor system trends north-east. (See Map). Mineralization is definitely associated with some of the east-west and north-east trending faults. In the Mile Wide Mine, the mineralization appears to be associated with both northeast and northwest trending faults. Mineralization is much stronger where these two fault systems intersect.

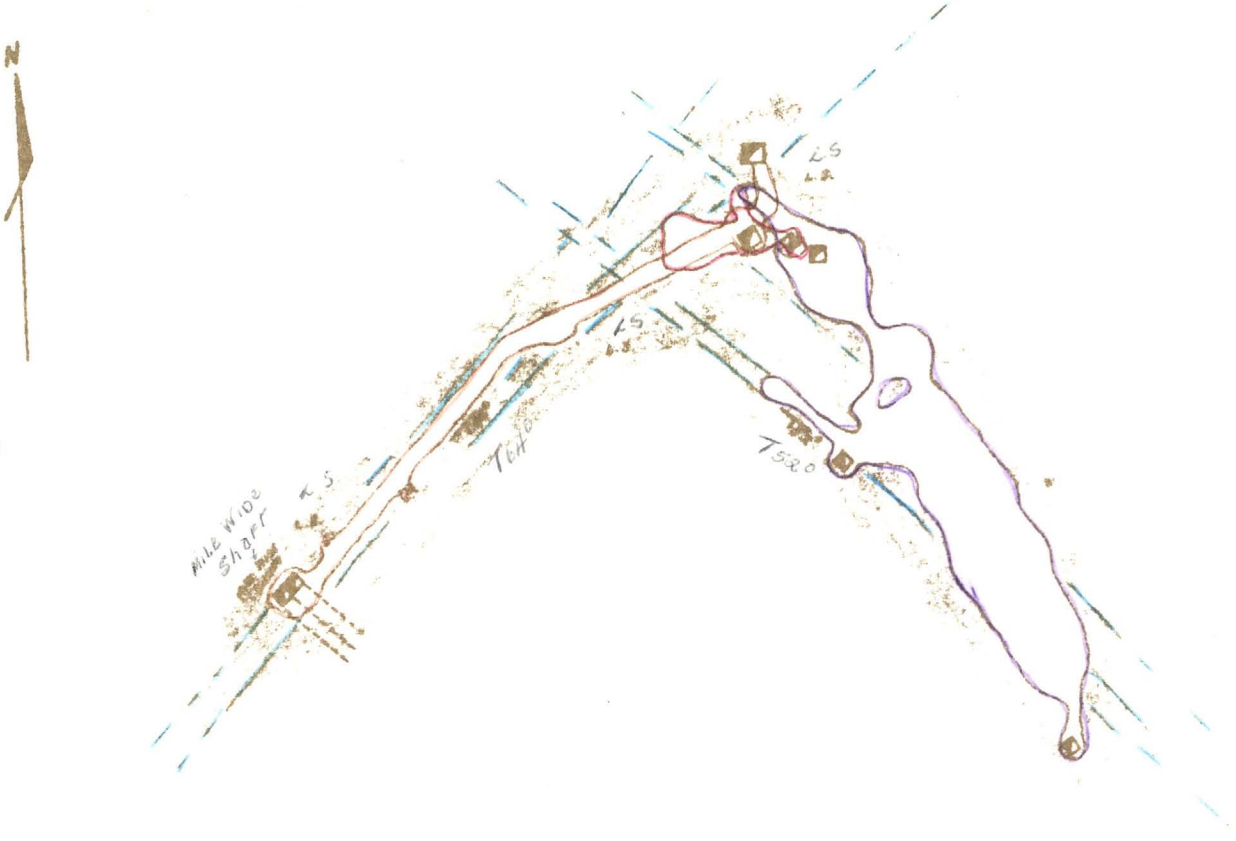
Outcrops of magnetite were observed along the limestone quartz monzonite contact. About 1/4 mile north of the Mile Wide Mine these contact deposits may have slight possibilities for sulfide mineralization. However, it is the writers opinion that the best sulfide mineralization will be found along major fault systems, and particularly at fault intersections near granite or quartz monzonite intrusions. Many small fault and fissure veins observed by the writer were found to wedge out at shallow depth, so it is advisable to concentrate on major fault systems.

Respectfully submitted,

Wayne Wallace

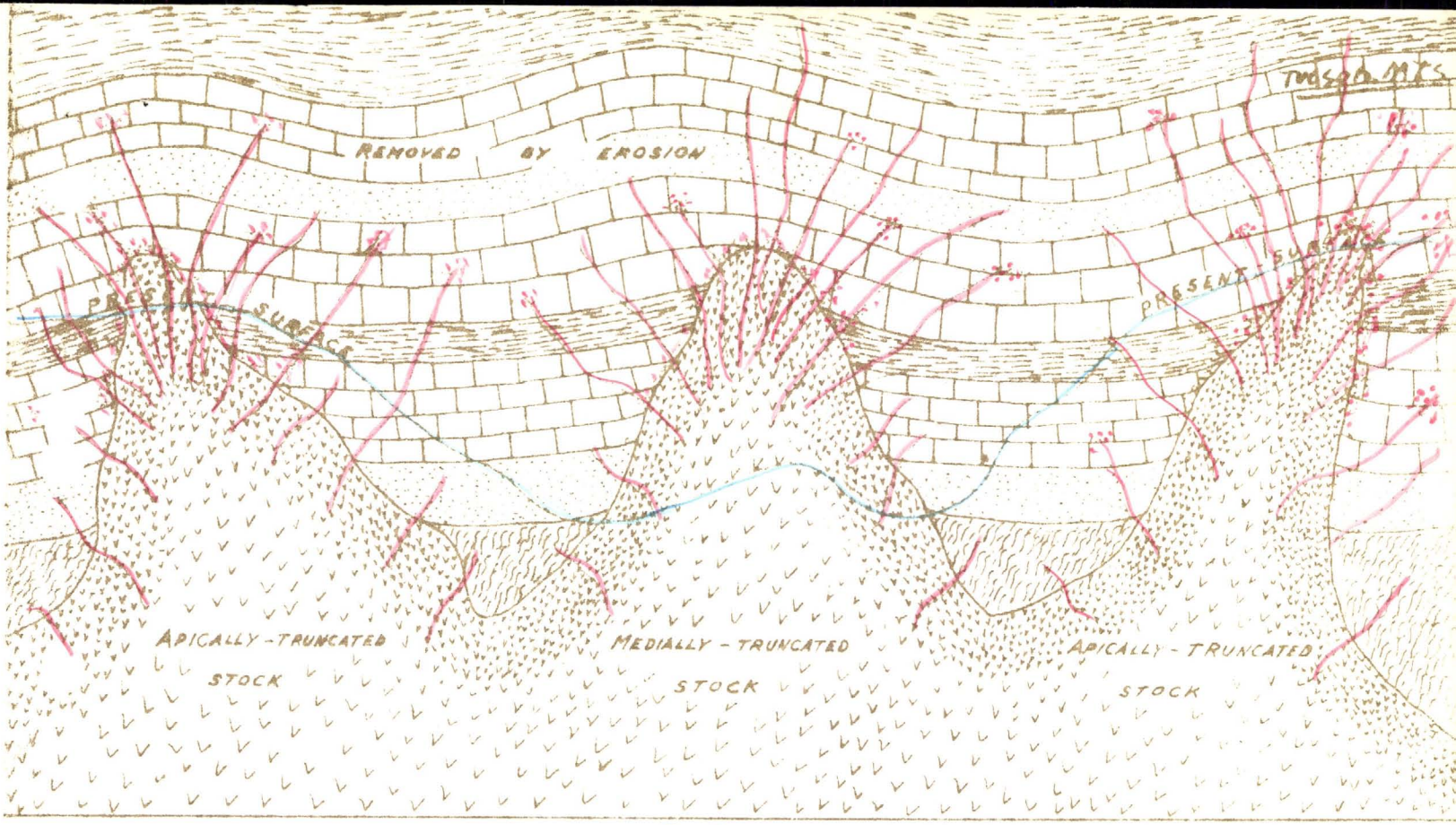
Tucson Mts

A PORTION OF UNDERGROUND WORKINGS OF THE MILE WIDE MINE



FAULTS
1st LEVEL
1½ LEVEL
1⅔ LEVEL

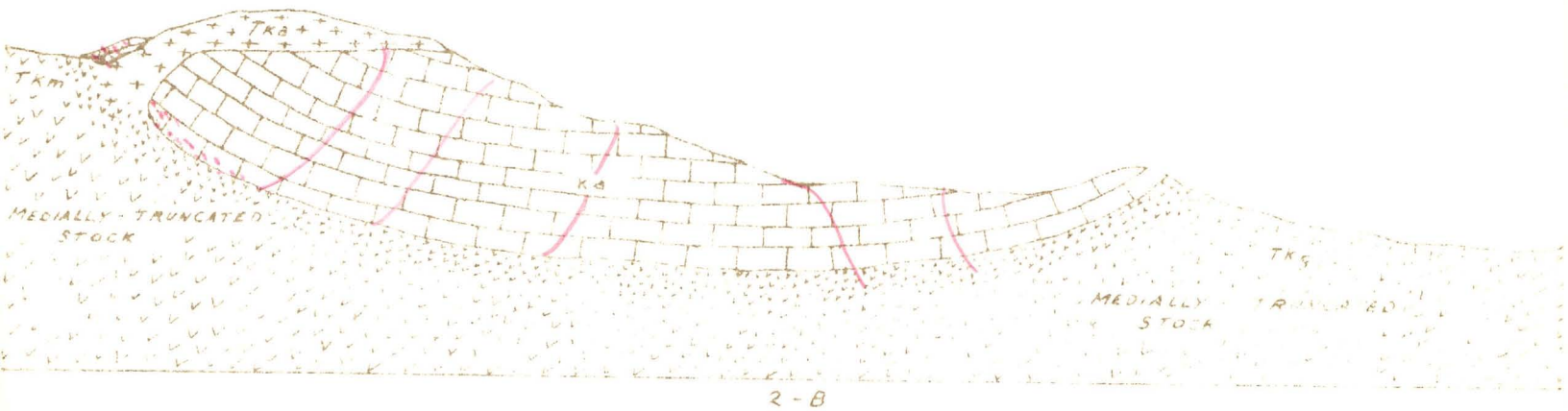
BY BRUNTON SURVEY
SCALE 1" = 50'



2-A

RELATIONSHIP OF STOCKS TO ORE DEPOSITS

AFTER B.S BUTLER



2-B

GENERALIZED CROSS-SECTION OF MILL WELL GOULD MINE AREA

TKQ - DACITE

TKm - QUARTZ MONZONITE

KA - GRANITE

0 - LIMESTONE

UNIVERSITY OF ARIZONA
Tucson

College of Mines
Arizona Bureau of Mines

Copy
February 12, 1942

METALLURGICAL TEST

Ore no. 612

The sample of this ore was submitted for test by Mr. John Greenwood of Tucson from the Gould Mine of the Copper Bell claims located approximately fifteen miles west of Tucson, with the request that a method treatment be determined. The Arizona Bureau of Mines has no information relative to the tonnage of ore available in this mine, nor of the average grade of ore.

The sample was a heavy pyritic ore, containing copper chiefly as chalcopyrite in a siliceous gangue, the analysis was as follows:

% Copper	% Iron
4.8	25.6

Liberation of the sulphide minerals from each other and from the gangue was practically complete at 100-mesh.

Test No. 612A, grinding to approximately 100-mesh and using six pounds of lime per tons of ore was not successful, due to insufficient pyrite depression.

Test No. 612B, with the same grind and tend pounds of lime per ton of ore was made as presented on following page and gave these results:

SUMMARY:

The results of the tests show that an ore of this character, a copper extraction of 96.4 percent may be expected in a concentrate, containing 28.8 percent of copper. At some sacrifice in extraction, this grade could probably be raised if it were desired. Grind should be to approximately 100-mesh. In addition to 10 lbs. of lime per ton, the only reagents required are 0.08 lb. of Ethyl Xanthate (z3) and 0.05 lb. of Dupont Frother. Total flotation time was 13 minutes.

The Arizona Bureau of Mines

By: E. H. Crabtree, Jr.
Metallurgist.

Test No. 612B

	Wt. Grams	Dilution Water:Solids	Time-Min.	Reagents Lime	Lbs. per ton/ore Z	Frother
Grind	510	0.75/1	30	10.0	3	
1st Flotation		3/1	3		0.02	0.05
2nd Flotation		3/1	5		0.02	
3rd Flotation		3/1	5		0.04	

pH of tails 8.6
Free CaO in tails 0.1 pound per ton of water
Screen analysis of tails: 612% plus 100 mesh.

PRODUCTS

	Wt Grams.	Tons in 100 Tons feed	%Copper	% of total Copper
Conc. No.1	58.6	11.5	30.8	75.5
Conc. No. 2	15.2	3.0	27.0	17.3
Conc. No.3	6.1	1.2	13.8	3.6
Tails	428.0	84.3	0.21	3.6
Calc. Heads	507.9	100.0	4.69	100.0
Assayed Heads		100.0	4.80	100.0

Compositing the above three concentrates into one concentrated, the products will be as follows:

	Tons in 100 tons of Mill Feed	% Copper	% Total Copper
Assayed Head	100	4.80	100.0
Calculated Heads	100	4.69	100.0
Copper Conc.	15.7	28.8	96.4
Tails	84.3	0.21	2.6

Copper Bell (Gould)

Tucson

September 25, 1942

George A. Bellam

Production Possibilities Survey

This property is situated in the Tucson Mining District about 11 miles northwest of Tucson. It is owned by John Greenwood, Mgr., 40 E. 13th St., Tucson, Martin Waer, Elmer Dow and Abel Weinberg. There is a good road into the property, which is on the edge of the Tucson Park area. Ample water is available for all mining purposes.

Ore occurs as intrusions in limestone, values in copper as chalcocite with some bornite. Although no notable operations have been conducted for about 40 years, some 500,00 lbs. of copper have been produced in the past shipments going to Globe and Sasco smelters, where this siliceous flux was desired.

Development consists of a 350' shaft with tunnel opening on 100' level drifting ans x-cuts on 200' level and 300' levels: winze near shaft in tunnel also opening lower levels: and exposures of two parallel veins which have not been developed. There is water just below the tunnel level of 100.

The owners wish to apply for a preliminary development loan. They have been confronted with a problem in this regard, since the old shaft is badly caved and it might not be practical to rehabilitate it. In 1940 about 100 tons of ore was taken out on the tunnel level next to the shaft. All of the timbering came in and considerable work will be involved in repairing it about the water, while it is reported caved below also. The owners were figuring on a new shaft at the tunnel portal to open the lower levels. However, the winze is in good condition and will enable access to all parts of the workings. I recommended that they merely apply for an unwatering loan, say it will cost $1000 or $1500 to unwater, and upon access and sampling, future development may be decided upon.

The present reserves, estimated at about 100,000 tons, average about 4% copper. Yesterday, I was informed by Campbel, who had sampled the property in the past, that 25,000 tons of at least 4% copper ore can be taken out above the water at present. This, together with estimates of production contained in the Henderson report may be rather optimistic, as were the plans for a mill on the property. However, after spending some time in the workings, I believe substantial tonnage, say of 3-1/2% copper content, to the amount of 25 tons per day of good milling ore could be sent to the Jacobs mill. Although Greenwood states that he faces no particular problems, he will undoubtedly run up against the usual labor and equipment shortages for larger operation. He has three or four men available for the proposed unwatering and repair work now, and can readily get one or two additionnal men for the smaller operation, in addition to two of his partners, one of whom is a good miner. Greenwood himself has had considerable mining experience. He can readily get together a crew of ten and for the immediate present -- within the next six months. I believe a small operation is justified.

Geo. A. Bellam

University of Arizona
Arizona Bureau of Mines
Ore Testing Service

March 15, 1945

Mr. H. C. Ertal
Route 1, Box 980
Tucson, Arizona

Dear Mr. Ertal: Re: Ore No. 960

The sample or copper ore submitted by you March 6 has been tested by flotation for the recovery of copper. The Arizona Bureau of Mines has no knowledge of the tonnage of material which the sample represents.

