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A  
GEOLOGIC and ENGINEERING  
REPORT

on the

LITTLE JOE AMENDED

GOLD CLAIMS

IN

Yavapai County, Arizona

by

Richard E. Mieritz, P. E.  
Consulting Mining Engineer  
Phoenix, Arizona

August 24, 1962

TABLE of CONTENTS

	<u>Page</u>
Introduction - - - - -	1
Conclusions - - - - -	1
Property and Location - - - - -	1
Accessibility and Facilities - - - - -	1
History and Past Production - - - - -	2
Development - - - - -	3
Geology - - - - -	3
Mineralization - - - - -	3
Sampling and Evaluation - - - - -	4
Ore Reserves and Value - - - - -	5
Estimated Economic Outcome - - - - -	6
Capital Investment-Mining - - - - -	6
Potential Reserve Development - - - - -	7
Geologic Potential - - - - -	7

MAPS ATTACHED

- Index Map
- Location Map
- Claim Map
- Surface Map
- Geologic Map.

## INTRODUCTION

This report covers a geologic evaluation and appraisal of the Little Joe Amended gold claims in Yavapai County, Arizona and same was requested by the present owners. Field work was completed on August 18 and 19, 1962 by the writer.

## CONCLUSIONS

The examination of the Little Joe gold property provides evidence to justify the following evaluated conclusions:

- (1) A strong narrow fault fissure with strong gold mineralization exists in the property which is deserving of exploration,
- (2) The present development and recent sampling indicate the inferred existance of 300 tons high grade ore (approx. \$100.00) and justifies the start of an operation.
- (3) The potential of ore is great as expressed by the 2000 foot surface geologic exposure.
- (4) The ore vein would lend itself to a cheap, selective cut and fill mining method with minimum waste removal.
- (5) A \$50.00 plus per ton profit could be realized before taxes and royalty were the suggested operation used, and,
- (6) An initial capital investment of some \$20,000 would be required to get property into production.

## PROPERTY and LOCATION

Two unpatented lode claims, Little Joe #1 Amended and Little Joe #2 Amended comprise the property. Present owners are Messrs. J. C. Kostolnik, Alex Prohoroff, Robert F. Barkley and Urban Kapler, all of Phoenix, Arizona. The claims appear to be in good legal standing.

The property is located approximately in the west half of Section 24, T. 11 N., R. 4 W. in the Prescott National Forest, Yavapai County, Arizona, about seven airline miles from Kirkland Junction, a small community on U. S. Highway 89 between Wickenburg and Prescott, two towns of moderate size. (see Index Map and Location Map)

## ACCESSIBILITY and FACILITIES

Except for the last half mile, which is in dispute, travel to the property can be made by passenger car,



however, a 4 forward speed vehicle can presently be driven right to the property. Travel is completed by traversing 3.5 miles of well maintained gravel road easterly towards Wagoner from a point or turnoff west of Kirkland Junction to a "Y", thence on the right limb of "Y" southeastly 1.8 miles over a moderately maintained rancher road to a second "Y", thence on the right limb of "Y" southwesterly 6.2 miles over a similar type road to an abandoned headframe and buildings, (on right, known locally as Placerita), thence  $\frac{1}{2}$  mile further to the "Little Joe" turnoff, thence left, or north, 0.8 mile over a rough road in disrepair to the Property.

Recent Yavapai County maps indicate the existence of a road within a mile north of the property. By continuing this road to the south and a connection made, it would save approximately 5 miles of travel.

There are no facilities or utilities on or near the property. A small Spring is reported as being near Placerita, the abandoned community previously referred to.

The nearest railroad shipping point is Kirkland, a 17 to 18 mile truck haul.

The immediate area is heavily covered with large brush typical of the 4000 to 5000 foot elevation, including manzanita trees. Precipitation as snow and rain is fair to moderate, thus unlikely to hamper operations for any duration.

