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W. F. STAUNTON
 MINING ENGINEER
 124 WEST FOURTH STREET
 LOS ANGELES, CAL.

A 2/10 31

Los Angeles, Calif., Feb. 21, 1931.

Mr. G. M. Colvocoresses
 1108 Luhrs Building,
 Phoenix, Arizona.

W. F. Staunton

Dear Mr. Colvocoresses:

In response to your letter of Jan. 15 I am sending you the following memoranda on the Verde Central mine. I had hoped by this time to be able to be more definite about what can be done.

	Tons of Ore			Copper produced.	Silver produced.
	From mine.	From dump.	Total.	Lbs.	Oz.
1929	89,350	3,700	93,050	4,335,261	19,796
1930					
9 mos.	82,876	10,000	92,876	4,126,497	19,344
	<u>172,226</u>	<u>13,700</u>	<u>185,926</u>	<u>9,563,758</u>	<u>39,140</u>

The grade of the ore was quite uniform, averaging about 2.6% copper. The Tailings averaged about .24, showing an extraction of 92%. The concentrates averaged about 21%.

Due to the troubles of getting started the costs were high in 1929, the first year of operation, averaging as follows:

Ore extraction	\$3.61 per ton.
Development	.23
General expense	.34
Milling	1.74
Frts. treatment and selling	<u>1.60</u>
	7.52 per ton.

This was equivalent to about 16.1 ¢ per pound of copper sold.

In 1930 there were only 9 months of operation, the mine being closed Sept. 30. The corresponding costs were:

Ore extraction	2.81
Development	.20
General expense	.14
Milling	1.13
Frts. treatment and selling	<u>1.50</u>
	5.78

Equivalent to 13 ¢ per pound sold.

The average cost would thus appear to have been about 14.5¢ which is higher than the fact because the management was required to include a charge of \$6.50 per ton for the 13,700 tons of dump ore used. The dump ore was the result of prospecting etc. previous to starting operation. The actual cost of putting it in the mill was about 50 ¢ a ton. Allowance for this excess charge brings the actual cost of copper sold to 13.5¢.

The sudden drop in the market price in 1930 from 18¢ to below 10¢, with a large amount of copper lacking final settlement due to differences of opinion as to terms of settlement with the smelter has ~~made~~ made it impossible up to this time to make a definite financial statement. It is understood that arbitrators are now trying to agree on a basis of settlement.

The amount of ore remaining in the developed stopes can only be estimated on the basis of experience in the mining already done. It is probably about as much as has been taken out, say from 150,000 to 200,000 tons and of about the same average grade.

It is not, however, the developed ore that should be considered so much as the great prospective value of the unexplored ground, especially at greater depth. As you know, there was no ore at the surface and almost none above 800 feet in depth. It is true that the 1900 level showed comparatively little pay ore, but work on that level was confined to the Rock Butte vein in the extreme northeasterly part of the property, which, while poor at that particular horizon, nevertheless was accompanied by conditions giving great promise of improvement deeper down.

On the 1000 level to the south a large area of black schist was found identical with that in the United Verde mine carrying disseminated chalcopryite, at times in bands or bunches up to 2 feet and high enough in grade to be classed as ore but evidently originating below and weakening in their upward course. At the time of closing down, the 1450 level (600 feet below the nominal 1000) was being extended to explore this area and while still lacking several hundred feet of reaching it was already showing stringers of ore and generally favorable conditions.

Economic geologists seem agreed in classifying the Jerome ore deposits as of the deep seated, high pressure type, the existence of bonanzas being due to the conjunction of the mineralizing agencies with areas chemically and physically favorable for deposition, such as intense schistosity especially when there was also transverse fracturing and intersection by impervious walls such as the large diorite dike in the United Verde which appeared to act as a dam and guide to localize the mineralization. In the case of the United Verde the intense mineralization reached a higher horizon than at other points and the accident of the great fault and the erosion of Bitter Creek exposed the ore. In the Verde Central the mineralization did not come so high nor were the favorable conditions for deposition so pronounced at what is now the surface, but such conditions are increasingly evident in the mine as greater depth is attained. Doubtless, at the time of origin, both were buried at depths which would have precluded any suspicion of their existence.

I feel that sufficient attention has not been paid to possibilities in the southerly part of Verde Central above the tunnel level. The tunnel is 600 feet below the sedimentaries, or, geologically, at the same horizon as the so-called 1400 level of the United Verde Extension, which, owing to the great fault, is also 600 feet below the sedimentaries. It would take too much space to present here the many reasons for this feeling and I only mention it to suggest that there is a possibility of doing something with the property without going to the expense of unwatering. If there is ore in the 600 feet of ground between the tunnel and the surface it is practically certain that the upper part of it at least is in the form of chalcocite rather than chalcopryite. The evidence that has brought about this feeling consists briefly of a small amount of surface work done years ago on the Wichita claim and vicinity to test the geological conditions, and the cutting of a 65 foot mineralized shearing in the tunnel underneath carrying disseminated chalcopryite rather abundantly. A small amount of further work on

Feb. 2, 1931.

the surface over this point and under the overlying sedimentaries may easily give a clue that could be followed up by further work in the tunnel with very important results.

As previously stated it is impossible to give the present financial condition of the Verde Central accurately until the difference with the smelter is adjusted. Their claim is that final settlements were to be made at the price received by them for the copper and that Verde Central copper was sold proportionately to their own. As they sold comparatively little for a long time prior to the drop and then sold a great deal, the result was disastrous for Verde Central and I understand the smelter claims a refund of something like \$190,000. For this reason it would have naturally been expected that the U.V.X. would have purchased the property and I have no doubt it would have done so except for the short life given the U. V. X. by its owners. The C. & A. Co. owns nearly two-thirds of the Verde Central stock and can do as it pleases. I believe that it would give an option on its stock, or on the whole property for that matter, at a very low price and with no down payment to responsible people who would assume Verde Central's liability to the smelter and agree to do a moderate amount of development work. It is, of course, the worst possible time to try to sell a copper mine, but on that account it should be the best time to buy one, for unless all precedent is to be reversed the present depression will pass.

Very truly yours,



WFS/H

NAME: Verde Central.

DISTRICT: Verde.

LOCATION: Jerome, Arizona.

OWNERS: Verde Central Mines, Inc.,
W. F. Staunton, Pres.,
E. L. Bartholemew, Supt.

DATE VISITED: August 24, 1923. H. S. McKnight.

NOTES: Cap. \$2,500,000.00 Par value \$1.00
500,000 shares issued.

The property consists of 20 patented claims, or 308 acres, in the center of the Verde district, Jerome. It contains the extension of the Venture vein of claims owned by the U. V. X. Co.

The ore consists primarily of chalcopyrite replacing black chloritic schist. Some chalcocite and rarely native copper is found. All of the ore carries low values in gold and silver.

The schist or vein material occurs along a fault plane between a gray quartz porphyry and a greenstone. On the 600 level and above there is no schist apparent. On the 800 level the average width of the schist is 3 ft. and on the 1000 it is much wider, being at least 50 ft. wide at one place.

The strike of the vein or contact is NW-SE and the dip almost vertical. The quartz porphyry forms the foot wall and the greenstone the East or hanging wall. On the 800 level the greenstone in the H. W. is heavily stained with red iron oxide.

The shaft was sunk in the greenstone hanging wall at an angle of about 65 degrees, and x-cuts driven from the shaft to the vein. There are five levels in this shaft, namely :- Tunnel level, 300 level, 600 level, 800 level and 1000 level. The 1000 level is approximately 730 ft., vertically, below the surface.

There is some ore showing on the upper levels but nothing of importance was found until the 800 level was reached. Here the ore body consists of mineralized schist

Jerome

averaging 3 ft. in width and extending along the contact for 500 ft. The ore in this shoot is said to average on this level from 7 to 15 % copper, the grade depending upon the extent of replacement. The above average is based upon cut samples taken across entire face after blasting each round and upon car samples of the muck removed. These figures look to be rather high.

A raise from the 800 to the 600 level was put up in ore nearly all the way to the 600 level. A subdrift half way up has been started in ore.

The ore extends to within a few feet of the SE face of the drift on the 800 level. Several short x-cuts from this drift into each wall failed to find ore.

On the 1000 level the ore is similar to that above but is more spotted and spread over a greater width. The black schist or ore zone is much wider and shows varying degrees of replacement, in some places the schist being entirely replaced by chalcopyrite. I was told that the average grade of the ore on this level was about the same as that on the 800 level, but a great deal of the schist is apparently entirely barren. Very little iron pyrite was seen and practically no ore other than that of copper.

In driving the main x-cut in the H. W. from the shaft to the contact on the 1000 level, a vein of quartz was cut which lies parallel, or nearly so, to the contact and which carries ore. Drifting is being done on this vein in both directions and the SE face is in ore. A small sample of ore taken from the face ran:

Au = Nil Ag = Tr Cu = 2.05%

The above main x-cut has been extended beyond the contact vein about 70 ft. into the quartz porphyry footwall and the face, at time of visit, was in a good grade of ore. This ore seems to be a stringer running at an acute angle from the main ore shoot and extending into the porphyry. The width of this shoot has not been determined.

The NW face of the main drift on this level is barren.

as is the NW face of the main drift on the 800 level.

The SE face of the drift is now being advanced and is in ore of medium grade. This face has not yet reached the ground directly under the best showing on the 800 level.

Due to dirty wet walls it was difficult to judge the grade or continuity of the ore but the general average of the schist would appear to be somewhat lower than that claimed by those in charge.

Sampling on this level was said to have been done in the same way as on the 800 level, - cut samples across the entire face after each round and also grab samples from cars.

The Supt. said that they would sink to 500 ft. below the 1000 level before starting stoping operations. They do not expect to extend the present inclined shaft but will sink a permanent vertical shaft which will strike points on the lower levels nearer the ore body.

There is approximately 4000 tons of ore on the dump which will average from 4 % to 5 % copper. This ore was taken from the 800 and 1000 levels in doing development work.