The material was crushed to minus one-quarter inch and on-half was then crushed through rolls to minus 10-mesh. From this 10-mesh material head and test samples were cut.

TEST B

The ore was ground in laboratory ball mill for 30 minutes and floated with 6 lb. of lime per ton added to the ball mill, and 0.05 pounds of potassium xanthate and 0.05 frothers B-23 per ton. These reagents were conditioned for three minutes. The concentrate was removed for five minutes and the middlings for seven minutes. Results of this test are given in following talbe.

	Tons per 100 tons Heads	Copper %	Silver ounces per ton	Gold ounces per ton	Distribution of copper %
Head	100.0	2.88	0.13	Tr	
Calculated Head		2.87	0.1324		
Concentrate	9.9	28.02	0.4	Tr	96.7
Middling	1.7	1.86	0.2		1.1
Tailing	88.4	0.07	0.10		2.2

Screen test of tailing:

		Weight, percent
	Plus 100-mesh	0.5
Minus 100	Plus 200-Mesh	9.0
Minus 200-mesh		90.5

Test C

In test C, a sample was ground in laboratory ball mill for 20 minutes with the same reagent as Test B, except one-tenth pound of pine oil per ton of ore was used instead of Frother B-23. The copper concentrate was floated for twelve minutes, and then 0.05 pounds of reagent 208 was added and concentrate taken off, which contained mostly pyrite. The following table gives the results of this test:

	Tons per 100 tons Heads	Copper %	Silver Ounces per ton	Gold ounces per ton	Distribution of copper percent
Head	100.0	2.88	0.13	Trace	
Calculated Head		2.85			
Copper Conc.	12.08	23.03	0.4		97.30
Pyrite Conc.	14.08	.23	0.6		1.10
Tailing	73.7	.06	0.1		1.60

Screen test of tailing:

		Weight, percent
	Plus 100-mesh	3.0
Minus 100	plus 200-mesh	26.5
Minus 200-mesh		68.5

CONCLUSION

The copper in this sample can be recovered by flotation by grinding to 90 percent minus 200-mesh. This grind gave 96.7 percent extration. A coarser grind, 68.5 percent minus 200 gave a concentrate, including the middling, of 97.3 percent but with a lower copper content per ton of concentrate. The grade in Test C could be increased by cleaning the concentrate.

G. H. Reservearo
Metallurgist

Incorporate for 1,000,000 shares, par value $1.00

500,000 in Treasury
100,000 @ $.50 per hundred -- $50,000.00
400,000 Sanders D. Grey -- @ $.25.
Can take in 3rd party if necessary -- $100,000.00

Cost of Mine - - $10,000.00
Cash in 60 days- 1,000.00
Building cabins - -1,000.00
Fixing road - - - -1,000.00

$30,000.00 already spent on mine development

17 miles from Tucson
5,000 tons and over shipped to smelter at Globe
D. E. Said

To incorporate $200.00 cash
Stock books 50.00

C O P Y

Mr. Douglas Grey:

The Gould Mine has an ore body opened up that has been estimated to contain 150,000 tons of ore carrying 3% copper. In the bottom workings sulphide ore was opened up which assayed 14% copper and some ten tons of this ore was laying in the 150 foot level in the year 1921.

There is no questions but that good, large tonnage of ore carrying up to 10% copper can be developed on the Gould Property.

The mining and smelting of the Gould ore can be done at a cost of about $4.00 per ton.

Yours truly,

Tucson, Arizona
March 6, 1922

Mr. Douglas Gray
Tombstone, Arizona

Dear Sir:

We are the owners of all of the issued stock of the Amole Mines Company, except qualifying shares issued to the directors. You desire an option upon one-third of such stock, which in consideration of the sum of one dollar to us in hand paid, and other valuable considerations, we hereby give and grant upon the following terms: Within nine months you are to pay to us the sum of $964.00, whereupon we will cause said stock to be transferred to you, provided that in addition to said sum of $964.00 you repay to us one-third of any and all moneys which we may, from and after this date, and prior to the exercise of this option, have expended in and about and because of said property. This option is personal to you and may be exercised by no one else, and in the event of your death, it shall at once cease and determine.

Dated this 6th day of March, 1922.

/s/ M. C. Wakefield
/s/ Chas. F. Solimon

APPROXIMATE COST OF SMELTING PLANT 150 TONS DAILY CAPACITY

Excavation of site	$1000.00
Smelter building and ore bins lumber	4000.00
labor	2500.00
Oil Engine	3000.00
Furance	5000.00
Blower	2250.00
Blake Crusher	750.00
Pumps, pipeline and tanks	1500.00
Forehearths, slag pots, etc.	1200.00
Smoke stack and flue	2000.00
3 sets Weighing machines	1500.00
Tools for operating	350.00
Pipes, fittings, valves etc.	500.00
Sand, lime, cement & bricks	400.00
Assay office and office buildings	1000.00
Construction labor erection of plant and other incidentals such as salaries	5000.00
	31,950.00

Tombstone, Arizona
July 2nd, 1922.

Mr. William Kemp
Tucson, Arizona

My Dear Kemp: -

How are you getting along with the Gould mines? You promised to send me copy of the option you had on the property, I wanted very much to see it.
I would like to talk with you about this matter and perhaps we could make some kind of a deal that would be pleasing to you.
With kind regards, I am,

Yours very truly,

TUCSON WAREHOUSE & TRANSFER CO., INC.
26-28-30 N. Scott St., Tucson, Arizona July 2, 1922

Mr. Douglas Grey,
Tombstone, Arizona

Dear Mr. Grey:

I regret that I have been so dilatory in sending you the copy of option on the Gould Mines. It is not that the matter was forgotten, but each time I have gone to my bank box, I have neglected to get the document so that I might have our stenographer make a copy.

She is at present away on her vacation and I would like to wait until her return. However, I have been so careless in this matter that is you wish, I can make this copy myself, if you will let me hear from you again.

I think the date of the last option given is December 21, 1921.

With kind personal regards, I remain,

Yours truly,

/a/ Mary cameron Wakefield

C O P Y

Tombstone
Arizona
July 3rd,
1922

Mr. M. C. Wakefield
Tucson, Arizona

Dear Mrs. Wakefield: -

I have your nice letter of the 2nd, and your excuses for not sending me the copy of option on the Gould Mines is all right, when your Stenographer returns I shall be pleased to receive same.

From all accounts it has and is very hot just now in Tucson and Phoenix must be dreadful.

Personally, I want to ask you if you can not take over my interest in the Gould Mines for a very small amount. I would then be satisfied and at this time it would help us out very much. We are having pretty hard times no days and my Wife is keeping a few boarders to help out for the time being, other wise I would certainly hold on to my interest as I have great faith in the property.

I have seen Mr. Kemp since you were here and his opinion of the property is certainly good.

If you could give Mrs. Gray for Me FIVE Hundred dollars I would turn over my entire interest to you and draw out entirely. I am saying this to you personally, and I know Mr. Solimon would be pleased to have us make a little deal of this kind. One way and another I have put up quite a good deal on the Gould mines and have made many trips at my own expense. Kindly let me hear from you by return mail.

Very sincerely,

_____

Walter W. Wishon
Mining Engineer
Los Angeles, California
7-6-1908

To-
S. H. Gould
President and General Manager
Gould Copper Mining Company

Sir:

I have the honor to hand you the following report on your property with maps and cross sections to define and illustrate it.

LOCATION, AREA, ETC.

The mining estate of the Gould Copper Mining Company lies in almost a solid body, without any intervening claims, in a general rectangular form, in the Tucson Mining District, Pima County, Arizona, distant about eleven miles west of Tucson, the county seat and trading point.

The elevation is approximately 3,400 feet above sea level and ranges from 400 to 1000 feet above surrounding valley.

The area embraced in the property is approximately 210 acres, all fully surveyed, as per topographical map herewith.

GEOLOGY

The geology is of the usual type of Arizona contact copper ore deposits, consisting of interbedded magnesium, limestone, highly metamorphosed, in contact with granite porphyry, on the north side of the property, along with the crest of the mountain uplist. This contact series has been fissured, faulted or intruded, and partially overflowed by the outpourings of the quartz porphyrites, resulting in the "garnetization" of the sedimentary rocks and their mineralization in the form of loades or reefs, which occur in approximately parallel lines along and near the planes of contact. Epidote also occurs with the garnet, in fact, both are common associates of copper in the southwest.

The great mountain uplist of about 1000 feet vertical, has broken the interbedded limestone formation, as shown by the bedding planes of the remaining mass, which, although mineralized to a marked degree as shown by its decomposed epidote reefs, yet it shows none of the huge garnet outcrops, lode-like in character, which appear in great lenticular masses here and there along their strike, as in that of the great mountain uplift.

It is in this area of greatest activity that three large mineralized reefs, or veins, traverse the property for its entire length of about 4800 feet, as shown on map herewith. On the west end of the property, these reefs approach each other where, on the Sierra Arriba claim, the epidote garnet mass becomes extremely large in consequence, and the copper mineralization of greater value than usually found elsewhere, noted on the surface, although all the reefs are copper bearing and have the semblance of regular lodes.

MINERALOGY

The copper ore is found in the form of sulphide, usually chalcopyrite, disseminated in the midst of the garnet, in grains, stringers and often in nodular masses, associated with much iron sulphide, lime spar and some quartz. In some instances, the chalcopyrite has yielded to the secondary mineral, bornite, which is found scattered here and there throughout the great mass, thereby bringing the copper percentage up to a mark that allows of great widths in these huge lodes to be mined and smelted at a profit. This is also due to the ratio of predominating gangue materials being so largely basic in nature, as to admit of fluxing silicious ores, in which the veins of the surrounding country abound.

DEVELOPMENT

The veins have an east-west strike and dip northerly into the mountain at an angle of about 60 degrees from the horizontal.

The chief development consists of a working shaft with manway, 360 feet in depth, on Copper Mine Claim No. 5, with cross-cuts and drifts on the 100 foot level, and the 300 foot level, as per map showing horizontal and vertical projections herewith. There is also a winze from the 100 foot level to the 300 foot level, and a cross-cut, shown on map, south from shaft on the 200 foot level, which showed much iron pyrite assaying about 1-1/2 percent copper, but it produced so much water that a pump was be requied, hence it was bulkheaded to stop the flow.

About 600 feet east of the main shaft and 60 feet lower, on Copper Mine No. 1 claim, there is a 50 foot shaft on the same vein of the main working shaft. This shaft is all in ore. About 700 feet northerly from this 50 foot shaft, and on the second parallel vein on Copper Mine Claim, in a cross-cut tunnel 70 feet in length which, although but an apex cross-cut, is all in ore. The croppings here, and immediately to the east, are huge. From this 60 foot cross-cut, and from the 50 foot shaft already mentioned, 30 tons of ore were selected and shi ped to the El Paso Smelter, which sampled 8.6% copper, 5.0 silver and $1.50 gold per ton. About 90 feet vertically below the 70 foot cross-cut tunnel, above mentioned, a tunnel of like length is now being driven to cross-cut the ledge, but it has not yet entered the ledge.

On the Invincible Claim is a 10 foot shaft, sunk on the western extremity of a very large garnet outcrop, which shows very fine pyrite, much resembling marcasite, especially throughout the gangue at and near the bottom of the shaft, and assaying about 1-1/2% copper.

On the Sierra Arriba Claim is a 10 foot shaft and a 20 foot tunnel; on the Greenwich Claim is a 20 foot shaft. The Sierra Arriva claim and the Invincible Claim have the most wonderful cropping of the entire property, both as to size and quality, although other large lenses also appear at intervals along each of the veins, but the mineralization appears better in the veins nearest the granite porphyry contact and also as they approach each other in the western extremity of the property.

It is there by judgement that the main 360 foot working shaft before mentioned, has been sunk upon the leanest vein thereof, being yet, at a

depth of 50 foot ore was encountered, which had evidently leached and re-concentrated, as it assayed 17% copper. At a depth of 113 feet and known as the 100 foot level, the shaft sunk vertically, encountered the foot wall and a cross-cut at the horizon, proved a width of 30 feet of ore. A drift, westerly upon it, shows ore of good commercial value, its entire length of 75 feet. The face, at that point, is 20 feet wide with neither wall showing. East from the shaft the orebody gives way to massive iron pyrite in a very soft gangue, and a little further east, the vein is faulted, which has been cross-cut and evidently a new body is found just coming into the present face. This ore is believed to be the same as that encountered in bottom of the 50 foot shaft to the east.

The cross-cut on the 200 foot level shows the ore body to be about 50 feet in width, which has been drifted upon westerly about 60 feet. The copper value appears to be less on this particular portion of the 200 foot level, than that on the 100 foot level, but in the east drift an upraise, as well as the winze, for 50 feet in depth, shows quite high grade ore. As shown on the map herewith, the winze is sunk on the ore to the 250 foot level, at which point the ore deips out of the winze, as it there changes vertically to the 300 foot level in order to use it for a chute. Two drifts have been started westerly from the winze, about the 250 foot level, both showing high grade ore, which tends to prove that the large mass of low grade ore encountered to the west on the sill floor of the 200 foot level, is due entirely to a "horse" or a much harder vein material which was more difficult for the ore bearing solution to penetrate. While the value of the "horse" or vase mass of harder vein material on the 200 foot level, will probably not average more than 2% copper, yet the ore disclosed in the upraise and the winze, will average fully 5% copper.

It is quite a difficult matter to obtain a fair sample of the ore bodies without actual mining, hence, I have taken as an average, the entire ore bodies so far opened, the average assays as found by the Old Dominion Smelter at Globe, Arizona, in sampling the 100 tons of ore shipped just as mined to them, and with instructions from the smelter prople to keep the ore as low as possible on copper, but on the other hand, as high in basic elements and sulphur as possible, as they desired it for flux and matte fall chiefly.

This average analysis is: Copper 3.2%; Silica 26.0%; iron 25.1%; Aluminum 1.26%; Lime (Ca) 13.2%; Sulphur 19.0%; The gold and silver values being below their scale of $1.00 gold and 2.0 silver, no record of those values was given. However, from numerous assays taken while the ore was being shipped, it is safe to say that ore of this copper grade will average about $.60 gold and 1.5 ounces silver perton.

Owing to the great demand for ore of this character, that company now offers, for this ore, $0.08 per unit for the iron, lime and sulphur percentages, or 57.3 unites. Total at 8 cents ---------- $4.58

Copper on electrolytic assay less 2-1/2 cents from New York. Electrolytic quotations $2.00 per unit - -	6.40	10.98
From which deduct 10 cents per until for silicia percentage above 20%, 6 units - - - - - - - - - - - - - - -	.60	
Smelting charge, No. 1 Railway charge for freight - - - -	2.00	2.60
From which deduct: wagon haul of $3.00 and cost of mining which in ore bodies of this magnitude will be from $1.00 to $2.00 per ton total - - -		5.00
		$3.38

It is therefore apparent that the erection of a smelting plant upon the property is imperative, and therefore, a smelter site has been provided by the Company at the foot of the mountain, about 3/4ths of a mile distant from the main working shaft, which is admirably adapted for that purpose.

The ore is best adapted for treatment in the blast furnace type of not less than 500 tons units. In the first smelting, the average ore of, say 3.0% copper value, will produce about 17.0% matte, the second smelting about 50% matte, and by using the semi-pyritic process as now used at the Washoe Smelting Plant of the Anaconda Company of Montana, ore of this character can be treated with less than 3% coke on the charge. By providing from 96% to 98% copper, which may be case direct in cathode form, for shipment to the refinery.

As before stated, the fluxing quality of this ore is such that the silicious ores of the surrounding district can be treated therewith. These are now paying a smelting charge at El Paso from $10.00 to $12.00 per ton. By fluxing these ores to their limit, and charging El Paso rates, the ores of the Gould Copper Mining Co., can be both mined and smelted without cost as to its own ores, and in addition, save to the seller of silicious ores the minimum freight haul of $2.00 per ton to the El Paso Plant. The entire surrounding country is known to be rich in silicious ores and the erection of this plant would greatly stimulate their present output.