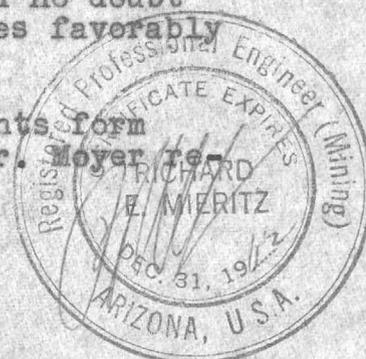
#### HISTORY and PAST PRODUCTION

Much of the following information was obtained from the files of the Arizona Department of Mineral Resource and which was supplied them by the original owner-operator.

Nine claims were originally located by the discoverer Byron Moyer in 1933. The quartz-iron vein varies from 3 to 20 inches in width, strikes NE for 2250 feet and dips steeply to the southeast. The narrow high-grade vein is associated with a 4 to 14 foot wide iron stained zone (Mr. Moyers term, an iron dike), in the schist.

The deceased owner-operator had shipped a car load to the the A. S. & R. Smelter at El Paso, Texas which netted him \$42.00 per ton. Small lot high-grade shipments to Mr. Smoot in Prescott netted Mr. Moyer \$50.00 to \$264.00 per ton. Mr. Moyer states he figured the ore in the mine would average \$100.00 per ton after smelting and freight charges. This indicates that Mr. Moyer studied the situation carefully and no doubt sampled the development. This figure also compares favorably with the evaluation completed by the writer.

In answer to Mineral Resources Departments form question as to any "special problems" involved, Mr. Moyer re-



marked "How to operate the property on \$5.00 rock". His thoughts were to mine a wide width, "high tonnage-low grade" and it is not possible to operate this property on that basis, as will be explained later in the report.

The above information has been included in the report to indicate the parallelism of facts and thoughts between the writer and Mr. Moyer with reference to the grade of ore, how it should be mined and the geologic conditions.

Since the death of Mr. Moyer, the property has been unattended and no work has been done. As a result, thieves have robbed the timber in the vertical shaft, dumped the unwanted timber in same and the elements have taken their toll on the trenches and road.

#### DEVELOPMENT

Development of the claims includes surface trenches, two adit stopes, an adit at a 5-10° minus slope, a 50(?) foot vertical shaft with drift at bottom and a sub-drift. (see Surface Map). The surface trenches have sloughed, the vertical shaft in disrepair and the sub-drift caved. Geologic conditions can be observed in the remaining workings.

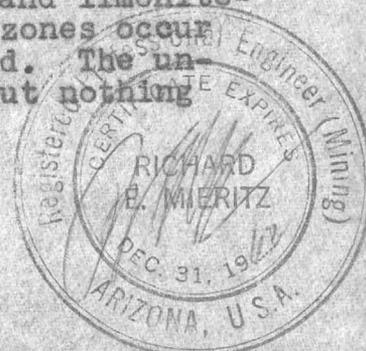
#### GEOLOGY

The country rock in the area is granite and schist. In the vicinity of the property the schist is the host rock, the general trend of which is N. 37 to 50° E. with dips of 60 to 90° SE. Within the property, the schist is locally contorted as evidenced by strike and dip changes. Major fault fractures tend to parallel the strike of the schist as well as the dips and minor faults normal to the schist strike are usually flat dipping and have a tendency to slightly offset the major fault-fractures, thus they are later than the major fractures and the mineralization.

Since much of the claimed area is heavily brush, vegetated and soil covered, geologic exposures are limited to the drainage pattern of washes, etc., which have cut through the soil cover. (see Geologic Map). The surface Geologic Map was completed by transit and stadia survey.

#### MINERALIZATION

Gold is the principal mineral of value, silver being negligible, in the fault-fissure of quartz and limonite-hematite iron and its derivatives. Several such zones occur within the claims but only one has been prospected. The unprospected zones do have an occasional small pit, but nothing of great significance.



The prospected structure is strong in character and gold mineralization. Although it is relatively narrow, ranging from 3 to possibly 20 inches in width, it does have clearly defined walls. The examination did not reveal a 20 inch width, however, the writer was not able to inspect the shaft bottom or the workings at this depth, whereas the original owner-operator did. It is therefore possible a 20 inch width exists in as much as I did observe a 3 inch width. The previous owner-operator appears to be truthful in his statements.