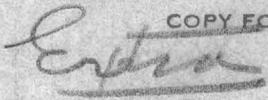
The operators seem confident of developing a large mine producing direct smelting ore. The ore developed at present, however, is not of that type, it being silicious and containing very little iron. A small sample of ore taken from the SE face of main drift on 1000 level ran

Au = Nil Ag = Nil Cu = 0.50 Insol. = 57.8 Fe = 12.7

H.S.M.

Mine sold to United Verde Copper
Co in 31 or so & not quoted since
that date. J. H. C.

COPY FOR


SOUTHWEST METALS COMPANY

HUMBOLDT, ARIZONA

September 30, 1926.

Mr. Wm. F. Staunton, Manager,
Verde Central Mining Co.,
Jerome, Arizona.

Dear Mr. Staunton:

Referring to my visit to your property on the 25th inst., and samples which were taken from the dump, I will arrange to have the results of these samples sent to you as soon as they have been run. No. 1 sample, representing the reject from the samples which you had taken, mostly on the 1000 and 1400 levels ore bodies, has been analysed with following result: Gold .02; Silver .4 oz.; Copper 3.50%; Insoluble 66%; Iron 12%.

We have carried out some flotation tests on this sample and will carry out similar tests on the others as soon as they can be prepared.

Of course the result of this one test can not be considered in any sense conclusive, but I believe that the sample was fairly representative ore and if so our results indicate that the material is very suitable for concentration and that in all probability a recovery of better than 80% of the gold and silver values can be obtained, and that better than 90% of the copper, with a ratio of concentration somewhat in excess of three to one.

If additional tests should substantiate these tentative conclusions, there is every probability that we could

Mr. Staunton, - 2.

September 30, 1926.

offer you terms for purchase of ore loaded on Santa Fe railway cars, f.o.b. Clarkdale, as follows:

Pay for 80% or better of GOLD contained at \$19.50 per ounce.

Pay for about 80% of SILVER contained at New York market price.

Pay for about 90% of COPPER contained with minimum deduction 8 pounds per ton at New York Market less 2.75¢ per pound, it being understood that payment would not be due for three months after the ore had been sampled at Humboldt, and the market quotation covering the purchase price of copper would be that of the second month succeeding sampling at Humboldt.

TREATMENT CHARGE not exceeding \$3.50 per ton.

While I have not attempted to figure closely on the higher grade ore which you might expect to ship for direct smelting, it seems probable that we could handle this on just about the same terms, plus additional freight rate, if any. Ordinarily we would pay for a higher percentage of the gold and silver contained in smelting ore, and also for 92% of the copper, but on these regular smelting terms we would expect a higher toll charge on this better grade material, and also should penalize for excess silica which I presume will be contained in almost all of your shipping ore.

The above terms for milling ore are based on our ability to secure, as we have been promised, a rate of 50¢ per ton from Clarkdale to Humboldt on ore which would not exceed a net value to shipper, after deducting freight and treatment charges, of \$10.00 per ton, if we have to pay

Mr. Staunton, - 3.

September 30, 1926.

a higher railway freight rate the difference between such rate and 50¢ would have to be added in figuring charges.

I am giving you these tentative figures so that you can do some calculating and take the matter up with Mr. Campbell and your directors if you desire to do so, and I sincerely hope that you will decide that it is advantageous to begin shipments in the near future, and that we can come to a definite agreement with you to purchase the ore from your dump and also the production of your mine as this may be forthcoming. We are prepared to immediately handle up to 200 tons of concentrating ore per day, and also up to 100 tons of smelting ore per day, and can arrange to handle a larger tonnage at a later date, but I presume these figures will exceed your production for some time to come.

I am going East tomorrow night and shall not be back until about October 20th, but if you have occasion to communicate with us in the meantime any matters of importance will be referred by telegram to me in New York, or Mr. Williams or Mr. Reed can call on you and discuss any situation that may arise.

With best personal regards,

Sincerely yours,

(Signed) G.M.C.
General Manager.

GMC-s

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Hotel Van Nuys

BOGGS HOTEL CO.
ROSS N. BOGGS, PRESIDENT & MANAGER

Los Angeles, Cal.

May 29, 1924.

Verde Combination

Boggs

Mr. G. M. Colvocoresses,
Humbolt, Arizona.

Dear Mr. Colvocoresses:

Yours of the 26th ult. just at hand. I herewith enclose reports of Verde Combination and Verde Junior properties which I have arranged for consolidating into one Company. The Verde Junior property is so closely connected geologically and otherwise with the Combination that you could not intelligently develop present ore showings in one without practically proving up the other.

The Combination has about 500 acres, 300 about of which is patented and joins the Verde Central properties on the Southeast. The Verde Junior has about 100 acres, I think it is, 80 of which is patented and joining the Combination on the Southeast.

Both of these properties lie in the trend of the Mineral Zone which is said to extend from the United Verde over and onto the Verde Central and onto and across the Verde Combination and Verde Junior. The United Verde and Verde Central contact along the upper fault passes from these properties to and through the middle or upper portion of the Verde Combination and Verde Junior with similar characteristic vein outcrops and surface sulphide ore showings and formations as the United Verde and just as numerous or more so than they were on the United Verde before the big glory hole shoveled them away from the United Verde. All these ore showings carrying equally as well in gold and silver values with the copper as did the old surface developments and prospect holes and surface outcrops on the early day workings of the United Verde.

There is probably 2000 feet in length of these outcrops along the contact crossing on what is known as the Connor Group of the Combination ground and the

Verde Junior ground and covers an area in many places several hundred feet in width from the old Black Hills shaft (the old Black Hills group being part of Combination ground also), to almost the lower tunnel on the Verde Junior group. There are several openings and tunnels, the deepest of which gives about 150 feet along this width all showing more or less fairly good values and vein outcrops.

The Verde Combination is all equipped and by extending the power line over about 1500 feet or so, from present plant, could reach the lower tunnel on the Verde Junior where the work is contemplated and advised to be done to carry this tunnel (which is in 350 or 400 feet) on about 1500 to 1800 feet further, where it will cross cut this contact and 2000 feet of mineralized area and ore and vein outcrops and get 800 to 1000 feet more depth. This tunnel would cut under and develop this entire mineralized area and spurs could be run from the main tunnel at various points to get under the places opened up and showing large mineral bearing areas, and vein outcrops, some of which have good ore showings in the present old surface workings. One of these is an old shaft about 700 feet deep sunk on the old Black Hills group about 20 or 25 years ago where some very fair ore was found near the bottom and a miner says one of the drifts or cross-cuts showed a face of good commercial ore. This 1500 or 1800 foot tunnel would cut about 300 feet deeper than this shaft and if ore is found, a connection could be made so that air could be brought into the tunnel and this former work could be made valuable use of. Since the Verde Central developments along this same contact on which this shaft is sunk, it really strengthens the beliefs and proves up to a great extent the immediate possibilities in these old workings. An old incline shaft a few hundred feet further down the hill connects with the old Vertical shaft on the Black Hills and I am told by former owners who had charge of the work at that time, that they found considerable good ore in this incline shaft which I think was sunk on the contact.

North of these old works are several other shallow workings extending over onto the Connor group of Combination ground, all of which show good ore, one place which has several inches of massive Chalcopyrite in a five foot vein and which outcropped on the surface. A little work was done here and the vein continued on Vertical.

Page # 3.

East
Then north of old Black Hills shaft are 3 other old workings on the Verde Junior ground in a distance of 1000 to 1500 feet all of which shows extensive mineralization and healthy sulphide veins.

The Verde Combination has a capital of 2,000,000 shares with 1,600,000 shares outstanding. We are arranging to reorganize with a capital of 2,500,000 shares, par value \$1.00 and consolidate the Verde Junior property with the Combination.

We will put in the treasury -----1,300,000 shares
and give-----1,200,000 "
to the present owners in Combination
and Verde Junior, and pay besides \$85,000
cash for Verde Junior, the payments to be *one half*
made on the Verde Junior in 6 months and balance
in 8 months.

We will arrange a deal on 1,250,000 shares of the treasury, (leaving 50,000 shares in the treasury) for \$485,000, on the following terms: \$50,000 cash and \$10,000 per month for 3 months, and \$20,000 per month thereafter. You to have the management and control and 3 directors out of 5.

All stock to be pooled for one year except 50,000 shares which go to James M. Layman, for expenses, etc. in arranging a deal, and reorganizing, etc.

Outside of the \$85,000 to be paid on the Verde Junior, all the money goes to the treasury to be used for mining and development. Work can be started on short notice as it will only require a few days to bring power over from Verde Combination plant where Morgan did extensive development on the lower fault with very little encouraging results.

This proposition has been presented to another large operator who is considering it. This party you know well, and I think they are very much interested.

In case you wish to back this proposition, I feel sure I can arrange with substantial brokers to trade the stock on the New York or Boston Curb and handle whatever amount you wish to sell out of the 1,250,000 shares. It would probably require 30 to 60 days to get all old stock in and exchanged for the new reorganization stock and arrange all legal details in the change. Immediate action is desired.

Sincerely,

James M. Layman
0031

Page # 4.
P.S.

You know yourself that if this stock is put on the curb market and work is started vigorously with substantial financial backing, that very little, if any would be sold under \$1.00 and with any favorable showings whatever in development, it would go to several dollars.

J.M.L.

REPORT ON THE COPPER, SILVER AND GOLD
PROPERTY OF THE UNITED VERDE JUNIOR
PROPERTY

- - - - -

VERDE MINING DISTRICT - YAVAPAI COUNTY, ARIZ.

- - - - -

LOCATION.

The properties known as the United Verde Junior Copper Group, are located in the Verde Mining Dist. on the Northeastern slope of the Black Hills Range. The geographical distance from the town of Jerome and the famous United Verde Mine, is about one (1) mile due South. The claims are reached both by a short mountain trail and a good wagon road, which connects them with the Santa Fe at Clarkdale and Clemenceau about three to five miles, respectively.