Looking westerly from the Gould Copper Company's property, one can see the new Sasco Smelter with its two units of 350 tons each and its adjacent mining property, the Silver Bell, which now has a depth of 1200 feet.

During the development of, and while building a reduction plant on the Gould property, the Sasco Smelter could be utilized to great advantage, by building a spur track of about 12 miles from the west end of the property to the main line of the Southern Pacific Railway, which would give all rail connections with the smelter, with a freight charge of probably 50 cents perton. As stated before, this west end of the Gould property not only has a wonderful surface showing of copper, but it can be tunneled to great advantage and the entire system of veins economically worked therefrom.

The geological condition of the Gould and Silver Bell properties are similar in many respects, except that of the Silver Bell is more crushed and broke, yet their orebodies, like that of the Gould property, carried low copper percentages in their upper horizons, but this value had gradually enhanced as depth was attained.

As mined and smelted in the large way, it is quite probable that ore of this character, especially when used for fluxing, can be found profitable with values as low as 1-1/2% copper, and it is believed by the writer, that much of the large mass of croppings, especially on the westward extremities of the veins of the Gould property, will be found to show that percentage and that immediately below such croppings a good commercial grade ore will be found. In fact, in the three visits that I have made to the property, I have found considerable very high grade ore, as a float from an ore body evidently covered, lying above the highest veins and just north of the huge outcrop, as shown on the map on the Invincible and Esperanzo claims, and probably at or near the granite-porphyry contact.

ECONOMIC CONSIDERATIONS

The conditions attendant upon operation are in every way favorable for

cheap mining and reduction. The topography is such that the ore can be delivered by tramway at the smelter side at the foot of the mountain, later to be succeeded by tunnels. The mine furnishes an abundance of water for the proposed smelter, in fact, will yield considerable water and thereafter can be utilized to irrigate the fertile valley adjacent.

An electric power plant can be erected on the Railway and operated very cheaply, using fuel oil and the power generated, conveyed to both smelter and mine. There is a good wagon road from the railroad at Tucson to the mine, now 17 miles, which can be shortened, over which machinery can be hauled at nominal cost. The smelter site is a gentle sloping tract, admirably suited for the purpose, being interesected by a deep gulch which furnishes excellent dumping ground for slag for years to come.

The general plan of development and operations admits of a very cheap cost of handling the ore from the mine to the finished product, the estimated available commercial ore aggregates a total of about 100,000 tons, and a supply of 1000 tons or more per day, is well within the range of early attainment. A tunnel driven at about 400 feet level, and a second at about 700 foot level and the third at about 1000 foot level. Thus it may be seen what extensive development may be persecuted without requiring any ore whatever to be hoisted.

Any self-fluxing ore enables economies which greatly cheapen the cost of treatment, but when these qualities are such that they are also enabled to treat a large proportion of silicious ores with a high treatment charge for same, the flushing qualities assume an approximate value in these ores equal to the total copper, silver and gold content, hence, the blister copper for this property and proposed smelting plant should be marketed as low as that of any plan in Arizona, in fact, it may be stated that the problem before the Gould Copper Mining Company is not of ore development entirely, but largely one of operating, being confined to a study of necessary equipment and best method of handling.

Owing to the extensive nature of the ore bodies, and the large tonnage which can be produced, I am of the unqualified opinion, that the property of the Gould Copper Mining Company should rank well with the large producers when once under full operation.

Respectfully,submitted,

/s/ W. W. Wishon

Los Angeles, California
July 6, 1908

TO WHOM IT MAY CONCERN:

THIS IS TO CERTIFY, That I have examined the titles to the following groups Mining claims, all situated in the Amole Mining District, Pima County, Arizona, as follows, to-wit:

(1) The COPPER KING Group, so-called, consisting of the following claims: Columbia, Cop er King, San Fernando, San Miguel, Copper Crown, Margarita, Copper Top, Cimmaron, Alta, San Francisco, St. Louis, St. Paul, Buena Vista, Washington, Copper Queen, Copper Bell Mining Claims, and Copper King and Copper Crown Millsites.

(2) The ORIENT Group, consisting of the following claims: Orient Nos. 1 to 14, inclusive, Mining Claims.

(3) The ESPERANZA group, consisting of the following claims; Esperanza Nos. 1 to 12 inclusive, Mining Claims.

(4) The COPPER MOUNTAIN Group, consisting of the following claims: Copper Mountain Nos. 1 to 6, inclusive, Mining claims.

(5) The ORO FINA Placer Group, consisting of the following claims: Oro Fina Nos. 1 and 2 Placer Mining Claims.

The title of the Copper King Group is vested in Elena de Pellon, Louis Pellon, Pedro M. Pellon, Concha McCrillas, Anita Pellon, Charles Pellon, Teresa Pellon, the latter two being minors and represented by Elena Pellon, guardian, and Isabel Waer and L. Martin Waer. Conveyances have been executed by all of said persons to Mile Wide Copper Company and placed in escrow in the Consolidated National Bank of Tucson, the guardian being authorized by Superior Court.

The title of the Orient group is vested in M. Waer. Conveyance has been executed by him to C. P. Reiniger and J. H. King, and placed in escrow in said bank. Also conveyance from C. P. Reiniger and J. H. King to Mile Wide Copper Company attached to the foregoing escrow.

The title of the Esperanza Group is in J. U. Mettler, Conveyance has been executed by him to Charles P. Reiniger and J. H. King and placed in the Consolidated National Bank of Tucson. Also attached to said escrow is conveyance executed by said Reiniger and King to Mile Wide Copper Company.

The title of the Copper Mountain Group is in Martin Waer, Jr. and John Latz. Conveyance has been executed by them to C. P. Reiniger and J. H. King, and placed in escrow in the Consolidated National Bank. Attached to said escrow is conveyance from Reiniger and King to Mile Wide Copper Company.

Title to the Oro Fina Claims is in L. Martin Waer, Isabel Waer, Henry Waer, Herman Waer, M. Waer, L. Waer, J. Ide, and Caroline Ide. Deed has been executed by all of them to Mile Wide Copper Company and placed in escrow in the Consolidated National Bank, with conveyance of Copper King Group, and deed will be delivered at the same time the deed to said Copper King Group is delivered.

S. L. Kingan

Tucson, Arizona
November 17, 1916

S T A T E M E N T
O F
THE COPPER KING GROUP OF COPPER, SILVER AND GOLD MINES

Located and situated in the Amole Mining District, on the West slope of the Tucson Mountains facing the Silver Bell Mines and Mining District, in Pima County, Arizona, about 12 miles in a westerly direction from Tucson. The group consists of 16 mining claims, 600 feet in width and 1500 feet in length, together with a five acre mill site and water right belong to said group of mining claims, which is called the Copper King and Copper Crown Mill Site.

The names of said claims are as follows:

Columbia	St. Paul
San Luis	San Francisco
Copper Top	Alta
Cimarron	Margarita
Copper Crown	Copper King
Copper Queen	Copper Bell
San Fernado	Washington
Buena Vista	San Miguel

Copper King and Copper Crown
Mill Site and Water Right

The general course of the veins is from the easterly to the westerly being about 20 degrees north of east and 20 degrees south of west.

The formation in which these veins or deposits occur is limestone, porphyry and quartzite, heavily charged and capped with iron, the width of veins on surface being from 15 to 250 feet. The nature of the ore is an iron sulphide, carrying copper, silver and gold. The ore from the different parts of the workings gave a return at the smelter of 18 3/10 percent in copper, $1.70 in gold and 4-1/2 ounces in silver. The next lot shipped from the Copper King shaft or works, which was taken as it came from a large body of ore to the amount of 16 tons gave 11-7/10 percent in copper, $1.30 in gold and 4-1/2 ounces silver. The former shipment was 22 tons partly assorted ore.

The general samplings of those different claims, and workings averages 7 percent copper, $1.80 in gold and 5-1/2 ounces in silver. I consider this latter a general average of the different and larger workings. The general ore, which is in large quantities, is a free smelting ore and carries a large percent of iron, sulphur and lime, and makes a self-fluxing ore for smelting purposes. From this mine there has been some 360 tons of ore shipped that averaged 9% copper, $1.50 gold and $3.50 in silver per ton.

THE COPPER KING: Has one shaft 78 feet deep about in the center of the vein and a cross-cut towards the south 75 feet and a drift along the vein towards the hanging wall, or supposed hanging wall, 310 feet in length and winze sunk on the supposed hanging wall, but discovered to be in about the center of the ore body, at the end of the cross-cut 25 feet deep with a high grade of yellow and chalcocite and

ruby copper and black sulphides, assay values going as high as 37 percent copper. Another winze sunk down to 30 feet deep in solid sulphides and averaging 14-1/2 percent copper, $1.00 gold and 4-1/2 ounces silver.

It is demonstrated that as depth is obtained the ore increases in quantity and values. The width cannot be ascertained at the bottom, as it has not been cross-cut the full width of same. At this place on the surface, the vein measures 200 feet in width by tape line. At present a new shaft has been sunk to connect with the old underground workings, but is not now deep enough to reach the high grade ore. The present development shows it is leading to enormous, big ore bodies, rich in copper, gold and silver.

There is now being installed compressor for air or machine drills and a large hoist with automatic dumper.

THE MARGARITA: Shaft 100 feet in depth and a cross-cut 26 feet towards the south at a depth of 55 feet and a drift towards the east 135 feet. In the drift, a winze is sunk 28 feet deep and drift 30 feet, supposed to be the footwall on the vein, and all in ore, then a cross-cut towards the south 20 feet towards the hanging wall, which is lime spar and iron, as the lime overlies the ore bodies. At this place, the width of the ore body is 22 feet, as far as cross-cut, and towards the north, extent or width not known. The samples taken from these workings assayed 8.2 percent copper, $2.30 gold and 5-1/2 ounces silver. Have taken samples from this claim of native copper that went as high as 78 percent. This ore is very heavy material of a sulphide or oxidized iron, and a very fine smelting ore. There are a number of other smaller workings from 10 to 20 feet in depth and all have a showing of good ore. Width of surface croppings capped with iron and carbonate of copper is 150 feet in width. And from these workings a large quantity of ore has been shipped to smelter. At present, development work is being done. Machinery about to be put on.

THE SAN FRANCISCO AND BUENA VISTA: Both on the same strike as the Copper King and the Margarita. Workings on these claims range from 10 to 20 feet, to show extent of ore bodies.

THE ST. PAUL: Is a parallel vein or lode of the Copper King towards the north on which there is not very much work done, carrying yellow sulphide of copper with gold and silver, capped with iron for more than 150 feet in width, and heavily charged with epidote of lime and the surface croppings show over 300 feet in width and has a dip towards the Copper King ore body.

THE CIMARRON: Being on the same vein or lode as the Columbia, Copper Bell and Copper Top, has one shaft 22 feet deep and a number of other workings on vein, all in good ore, and gives assay values 14-3/10 percent copper, $7.00 in gold, 4 ounces silver. This ore has been tested for the purpose of obtaining a shipping ore. The actual width of veing cannot be ascertained, as no cross-cut has been made. Workings show in some places gold which goes as high as $25.00 per ton.

THE COLUMBIA: Veins running same as the Cimarron. Has one shaft 12 feet deep and several open cuts, ranging from 12 to 25 feet deep; one tunnell 100 feet, run for the purpose of cross-cutting the vein or ore body. The surface is capped heavily with hematite and oxidized iron. There is, in these workings, a green malachite, black ozide and yellow pyrites of copper. The ore from these workings gave assay value of 23 percent copper, $4.00 gold, and 6-1/2 ounches silver. The width of vein has not yet been ascertained, as no cross-cut has been made. Vein capped on surface with hematite and oxidized iron and carbonate of copper. The width of the surface capping extending over 50 feet. This vein or ore body lies about 1000 feet north of the Copper King and having a dip towards the Copper King vein.

THE COPPER CROWN: Being on same vein as the San luis, Copper Queen and San Miguel. It has one tunnel 63 feet in length and one cross-cut of 12 feet on end of this tunnel, and another tunnel of 170 feet run for the purpose of cross-cutting the vein or ore body from the lower base. There are several shafts from 10 to 25 feet deep, all in good ore. The ore cut by the tunnell to the width of 3 feet averages 18 percent copper, $2.80 gold, and 8-1/2 ounces silver. The width of vein cannot be estimated as it has not been fully cross-cut. It has been fully demonstrated that, as depth is obtained, the ore increases in value and quantity. Surface croppings show width of vein from 60 to 100 feet.

The balance of the claims; the workings range from 10 to 30 feet deep in shafts, open cuts and small tunnels to discover the ore.

The course of these lodes or veins is from the easterly to the westerly, with a variation of 20 degrees north of east and 20 degrees south of west. The Copper King has a dip towards the south on an angle of about 80 degrees. The St. Paul and Columbia running parallel on the north and dip towards the Copper King at an angle of about 40 degrees and, in my opinion, it is only a question of time and depth when they will join together and form one large ore body. All the rest of the veins or ore bodies lying north of the Copper King vein are dipping towards it, there being five veins or ore bodies.

WATER: Can be had as shown by map, at Mill site or Water Right as there is living water all year round for domestic purposes and will supply several thousand people and animals. By sinking a well fifty or sixty feet and cross-cutting the canyon, water can be had or obtained for any sized plant or machine.

WAGON ROAD: A good suitable wagon or automobile truck road leading to the mines at present, 16 miles and to the nearest R. R. station on the Southern Pacific, only 8 miles.

Facilities for working are excellent.

This mineral zone extends from the westerly toward the easterly, eight miles in length and three miles in width and this group of mines is right in the heart of this great mineral zone.

I see no reason why the Copper King Group and other groups in this locality, by proper development, will not make large producers, they being in the center of this great mineral belt, and in my opinion, will in time rival the Copper King of Bisbee and the United Verde of Jerome, as I visited both of them when they were more prospects, and other properties which are now large producers, as I have seen them all for the past 35 years and when they were nothing but prospects. This property has all the earmarks of making a producer that will figure up in the millions as well as the Copper Queen of Bisbee and the United Verde of Jerome.

The following group of mining claims, consisting of 12 full claims and known as the

ESPERANZA GROUP: Lies on the south and parallel to the Copper King Group of Mines and adjoins the Copper Mountain Group of mines on the west, and have a good showing of copper, gold and silver ore.

THE ORIENT GROUP: Adjoins the Copper King Group on the east and, as shown on map, which has one shaft 110 feet deep, one tunnel of 90 feet, and other workings ranging from 10 to 20 feet deep and most of them showing a good grade of copper, gold and silver ore, with cappings of iron on the surface of the same nature as the Copper King Group, some assaying 86 ounces silver, gold $3.50 and 18.7 percent copper. This group has four parallel veins ranging from 15 to 100 feet in width, same nature and same zone as the Copper King. These mines will become very valuable by proper development and make large producers and the ores are excellent for smelting, being only about 7 miles from S. P. Railroad and the Santa Cruz river. Good wagon or automobile truck road leading right onto the ground.

COPPER MOUNTAIN GROUP: Consists of six claims, being the extension of Espanza Group, as shown on map, and runs parallel on the south side of the Orient and in consolidation therewith. The workings consist of one tunnel 320 feet in length and one winze in said tunnel 52 feet deep and a drift 30 feet in said tunnel and a number of other workings ranging from 10 to 30 feet in depth. The veins or ore bodies are heavily capped with iron and lime, and the ore extracted from same averages 4.5 percent copper, $2.00 gold, and 6.5 ounces silver, which is an excellent ore for smelting or concentration. Some of the ores running as high as 32 percent copper. This property can supply a large tonnage of good paying ore in the way of copper, gold and silver, and has excellent facilities for working and operating, as its mineralization is very extensive in length and width.

THE MINE: The work in the mine has been persistently pushed with one objective - depth and development. The outcrops of the Copper King group were less promising than in any other part of the property, but the Copper King had: 1. An andesite lime contact. 2. An extensive zone of alteration and leaching. 3. Ample evidence of slipping. 4. A slight copper stain.

It had no large iron gossans, so common on other parts of the property and so characteristic of copper deposits. It had nothing visible to warrant expenditure, except that every physical condition was ideal and if copper was there atll it would be as a large deposit. To the layman

It looked like a long chance, but to the mining man, its conditions were almost too good to be true, and the developments have confirmed this belief.