Gold has not penetrated the wall rock either in appreciable content or distance. This is borne out by the results of several samples taken specifically to demonstrate this condition. (see sample data).

The gold values are confined to the narrow quartz-heavy iron fault fissure. Strike length-wise, consistent values seem to be the rule rather than the normal erratic values commonly associated with gold mineralization in Arizona. Results of two samples taken in the adit bear out this thought.

The fissure vein will have a tendency to pinch and swell, however, it is the opinion of the writer that such conditions will be far apart vertically and horizontally and that a consistent 6 to 9 inch width will be most common and persistent.

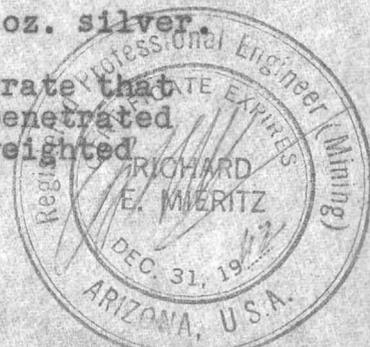
#### SAMPLING and EVALUATION

A total of nine samples were taken on the property to demonstrate various characteristics and provide information to determine the best possible economic mine extraction method. The tabulation below shows the results of the sampling completed. For position of samples see small Surface Map and Geologic Map.

No.	Sample Description	Oz/ton	\$35.00 Value
1	Back, in Adit. 6"	3.18	111.00
2	Back, in Adit. 1.83', (next to #1) F.W.	0.04	1.40
3	Back, in Adit. 2.75', (next to #1) H.W.	0.04	1.40
4	Back, in Adit, 2.83' near face includes 5" hi-grade	0.38	13.30
5	Upper open cut, face, 6"	0.56	19.60
6	Chip Char. 2', surface	0.02	0.70
7	Shaft, 9' depth, 4"	0.54	18.90
8	Shaft, 13' depth, 6"	0.90	31.50
9	Shaft, 17' depth, 6"	0.45	15.75

Composite of samples 7, 8 and 9 had 0.40 oz. silver.

Samples 1, 2 and 3 were taken to demonstrate that mineralization is limited to fissure and has not penetrated the foot or hanging wall to any great degree. A weighted



assay value of samples 1 thru 3 shows a gold content of 0.35 oz/ton or \$12.19 per ton. This compares favorably with sample 4 which was taken near the face of the adit and the 2.83 foot width sample included 5 inches of the quartz-iron fissure. Its content was 0.38 oz. at a value of \$13.30, a 92% accuracy check test.

Sample 5 is from the face of the open cut above the adit open cut. It is approximately 50 feet southwest and approximately 30 feet higher on the dip than sample 4.

Sample 6 was a grab-character sample of iron stained surface schists material exposed northeast of the Little Joe #2 Amended claim.

Samples 7, 8 and 9 were taken from the fissure exposed in the vertical shaft at the depths shown. Sample 9 would be approximately 15 feet down dip and about 140 feet north east of sample 4.

Considering samples 1 thru 5 and 7 thru 9, a strike length of 200 feet and a dip length of 50 feet has been sampled.

It is well to note at this point that samples 5, 7, 8 and 9 do not compare favorably with samples 1 and 4. (all samples were taken from the narrow vein). (sample 4 calculated back to the 5 inch hi-grade vein is 2.4 oz. or \$84.00/ton.). The average of samples 1 and 4 is \$97.50 while the average for samples 5, 7, 8 and 9 is \$21.40, the average of all being \$46.80.

Admittedly, the gold content of the vein will vary, however, samples 5, 7, 8 and 9 were taken from the vein on faces exposed to the elements, rain, wind, etc. while samples 1 and 4 were taken from the back in the adit and thus protected from the elements. The physical character of the narrow vein is such that much value could be washed from the soft limonite-hematite which makes up much of the friable, loose vein. What value was assayed is that which is married to the quartz in the fissure vein.