The claims cover a true mineral ledge or vein which crops out above the ground, together with several minor "feeder veins", along the back bone of a ridge or "spur" running practically East and West, or at right angles with the Main Divide.

The Main Divide of the Black Hills Range, is marked by a Malapais or Lava Bluff, known locally as the "Rim" which runs practically due North and South.

The Mining properties of the Verde District are thus to be found on the mineralized areas of the foothills of the great mineral bearing range. (See Plan #1).

The claims of this Company are located on the Second Spur, South of Jerome, and about 1500 feet below a horizontal strata of lime and sandstone, which underlies the Lava Caping.

The precise location of the Group is more clearly defined by reference to the plan herewith attached. (See Chart #1.)

AREAS

There are six full and fractional claims in the group recorded under the following names:

"Copper Glance"		"Willow"
"Deer Trail"		"Red Willow"
"Bellone"	and	"Columbia"

There are approximately 80 acres of valuable mineral land in the group and the ground is patented.

GENERAL HISTORY OF THE DISTRICT

The Metallic output of the District to date, has been almost wholly confined to the Jerome properties of the United Verde Copper Company and Verde Extension, although several smaller companies have shipped several thousand tons of copper, silver and gold ore during various stages of development. Among them is the United Verde Junior Copper Company, which has already encountered in its initial exploration work, several deposits of high-grade copper ore, carrying substantial gold and silver values.

It is a well-known fact that the gold and silver contained in the ore of the United Verde Copper Company almost pays the entire cost of mining and reduction, and that the copper bullion is almost pure profit.

The District was discovered in the early Eighties, and its properties were then worked solely as gold and silver mines.

GENERAL GEOLOGY

As previously stated, the Black Hills Range, which unquestionably covers the "mother lode", at some great depth, of an immense deposit of rich copper ore, runs about due North and South.

The difference in elevation between the summit of the range and the Verde Valley, is fully 4000 feet on the average. At right angles with this 20 mile range of hills, that is to say, running East and West, are the foothills and spurs on the second one of which, South of the Big U. V. Mine, the properties of this company are located.

Still further South on succeeding ridges are to be found the "Iron King Group" of the United Verde Copper Co., and the famous "Copper Chief Mine", which is reliably reported to have "blocked out" over \$3,000,000.00 worth of ore in the first development stages.

It will thus be seen from a study of Plan #1, that this property lies in the heart of a richly mineralized area and covers a ledge of copper ore, which has already been "proven" up" to a point

where the ore is worth shipping if it were extractable in a greater quantity.

It is, therefore, no longer a prospect, but a partially developed mine.

The formation of the District is basically granitic or consisting of primary plutonic rocks. This massive formation has been broken up and displaced and forced into the ridges which it now forms by volcanic action.

Secondary formations of igneous and metamorphic rocks intrude the basic in the common forms of diorite, diabase schists and basalt.

Subsequent fissuring admitted of the further intrusion of porphyretic schistose ledges, and veins in which the solutions of copper sulphides were deposited.

These copper ledges parallel the East and West course of the spurs and run into and under the sedimentary stratas of the great divide, thus proving the source of their mineral wealth.

The veins are capped with gold-bearing quartz deposits and massive oxide of iron gossans from which the mineral values have been leached to a great extent by atmospheric decomposition and the percolating action of water.

DISCOVERY AND DEVELOPMENT

When the main ledge on this property was discovered, a tunnel was driven into the hill to tap the vein at a distance of some 300 feet perpendicularly beneath the "apex" or cropping on the North slope of the spur. (See Plan #2)

Test assays showed the quartz-iron carbonate matrix or sponge of the exposed gossan to carry as high as \$75.00 values in gold and silver per ton, and from a trace to two percent. in copper.

The main ledge indicated an iron capping well over 100 ft. wide, while numerous feeder veins, rich in iron oxides and showing considerable leaching, were also discovered.

TUNNEL #1

Tunnel #1, which developed this ledge as stated, to a

depth of about 300 ft. beneath the apex and about 1000 ft. perpendicularly below the highest point at which minerable deposits of gold and rich copper carbonates have been found, proved the locator's judgment to have been correct as regards the strike, dip and mineralization of the Lode.

This tunnel, running practically due South(see Plan) cross-cuts a series of veins, varying from a few inches to 50 ft. in width.

The samples taken from the veins here encountered, show it to be a part of the oxide zone. It was driven about 130 ft. into the hill, thus not developing the ledge to the full indicated depth beneath the summit, but the specimens assayed from 2% to 12% in copper carbonates with an average of a dollar or two in gold and silver.

SPECIMEN #1

Taken from the iron and sand carbonates about 70 ft. in the tunnel, shows character of gossan mineral.

SPECIMEN #2.

Taken from winze, or shaft, some 50 ft. deep which was sunk on a thin feeder vein about 30 ft. from mouth of tunnel, it assays on an average of 10% in copper, same being a picked sample.

Taken as a whole, the substantial width of the iron capping (indicating a copper deposit fully as wide), the values on gold and copper; the streaks of copper and iron sulphides and the panels of copper carbonates on the technical forms of "Azurite" and "Malachete", all pointed to direct genetic connection with a commercial deposit of copper ore in the lower sulphide zone.

TUNNEL #2.

Tunnel #2 was then driven some 150 ft. lower perpendicularly and some 500 ft. East on the same side of the hill and to tap the same ledge. (See Plan #2.)

This tunnel had not gone in 50 ft. before a highly mineralized feeder-vein of copper sulphides was encountered, thus proving the connection between the upper carbonate and the lower sulphide zones.

The specimens here taken, show some fine copper "Bornite" and "Chalcopyrite", which assayed from 18% to 26% in copper bullion.

SPECIMEN #3.

This sample shows the heavy mineralization in iron and carries from 5% to 10% copper.

SPECIMEN #4.

A rich "Peacock" or "Bornite and Chalcopyrite" assaying 23.5% copper.

The veins here found are much better defined and more numerous. While no commercial deposit of copper was encountered by this tunnel, the showing is a big improvement on the upper tunnel, clearly indicating that lower down in the sulphide zone, and below permanent water level a minerable deposit of high-grade copper ore should be opened up.

TUNNEL #3.

The substantial showings of mineral values in the upper tunnels, warranted the further development of the properties.

To this end, the driving of Tunnel #3 was undertaken.

The object being to cut the ore body at the lowest depth beneath the apex; it was therefore begun at the lowest convenient point on the claims, i.e., in the ravine at the Eastern end of the group and fully 600 ft. perpendicularly below the level of Tunnel #1. The distance from the mouth of Tunnel #1 to the mouth of Tunnel #3, is about 1500 ft. or more, in a Northeasterly direction. (See Plan.)

The proposed length of this Tunnel was 1500 ft. My examinations show that this tunnel will have to be driven into the hill fully that distance in order to cross-cut the ledge at a depth of 1000 ft.

Tunnel #3 was in 350 ft. when work was discontinued on the property. Numerous feeder veins and schists, or "slate" panels were cross-cut, carrying values of from 5% to 10% in copper, and showing strong mineralization in iron pyretes. No main ledges have so far been reached by the tunnel. The country rock also shows considerable impregnation with iron sulphides carrying copper values.

As far as the tunnel has gone, the indications are very favorable and substantiate fully the belief that a rich deposit of copper ore exists within the confines of this group of 80 acres of mineral land.

PHYSICAL CONDITIONS

There is an abundance of clear spring water on the property, sufficient for a large plant.

The geographical conditions are ideal for cheap tunnel development; the hillside on which the claims are located being very steep, thus obviating the heavy expense of shaft sinking.

The properties are easily accessible. There are at present five or six ample buildings on the property, requiring only a little repairing to make them habitable.

The only other expense before beginning operations, would therefore be the purchase of a supply of hand-drilling tools and steel, and the small equipment and outfit, such as rails, cars, powder, etc. necessary to carry on the work.

The proposition is practically ready to begin active mining operations on within one week's time.

RECOMMENDATIONS.

Taken as a whole, I am very favorably impressed with the merits of this group, and after a careful examination, I find the indications of a rich copper-gold mine to be above my expectations.

I have spent some ten years in Arizona, as a practical miner, and mining engineer, and after three years' experience as a miner in this Section, I can pronounce this group easily, one of the best mining ventures in the District.

The picked specimens of ore, show the character of the mineralization here found, and the permanency and regularity of the veins indicate their genetic connection with a minerable copper deposit. The only further requirement, in order to make a profit-producing mine of the proposition, is to explore and open up the deposit at a greater depth.

I am firmly convinced that the deposits with which the proven veins connect are of commercial size and extent, and that

the proposition as it stands, is well worthy of a further expenditure of \$50,000.00 in development work.

I would recommend simply that the original plan be carried out and that Tunnel #3, be driven at least an additional 1200 feet into the hill in order to cross-cut the ledges opened up by Tunnels Nos. 1 and 2.

At this depth the deposits should be of ample size to produce good shipping ore.

The property can be developed to a depth of fully 2000 ft. by tunneling alone.

One vein of ore, no richer than that which has already been taken from the tunnels above, and only a few feet wide, extending from the 1000 ft. level to the apex, would alone make a valuable mine of the proposition.

The indications can be truthfully said to point to a still greater future for the group.

Respectfully submitted,

E. H. Lebel.

Consulting Engineer.

REPORT ON THE COPPER, SILVER AND GOLD
PROPERTY OF THE UNITED VERDE JUNIOR
PROPERTY

VERDE MINING DISTRICT - YAVAPAI COUNTY, ARIZ.

LOCATION.

The properties known as the United Verde Junior Copper Group, are located in the Verde Mining Dist. on the Northeastern slope of the Black Hills Range. The geographical distance from the town of Jerome and the famous United Verde Mine, is about one (1) mile due South. The claims are reached both by a short mountain trail and a good wagon road, which connects them with the Santa Fe at Clarkdale and Clemenceau about three to five miles, respectively.