It was not anticipated that copper ore would be encountered at less than 200 feet depth, on account of the extent and completeness of surface leaching, and, in as much as the copper, if present, would be in the form of a replacement of the lime, it was not expected to find it in a solid for, but rather in a desseminated form, and predictions would have been amply verified if ore running /# 6 to 8 percent had been found. In the above two factors, all expectations were more than surpassed. Ore in solid form, a complete replacement of the lime running 20 percent copper was encountered at less than 100 feet.

The new shaft, known as the No. 2 shaft, was purposely placed away from where ore was expected. It was placed 20 feet from the hanging wall, inclined on the dip, but it was evident from the beginning that the leached zone was even much wider than this. At a depth of 95 feet, white iron was encountered, containing but a trace of copper. The ore body entered on the hanging wall side and from then on through the next 20 feet, the ore increased in both quantity and quality until the maximum was reached at about 115 feet, and has been maintained since. As an illustration, five assays taken one day averaged about 13% copper, and but two days later, five assays went uniformly between 20 and 21 percent.

No cross-cutting has been done as yet, for the shaft has not reached sufficient depth for another working level, but the evidence is both sufficient and conclusive that the No. 2 shaft has encountered an immense body of high grade copper ore, higher grade than is mined in quantity in any mine in the state of Except the United Verde Extension, the ore body of which is quite phenomenal.

GEOLOGY: The general structure is very much the same as the other desert regions of Arizona, in its having a granite stock base, underlying some prophyritic, sedimentary and igneous rocks, both acid and basic.

A series of intrusive dikes of an olive green andesite porphyry, Limestone, Rhyolite and Granite represents the Northern section. The limestone near the dike is very much altered - as we ascend the mountain, the evidence of metamorphism increases, reaching its maximum near the outcrop of a gneiss rock which appears at an elevation of about 500 feet above the camp. At about the same elevation, there appears a porphyrytic dike that appears between the gneiss and granite, and below it, one of the series of olive dikes, mentioned before, the limestone is almost entirely changed, so much so, that the original rocks are hardly recognizable.

One of the distinctive features of this section is the presence of the greenish dike named andesite porphyry following one another with such uniformity and the very conspicuous change in the texture. Mineralogical and chemical composition of the rocks, as they approach the gneiss and granite.

The southeastern section presents evidence of an organic movement somewhat different from the above section. The trend of the formation is

not the same, nor as consistent, and the variety of the rocks suggest a more recent and repeated dynamic disturbance of the original arrangement of the formation, Trap, felsite, quartz porphyry, granite and diorites occur in numerous places associated with many contact minerals.

OCCURRENCE OF THE ORES: The Mile Wide shaft is sunk near the one of the andesite porphyry dikes which has a general bearing of Northeast and southwest, in common will all the dikes north and south of the shaft. The ore is in the form of a chalcopyrite, oxidized at the surface. It is found in pockets near the contact of the limestone and dike.

At the present time, I am disposed to believe that the ore is associated with the dike and found its present place by a process of selective precipitation in the limestone and environment. Ransome found a trace of copper in a diabase dike at Globe analyzed for copper. Lindgren, referring to andesite rocks called greenstone, presumes the copper found in the veins in the vicinity was derived from the same andesite rocks.

OPERATIONS: All claims have been worked to some extent, some more than others. Considerable work has been at the Copper Mountain, Margarite and on different elevations along the slope of the Amole Mountains. The principal work, however, has been where the present shaft is sunk. At this point, advantage was taken of an old shaft, from which some ore had been taken, and a connection made with the present, new shaft.

The old shaft, which is sunk near the bed of a dry stream, was originally sunk to about 50 feet, more or less. At 30 feet, the contact was intersected and followed downward. The present company commenced drilling at the 39 foot leve, and approximately proceeded as follows: SE about 119 feet, to where some oxidized and sulphide ores were found in a joint bearing N 60 W, which , after bein followed about 12 feet, a winze was sunk thereon, and some ore taken out of a pocket 23 x 8 x 13 this measuremont includes the winze at the point of measurement. The joint bearing N 60 W, appearing near the tope of the winze, has evidently enriched the ground in this locality. For bout 47 feet on the same bearing, the sides of the main joint is particularly well-defined on the hanging wall and showing some movement.

The new shaft was intersected about 22 feet further, being a total distance from the cross-cut of 130 feet. The new shaft was started about 78 feet above the old shaft on the first level ground above the arroyo or stream (See Photo). From the first level (78 feet from the tope of the new shaft) to the second level is 112 feet. From the second level to the bottom of the shaft 23.5 feet. In sinking the shaft between the two levels, ore was found at about the same level, perhaps somewhat lower than found in the winze, and appeared intermittently to within 50 feet of the second level. At this point it disappeared in the foot wall.

At the bottom or second level, two levels were being driven when I was there. One bearing N 45 W 13 feet, NE 15 feet. The other, S 12 W 15 feet. Some fracturing bearing about N 44 E and dipping south was apparent, also an olive color bearing substance was commencing to show in the south shaft bearing about N 5 E.

A cross-cut was beeing started when I left, for the purpose of cutting the ore passed through the shaft, and ere this it should have been intersected.

On the Copper Mountain, a shallow shaft has been sunk, and a drfit a few hundred feet long driven, showing some ore in both shaft and drift. I have not been able to analyze the samples taken from here, but give an analysis given by Mr. Camphus.

ANALYSIS:

Top tunnel workings	22.78% Copper
Orient workings	25.01% Copper
Copper King winze	12.09% Copper

At the Margarite a shaft has been sunk about 100 feet on the contact (see photo), and some ore taken out.

The openings on the side of the Amole Mountain consists of a drift and some open cuts. I would like to see this location further explored. I have not had the samples taken from here assayed.

CONCLUSION:
I consider the Mile Wide presents a very legitimate opportunity for anyone desiring to invest in mining and willing to incur the usual mining risk.

SUMMARY: The Mile Wide formation shows a sequence of olivine dikes called andesite and a much altered limestone having an inclination of about 60 degrees to the southeast, all having a general northwest trend.

The development of the Mile Wide has determined very conclusively that copper in the form of chalcopyrite is found near the contact of the andesite dike and limestone.

There are three locations on the property worthy of being proven, namely the Margarite, the Amole upper workings, and the Copper King. I favor the prosecution of the work at the Mile Wide and consider the locations mentioned in the preceding paragraph as good selections for testing.

The MILE WIDE, as I stated before, is a VERY LEGITIMATE MINING enterprise It present MANY ATTRACTIVE FEATURES from a point of a mining investment, and I am pleased to report FAVORABLY on the property.

Respectfully submitted,

J. A. Ede

UNIVERSITY OF ARIZONA

Tucson
ARIZONA STATE BUREAU OF MINES

October 26, 1916

Mr. Charles P. Heiniger,
c/o Mile Wide Copper Company
Tucson, Arizona

Dear Mr. Reiniger:

Referring to yours of the 25th regarding the telegram from Mr. Giffen, I beg to advise as follows:

No. 1 shaft, ore came in at 45 feet, of unknown depth, averaging about 6% copper. 55 feet, unknown depth, averaging 12% copper; 35 feet, unknown width, averaging 12% copper.

In the winze, ore came in 95 feet below the surface, unknown width, averaging 8% copper; 105 feet, unknown width, averaging 20% copper; 115 feet, 125 feet, 145 feet, 155 feet, the same.

In all of the above, when I speak of unknown width, I mean that the full width has not been determined. It would be impossible to deviate from the straightness of the shaft in order to determine the width of the ore body, and we shall not know that width until we have been able to cross-cut from the north and south laterals.

Very truly yours,

CHARLES F. WILLIS.

CFW.H

THE MILE WIDE COPPER COMPANY

September 1, 1916

to

February 1, 1917.

The progress of the Mile Wide during the past five months is more than gratifying, it was far beyond the most optimistic expectations.

On September 1st shaft no. 2 was in ore but no width had been determined. Ore was encountered at 95 feet on the hanging wall side and within 5 feet had extended entirely across the shaft. It proceeded to fill the shaft to a depth of 155 feet, and then went into the hanging wall again.

This ore was of direct, smelting, self-fluxing type, being chalcopyrite running heavy in lime, with much iron and manganese and little silicia. The whole ore body, as passed through, ran about 12 to 14% copper, but by selection shipments could be made running 21% copper.

It was impossible to follow the ore with the shaft, as a shaft must be straight, so the shaft was sunk to 220 feet in depth, and after leaving 20 feet for a sump to collect the water, a level was run on the 200.

Previous to cross-cutting, it was desired to know something definite about the width of the deposit, the direction of the slips, etc., and in order to do this, the ore body was cross-cut about at the middle of the ore that was struck in the shaft at the 125 foot level. A little work here showed the deposit to be at least 22 feet wide.

This work proved definitely where to go and in a very few days the same ore body was encountered on the south drift of the 200 foot level, and have been cross cut to date to a width of 16 feet. The average value of this ore is probably as good as that encountered in the shaft, but it is not as spectacular in appearance, as it is more intimately mixed and does not contain as much massive chalcopyrite. This is characteristic

and as greater depth is reached, more evenness of value will follow.

It was proven: ore was found in the old shaft and a considerable quantity was extracted, but by this time it was handled twice underground, windlassed to the surface, packed on burro to the road, copper at a dollar a pound was not enough. But the fact was proven to their satisfaction, that the epidotized, chloritized, leached andesite lime contact made ore in depth.

Then, ever conservative and anxious to make every dollar do its work fully, another prospecting shaft was started upon the hill, where ample dumping ground was available, and where it could be reached by a road, and a prospecting outfit of machinery installed consisting of a small hoist and a one drill compressor.

Confident of the ore that they could not see, it was decided that the new shaft be sunk at least twenty feet away from the place where the contact was mathematically figured to be. The ore should not, theoretically, be encountered in any solidity or quantity under 300 feet depth, as it was planned to go that deep and then crosscut to the contact. (A shaft sunk on the contact would not be permanent, unless timbered very heavily and a crosscut would be cheaper than timber.)

But contrary to all geological reasoning, and twenty feet away from where the contact should be, at 95 feet, iron pyrite, running 4% copper was found. The following day, the muck showed 9% copper. The next day 14% copper was exposed and thereafter, to the 155 feet level, copper ore, averaging about 21% copper filled the shaft. Coming in on the hanging wall, and leaving on the hanging, indicated that the ore had bellied from the contact 20 feet away.

Even to the blindest, there was but little doubt that a mine was found. The company felt that a large ore body was encountered and warranted extensive development. Hence, machinery was ordered at once for six times the power and compressor capacity of the prospecting outfit.

Sinking was continued as rapidly as possible, with the limited power and air capacity, and after going to 220 feet, a level was started at the 200. But as the desire of the company was to move surely and make no mistakes, it was decided to determine the exact depth of strike and width of the ore body first. Hence, going back to the 125 foot lever, about the center of the big ore body passed through in the shaft, a crosscut was started, and among the things determined, was that the width of the ore body was at least 22 feet.

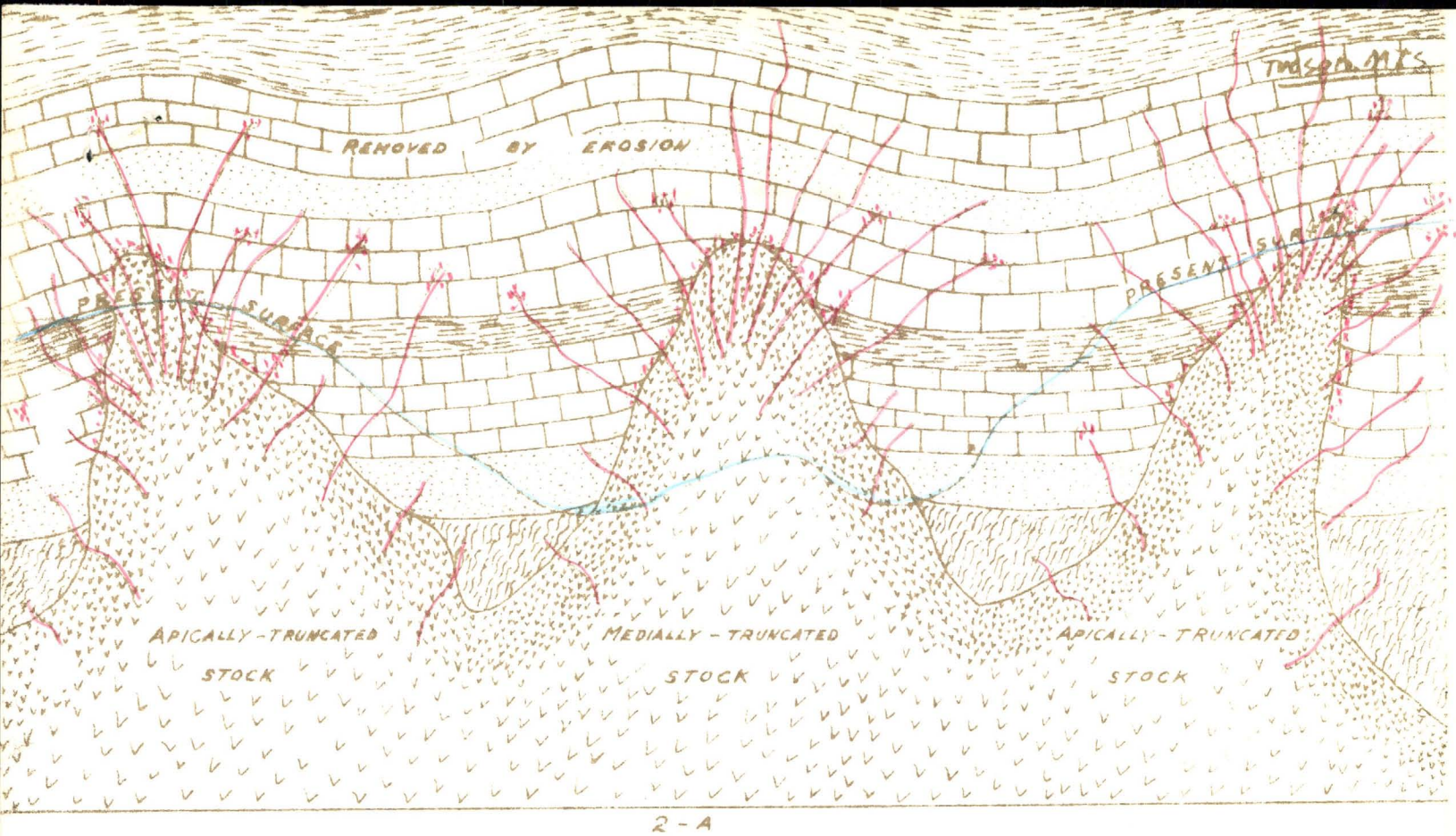
Then turning to the 200 level, mathematical calculations showed that by crosscutting only four feet to the east, the ore body should be hit. True enough, a little less than four feet were necessary to hit the ore body, similar in character and value to that of the shaft. Crosscutting this body, the width was determined at 16 feet. Today, drifting has just started along this ledge to get stoping ground ready for real mining and shipping. With ore in the old shaft, 200 feet sway from the new workings, ore in the new shaft proven from 95 feet to 200 feet in depth at least, with 22 foot width at the 125 foot level and at least 16 feet in width on the 200 foot level, it looks like a real mine, and with 14% to 20% values, it looks like a very, very rich mine.