#### ORE RESERVES and VALUE

Ore reserves at this writing can only be classified as inferred. The block of ore considered would have a strike length of 200 feet (from vertical shaft to southwest end of Adit stope), 40 feet in depth and 6 inch width. Using a 12 cubic foot factor, 300 tons of hi-grade ore can be "inferred".

The weighted average of samples taken in the mineralized fault zone is \$98.70/ ton for an average width of 5 1/2 inches. Thus, an in place value of \$30,000 is indicated.



## ESTIMATED ECONOMIC OUTCOME

Limited sampling indicates that selective mining of the mineralized fissure must be done. Extreme care is necessary to prevent dilution, however, this hazard is eased considerably because of the physical characteristics of the fault fissure such as (1) well defined walls, (2) the unmarried condition between fissure material and host rock and (3) the relative friable condition of the fissure material lending itself to pneumatic "chiseling" removal.

Mining must be accomplished by "cut and waste fill" in as much as 85% of material broken would be waste. Muck removal to surface other than ore, is limited to that portion that must be moved to permit sufficient working height in stope, perhaps 50% to the surface, 50% in the stope. Therefore, handling, drilling and powder costs chargeable to mining would be greatly reduced.

Considering the suggested mining method, direct operational costs, transportation costs and smelter charges should approach the following:

Mining, 1 ton ore-6" avg. width	\$ 3.00
Mining, 6 tons waste, 3.5' width including ore zone	\$27.00
Truck transportation, 1 ton to Hayden or Superior, sacked.	\$ 7.00
Smelter charge, 1 ton ore	<u>\$10.50</u>
Total charges against 1 ton ore	\$47.50
Average in place value per ton ore	\$98.70
Indicated profit per ton ore	\$51.30

A cost reduction can be obtained by reducing the mining width to 3 feet. Once stopes are prepared, two miners can easily "chisel" 3 tons ore, drill and blast 18 tons of waste and move 9 tons waste to surface per day. (the other 9 tons waste remaining in stope as fill).

The "block" of "inferred" ore mentioned under Ore Reserve paragraph could show a profit of \$15,000 over a 100 day period.

### CAPITAL INVESTMENT - MINING

The capital investment figure presented here is a reflection of the proposed mining method and the limited scale operation. Dead work or preparatory work such as shaft repair (timbers, etc), sinking shaft to a 110 foot depth, drifting west at the 100 foot level, plus or minus 150 feet, raising and stope preparation is considered under the expense



item of operating expenses, that is, labor, supplies, etc.

By way of equipment, the major items would be compressor, small hoist, jack leg and drill, ore cars and accessories a air and water lines, hoses, track, ties, etc.

The present market of used and reconditioned mining equipment is very favorable, thus, it is advisable to use the average purchase price figures common to this market.

Equipment and accessories	\$ 10,000.00
Supplies and tools	\$ 3,000.00
Operating expenses	\$ 7,000.00
Total	<hr/> \$ 20,000.00

#### POTENTIAL RESERVE DEVELOPMENT

The strong geologic characteristics of the limited explored fault fissure suggest a considerable "ore" potential exists both in strike length and dip depth. This suspected potential must be ascertained by employing surface trenching and diamond drilling as the exploratory tools respectively for both directions of potential.

Small hand dug trenches should be completed and sampled to test the strike length on the surface by spacing at 25 foot intervals where possible for 200 feet NE and 400 feet SW of the vertical shaft.

Testing of the strike length at a pre-determined depth, say 100 feet below the shaft collar elevation, should consider three diamond drill holes, one near the vertical shaft, one approximately 350 feet southwest of shaft and the third approximately 175 feet northeast of shaft. Assuming results compare favorably with the results of this examination, approximately 2,500 tons of gold ore would be indicated with an in place value of \$250,000.