The claims cover a true mineral ledge or vein which crops out above the ground, together with several minor "feeder veins", along the back bone of a ridge or "spur" running practically East and West, or at right angles with the Main Divide.

The Main Divide of the Black Hills Range, is marked by a Malpais or Lava Bluff, known locally as the "Rim" which runs practically due North and South.

The Mining properties of the Verde District are thus to be found on the mineralized areas of the foothills of the great mineral bearing range. (See Plan #1).

The claims of this Company, are located on the Second Spur, South of Jerome, and about 1500 feet below a horizontal strata of lime and sandstone, which underlies the Lava Caping.

The precise location of the Group is more clearly defined by reference to the plan herewith attached. (See Chart #1).

AREAS

There are six full and fractional claims in the group recorded under the following names:

"COPPER GLANCE" "WILLOW"
"DEER TRAIL" "RED WILLOW"
"BELLONE" and "COLUMBIA"

There are approximately 80 acres of valuable mineral land in the group and the ground is patented.

GENERAL HISTORY OF THE DISTRICT

The Metallic output of the District to date, has been almost wholly confined to the Jerome properties of the United Verde Copper Company and Verde Extension, although several smaller companies have shipped several thousand tons of copper, silver and gold ore during various stages of development. Among them is the United Verde Junior Copper Company, which has already encountered in its initial exploration work, several deposits of high-grade copper ore, carrying substantial gold and silver values.

It is a well-known fact that the gold and silver contained in the ore of the United Verde Copper Company almost pays the entire cost of mining and reduction, and that the copper bullion is almost pure profit.

The District was discovered in the early Eighties, and its properties were then worked solely as gold and silver mines.

GENERAL GEOLOGY.

As previously stated, the Black Hills Range, which unquestionably covers the "mother lode", at some great depth, of an immense deposit of rich copper ore, runs about due North and South.

The difference in elevation between the summit of the range and the Verde Valley, is fully 4000 feet on the average. At right angles with this 20 mile range of hills, that is to say, running East and West, are the foothills and spurs on the second one of which, South of the Big U. V. Mine, the properties of this company

are located.

Still further South on succeeding ridges are to be found the "Iron King Group" of the United Verde Copper Co., and the famous "Copper Chief Mine", which is reliably reported to have "blocked out" over \$3,000,000.00 worth of ore in the first development stages.

It will thus be seen from a study of Plan #1, that this property lies in the heart of a richly mineralized area and covers a ledge of copper ore, which has already been "proven" up to a point where the ore is worth shipping if it were extractable in a greater quantity.

It is, therefore, no longer a prospect, but a partially developed mine.

The formation of the District is basically granitic or consisting of primary plutonic rocks. This massive formation has been broken up and displaced and forced into the ridges which it now forms by volcanic action.

Secondary formations of igneous and metamorphic rocks intrude the basic in the common forms of diorite, diabase schists and basalt.

Subsequent fissuring admitted of the further intrusion of porphyretic schistose ledges, and veins in which the solutions of copper sulphides were deposited.

These copper ledges parallel the East and West course of the spurs and run into and under the sedimentary stratas of the great divide, thus proving the source of their mineral wealth.

The veins are capped with gold-bearing quartz deposits and massive oxide of iron gossans from which the mineral values have been leached to a great extent by atmospheric decomposition and the percolating action of water.

DISCOVERY & DEVELOPMENT

When the main ledge on this property was discovered, a tunnel was driven into the hill to tap the vein at a distance of some 300 feet perpendicularly beneath the "apex" or cropping on the North slope of the spur. (See Plan #2)

Test assays showed the quartz-iron carbonate matrix or sponge of the exposed gossan to carry as high as \$75.00 values in gold and silver per ton, and from a trace to two percent. in copper.

The main ledge indicated an iron capping well over 100 ft. wide, while numerous feeder veins, rich in iron oxides and showing considerable leaching, were also discovered.

TUNNEL # 1.

Tunnel # 1, which developed this ledge as stated, to a depth of about 300 ft. beneath the apex and about 1000 ft. perpendicularly below the highest point at which minerable deposits of gold and rich copper carbonates have been found, proved the locator's ^{judgment} judgment to have been correct as regards the strike, dip and mineralization of the Lode.

This tunnel, running practically due South (see plan) cross-cuts a series of veins, varying from a few inches to 50 ft. in width.

The samples taken from the veins here encountered, show it to be a part of the oxide zone. It was driven about 130 ft. into the hill, thus not developing the ledge to the full indicated depth beneath the summit, but the specimens assayed from 2% to 12% in copper carbonates with an average of a dollar or two in gold and silver.

SPECIMEN # 1.

Taken from the iron and sand carbonates about 70 ft. in the tunnel, shows character of gossan mineral.

SPECIMEN # 2.

Taken from winze, or shaft, some 50 ft. deep which was sunk on a thin feeder vein about 30 ft. from mouth of tunnel, it assays on an average of 10% in copper, same being a picked sample.

Taken as a whole, the substantial width of the iron capping (indicating a copper deposit fully as wide), the values on gold and copper; the streaks of copper and iron sulphides and the panels of copper carbonates on the technical forms of "Azurite" and "Malachete", all pointed to direct genetic connection with a commercial deposit of copper ore in the lower sulphide zone.

TUNNEL # 2.

Tunnel # 2 was then driven some 150 ft. lower perpendicularly and some 500 ft. East on the same side of the hill and to tap the same ledge. (See Plan #2).

This tunnel had not gone in 50 ft. before a highly mineralized feeder-vein of copper sulphides was encountered, thus proving the connection between the upper carbonate and the lower sulphide zones.

The specimens here taken, show some fine copper "Bornite" and "Chalcopyrite", which assayed from 18% to 26% in copper bullion.

SPECIMEN # 3.

This sample shows the heavy mineralization in iron and carries from 5% to 10% copper.

SPECIMEN # 4.

A rich "Peacock" or "Bornite and Chalcopyrite" assaying 23.5% copper.

The veins here found are much better defined and more numerous. While no commercial deposit of copper was encountered by this tunnel, the showing is a big improvement on the upper tunnel, clearly indicating that lower down in the sulphide zone,

and below permanent water level a minerable deposit of high-grade copper ore should be opened up.

TUNNEL # 3.

The substantial showings of mineral values in the upper tunnels, warranted the further development of the properties.

To this end, the driving of Tunnel #3 was undertaken.

The object being to cut the ore body at the lowest depth beneath the apex; it was therefore begun at the lowest convenient point on the claims, i.e., in the ravine at the Eastern end of the group and fully 600 ft. perpendicularly below the level of Tunnel # 1. The distance from the mouth of Tunnel #1 to the mouth of Tunnel # 3, is about 1500 ft. or more, in a Northeasterly direction. "(See Plan).

The proposed length of this Tunnel was 1500 ft. My examinations show that this tunnel will have to be driven into the hill fully that distance in order to cross-cut the ledge at a depth of 1000 ft.

Tunnel #3 was in 350 ft. when work was discontinued on the property. Numerous feeder veins and schists, or "slate" panels were cross-cut, carrying values of from 5% to 10% in copper, and showing strong mineralization in iron pyretes. No main ledges have so far been reached by the tunnel. The country rock also shows considerable impregnation with iron sulphides carrying copper values. As far as the tunnel has gone, the indications are very favorable and substantiate fully the belief that a rich deposit of copper ore exists within the confines of this group of 80 acres of mineral land.

PHYSICAL CONDITIONS.

There is an abundance of clear spring water on the property, sufficient for a large plant.

The geographical conditions are ideal for cheap tunnel development; the hillside on which the claims are located being very steep, thus obviating the heavy expense of shaft sinking.

The properties are easily accessible. There are at present five or six ample buildings on the property, requiring only a little repairing to make them habitable.

The only other expense before beginning operations, would therefore be the purchase of a supply of hand-drilling tools and steel, and the small equipment and outfit, such as rails, cars, powder, etc. necessary to carry on the work.

The proposition is practically ready to begin active mining operations on within one week's time.

RECOMMENDATIONS.

Taken as a whole, I am very favorably impressed with the merits of this group, and after a careful examination, I find the indications of a rich copper-gold mine to be above my expectations.

I have spent some ten years in Arizona, as a practical miner, and mining engineer, and after three years' experience as a miner in this Section, I can pronounce this group easily, one of the best mining ventures in the District.

The picked specimens of ore, show the character of the mineralization here found, and the permanency and regularity of the veins indicate their genetic connection with a minerable copper deposit. The only further requirement, in order to make a profit-producing mine of the proposition, is to explore and open up the deposit at a greater depth.

I am firmly convinced that the deposits with which the proven veins connect are of commercial size and extent, and that the proposition as it stands, is well worthy of a further ex-

penditures of \$50,000.00 in development work.

I would recommend simply that the original plan be carried out and that Tunnel # 3, be driven at least an additional 1200 feet into the hill in order to cross-cut the ledges opened up by Tunnels Nos. 1 and 2.

At this depth the deposits should be of ample size to produce good shipping ore.

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One vein of ore, no richer than that which has already been taken from the tunnels above, and only a few feet wider, extending from the 1000 ft. level to the apex, would alone make a valuable mine of the proposition.

The indications can be truthfully said to point to a still greater future for the group.

Respectfully submitted,

E. H. LEBEL,
Consulting Engineer.

captured

James M. Johnston
to New York

Jerome, Arizona
March 31st, 1924.

Mr. James M. Layman,
% Van Nuys Hotel,
Los Angeles, California.

Dear Sir:

Acting on your request, I came to Jerome, Arizona, and carefully examined the Verde Combination Copper Company's ground, situated near the town of Jerome, Verde District, Yavapai County, Arizona. I arrived here from Los Angeles, California on the afternoon of March 22nd, as soon as I had secured a room at the Connor Hotel, I walked down to the United Verde Extension Office to present a letter you had given me to Mr. George Kingdon, General Manager of the United Verde Extension property. He being away, I presented it to Mr. M. E. McLean, General Superintendent, and made arrangements to go through the United Verde Extension the next morning.