Needs

Geological Reconnaissance

Report

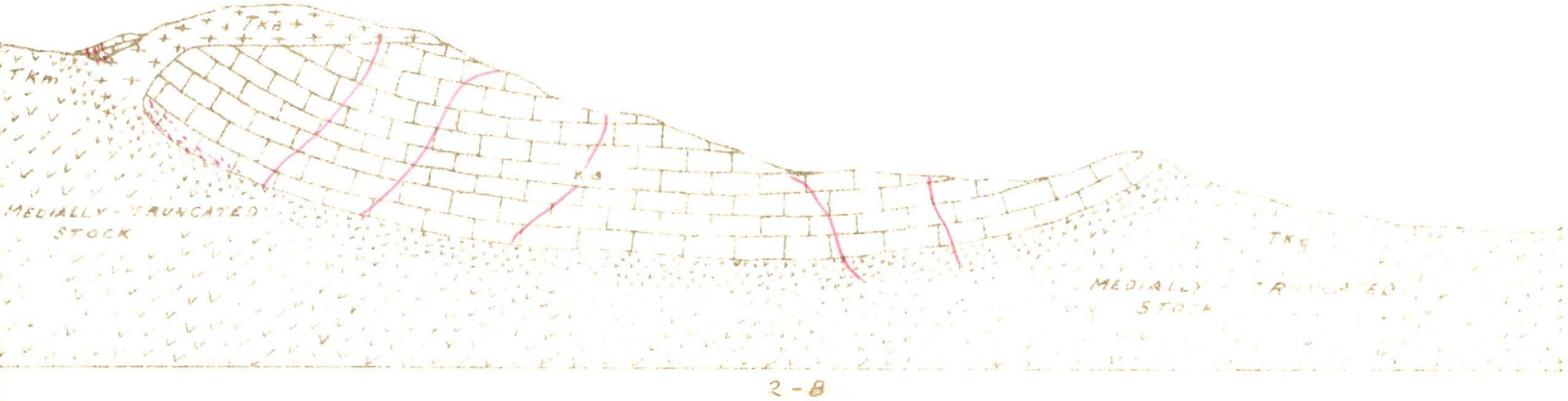
Only 3 made under assumption
only 3 Vinfax Copies could
be made of maps



2-A

RELATIONSHIP OF STOCKS TO ORE DEPOSITS

AFTER B.S BUTLER



2-B

GENERALIZED CROSS-SECTION OF MILE WIDE GOULD MINE AREA

TRD - DACITE

TKm - QUARTZ MONZONITE

TKD - GRANITE

S - LIMESTONE

Tucson Mts

A PORTION OF UNDERGROUND WORKINGS OF THE MILE WIDE MINE

UNIVERSITY OF ARIZONA
Tucson

College of Mines
Arizona Bureau of Mines

Copy
February 12, 1942

METALLURGICAL TEST

Ore no. 612

The sample of this ore was submitted for test by Mr. John Greenwood of Tucson from the Gould Mine of the Copper Bell claims located approximately fifteen miles west of Tucson, with the request that a method treatment be determined. The Arizona Bureau of Mines has no information relative to the tonnage of ore available in this mine, nor of the average grade of ore.

The sample was a heavy pyritic ore, containing copper chiefly as chalcopyrite in a siliceous gangue, the analysis was as follows:

% Copper	% Iron
4.8	25.6

Liberation of the sulphide minerals from each other and from the gangue was practically complete at 100-mesh.

Test No. 612A, grinding to approximately 100-mesh and using six pounds of lime per tons of ore was not successful, due to insufficient pyrite depression.

Test No. 612B, with the same grind and tend pounds of lime per ton of ore was made as presented on following page and gave these results:

SUMMARY:

The results of the tests show that an ore of this character, a copper extraction of 96.4 percent may be expected in a concentrate, containing 28.8 percent of copper. At some sacrifice in extraction, this grade could probably be raised if it were desired. Grind should be to approximately 100-mesh. In addition to 10 lbs. of lime per ton, ~~0.10#~~ the only reagents required are 0.08 lb. of Ethyl Xanthate (z3) and 0.05 lb. of Dupont Frother. Total flotation time was 13 minutes.

The Arizona Bureau of Mines

By: E. H. Crabtree, Jr.
Metallurgist.

Test No. 612B

	Wt. Grams	Dilution Water:Solids	Time-Min.	Reagents Lbs. per ton/ore Lime	Z	Frother
Grind	510	0.75/1	30	10.0	3	
1st Flotation		3/1	3		0.02	0.05
2nd Flotation		3/1	5		0.02	
3rd Flotation		3/1	5		0.04	

pH of tails 8.6
Free CaO in tails 0.1 pound per ton of water
Screen analysis of tails: 612% plus 100 mesh.

PRODUCTS

	Wt Grams.	Tons in 100 Tons feed	%Copper	% of total Copper
Conc. No.1	58.6	11.5	30.8	75.5
Conc. No. 2	15.2	3.0	27.0	17.3
Conc. No.3	6.1	1.2	13.8	3.6
Tails	428.0	84.3	0.21	3.6
Calc. Heads	507.9	100.0	4.69	100.0
Assayed Heads		100.0	4.80	100.0

Compositing the above three concentrates into one concentrated, the products will be as follows:

	Tons in 100 tons of Mill Feed	% Copper	% Total Copper
Assayed Head	100	4.80	100.0
Calculated Heads	100	4.69	100.0
Copper Conc.	15.7	28.8	96.4
Tails	84.3	0.21	2.6

Copper Bell (Gould)

Tucson

September 25, 1942

George A. Bellam

Production Possibilities Survey

This property is situated in the Tucson Mining District about 11 miles northwest of Tucson. It is owned by John Greenwood, Mgr., 40 E. 13th St., Tucson, Martin Waer, Elmer Dow and Abel Weinberg. There is a good road into the property, which is on the edge of the Tucson Park area. Ample water is available for all mining purposes.

Ore occurs as intrusions in limestone, values in copper as chalcocite with some bornite. Although no notable operations have been conducted for about 40 years, some 500,00 lbs. of copper have been produced in the past shipments going to Globe and Sasco smelters, where this siliceous flux was desired.

Development consists of a 350' shaft with tunnel opening on 100' level drifting ans x-cuts on 200' level and 300' levels: winze near shaft in tunnel also opening lower levels: and exposures of two parallel veins which have not been developed. There is water just below the tunnel level of 100.

The owners wish to apply for a preliminary development loan. They have been confronted with a problem in this regard, since the old shaft is badly caved and it might not be practical to rehabilitate it. In 1940 about 100 tons of ore was taken out on the tunnel level next to the shaft. All of the timbering came in and considerable work will be involved in repairing it about the water, while it is reported caved below also. The owners were figuring on a new shaft at the tunnel portal to open the lower levels. However, the winze is in good condition and will enable access to all parts of the workings. I recommended that they merely apply for an unwatering loan, say it will cost $1000 or $1500 to unwater, and upon access and sampling, future development may be decided upon.

The present reserves, estimated at about 100,000 tons, average about 4% copper. Yesterday, I was informed by Campbel, who had sampled the property in the past, that 25,000 tons of at least 4% copper ore can be taken out above the water at present. This, together with estimates of production contained in the Henderson report may be rather optimistic, as were the plans for a mill on the property. However, after spending some time in the workings, I believe substantial tonnage, say of 3-1/2% copper content, to the amount of 25 tons per day of good milling ore could be sent to the Jacobs mill. Although Greenwood states that he faces no particular problems, he will undoubtedly run up against the usual labor and equipment shortages for larger operation. He has three or four men available for the proposed unwatering and repair work now, and can readily get one or two additional men for the smaller operation, in addition to two of his partners, one of whom is a good miner. Greenwood himself has had considerable mining experience. He can readily get together a crew of ten and for the immediate present -- within the next six months. I believe a small operation is justified.

Geo. A. Bellam

University of Arizona
Arizona Bureau of Mines
Ore Testing Service

March 15, 1945

Mr. H. C. Ertal
Route 1, Box 980
Tucson, Arizona

Dear Mr. Ertal: Re: Ore No. 960

The sample or copper ore submitted by you March 6 has been tested by flotation for the recovery of copper. The Arizona Bureau of Mines has no knowledge of the tonnage of material which the sample represents.

The material was crushed to minus one-quarter inch and on-half was then crushed through rolls to minus 10-mesh. From this 10-mesh material head and test samples were cut.

TEST B

The ore was ground in laboratory ball mill for 30 minutes and floated with 6 lb. of lime per ton added to the ball mill, and 0.05 pounds of potassium xanthate and 0.05 frothers B-23 per ton. These reagents were conditioned for three minutes. The concentrate was removed for five minutes and the middlings for seven minutes. Results of this test are given in following talbe.

	Tons per 100 tons Heads	Copper %	Silver ounces per ton	Gold ounces per ton	Distribution of copper %
Head	100.0	2.88	0.13	Tr	
Calculated Head		2.87	0.1324		
Concentrate	9.9	28.02	0.4	Tr	96.7
Middling	1.7	1.86	0.2		1.1
Tailing	88.4	0.07	0.10		2.2

Screen test of tailing:

		Weight, percent
	Plus 100-mesh	0.5
Minus 100	Plus 200-Mesh	9.0
Minus 200-mesh		90.5

Test C

In test C, a sample was ground in laboratory ball mill for 20 minutes with the same reagent as Test B, except one-tenth pound of pine oil per ton of ore was used instead of Frother B-23. The copper concentrate was floated for twelve minutes, and then 0.05 pounds of reagent 208 was added and concentrate taken off, which contained mostly pyrite. The following table gives the results of this test:

	Tons per 100 tons Heads	Copper %	Silver Ounces per ton	Gold ounces per ton	Distribution of copper percent
Head	100.0	2.88	0.13	Trace	
Calculated Head		2.85			
Copper Conc.	12.08	23.03	0.4		97.30
Pyrite Conc.	14.08	.23	0.6		1.10
Tailing	73.7	.06	0.1		1.60

Screen test of tailing:

		Weight, percent
	Plus 100-mesh	3.0
Minus 100	plus 200-mesh	26.5
Minus 200-mesh		68.5

CONCLUSION

The copper in this sample can be recovered by flotation by grinding to 90 percent minus 200-mesh. This grind gave 96.7 percent extration. A coarser grind, 68.5 percent minus 200 gave a concentrate, including the middling, of 97.3 percent but with a lower copper content per ton of concentrate. The grade in Test C could be increased by cleaning the concentrate.

G. H. Reserveare
Metallurgist

Walter W. Wishon
Mining Engineer
Los Angeles, California
7-6-1908

To-
S. H. Gould
President and General Manager
Gould Copper Mining Company

Sir:

I have the honor to hand you the following report on your property with maps and cross sections to define and illustrate it.

LOCATION, AREA, ETC.

The mining estate of the Gould Copper Mining Company lies in almost a solid body, without any intervening claims, in a general rectangular form, in the Tucson Mining District, Pima County, Arizona, distant about eleven miles west of Tucson, the county seat and trading point.

The elevation is approximately 3,400 feet above sea level and ranges from 400 to 1000 feet above surrounding valley.

The area embraced in the property is approximately 210 acres, all fully surveyed, as per topographical map herewith.

GEOLOGY

The geology is of the usual type of Arizona contact copper ore deposits, consisting of interbedded magnesium, limestone, highly metamorphosed, in contact with granite porphyry, on the north side of the property, along with the crest of the mountain uplist. This contact series has been fissured, faulted or intruded, and partially overflowed by the outpourings of the quartz porphyrites, resulting in the "garnetization" of the sedimentary rocks and their mineralization in the form of loades or reefs, which occur in approximately parallel lines along and near the planes of contact. Epidote also occurs with the garnet, in fact, both are common associates of copper in the southwest.

The great mountain uplist of about 1000 feet vertical, has broken the interbedded limestone formation, as shown by the bedding planes of the remaining mass, which, although mineralized to a marked degree as shown by its decomposed epidote reefs, yet it shows none of the huge garnet outcrops, lode-like in character, which appear in great lenticular masses here and there along their strike, as in that of the great mountain uplift.

It is in this area of greatest activity that three large mineralized reefs, or veins, traverse the property for its entire length of about 4800 feet, as shown on map herewith. On the west end of the property, these reefs approach each other where, on the Sierra Arriba claim, the epidote garnet mass becomes extremely large in consequence, and the copper mineralization of greater value than usually found elsewhere, noted on the surface, although all the reefs are copper bearing and have the semblance of regular lodes.

MINERALOGY

The copper ore is found in the form of sulphide, usually chalcopyrite, disseminated in the midst of the garnet, in grains, stringers and often in nodular masses, associated with much iron sulphide, lime spar and some quartz. In some instances, the chalcopyrite has yielded to the secondary mineral, bornite, which is found scattered here and there throughout the great mass, thereby bringing the copper percentage up to a mark that allows of great widths in these huge lodes to be mined and smelted at a profit. This is also due to the ratio of predominating gangue materials being so largely basic in nature, as to admit of fluxing silicious ores, in which the veins of the surrounding country abound.

DEVELOPMENT

The veins have an east-west strike and dip northerly into the mountain at an angle of about 60 degrees from the horizontal.

The chief development consists of a working shaft with manway, 360 feet in depth, on Copper Mine Claim No. 5, with cross-cuts and drifts on the 100 foot level, and the 300 foot level, as per map showing horizontal and vertical projections herewith. There is also a winze from the 100 foot level to the 300 foot level, and a cross-cut, shown on map, south from shaft on the 200 foot level, which showed much iron pyrite assaying about 1-1/2 percent copper, but it produced so much water that a pump was be requied, hence it was bulkheaded to stop the flow.

About 600 feet east of the main shaft and 60 feet lower, on Copper Mine No. 1 claim, there is a 50 foot shaft on the same vein of the main working shaft. This shaft is all in ore. About 700 feet northerly from this 50 foot shaft, and on the second parallel vein on Copper Mine Claim, in a cross-cut tunnel 70 feet in length which, although but an apex cross-cut, is all in ore. The croppings here, and immediately to the east, are huge. From this 60 foot cross-cut, and from the 50 foot shaft already mentioned, 30 tons of ore were selected and shi ped to the El Paso Smelter, which sampled 8.6% copper, 5.0 silver and $1.50 gold per ton. About 90 feet vertically below the 70 foot cross-cut tunnel, above mentioned, a tunnel of like length is now being driven to cross-cut the ledge, but it has not yet entered the ledge.

On the Invincible Claim is a 10 foot shaft, sunk on the western extremity of a very large garnet outcrop, which shows very fine pyrite, much resembling marcasite, especially throughout the gangue at and near the bottom of the shaft, and assaying about 1-1/2% copper.

On the Sierra Arriba Claim is a 10 foot shaft and a 20 foot tunnel; on the Greenwich Claim is a 20 foot shaft. The Sierra Arriva claim and the Invincible Claim have the most wonderful cropping of the entire property, both as to size and quality, although other large lenses also appear at intervals along each of the veins, but the mineralization appears better in the veins nearest the granite porphyry contact and also as they approach each other in the western extremity of the property.

It is there by judgement that the main 360 foot working shaft before mentioned, has been sunk upon the leanest vein thereof, being yet, at a

depth of 50 foot ore was encountered, which had evidently leached and re-concentrated, as it assayed 17% copper. At a depth of 113 feet and known as the 100 foot level, the shaft sunk vertically, encountered the foot wall and a cross-cut at the horizon, proved a width of 30 feet of ore. A drift, westerly upon it, shows ore of good commercial value, its entire length of 75 feet. The face, at that point, is 20 feet wide with neither wall showing. East from the shaft the orebody gives way to massive iron pyrite in a very soft gangue, and a little further east, the vein is faulted, which has been cross-cut and evidently a new body is found just coming into the present face. This ore is believed to be the same as that encountered in bottom of the 50 foot shaft to the east.

The cross-cut on the 200 foot level shows the ore body to be about 50 feet in width, which has been drifted upon westerly about 60 feet. The copper value appears to be less on this particular portion of the 200 foot level, than that on the 100 foot level, but in the east drift an upraise, as well as the winze, for 50 feet in depth, shows quite high grade ore. As shown on the map herewith, the winze is sunk on the ore to the 250 foot level, at which point the ore deips out of the winze, as it there changes vertically to the 300 foot level in order to use it for a chute. Two drifts have been started westerly from the winze, about the 250 foot level, both showing high grade ore, which tends to prove that the large mass of low grade ore encountered to the west on the sill floor of the 200 foot level, is due entirely to a "horse" or a much harder vein material which was more difficult for the ore bearing solution to penetrate. While the value of the "horse" or vase mass of harder vein material on the 200 foot level, will probably not average more than 2% copper, yet the ore disclosed in the upraise and the winze, will average fully 5% copper.