At 8 o'clock Sunday morning, I had the pleasure of going through the United Verde with Mr. McLean, and Mr. R. D'Arcey, Chief Engineer, and the mine foreman. Mr. McLean being very busy, turned me over to Mr. D'Arcey, and D'Arcey went to a great deal of trouble and pains explaining the faulting and occurrence of the wonderful rich ore body found in this mine.

I examined the steam shovel work and glory hole of the United Verde Company on Monday, and went over the maps and got a general view of the ground owned by the Verde Combination with Mr. A. Colbath.

On Tuesday I presented my letter to Mr. R. E. Talley, General Manager of the United Verde Copper Company and he turned me over to Mr. H. DeWitt Smith, General Superintendent. Mr. Smith treated me with extreme kindness and had one of the Company engineers take me through the United Verde Mine.

I met Mr. W. F. Staunton, General Manager of the Verde Central, and Mr. E. F. Bartholomew, General Superintendent, Tuesday evening, and made arrangements to visit the Verde Central Mine on Wednesday.

I met Mr. Bartholomew at the Verde Central Mine at 8

o'clock Wednesday morning, and had the pleasure of looking at which I consider the next big mine to be opened up in the Verde Mining District.

Thursday I put in on the surface and tunnels of the Verde Combination and Verde Junior ground. Friday spent three hours with Mr. L. E. Reber, Jr., Chief Geologist for the United Verde Copper Company, and he very kindly let me look over the geological maps he has made of this district and discussed the general and detailed geology of different parts of this camp. I got some very valuable and detailed information from Mr. Reber for which I am very thankful. The rest of the time I have put on the Verde Combination ground, and discussing general geological conditions with prominent mining men of this camp.

I wish to thank Mr. D'Arcey, Chief Engineer and geologist of the United Verde Extension for his kindness to me, and the help he has given me. I may say, every one in the camp interested in mining, have been extremely kind to me, and have given me opportunity of visiting their mines and access to their maps. From this aid and the knowledge I have gained by going over your ground and examining tunnels and surface showings, I am able to pass on the value of your Verde Combination and Verde Junior ground and the possibilities of development.

SUMMARY AND CONCLUSIONS:

I have come to the conclusion, after examining your Verde Combination and Verde Junior ground, that it covers the best undeveloped piece of ground in this Verde Mining District, and with expenditure of from Thirty to Fifty Thousand Dollars in driving a tunnel, has the possibility of opening up a very valuable and rich copper property.

In examining this ground, I came to the conclusion that its possibilities had to be arrived at by comparing its geological conditions with other producing mines, in camp, - as the work which has been done on the Verde Combination ground from their 1300 foot shaft has been very badly done. Most of the drifting has been

has been done towards the main fault and not into the hill where the ore came from. Most of this work from the shaft was done by Dave Morgan (who opened up the big pear shaped high-grade copper ore body for the United Verde Extension). He and others thought at that time that the main fault of the camp had something to do with the formation of the big calcocite ore body found in the United Verde Extension, and did not recognize the fact that this big fault was post mineral and that the big copper body found was detached from the big United Verde Ore body on the west side of the fault. The position of the shaft was not well chosen, as it was not necessary to sink a shaft as most of the Verde Combination and Verde Junior ground lay to the south and west of the shaft and could have been developed by a tunnel.

On the ground of the Verde Combination and Verde Junior, you find all the rocks and formations that are associated with the large ore bodies of the United Verde, United Verde Extension, and Verde Central, that is, the Green Stone Schists, black grey and porphoritic, diorite and quartz porphry. One thing that is very prominent is the fact that there is on this ground a large amount of schist and I have come to the conclusion that the big ore bodies in this camp are associated with the black or chloritic schist and the quartz porphry. This is shown by the work and large ore bodies being opened up in the United Verde on levels from the 1600 to 2200'; the ore is forming along contacts with the quartz porphry and black schists and is making into quartz porphry along fissures and on the contact with quartz porphry and green stone schists black in color. These same contacts of green stone schists and quartz porphry which are now being opened up on the Verde Central, pass through the Verde Combination ground, and I have no hesitation in stating that with careful work and intelligent development, they have the possibility of opening up bodies of ore similar to those being opened up in the Verde Central.

The contact they are following in Verde Central runs south 20 degrees east, it may go through the United Verde Company

Venture Claims, or the Verde Apex or Benture Hill group. If it follows its same strike, it should pass through this company's ground near the Black Hills shaft on this Company's ground, although I am of the opinion that it turns more to the East, as all this formation seems to have an east and west trend when it gets on the Verde Combination ground. This contact from Verde Central may come through near the Black Hills shaft which is possible. There should be some very valuable ground laying between this contact and the main fault which lays over 2000 feet to the east. Some ore taken from the Black Hills shaft (from X cut on the 1800' I am told), shaft being filled with water, shows calcopyrite in a black schist and is conclusive evidence to me of the presence of bodies of sulphide copper ore in depth.

From numerous cuts and tunnels on this ground, Verde Junior and Combination ground, and on surface outcrops, copper ores have been taken; also some rich gold-silver ores associated with quartz croppings or beds heavily iron-stained. Along trail crossing this ground, I found some Bornite in highly altered schist. All these surface showings, although they carry no tonnage of commercial ore, tend to confirm my opinion that with a tunnel crossing these quartz porphyry green-stone schist contacts at depth, there is a possibility of opening up a large body of shipping ore.

When these showings are taken in connection with the fact that this Camp at Jerome has some of the largest and richest copper deposits in the world, and all the rocks that are associated with these deposits appear on this ground and small bunches of ore are found, I have no hesitation in recommending that a tunnel be driven into this ground to explore these contacts at depth. This ground is practically virgin, although a lot of money has been badly spent in the shaft (which is full of water), and I did not have a chance of examining the workings, but this work from rocks found on the dump shows the presence of sulphide ore in depth, associated with bluish black schist and also porphyry.

I think for any person or body of men who wish to take

a gamble with possibilities of large returns, this presents the best bet I know of. If you take into consideration the ground adjoining and surrounding the Verde Combination ground; to the north lays the United Verde Copper Company, the Hull Copper Company, Cleopatra, northwest, the Verde Central Copper Company, Venture Claims of the United Verde Company, Verde Apex and Venture Hill, Smith group, which have some very good showings, all laying to the north and west of this ground, comprise the best ground in this district. To the south, the Verde Hub and Columbia Copper Company, owned by United Verde Company; to the north and east, Gadsden Co. controlled by C. & A. Copper Company; further south, Equator and Copper Chief, and Iron King, all of which have produced rich ore. This ground lays between the two largest faults in the Camp, the south Haynes Fault which is a long distance west, and the Main Verde Fault which lays to the east. As you leave the Main Fault, and go westerly over this ground, you cross belts of schist with porphyry intrusions as you get further west towards the Black Hills shafts, you find the Diorites, then the red sands, and lime stone cap. The ground owned by the Verde Combination and Junior, laying between the Black Hills and Main Fault, I consider the best undeveloped piece of mining ground in this Camp, and it offers wonderful possibilities. I have no hesitation in stating that the trend of the mineralization is through the Verde Combination and Junior ground, and it certainly warrants money being spent in careful development. A tunnel on this ground could tap this property from 1000 to 1500 feet in depth.

There is no doubt if sufficient money is raised and spent under intelligent mining men, that a large copper property will be found within the acreage owned by your Verde Combination and Verde Junior.

I remain,

Very respectfully yours,

(Signed) G. W. MC CASKELL
Mining Engineer.

R E P O R T

on the

VERDE COMBINATION COPPER COMPANY

Verde Mining District, Yavapai County,
A r i z o n a .

LOCATION:

The Verde Combination Copper Company group of claims are located in Verde Mining District, on the Northeast slope of the Black Hills range. They are located about one mile south of the town of Jerome, where the United Verde and the United Verde Extension are located. A road runs from Jerome to Mescal Gulch where the tunnel of the property starts. Other trails and wagon roads connect these properties with the Santa Fe at Clarkdale where the United Verde Smelter is located, about five miles distant, and Clemenceau, where the United Verde Extension Smelter is located, about three miles distant.

The Combination and Verde Junior property comprises the following claims, the following of which are patented:

Combination

Mescal
Steamboat
Monmont
Last Chance
Triangle
Prosperity
Indiana
Golden West
Axtel
Back Bone
Discanso
Vulcan
Olympia
Domingo
Mountain View
Key West
Key West #2
(also some fractions,
about 300 acres)

Verde Junior

Copper Glance
Deer Trail
Bellone
Willow
Red Willow
Dolumbia
(about 80 acres)

Unpatented claims - (about 160 acres)

Midnight (or Dewey)
Emerald Green
Blue Ledge
Ajan
Ann Buster
Nellie
Robert Emmett
Copper Lense

some of which have been jumped, but the company's lawyer, Mr. Morrison,

at Prescott, assures me they will have no trouble in putting the jumpers off this ground and suit has already been started.

These claims are located at an elevation of 5000 feet and are accessible for mining the year 'round. Water is found in Mescal Gulch where some of the company houses are located, but most of the men live in Jerome, about a mile distant. Labor is plentiful, part white and Mexican; wages high.

HISTORY:

The United Verde began its career in 1880 and is owned and controlled by Senator W. A. Clark, and is reported to have distributed over 50 millions in dividends. It has worked almost continuously since it was opened up. It is one of the richest and best managed copper properties in the world. United Verde Extension has been actively mining since 1914; up to August 1922, Fourteen Millions had been distributed amongst its stockholders in dividends.

This property developed one of the largest high-grade copper ore bodies ever found in the United States. It is calcocite, large stoping areas averaging 30 to 40% copper. Within the last year the Verde Central has opened up a large body of Calcopryrite on 800 and 1000 foot levels and promises to develop into a large mine.

GEOLOGY:

The geology of this district is well known, and I will touch upon the general geology very lightly, but any one wishing more detail re the geology of this district, can refer to paper by L. E. Reber, Geologist for United Verde Copper Company, paper delivered before the American Institute of Mining and Metallurgical Engineers August, 1923.

Up to date the main ore deposits have been opened up by three mining companies, the United Verde Extension, and the United Verde at Jerome, and (Copper Chief and Iron King), being about 4 miles south of Jerome. These two mines are on the west side of the Main Fault and the United Verde Extension being on the east side of the Fault. The Black Hills range bound the Verde Valley on the

Southwest, two lava capped mountains called Mingus and Woodschute Mountains are the high points of this range of hills, and are about 4000 feet above the Verde River. It is between the crest of this Black Hills range and the Verde River that the old Black Hills mining district lays, now known as the Jerome or Verde Copper district. The Main Fault which has a northwest strike and a downward throw of possibly 1600 feet to the east. This faulting exposed the United Verde ore body which lays to the west of the Fault. The main ridge of the Black Hills runs in a north and south direction and is capped by a Lava or Malapais flow; under this rim or cap rock lay the Limestones of Devonian or Carbiniferous age, below the Lime lay the Carbiniferous and Cambrian sand stones and Conglomerate, Below these come the Diorites, the Yavapai schist over-lying in many places the Diorites. The Yavapai schist is Pre-Cambrian (Algonkian).

While the Main Fault exposed the United Verde ore body on its west, the United Verde Extension body which was a part off it, was capped by the lava limestone and sandstone, and it was only after a shaft had penetrated these rocks overlying this ore body and development work was done, that this large rich ore body was found. Your ground covered by the Verde Combination and Verde Junior is on the west side of the Fault. The high ground above the Black Hills shaft on your ground, is capped with limestone; lying below this are exposed the sandstones. Most of your ground is covered by schists and diorite. Some dikes also cross the ground, probably Andesite. Some places the schist is highly altered; other places it is porphoritic in structure. Some quartz porphry is exposed, and in places quartz outcrops, carrying iron oxide and sulphides. The formation seems to have swung around to the east almost at right angles to the high ridge and your ground is probably on the second spur south of Jerome.

As all the rocks that are associated with the big ore deposits are present on your ground, and large masses of well developed schist are present, the occurrence of large ore bodies of the schist replacement type are possible, especially along the schist quartz porphry contact. The highly altered schist in some places

assays in gold and silver, while the quartz outcrops carrying iron in oxide and pyrite assay in gold and silver. I consider the prospect of getting large bodies of copper on Combination and Verde Junior at depth very probable.

There is no timber on the ground and mining timber would have to be brought in. In case copper ore is struck, it would in all probability be high-grade, and direct smelting type. It would in all probability be purchased by one of the smelters in the Valley, near your ground, where it would have to be hauled by teams or trucks, later on if development warranted, a deep tunnel could be driven and hauled by cars to the Smelter.

EQUIPMENT.

The Verde Combination shaft is equipped with a fine electrical driven hoist and two 200-foot air compressors, drill sharpeners, etc. Power is supplied by the Arizona Power Company.

The shaft has been sunk to 1300 feet level, and drifting has been done on this and other levels. As it and the tunnel were full of water, I was unable to make an examination of workings, but from pieces of rock picked up on the dump, some calcopyrite and pyrites of iron were found, indicating the presence of sulphides at depth, and possibilities of opening up with careful prospect work.

SAMPLES:

I have taken no samples, as those I would have taken would be picked pieces. Assay would not mean anything, except that they show values on the surface which might indicate larger bodies of copper ores at depth. Assays which I have before me taken from these croppings, run from 2% to 25% copper, and about \$1.00 gold and silver.

CONCLUSION:

After making an examination of the Verde Combination ground, I am of the opinion it, if possible, should be handled as one group with the Verde Junior property. A 2500 ft. tunnel on the Verde Junior, driven in a westerly direction, would cut this ground 1000 to 1500 feet deep. I think that this tunnel could be driven for \$50,000.00. It might not be necessary to drive it more than 1000 to 1500 feet. It would at least open up prospects where cross

cutting could be done intelligently, with the possibility of opening up a big copper mine.

I consider the Combination and Verde Junior properties the best undeveloped piece of mining ground in the Jerome district, and is the only large acreage or group of mining claims that have not been taken over by the larger Copper Companies. There is not the slightest doubt but that the ore deposits that have been opened up to the north have a strike through this ground and connect up with the copper properties lying south of your Verde Combination and Verde Junior ground. As far as geological conditons and formation, I consider this ground of equal prospective value to any undeveloped ground in the Jerome district, and unhesitatingly recommend it to any part of men or Company wishing a good copper prospect with possibilities of opening up a big high-grade copper mine, such as have made Jerome world-famous.

(Signed) G. W. McCaskell
Mining Engineer.

Jerome, Arizona,
March 31st, 1924.

Mr. James M. Layman,
% Van Nuys Hotel,
Los Angeles, California.

Dear Sir:

Acting on your request, I came to Jerome, Arizona, and carefully examined the Verde Combination Copper Company's ground, situated near the town of Jerome, Verde District, Yavapai County, Arizona. I arrived here from Los Angeles, California on the afternoon of March 22nd, as soon as I had secured a room at the Connor Hotel, I walked down to the United Verde Extension Office to present a letter you had given me to Mr. George Kingdon, General Manager of the United Verde Extension property. He being away, I presented it to Mr. M. E. Mc Lean, General Superintendent, and made arrangements to go through the United Verde Extension the next morning.

At 8 o'clock Sunday morning, I had the pleasure of going through the United Verde Extension with Mr. Mc Lean, and Mr. R. D'Arcey, Chief Engineer, and mine foreman. Mr. Mc Lean being very busy, turned me over to Mr. D'Arcey, and D'Arcey went to a great deal of trouble and pains explaining the faulting and occurrence of the wonderful rich ore body found in this mine.

I examined the steam shovel work and glory hole of the United Verde Company on Monday, and went over the maps and got a general view of the ground owned by the Verde Combination with Mr. A. Colbath.

On Tuesday I presented my letter to Mr. R. E. Talley, General Manager of the United Verde Copper Company and he turned me over to Mr. H. De Witt Smith, General Superintendent. Mr. Smith treated me with extreme kindness and had one of the Company engineers take me through the United Verde Mine.

I met Mr. W. F. Staunton, General Manager of the Verde Central, and Mr. E. F. Bartholomew, General Superintendent, Tuesday evening, and made arrangements to visit the Verde Central Mine on Wednesday.

I met Mr. Bartholomew at the Verde Central Mine at 8 o'clock Wednesday morning, and had the pleasure of looking at which I consider the next big mine to be opened up in the Verde Mining District.

Thursday I put in on the surface and tunnels of the Verde Combination and Verde Junior ground. Friday spent three hours with Mr. L. E. Reber, Jr., Chief Geologist for the United Verde Copper Company, and he very kindly let me look over the geological maps he has made of this district and discussed the general and detailed geology of different parts of this camp. I got some very valuable and detailed information from Mr. Reber for which I am very thankful. The rest of the time I have put on the Verde Combination ground, and discussing general geological conditions with prominent mining men of this camp.

I wish to thank Mr. D'Arcey, Chief Engineer and geologist of the United Verde Extension for his kindness to me, and the help he has given me. I may say, every one in the camp interested in mining, have been extremely kind to me, and have given me opportunity of visiting their mines and access to their maps. From this aid and the knowledge I have gained by going over your ground and examining tunnels and surface showings, I am able to pass on the value of your Verde Combination and Verde Junior ground and the possibilities of development.

SUMMARY AND CONCLUSIONS:

I have come to the conclusion, after examining your Verde Combination and Verde Junior ground, that it covers the best undeveloped piece of ground in this Verde Mining District, and with expenditure of from Thirty to Fifty Thousand Dollars in driving a tunnel, has the possibility of opening up a very valuable and rich copper property.

In examining this ground, I came to the conclusion that its possibilities had to be arrived at by comparing its geological conditions with other producing mines, in camp, - as the work which has been done on the Verde Combination ground from their 1300 foot shaft has been very badly done. Most of the drifting has been done towards the main fault and not into the hill where the ore came from. Most of this work from the shaft was done by Dave Morgan (who opened up the big pear shaped high-grade copper ore body for the United Verde Extension). He and others thought at that time that the main fault of the camp had something to do with the formation of the big calcocite ore body found in the United Verde Extension, and did not recognize the fact that this big fault was post mineral and that the big copper body found was detached from the big United Verde Ore body on the west side of the fault. The position of the shaft was not

well chosen, as it was not necessary to sink a shaft as most of the Verde Combination and Verde Junior ground lay to the south and west of the shaft and could have been developed by a tunnel.

On the ground of the Verde Combination and Verde Junior, you find all the rocks and formations that are associated with the large ore bodies of the United Verde, United Verde Extension, and Verde Central, that is, the Green Stone Shists, black grey and porphyritic, diorite and quartz porphyry. One thing that is very prominent is the fact that there is on this ground a large amount of shist and I have come to the conclusion that the big ore bodies in this camp are associated with the black or chloritic shist and the quartz porphyry. This is shown by the work and large ore bodies being opened up in the United Verde on levels from the 1600 to 2200'; the ore is forming along contacts with the quartz porphyry and black shists and is making into quartz porphyry along fissures and on the contact with quartz porphyry and green stone shists black in color. These same contacts of green stone shists and quartz porphyry which are now being opened up on the Verde Central, pass through the Verde Combination ground, and I have no hesitation in stating that with careful work and intelligent development, they have the possibility of opening up bodies of ore similar to those being opened up in the Verde Central.