It is quite a difficult matter to obtain a fair sample of the ore bodies without actual mining, hence, I have taken as an average, the entire ore bodies so far opened, the average assays as found by the Old Dominion Smelter at Globe, Arizona, in sampling the 100 tons of ore shipped just as mined to them, and with instructions from the smelter prople to keep the ore as low as possible on copper, but on the other hand, as high in basic elements and sulphur as possible, as they desired it for flux and matte fall chiefly.

This average analysis is: Copper 3.2%; Silica 26.0%; iron 25.1%; Aluminum 1.26%; Lime (Ca) 13.2%; Sulphur 19.0%; The gold and silver values being below their scale of $1.00 gold and 2.0 silver, no record of these values was given. However, from numerous assays taken while the ore was being shipped, it is safe to say that ore of this copper grade will average about $.60 gold and 1.5 ounces silver perton.

Owing to the great demand for ore of this character, that company now offers, for this ore, $0.08 per unit for the iron, lime and sulphur percentages, or 57.3 unites. Total at 8 cents ---------- $4.58

Copper on electrolytic assay less 2-1/2 cents from New York. Electrolytic quotations $2.00 per unit - -	6.40	10.98
From which deduct 10 cents per until for silicia percentage above 20%, 6 units - - - - - - - - - - - - - - -	.60	
Smelting charge, No. 1 Railway charge for freight - - - -	2.00	2.60
From which deduct: wagon haul of $3.00 and cost of mining which in ore bodies of this magnitude will be from $1.00 to $2.00 per ton total - - -		5.00
		$3.38

It is therefore apparent that the erection of a smelting plant upon the property is imperative, and therefore, a smelter site has been provided by the Company at the foot of the mountain, about 3/4ths of a mile distant from the main working shaft, which is admirably adapted for that purpose.

The ore is best adapted for treatment in the blast furnace type of not less than 500 tons units. In the first smelting, the average ore of, say 3.0% copper value, will produce about 17.0% matte, the second smelting about 50% matte, and by using the semi-pyritic process as now used at the Washoe Smelting Plant of the Anaconda Company of Montana, ore of this character can be treated with less than 3% coke on the charge. By providing from 96% to 98% copper, which may be case direct in cathode form, for shipment to the refinery.

As before stated, the fluxing quality of this ore is such that the silicious ores of the surrounding district can be treated therewith. These are now paying a smelting charge at El Paso from $10.00 to $12.00 per ton. By fluxing these ores to their limit, and charging El Paso rates, the ores of the Gould Copper Mining Co., can be both mined and smelted without cost as to its own ores, and in addition, save to the seller of silicious ores the minimum freight haul of $2.00 per ton to the El Paso Plant. The entire surrounding country is known to be rich in silicious ores and the erection of this plant would greatly stimulate their present output.

Looking westerly from the Gould Copper Company's property, one can see the new Sasco Smelter with its two units of 350 tons each and its adjacent mining property, the Silver Bell, which now has a depth of 1200 feet.

During the development of, and while building a reduction plant on the Gould property, the Sasco Smelter could be utilized to great advantage, by building a spur track of about 12 miles from the west end of the property to the main line of the Southern Pacific Railway, which would give all rail connections with the smelter, with a freight charge of probably 50 cents perton. As stated before, this west end of the Gould property not only has a wonderful surface showing of copper, but it can be tunneled to great advantage and the entire system of veins economically worked therefrom.

The geological condition of the Gould and Silver Bell properties are similar in many respects, except that of the Silver Bell is more crushed and broke, yet their orebodies, like that of the Gould property, carried low copper percentages in their upper horizons, but this value had gradually enhanced as depth was attained.

As mined and smelted in the large way, it is quite probable that ore of this character, especially when used for fluxing, can be found profitable with values as low as 1-1/2% copper, and it is believed by the writer, that much of the large mass of croppings, especially on the westward extremities of the veins of the Gould property, will be found to show that percentage and that immediately below such croppings a good commercial grade ore will be found. In fact, in the three visits that I have made to the property, I have found considerable very high grade ore, as a float from an ore body evidently covered, lying above the highest veins and just north of the huge outcrop, as shown on the map on the Invincible and Esperanzo claims, and probably at or near the granite-porphyry contact.

ECONOMIC CONSIDERATIONS

The conditions attendant upon operation are in every way favorable for

cheap mining and reduction. The topography is such that the ore can be delivered by tramway at the smelter side at the foot of the mountain, later to be succeeded by tunnels. The mine furnishes an abundance of water for the proposed smelter, in fact, will yield considerable water and thereafter can be utilized to irrigate the fertile valley adjacent.

An electric power plant can be erected on the Railway and operated very cheaply, using fuel oil and the power generated, conveyed to both smelter and mine. There is a good wagon road from the railroad at Tucson to the mine, now 17 miles, which can be shortened, over which machinery can be hauled at nominal cost. The smelter site is a gentle sloping tract, admirably suited for the purpose, being interesected by a deep gulch which furnishes excellent dumping ground for slag for years to come.

The general plan of development and operations admits of a very cheap cost of handling the ore from the mine to the finished product, the estimated available commercial ore aggregates a total of about 100,000 tons, and a supply of 1000 tons or more per day, is well within the range of early attainment. A tunnel driven at about 400 feet level, and a second at about 700 foot level and the third at about 1000 foot level. Thus it may be seen what extensive development may be persecuted without requiring any ore whatever to be hoisted.

Any self-fluxing ore enables economies which greatly cheapen the cost of treatment, but when these qualities are such that they are also enabled to treat a large proportion of silicious ores with a high treatment charge for same, the flushing qualities assume an approximate value in these ores equal to the total copper, silver and gold content, hence, the blister copper for this property and proposed smelting plant should be marketed as low as that of any plan in Arizona, in fact, it may be stated that the problem before the Gould Copper Mining Company is not of ore development entirely, but largely one of operating, being confined to a study of necessary equipment and best method of handling.

Owing to the extensive nature of the ore bodies, and the large tonnage which can be produced, I am of the unqualified opinion, that the property of the Gould Copper Mining Company should rank well with the large producers when once under full operation.

Respectfully, submitted,

/s/ W. W. Wishon

Los Angeles, California
July 6, 1908

Incorporate for 1,000,000 shares, par value $1.00

500,000 in Treasury
100,000 @ $.50 per hundred -- $50,000.00
400,000 Sanders D. Grey -- @ $.25.
Can take in 3rd party if necessary -- $100,000.00

Cost of Mine - - $10,000.00
Cash in 60 days- 1,000.00
Building cabins - -1,000.00
Fixing road - - - -1,000.00

$30,000.00 already spent on mine development

17 miles from Tucson
5,000 tons and over shipped to smelter at Globe
D. E. Said

To incorporate $200.00 cash
Stock books 50.00

C O P Y

Mr. Douglas Grey:

The Gould Mine has an ore body opened up that has been estimated to contain 150,000 tons of ore carrying 3% copper. In the bottom workings sulphide ore was opened up which assayed 14% copper and some ten tons of this ore was laying in the 150 foot level in the year 1921.

There is no questions but that good, large tonnage of ore carrying up to 10% copper can be developed on the Gould Property.

The mining and smelting of the Gould ore can be done at a cost of about $4.00 per ton.

Yours truly,

Tucson, Arizona
March 6, 1922

Mr. Douglas Gray
Tombstone, Arizona

Dear Sir:

We are the owners of all of the issued stock of the Amole Mines Company, except qualifying shares issued to the directors. You desire an option upon one-third of such stock, which in consideration of the sum of one dollar to us in hand paid, and other valuable considerations, we hereby give and grant upon the following terms: Within nine months you are to pay to us the sum of $964.00, whereupon we will cause said stock to be transferred to you, provided that in addition to said sum of $964.00 you repay to us one-third of any and all moneys which we may, from and after this date, and prior to the exercise of this option, have expended in and about and because of said property. This option is personal to you and may be exercised by no one else, and in the event of your death, it shall at once cease and determine.

Dated this 6th day of March, 1922.

/s/ M. C. Wakefield
/s/ Chas. F. Solimon

APPROXIMATE COST OF SMELTING PLANT 150 L%) TONS DAILY CAPACITY

Excavation of site	$1000.00
Smelter building and ore bins lumber	4000.00
labor	2500.00
Oil Engine	3000.00
Furance	5000.00
Blower	2250.00
Blake Crusher	750.00
Pumps, pipeline and tanks	1500.00
Forehearths, slag pots, etc.	1200.00
Smoke stack and flue	2000.00
3 sets Weighing machines	1500.00
Tools for operating	350.00
Pipes, fittings, valves etc.	500.00
Sand, lime, cement & bricks	400.00
Assay office and office buildings	1000.00
Construction labor erection of plant and other incidentals such as salaries	5000.00
	31,950.00

Tombstone, Arizona
July 2nd, 1922.

Mr. William Kemp
Tucson, Arizona

My Dear Kemp: -

How are you getting along with the Gould mines? You promised to send me copy of the option you had on the property, I wanted very much to see it.
I would like to talk with you about this matter and perhaps we could make some kind of a deal that would be pleasing to you.
With kind regards, I am,

Yours very truly,

TUCSON WAREHOUSE & TRANSFER CO., INC.
26-28-30 N. Scott St., Tucson, Arizona July 2, 1922

Mr. Douglas Grey,
Tombstone, Arizona

Dear Mr. Grey:

I regret that I have been so dilatory in sending you the copy of option on the Gould Mines. It is not that the matter was forgotten, but each time I have gone to my bank box, I have neglected to get the document so that I might have our stenographer make a copy.

She is at present away on her vacation and I would like to wait until her return. However, I have been so careless in this matter that is you wish, I can make this copy myself, if you will let me hear from you again.

I think the date of the last option given is December 21, 1921.

With kind personal regards, I remain,

Yours truly,

/a/ Mary cameron Wakefield

C O P Y

Tombstone
Arizona
July 3rd,
1922

Mr. M. C. Wakefield
Tucson, Arizona

Dear Mrs. Wakefield: -

I have your nice letter of the 2nd, and your excuses for not sending me the copy of option on the Gould Mines is all right, when your Stenographer returns I shall be pleased to receive same.

From all acounts it has and is very hot just now in Tucson and Phoenix must be dreadful.

Personally, I want to ask you if you can not take over my interest in the Gould Mines for a very small amount. I would then be satisfied and at this time it would help us out very much. We are having pretty hard times no days and my Wife is keeping a few boarders to help out for the time being, other wise I would certainly hold on to my interest as I have great faith in the property.

I have seen Mr. Kemp since you were here and his opinion of the property is certainly good.

If you could give Mrs. Gray for Me FIVE Hundred dollars I would turn over my entire interest to you and draw out entirely. I am saying this to you personally, and I know Mr. Solimon would be pleased to have us make a little deal of this kind. One way and another I have put up quite a good deal on the Gould mines and have made many trips at my own expense. Kindly let me hear from you by return mail.

Very sincerely,

A GEOLOGIC RECONNAISSANCE REPORT ON

THE "MILE WIDE", "GOULD" MINE AREA OF THE TUCSON MOUNTAINS, AMOLE DISTRICT, PIMA COUNTY, ARIZONA

30 April and 1 May 1952

The Tucson Mountains are located two miles west of Tucson, Arizona. They extend for about twelve miles in a northwest direction. The Mile Wide - Gould Mine Area is located on the west slope of the Tucson Mountains, about ten miles northwest of Tucson.

The object of this reconnaissance was to determine if the mineral possibilities of this area warrant further geophysical investigation.

The important mines in the area are the Mile Wide and the Gould. At present, both mines are flooded. The only underground portion of the mines visited was the first and second levels of the Mile Wide Mine. The first level showed very little important mineralization, and the only information obtained was the strike and dip of the vein. Several large stopes were visited between the first and second levels. The mineral mined from these stopes was mostly chalcopyrite. The largest stope visited measures 100' x 30' x 20'. (See Plate 1) On the dump of the Mile Wide Mine, there were good showings of chalcopyrite mineralization.

The present owner of the Mile Wide and Gould Mines claims that there are considerable ore reserves in the flooded portion of the mines.

However, it seems that during the last World War and at present, with the high prices being paid for base metals, the owner would have taken advantage of such high metal prices and exploited his ore reserves.

It is the opinion of the writer that if such ore reserve actually existed, they would have been mined during periods of great demand for base metals.

Although no information was available on the underground workings of the Mile Wide or Gould Mines, the dumps would indicate that both mines contain several thousand feet of workings.

The mineral deposits in the Mile Wide-Gould Mine Area appear to be of the contact type. This is evidenced by the association of such contact metamorphic minerals as: garnet, magnetite and epidote. At the time of mineralization, the igneous stock now exposed was in the upper or fracture zone. This is shown by the fault and fissure filling type of deposits.

Plate 2-A (after B. S. Butler) shows the relationship between mineralization and depth of stock as compared to the present erosion surface. Plate 2-B shows a generalized cross-section of the Mile Wide-Gould Mine Area. It can be seen from this cross-section that the stock exposed in this area is medially truncated. This reduces the possibility of good extensive mineralization. However, the presence of adequate precipitants, such as H_2S gas and pyrrhotite at the time of mineralization could cause the premature precipitation of abundant sulfides in this high temperature zone.

It was noted, that where most mineralized fissure veins cropped out on the surface, gossans were formed. These gossans contain not only quartz and limonite, but also large amounts of magnetite. This condition was caused by the sulfides being leached out and carried away by meteoric waters. The magnetite and quartz being more stable were left in place. The presence of magnetitie in most outcrops is

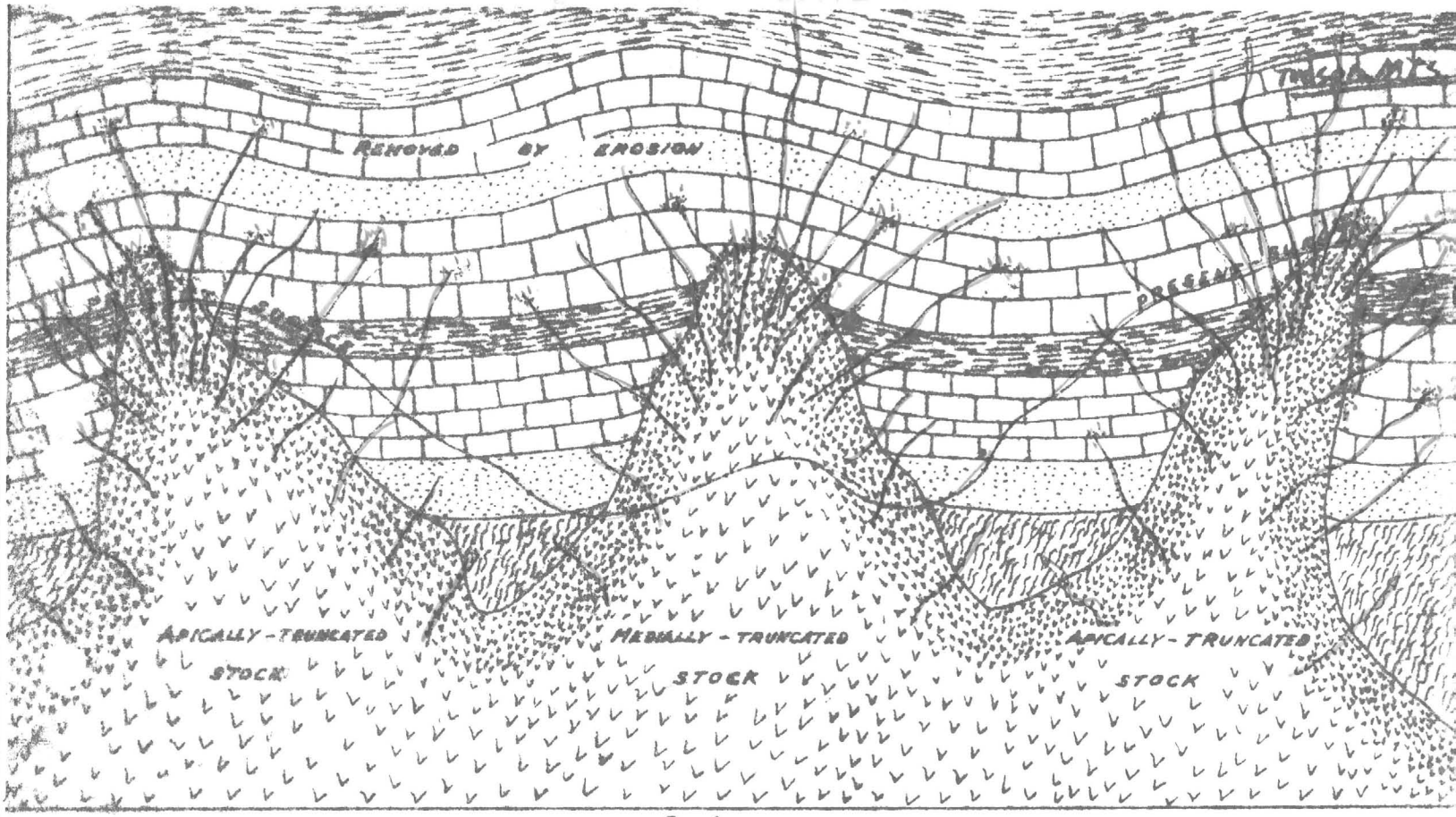
detrimental to the use of the magnetometer. Such surface features will cause erroneous magnetic values.