The contact they are following in Verde Central runs south 20 degrees east, it may go through the United Verde Company Venture Claims, or the Verde Apex or Benture Hill group. If it follows its same strike, it should pass through this company's ground near the Black Hills shaft on this Company's ground, although I am of the opinion that it turns more to the East, as all this formation seems to have an east and west trend when it gets on the Verde Combination ground. This contact from Verde Central may come through near the Black Hills shaft which is possible. There should be some very valuable ground laying between this contact and the main fault which lays over 2000 feet to the east. Some ore taken from the Black Hills shaft (from X cut on the 1800' I am told), shaft being filled with water, shows calcopyrite in a black shist and is conclusive evidence to me of the presence of bodies of sulphide copper ore in depth.

From numerous cuts and tunnels on this ground, Verde Junior and Combination ground, and on surface outcrops, copper ores have been taken; also some rich gold-silver ores associated with quartz croppings or beds heavily iron-stained. Along trail crossing this ground, I found some Bornite in highly altered shist. All these surface showings, although they carry no tonnage of commercial ore, tend to confirm my opinion that with a tunnel crossing these quartz porphyry green-stone shist contacts at depth, there is a possibility of opening up a large body of shipping ore.

When these showings are taken in connection with the fact that this Camp at Jerome has some of the largest and richest copper deposits in the world, and all the rocks that are associated with these deposits appear on this ground and small bunches of ore are found, I have no hesitation in recommending that a tunnel be driven into this ground to explore these contacts at depth. This ground is practically virgin, although a lot of money has been badly spent in the shaft (which is full of water), and I did not have a chance of examining the workings, but this work from rocks found on the dump shows the presence of sulphide ore in depth, associated with bluish black shist and also porphyry.

I think for any person or body of men who wish to take a gamble with possibilities of large returns, this presents the best bet I know of. If you take into consideration the ground adjoining and surrounding the Verde Combination ground; to the north lays the United Verde Copper Company, the Hull Copper Company, Cleopatra, northwest, the Verde Central Copper Company, Venture Claims of the United Verde Company, Verde Apex and Venture Hill, Smith group, which have some very good showings, all laying to the north and west of this ground, comprise the best ground in this district. To the south, the Verde Hub and Columbia Copper Company, owned by United Verde Company; to the north and east, Gadsden Co. controlled by C. & A. Copper Company; further south, Equator and Copper Chief, and Iron King, all of which have produced rich ore. This ground lays between the two largest faults in the Camp, the south Haynes Fault which is a long distance west, and the Main Verde Fault which lays to the east. As you leave the Main Fault, and go westerly over this ground, you cross belts of shist with porphyry intrusions as you get further west towards the Black Hills shafts, you find the Diorites, then the red sands, and lime stone cap. The ground owned by the Verde Combination and Junior, laying between the Black Hills and Main Fault, I consider the best undeveloped piece of mining ground in this Camp, and it offers wonderful possibilities. I have no hesitation in stating that the trend of the mineralization is through the Verde Combination and Junior ground, and it certainly warrants money being spent in careful development. A tunnel on this ground could tap this property from 1000 to 1500 feet in depth.

There is no doubt if sufficient money is raised and spend under intelligent mining men, that a large copper property will be found within the acreage owned by your Verde Combination and Verde Junior.

I remain

Very respectfully yours,


G. W. MC CASWELL,

Mining Engineer.

R E P O R T

on the

VERDE COMBINATION COPPER CO.

Verde Mining District, Yavapai County,
A r i z o n a.

LOCATION

The Verde Combination Copper Company group of claims are located in Verde Mining District, on the Northeast slope of the Black Hills range. They are located about one mile south of the town of Jerome, where the United Verde and the United Verde Extension are located. A road runs from Jerome to Mescal Gulch where the tunnel of the property starts. Other trails and wagon roads connect these properties with the Santa Fe at Clarkdale where the United Verde Smelter is located, about five miles distant, and Clemenceau, where the United Verde Extension Smelter is located, about three miles distant.

The Combination and Verde Junior property comprises the following claims, the following of which are patented:

Combination

Mescal
Steamboat,
Monmont,
Last Chance,
Triangle
Prosperity
Indiana
Golden West,
Axtel,
Back Bone,
Discanso,
Vulcan,
Olympia
Domingo
Mountain View
Key West
Key West # 2
(also some fractions,
about 300 acres)

Verde Junior

Copper Glance
Deer Trail
Bellone
Willow
Red Willow
Columbia,
(about 80 acres)

Unpatented claims - (about 160 acres),

Midnight (or Dewey),
Emerald Green,
Blue Ledge,
Ajan,
Ann, Buster,
Nellie,
Robert Emmett,
Copper Lense,

some of which have been jumped, but the company's lawyer, Mr. Morrison, at Prescott, assures me they will have no trouble in putting the jumpers off this ground and suit has already been started.

These claims are located at an elevation of 5000 feet and are accessible for mining the year 'round. Water is found in Mescal Gulch where some of the company houses are located, but most of the men live in Jerome, about a mile distant. Labor is plentiful, part white and Mexican; wages high.

HISTORY:

The United Verde began its career in 1880 and is owned and controlled by Senator W. A. Clark, and is reported to have distributed over 50 millions in dividends. It has worked almost continuously since it was opened up. It is one of the richest and best managed copper properties in the world. United Verde Extension has been actively mining since 1914; up to August 1922, Fourteen Millions had been distributed amongst its stockholders in dividends.

This property developed one of the largest high-grade copper ore bodies ever found in the United States. It is calcocite, large stoping areas averaging 30 to 40% copper. Within the last year the Verde Central has opened

up a large body of Calcopyrite on 800 and 1000 foot levels and promises to develop into a large mine.

GEOLOGY:

The geology of this district is well known, and I will touch upon the general geology very lightly, but any one wishing more detail re the geology of this district, can refer to paper by L. E. Reber, Geologist for United Verde Copper Company, paper delivered before the American Institute of Mining and Metallurgical Engineers August, 1923.

Up to date the main ore deposits have been opened up by three mining companies, the United Verde Extension, ~~Ref-Iron~~ and the United Verde at Jerome, and (Copper Chief and Iron King), being about 4 miles south of Jerome. These two mines are on the west side of the Main Fault and the United Verde Extension being on the east side of the Fault. The Black Hills ^{range} bound the Verde Valley on the Southwest, two lava capped mountains called Mingus and Woodschute Mountains are the high points of this range of hills, and are about 4000 feet above the Verde River. It is between the crest of this Black Hills range and the Verde River that the old Black Hills mining district lays, now known as the Jerome or Verde Copper district. The Main Fault which has a northwest strike and a downward throw of possibly 1600 feet to the east. This faulting exposed the ^{United} Verde ore body which lays to the west of the Fault. The main ridge of the Black Hills runs in a north and south direction and is capped by a Lava or Malapais flow; under this rim or cap rock lay the Limestones of Devonian or Carbiniferous age, below the Lime lay the Carbiniferous and Cambrian sand stones and Conglomerate,

Below these come the Diorites, the Yavapai shist overlying in many places the Diorites. The Yavapai shist is Pre-Cambrian (Algonkian).

While the Main Fault exposed the United Verde ore body on its west, the United Verde Extension body which was a part of it, was capped by the lava limestone and sandstone, and it was only after a shaft had penetrated these rocks overlying this ore body and development work was done, that this large rich ore body was found. Your ground covered by the Verde Combination and Verde Junior is on the west side of the Fault. The high ground above the Black Hills shaft on your ground, is capped with limestone; lying below this are exposed the sandstones. Most of your ground is covered by shists and diorite. Some dikes also cross the ground, probably Andesite. Some places the shist is highly altered; other places it is porphoritic in structure. Some quartz porphyry is exposed, and in places quartz outcrops, carrying iron oxide and sulphides. The formation seems to have swung around to the east almost at right angles to the high ridge and your ground is probably on the second spur south of Jerome.

As all the rocks that are associated with the big ore deposits are present on your ground, and large masses of well developed shist are present, the occurrence of large ore bodies of the shist replacement type are possible, especially along the shist quartz porphyry contact. The highly altered shist in some places assays in gold and silver, while the quartz outcrops carrying iron in oxide and pyrite assay in gold and silver. I consider the prospect of getting large bodies of copper on Combination and Verde Junior at depth very probable.

There is no timber on the ground and mining timber would have to be brought in. In case copper ore is struck, it would in all probability be high-grade, and direct smelting type. It would in all probability be purchased by one of the smelters in the near your ground, Valley, where it would have to be hauled by teams or trucks, later on if development warranted, a deep tunnel could be driven and hauled by cars to the Smelter.

EQUIPMENT:

The Verde Combination shaft is equipped with a fine electrical driven hoist and two 200-foot air compressors, drill sharpeners, etc. Power is supplied by the Arizona Power Company.

The shaft has been sunk to 1300 feet level, and drifting has been done on this and other levels. As it and the tunnel were full of water, I was unable to make an examination of workings, but from pieces of rock picked up on the dump, some calcopyrite and pyrites of iron were found, indicating the presence of sulphides at depth, and possibilities of opening up with careful prospect work.

SAMPLES: I have taken no samples, as those I would have taken would be picked pieces. Assay would not mean anything, except that they show values on the surface which might indicate larger bodies of copper ores at depth. Assays which I have before me taken from these croppings, run from 2% to 25% copper, and about \$1.00 gold and silver.

CONCLUSION:

After making an examination of the Verde Combination ground, I am of the opinion it, if possible, should be handled as one group with the Verde Junior property. A 2500 ft. tunnel on the Verde Junior, driven in a westerly direction, would cut this ground 1000 to 1500 feet deep. I think that this tunnel could be driven for \$50,000.00. It might not be necessary to drive it more than 1000 to 1500 feet. It would at least open up prospects where cross cutting could be done intelligently, with the possibility of opening up a big copper mine.

I consider the Combination and Verde Junior properties the best undeveloped piece of mining ground in the Jerome district, and is the only large acreage or group of mining claims that have not been taken over by the larger Copper Companies. There is not the slightest doubt but that the ore deposits that have been opened up to the north have a strike through this ground and connect up with the copper properties lying south of your Verde Combination and Verde Junior ground. As far as geological conditions and formation, I consider this ground of equal prospective value to any undeveloped ground in the Jerome district, and unhesitatingly recommend it to any party of men or Company wishing a good copper prospect with possibilities of opening up a big high-grade copper mine, such as have made Jerome world-famous.

G. H. Maxwell

Mining Engineer.

Sanford

✓

Jerome

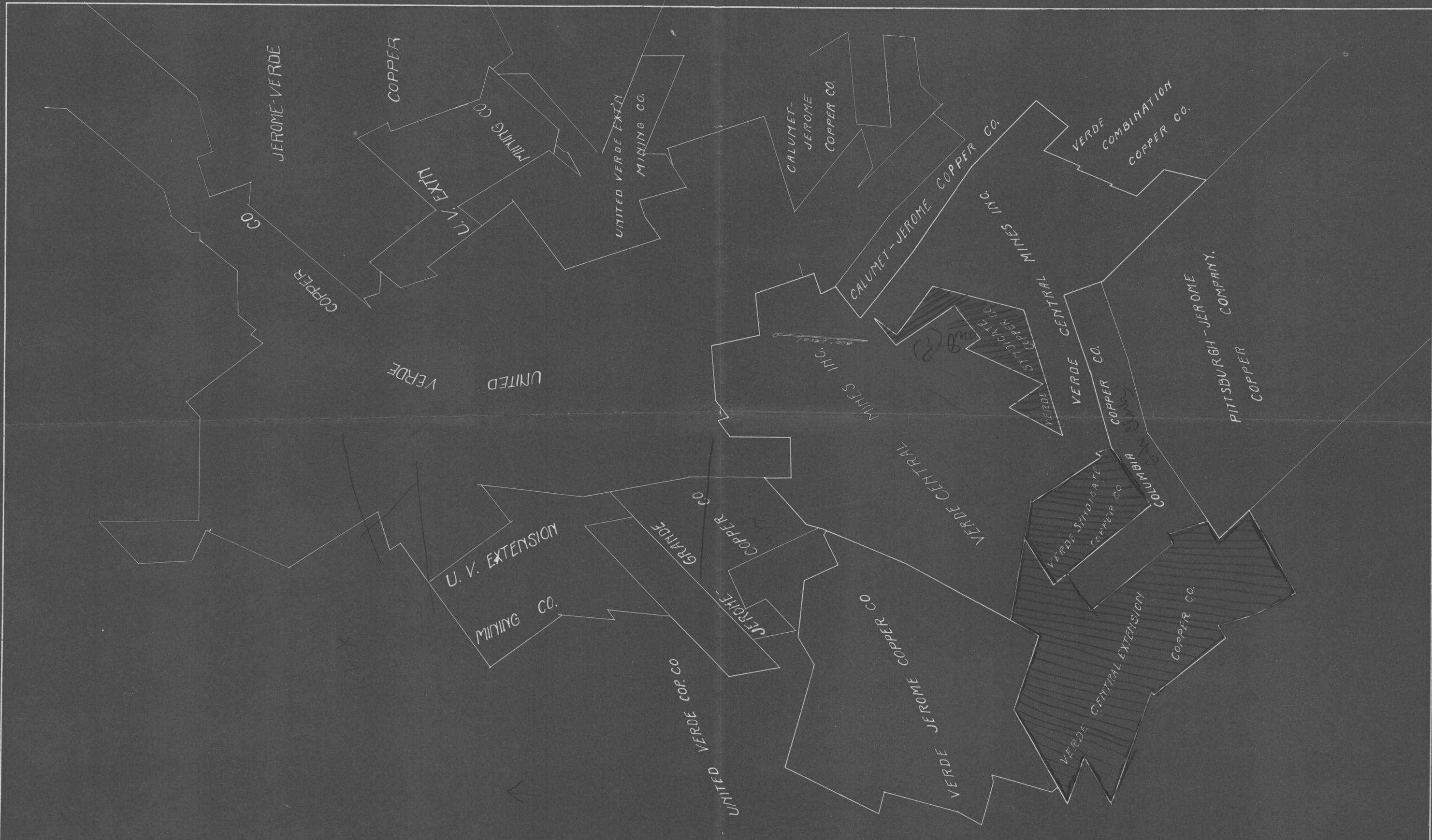
VERDE COMBINATION COPPER COMPANY, including the Black Hills Mine. Jas. Layman, Promoter and Manager, whom I met in Jerome. Visited mine first on 19th September with Joe Larson, and again on 24th September with R. A. Kelly. Everything shut down and plant and buildings dilapidated. Shaft said to be 800 feet deep. In schist. The large dump consists of schist and diorite with a little chalcopryite, less than a ton of ore all told. Some specular iron was observed and also some jasper quartz which evidently occurred in small seams. The shaft is located high up on the hill and the surface showings are not so good as on the Howe and Larrimore groups below.

The plant, all in poor condition for work, consists of a Laidlaw-Dunn-Gordon 12 x 7 x 12 compressor; an upright receiver; an Atlas Engine Works small steam engine; ~~waste~~ feed heater; 2 boilers (1 Atlas and 1 Baker Iron Works); 1 Snow 12 x 4 x 12 Steam pump; steam hoist with rusty cable.

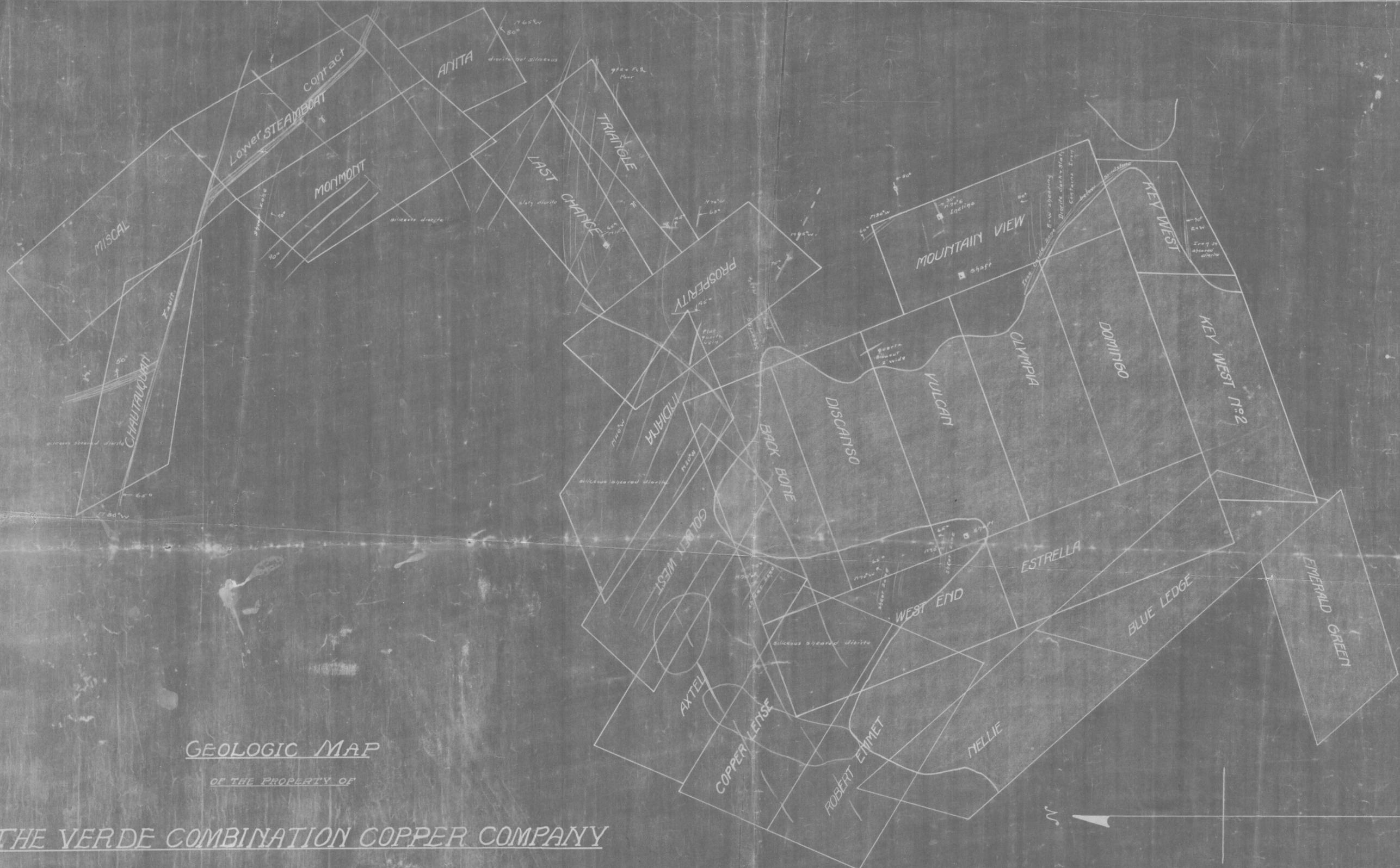
The literature circulated by the company would indicate that the plant is ready for operation.

It certainly is not.

J. G. Hume



NO.	MADE BY	DATE	DESCRIPTION	NO.	MADE BY	DATE	DESCRIPTION	DRAWN BY	DATE	TRACED BY	SCALE
5				1							CONSOLIDATED ARIZONA



GEOLOGIC MAP

OF THE PROPERTY OF

THE VERDE COMBINATION COPPER COMPANY

VERDE MINING DISTRICT

YAVAPI COUNTY

ARIZONA

SCALE 1 IN. = 400 FT.

6-20-16 A.P. Thompson

GEOLOGIC COLUMN

	Basalt		Tertiary
	Sandstone + Limestone		Paleozoic
	Diorite		Algonkian
	Diorite Breccia		
	Quartz Schist		

5076
1780

United Verde Copper Company
RECEIVED
JAN 24 1923
ENGINEERING DEPARTMENT