There are three fault systems in the area. A major system trends east-west, a secondary system trends north-west and a minor system trends north-east. (See Map). Mineralization is definitely associated with some of the east-west and north-east trending faults. In the Mile Wide Mine, the mineralization appears to be associated with both northeast and northwest trending faults. Mineralization is much stronger where these two fault systems intersect.

Outcrops of magnetite were observed along the limestone quartz monzonite contact. About 1/4 mile north of the Mile Wide Mine these contact deposits may have slight possibilities for sulfide mineralization. However, it is the writers opinion that the best sulfide mineralization will be found along major fault systems, and particularly at fault intersections near granite or quartz monzonite intrusions. Many small fault and fissure veins observed by the writer were found to wedge out at shallow depth, so it is advisable to concentrate on major fault systems.

Respectfully submitted,

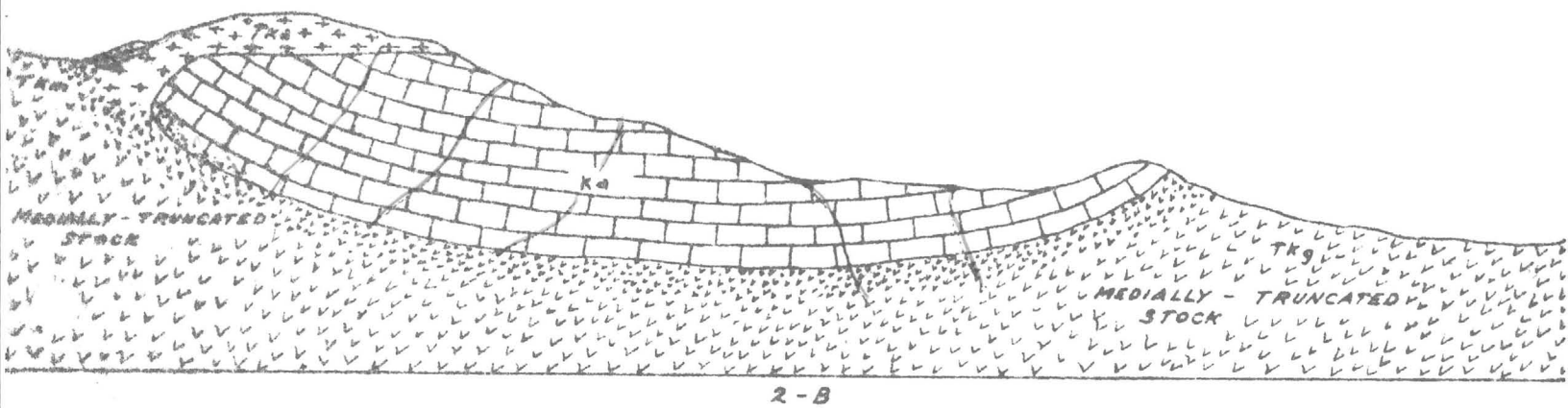
Wayne Wallace



2-A

RELATIONSHIP OF STOCKS TO ORE DEPOSITS

AFTER B.S. BUTLER



2-B

GENERALIZED CROSS-SECTION OF MILE WIDE, GOULD MINE AREA

TKd - DACITE

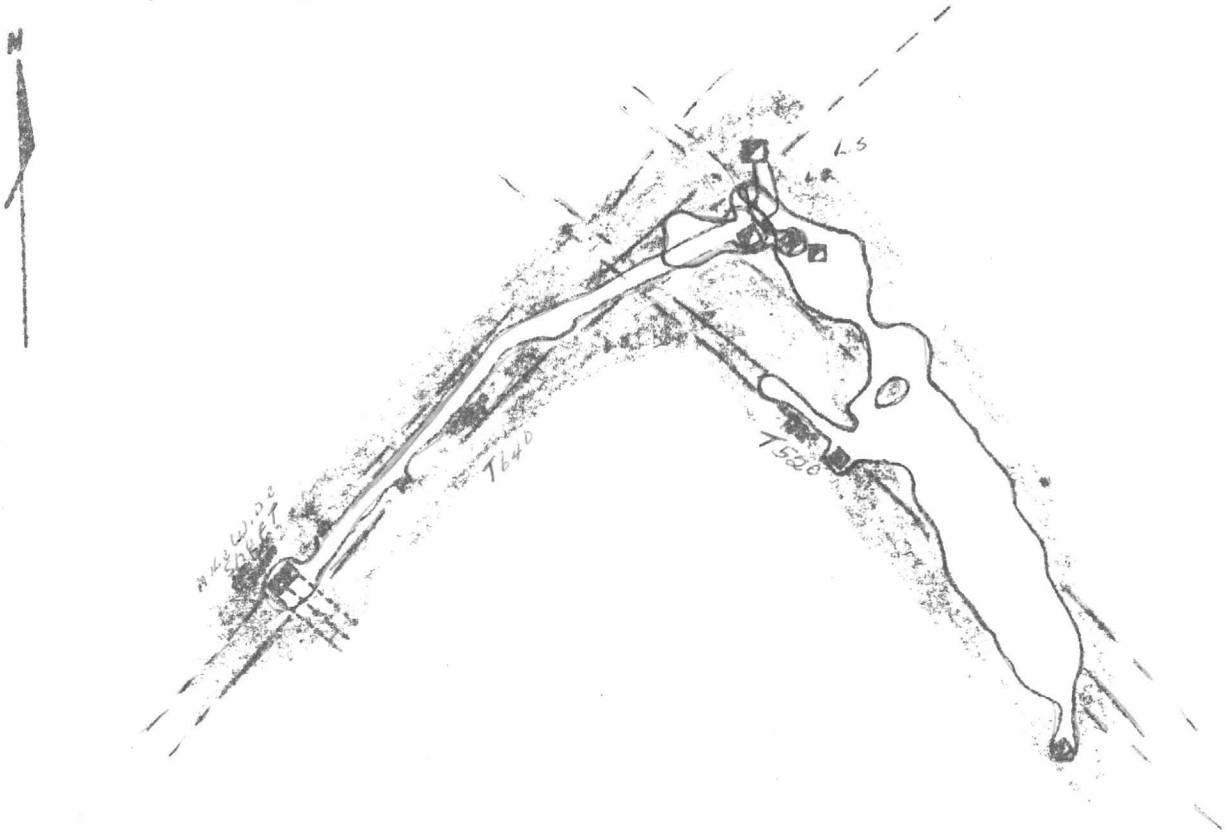
TKm - QUARTZ MONZONITE

TKg - GRANITE

Ka - LIMESTONE

Tucson Mts

A PORTION OF UNDERGROUND WORKINGS OF THE MILE WIDE MINE



FAULTS
1st LEVEL
1/2 LEVEL
1/3 LEVEL

BY BRUNTON SURVEY
SCALE 1" = 50'

TO WHOM IT MAY CONCERN:

THIS IS TO CERTIFY, That I have examined the titles to the following groups Mining claims, all situated in the Amole Mining District, Pima County, Arizona, as follows, to-wit:

(1) The COPPER KING Group. so-called, consisting of the following claims: Columbia, Cop er King, San Fernando, San Miguel, Copper Crown, Margarita, Copper Top, Cimmaron, Alta, San Francisco, St. Louis. St. Paul, Buena Vista, Washington, Copper Queen, Copper Bell Mining Claims, and Copper King and Copper Crown Millsites.

(2) The ORIENT Group, consisting of the following claims: Orient Nos. 1 to 14, inclusive, Mining Claims.

(3) The ESPERANZA group, consisting of the following claims; Esperanza Nos. 1 to 12 inclusive, Mining Claims.

(4) The COPPER MOUNTAIN Group, consisting of the following claims: Copper Mountain Nos. 1 to 6, inclusive, Mining claims.

(5) The ORO FINA Placer Group, consisting of the following claims: Oro Fina Nos. 1 and 2 Placer Mining Claims.

The title of the Copper King Group is vested in Elena de Pellon, Louis Pellon, Pedro M. Pellon, Concha McCrillas, Anita Pellon, Charles Pellon, Teresa Pellon, the latter two being minors and represented by Elena Pellon, guardian, and Isabel Waer and L. Martin Waer. Conveyances have been executed by all of said persons to Mile Wide Copper Company and placed in escrow in the Consolidated National Bank of Tucson, the guardian being authorized by Superior Court.

The title of the Orient group is vested in M. Waer. Conveyance has been executed b him to C. P. Reiniger and J. H. King, and placed in escrow in said bank. Also conveyance from C. P. Reiniger and J. H. King to Mile Wide Copper Company attached to the foregoing escrow.

The title of the Esperanza Group is in J. U. Mettler, Conveyance has been executed by him to Charles P. Reiniger and J. H. King and placed in the Consolidated National Bank of Tucson. Also attached to said escrow is conveyance executed by said Reiniger and King to Mile Wide Copper Company.

The title of the Copper Mountain Group is in Martin Waer, Jr. and John Latz. Conveyance has been executed by them to C. P. Reiniger and J. H. King, and placed in escrow in the Consolidated National Bank. Attached to said escrow is conveyance from Reiniger and King to Mile Wide Copper Company.

Title to the Oro Fina Claims is in L. Martin Waer, Isabel Waer, Henry Waer, Herman Waer, M. Waer, L. Waer, J. Ide, and Caroline Ide. Deed has been executed by all of them to Mile Wide Copper Company and placed in escrow in the Consolidated National Bank, with conveyance of Copper King Group, and deed will be delivered at the same time the deed to said Copper King Group is delivered.

S. L. Kingan

Tucson, Arizona
November 17, 1916

S T A T E M E N T
O F
THE COPPER KING GROUP OF COPPER, SILVER AND GOLD MINES

Located and situated in the Amole Mining District, on the West slope of the Tucson Mountains facing the Silver Bell Mines and Mining District, in Pima County, Arizona, about 12 miles in a westerly direction from Tucson. The group consists of 16 mining claims, 600 feet in width and 1500 feet in length, together with a five acre mill site and water right belong to said group of mining claims, which is called the Copper King and Copper Crown Mill Site.

The names of said claims are as follows:

Columbia	St. Paul
San Luis	San Francisco
Copper Top	Alta
Cimarron	Margarita
Copper Crown	Copper King
Copper Queen	Copper Bell
San Fernado	Washington
Buena Vista	San Miguel

Copper King and Copper Crown
Mill Site and Water Right

The general course of the veins is from the easterly to the westerly being about 20 degrees north of east and 20 degrees south of west.

The formation in which these veins or deposits occur is limestone, porphyry and quartzite, heavily charged and capped with iron, the width of veins on surface being from 15 to 250 feet. The nature of the ore is an iron sulphide, carrying copper, silver and gold. The ore from the different parts of the workings gave a return at the smelter of 18 3/10 percent in copper, $1.70 in gold and 4-1/2 ounces in silver. The next lot shipped from the Copper King shaft or works, which was taken as it came from a large body of ore to the amount of 16 tons gave 11-7/10 percent in copper, $1.30 in gold and 4-1/2 ounces silver. The former shipment was 22 tons partly assorted ore.

The general samplings of those different claims,and workings averages 7 percent copper, $1.80 in gold and 5-1/2 ounces in silver. I consider this latter a general average of the different and larger workings. The general ore, which is in large quantities, is a free smelting ore and carries a large percent of iron, sulphur and lime, and makes a self-fluxing ore for smelting purposes. From this mine there has been some 360 tons of ore shipped that averaged 9% copper, $1.50 gold and $3.50 in silver per ton.

THE COPPER KING: Has one shaft 78 feet deep about in the center of the vein and a cross-cut towards the south 75 feet and a drift along the vein towards the hanging wall, or supposed hanging wall, 310 feet in length and winze sunk on the supposed hanging wall, but discovered to be in about the center of the ore body, at the end of the cross-cut 25 feet deep with a high grade of yellow and chalcocite and

ruby copper and black sulphides, assay values going as high as 37 percent copper. Another winze sunk down to 30 feet deep in solid sulphides and averaging 14-1/2 percent copper, $1.00 gold and 4-1/2 ounces silver.

It is demonstrated that as depth is obtained the ore increases in quantity and values. The width cannot be ascertained at the bottom, as it has not been cross-cut the full width of same. At this place on the surface, the vein measures 200 feet in width by tape line. At present a new shaft has been sunk to connect with the old underground workings, but is not now deep enough to reach the high grade ore. The present development shows it is leading to enormous, big ore bodies, rich in copper, gold and silver.

There is now being installed compressor for air or machine drills and a large hoist with automatic dumper.

THE MARGARITA: Shaft 100 feet in depth and a cross-cut 26 feet towards the south at a depth of 55 feet and a drift towards the east 135 feet. In the drift, a winze is sunk 28 feet deep and drift 30 feet, supposed to be the footwall on the vein, and all in ore, then a cross-cut towards the south 20 feet towards the hanging wall, which is lime spar and iron, as the lime overlies the ore bodies. At this place, the width of the ore body is 22 feet, as far as cross-cut, and towards the north, extent or width not known. The samples taken from these workings assayed 8.2 percent copper, $2.30 gold and 5-1/2 ounces silver. Have taken samples from this claim of native copper that went as high as 78 percent. This ore is very heavy material of a sulphide or oxidized iron, and a very fine smelting ore. There are a number of other smaller workings from 10 to 20 feet in depth and all have a showing of good ore. Width of surface croppings capped with iron and carbonate of copper is 150 feet in width. And from these workings a large quantity of ore has been shipped to smelter. At present, development work is being done. Machinery about to be put on.

THE SAN FRANCISCO AND BUENA VISTA: Both on the same strike as the Copper King and the Margarita. Workings on these claims range from 10 to 20 feet, to show extent of ore bodies.

THE ST. PAUL: Is a parallel vein or lode of the Copper King towards the north on which there is not very much work done, carrying yellow sulphide of copper with gold and silver, capped with iron for more than 150 feet in width, and heavily charged with epidote of lime and the surface croppings show over 300 feet in width and has a dip towards the Copper King ore body.

THE CIMARRON: Being on the same vein or lode as the Columbia, Copper Bell and Copper Top, has one shaft 22 feet deep and a number of other workings on vein, all in good ore, and gives assay values 14-3/10 percent copper, $7.00 in gold, 4 ounces silver. This ore has been tested for the purpose of obtaining a shipping ore. The actual width of veing cannot be ascertained, as no cross-cut has been made. Workings show in some places gold which goes as high as $25.00 per ton.

THE COLUMBIA: Veins running same as the Cimarron. Has one shaft 12 feet deep and several open cuts, ranging from 12 to 25 feet deep; one tunnell 100 feet, run for the purpose of cross-cutting the vein or ore body. The surface is capped heavily with hematite and oxidized iron. There is, in these workings, a green malachite, black ozide and yellow pyrites of copper. The ore from these workings gave assay value of 23 percent copper, $4.00 gold, and 6-1/2 ounches silver. The width of vein has not yet been ascertained, as no cross-cut has been made. Vein capped on surface with hematite and oxidized iron and carbonate of copper. The width of the surface capping extending over 50 feet. This vein or ore body lies about 1000 feet north of the Copper King and having a dip towards the Copper King vein.

THE COPPER CROWN: Being on same vein as the San luis, Copper Queen and San Miguel. It has one tunnel 63 feet in length and one cross-cut of 12 feet on end of this tunnel, and another tunnel of 170 feet run for the purpose of cross-cutting the vein or ore body from the lower base. There are several shafts from 10 to 25 feet deep, all in good ore. The ore cut by the tunnell to the width of 3 feet averages 18 percent copper, $2.80 gold, and 8-1/2 ounces silver. The width of vein cannot be estimated as it has not been fully cross-cut. It has been fully demonstrated that, as depth is obtained, the ore increases in value and quantity. Surface croppings show width of vein from 60 to 100 feet.

The balance of the claims; the workings range from 10 to 30 feet deep in shafts, open cuts and small tunnels to discover the ore.

The course of these lodes or veins is from the easterly to the westerly, with a variation of 20 degrees north of east and 20 degrees south of west. The Copper King has a dip towards the south on an angle of about 80 degrees. The St. Paul and Columbia running parallel on the north and dip towards the Copper King at an angle of about 40 degrees and, in my opinion, it is only a question of time and depth when they will join together and form one large ore body. All the rest of the veins or ore bodies lying north of the Copper King vein are dipping towards it, there being five veins or ore bodies.

WATER: Can be had as shown by map, at Mill site or Water Right as there is living water all year round for domestic purposes and will supply several thousand people and animals. By sinking a well fifty or sixty feet and cross-cutting the canyon, water can be had or obtained for any sized plant or machine.

WAGON ROAD: A good suitable wagon or automobile truck road leading to the mines at present, 16 miles and to the nearest R. R. station on the Southern Pacific, only 8 miles.

Facilities for working are excellent.

This mineral zone extends from the westerly toward the easterly, eight miles in length and three miles in width and this group of mines is right in the heart of this great mineral zone.

I see no reason why the Copper King Group and other groups in this locality, by proper development, will not make large producers, they being in the center of this great mineral belt, and in my opinion, will in time rival the Copper King of Bisbee and the United Verde of Jerome, as I visited both of them when they were mere prospects, and other properties which are now large producers, as I have seen them all for the past 35 years and when they were nothing but prospects. This property has all the earmarks of making a producer that will figure up in the millions as well as the Copper Queen of Bisbee and the United Verde of Jerome.

The following group of mining claims, consisting of 12 full claims and known as the

ESPERANZA GROUP: Lies on the south and parallel to the Copper King Group of Mines and adjoins the Copper Mountain Group of mines on the west, and have a good showing of copper, gold and silver ore.

THE ORIENT GROUP: Adjoins the Copper King Group on the east and, as shown on map, which has one shaft 118 feet deep, one tunnel of 90 feet, and other workings ranging from 10 to 20 feet deep and most of them showing a good grade of copper, gold and silver ore, with cappings of iron on the surface of the same nature as the Copper King Group, some assaying 86 ounces silver, gold $3.50 and 18.7 percent copper. This group has four parallel veins ranging from 15 to 100 feet in width, same nature and same zone as the Copper King. These mines will become very valuable by proper development and make large producers and the ores are excellent for smelting, being only about 7 miles from S. P. Railroad and the Santa Cruz river. Good wagon or automobile truck road leading right into the ground.

COPPER MOUNTAIN GROUP: Consists of six claims, being the extension of Espanza Group, as shown on map, and runs parallel on the south side of the Orient and in consolidation therewith. The workings consist of one tunnel 320 feet in length and one winze in said tunnel 52 feet deep and a drift 30 feet in said tunnel and a number of other workings ranging from 10 to 30 feet in depth. The veins or ore bodies are heavily capped with iron and lime, and the ore extracted from same averages 4.5 percent copper, $2.00 gold, and 6.5 ounces silver, which is an excellent ore for smelting or concentration. Some of the ores running as high as 32 percent copper. This property can supply a large tonnage of good paying ore in the way of copper, gold and silver, and has excellent facilities for working and operating, as its mineralization is very extensive in length and width.

THE MINE: The work in the mine has been persistently pushed with one objective - depth and development. The outcrops of the Copper King group were less promising than in any other part of the property, but the Copper King had: 1. An andesite lime contact. 2. An extensive zone of alteration and leaching. 3. Ample evidence of slipping. 4. A slight copper stain.

It had no large iron gossans, so common on other parts of the property and so characteristic of copper deposits. It had nothing visible to warrant expenditure, except that every physical condition was ideal and if copper was there atll it would be as a large deposit. To the layman

it looked like a long chance, but to the mining man, its conditions were almost too good to be true, and the developments have confirmed this belief.

It was not anticipated that copper ore would be encountered at less than 200 feet depth, on account of the extent and completeness of surface leaching, and, in as much as the copper, if present, would be in the form of a replacement of the lime, it was not expected to find it in a solid for, but rather in a desseminated form, and predictions would have been amply verified if ore running ~~10~~ 6 to 8 percent had been found. In the above two factors, all expectations were more than surpassed. Ore in solid form, a complete replacement of the lime running 20 percent copper was encountered at less than 100 feet.

The new shaft, known as the No. 2 shaft, was purposely placed away from where ore was expected. It was placed 20 feet from the hanging wall, inclined on the dip, but it was evident from the beginning that the leached zone was even much wider than this. At a depth of 95 feet, white iron was encountered, containing but a trace of copper. The ore body entered on the hanging wall side and from then on through the next 20 feet, the ore increased in both quantity and quality until the maximum was reached at about 115 feet, and has been maintained since. As an illustration, five assays taken one day averaged a bout 13% copper, and but two days later, five assays went uniformly between 20 and 21 percent.

No cross-cutting has been done as yet, for the shaft has not reached sufficient depth for another working level, but the evidence is both sufficient and conclusive that the No. 2 shaft has encountered an immense body of high grade copper ore, higher grade than is mined in quantity in any mine in the state of Except the United Verde Extension, the ore body of which is quite phenomenal.

GEOLOGY: The general structure is very much the same as the other desert regions of Arizona, in its having a granite stock base, underlying some prophyritic, sedimentary and igneous rocks, both acid and basic.

A series of intrusive dikes of an olive green andesite porphyry, Limestone, Rhyolite and Granite represents the Northern section. The limestone near the dike is very much altered - as we ascend the mountain, the evidence of metamorphism increases, reaching its maximum near the outcrop of a gneiss rock which appears at an elevation of about 500 feet above the camp. At about the same elevation, there appears a porphyrytic dike that appears between the gneiss and granite, and below it, one of the series of olive dikes, mentioned before, the limestone is almost entirely changed, so much so, that the original rocks are hardly recognizable.

One of the distinctive features of this section is the presence of the greenish dike named andesite porphyry following one another with such uniformity and the very conspicuous change in the texture. Mineralogical and chemical composition of the rocks, as they approach the gneiss and granite.

The southeastern section presents evidence of an organic movement somewhat different from the above section. The trend of the formation is

not the same, nor as consistent, and the variety of the rocks suggest a more recent and repeated dynamic disturbance of the original arrangement of the formation. Trap, felsite, quartz porphyry, granite and diorites occur in numerous places associated with many contact minerals.

OCCURRENCE OF THE ORES: The Mile Wide shaft is sunk near the one of the andesite porphyry dikes which has a general bearing of Northeast and southwest, in common will all the dikes north and south of the shaft. The ore is in the form of a chalcopyrite, oxidized at the surface. It is found in pockets near the contact of the limestone and dike.

At the present time, I am disposed to believe that the ore is associated with the dike and found its present place by a process of selective precipitation in the limestone and environment. Ransome found a trace of copper in a diabase dike at Globe analyzed for copper. Lindgren, referring to andesite rocks called greenstone, presumes the copper found in the veins in the vicinity was derived from the same andesite rocks.

OPERATIONS: All claims have been worked to some extent, some more than others. Considerable work has been at the Copper Mountain, Margarite and on different elevations along the slope of the Amole Mountains. The principal work, however, has been where the present shaft is sunk. At this point, advantage was taken of an old shaft, from which some ore had been taken, and a connection made with the present, new shaft.

The old shaft, which is sunk near the bed of a dry stream, was originally sunk to about 50 feet, more or less. At 30 feet, the contact was intersected and followed downward. The present company commenced drilling at the 39 foot leve, and approximately proceeded as follows: SE about 119 feet, to where some oxidized and sulphide ores were found in a joint bearing N 60 W, which , after bein followed about 12 feet, a winze was sunk thereon, and some ore taken out of a pocket 23 x 8 x 13 this measurement includes the winze at the point of measurement. The joint bearing N 60 W, appearing near the tope of the winze, has evidently enriched the ground in this locality. For bout 47 feet on the same bearing, the sides of the main joint is particularly well-defined on the hanging wall and showing some movement.

The new shaft was intersected about 22 feet further, being a total distance from the cross-cut of 130 feet. The new shaft was started about 78 feet above the old shaft on the first level ground above the arroyo or stream (See Photo). From the first level (78 feet from the tope of the new shaft) to the second level is 112 feet. From the second level to the bottom of the shaft 23.5 feet. In sinking the shaft between the two levels, ore was found at about the same level, perhaps somewhat lower than found in the winze, and appeared intermittently to within 50 feet of the second level. At this point it disappeared in the foot wall.

At the bottom or second level, two levels were being driven when I was there. One bearing N 45 W 13 feet, NE 15 feet. The other, S 12 W 15 feet. Some fracturing bearing about N 44 E and dipping south was apparent, also an olive color bearing substance was commencing to show in the south shaft bearing about N 5 E.

A cross-cut was beeing started when I left, for the purpose of cutting the ore passed through the shaft, and ere this it should have been intersected.

On the Copper Mountain, a shallow shaft has been sunk, and a drfit a few hundred feet long driven, showing some ore in both shaft and drift. I have not been able to analyze the samples taken from here, but give an analysis given by Mr. Camphus.

ANALYSIS:

Top tunnel workings	22.78% Copper
Orient workings	25.01% Copper
Copper King winze	12.09% Copper

At the Margarite a shaft has been sunk about 100 feet on the contact (see photo), and some ore taken out.

The openings on the side of the Amole Mountain consists of a drift and some open cuts. I would like to see this location further explored. I have not had the samples taken from here assayed.

CONCLUSION:
I consider the Mile Wide presents a very legitimate opportunity for anyone desiring to invest in mining and willing to incur the usual mining risk.

SUMMARY: The Mile Wide formation shows a sequence of olivine dikes called andesite and a much altered limestone having an inclination of about 60 degrees to the southeast, all having a general northwest trend.

The development of the Mile Wide has determined very conclusively that copper in the form of chalcopyrite is found near the contact of the andesite dike and limestone.

There are three locations on the property worthy of being proven, namely the Margarite, the Amole upper workings, and the Copper King. I favor the prosecution of the work at the Mile Wide and consider the locations mentioned in the preceding paragraph as good selections for testing.

The MILE WIDE, as I stated before, is a VERY LEGITIMATE MINING enterprise It present MANY ATTRACTIVE FEATURES from a point of a mining investment, and I am pleased to report FAVORABLY on the property.

Respectfully submitted,

J. A. Ede

UNIVERSITY OF ARIZONA

Tucson
ARIZONA STATE BUREAU OF MINES

October 26, 1916

Mr. Charles P. Reiniger,
c/o Mile Wide Copper Company
Tucson, Arizona

Dear Mr. Reiniger:

Referring to yours of the 25th regarding the telegram from Mr. Giffen, I beg to advise as follows:

No. 1 shaft, ore came in at 45 feet, of unknown depth, averaging about 6% copper. 55 feet, unknown depth, averaging 12% copper; 35 feet, unknown width, averaging 12% copper.

In the winze, ore came in 95 feet below the surface, unknown width, averaging 8% copper; 105 feet, unknown width, averaging 20% copper; 115 feet, 125 feet, 145 feet, 155 feet, the same.

In all of the above, when I speak of unknown width, I mean that the full width has not been determined. It would be impossible to deviate from the straightness of the shaft in order to determine the width of the ore body, and we shall not know that width until we have been able to cross-cut from the north and south laterals.

Very truly yours,

CHARLES F. WILLIS.

CFW.H

THE MILE WIDE COPPER COMPANY

September 1, 1916

to

February 1, 1917.

The progress of the Mile Wide during the past five months is more than gratifying, it was far beyond the most optimistic expectations.

On September 1st shaft no. 2 was in ore but no width had been determined. Ore was encountered at 95 feet on the hanging wall side and within 5 feet had extended entirely across the shaft. It proceeded to fill the shaft to a depth of 155 feet, and then went into the hanging wall again.

This ore was of direct, smelting, self-fluxing type, being chalcopyrite running heavy in lime, with much iron and manganese and little silicia. The whole ore body, as passed through, ran about 12 to 14% copper, but by selection shipments could be made running 21% copper.

It was impossible to follow the ore with the shaft, as a shaft must be straight, so the shaft was sunk to 220 feet in depth, and after leaving 20 feet for a sump to collect the water, a level was run on the 200.

Previous to cross-cutting, it was desired to know something definite about the width of the deposit, the direction of the slips, etc., and in order to do this, the ore body was cross-cut about at the middle of the ore that was struck in the shaft at the 125 foot level. A little work here showed the deposit to be at least 22 feet wide.

This work proved definitely where to go and in a very few days the same ore body was encountered on the south drift of the 200 foot level, and have been cross cut to date to a width of 16 feet. The average value of this ore is probably as good as that encountered in the shaft, but it is not as spectacular in appearance, as it is more intimately mixed and does not contain as much massive chalcopyrite. This is characteristic

and as greater depth is reached, more evenness of value will follow.

It was proven: ore was found in the old shaft and a considerable quantity was extracted, but by this time it was handled twice underground, windlassed to the surface, packed on burro to the road, copper at a dollar a pound was not enough. But the fact was proven to their satisfaction, that the epidotized, chloritized, leached andesite lime contact made ore in depth.

Then, ever conservative and anxious to make every dollar do its work fully, another prospecting shaft was started upon the hill, where ample dumping ground was available, and where it could be reached by a road, and a prospecting outfit of machinery installed consisting of a small hoist and a one drill compressor.

Confident of the ore that they could not see, it was decided that the new shaft be sunk at least twenty feet away from the place where the contact was mathematically figured to be. The ore should not, theoretically, be encountered in any solidity or quantity under 300 feet depth, as it was planned to go that deep and then crosscut to the contact. (A shaft sunk on the contact would not be permanent, unless timbered very heavily and a crosscut would be cheaper than timber.)

But contrary to all geological reasoning, and twenty feet away from where the contact should be, at 95 feet, iron pyrite, running 4% copper was found. The following day, the muck showed 9% copper. The next day 14% copper was exposed and thereafter, to the 155 feet level, copper ore, averaging about 21% copper filled the shaft. Coming in on the hanging wall, and leaving on the hanging, indicated that the ore had bellied from the contact 20 feet away.

Even to the blindest, there was but little doubt that a mine was found. The company felt that a large ore body was encountered and warranted extensive development. Hence, machinery was ordered at once for six times the power and compressor capacity of the prospecting outfit.

Sinking was continued as rapidly as possible, with the limited power and air capacity, and after going to 220 feet, a level was started at the 200. But as the desire of the company was to move surely and make no mistakes, it was decided to determine the exact depth of strike and width of the ore body first. Hence, going back to the 125 foot lever, about the center of the big ore body passed through in the shaft, a crosscut was started, and among the things determined, was that the width of the ore body was at least 22 feet.

Then turning to the 200 level, mathematical calculations showed that by crosscutting only four feet to the east, the ore body should be hit. True enough, a little less than four feet were necessary to hit the ore body, similar in character and value to that of the shaft. Crosscutting this body, the width was determined at 16 feet. Today, drifting has just started along this ledge to get stoping ground ready for real mining and shipping. With ore in the old shaft, 200 feet sway from the new workings, ore in the new shaft proven from 95 feet to 200 feet in depth at least, with 22 foot width at the 125 foot level and at least 16 feet in width on the 200 foot level, it looks like a real mine, and with 14% to 20% values, it looks like a very, very rich mine.