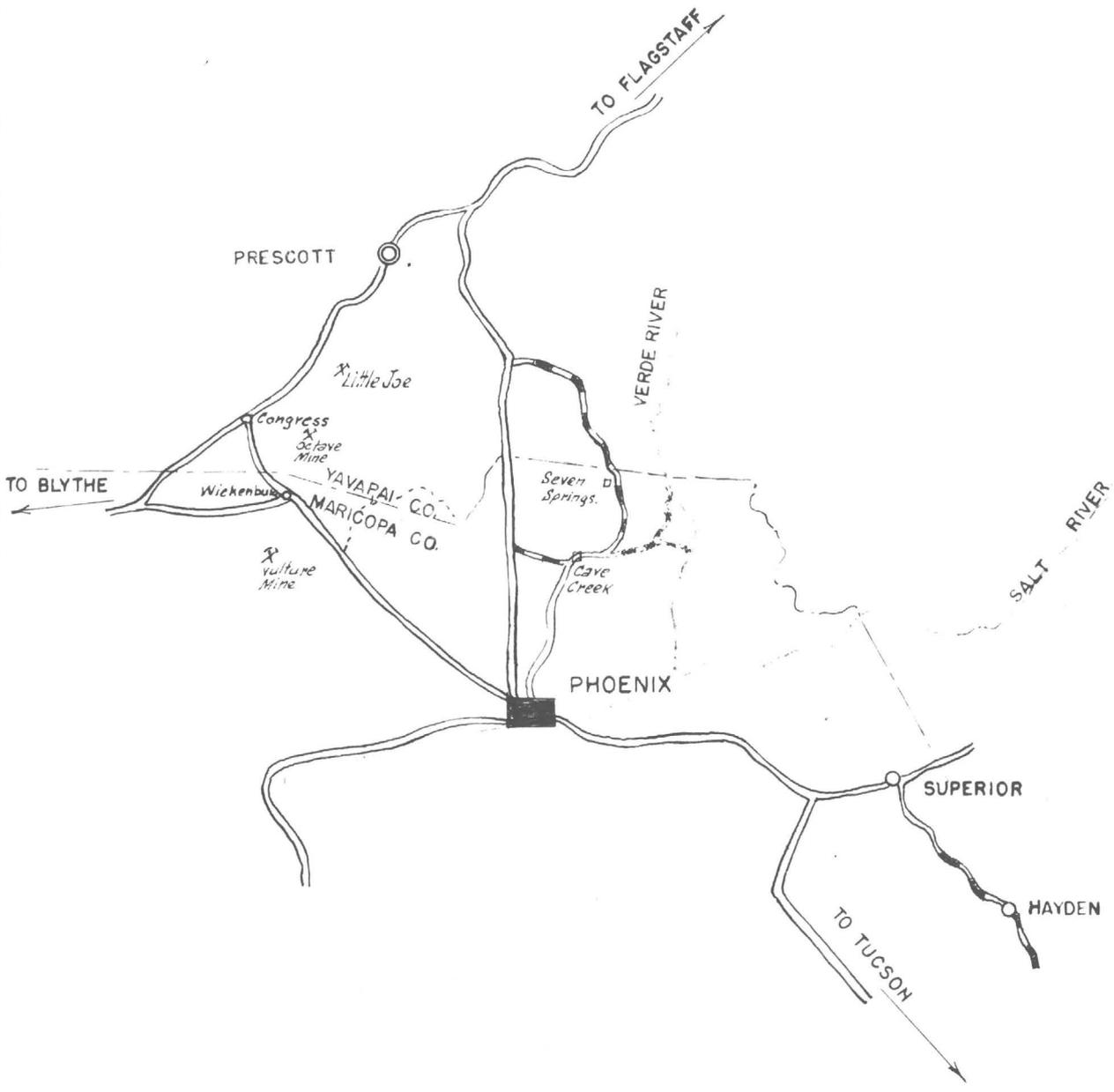
#### GEOLOGIC POTENTIAL

Surface geologic mapping of the brush covered property indicates the possible existance of parallel fault?-fissure veins. Although sporadic in outcrop evidence (see Geologic Map), they are of sufficient strength and character to desreve consideration and surface exploration and if same proves satisfactory, then depth development by diamond drilling.

The exploration suggested here and in previous paragraphs can be completed while work preparatory to mining operations is being done.

Respectfully submitted,

Richard E. Mieritz, P. E.  
Consulting Mining Engineer.  
Phoenix, Arizona.

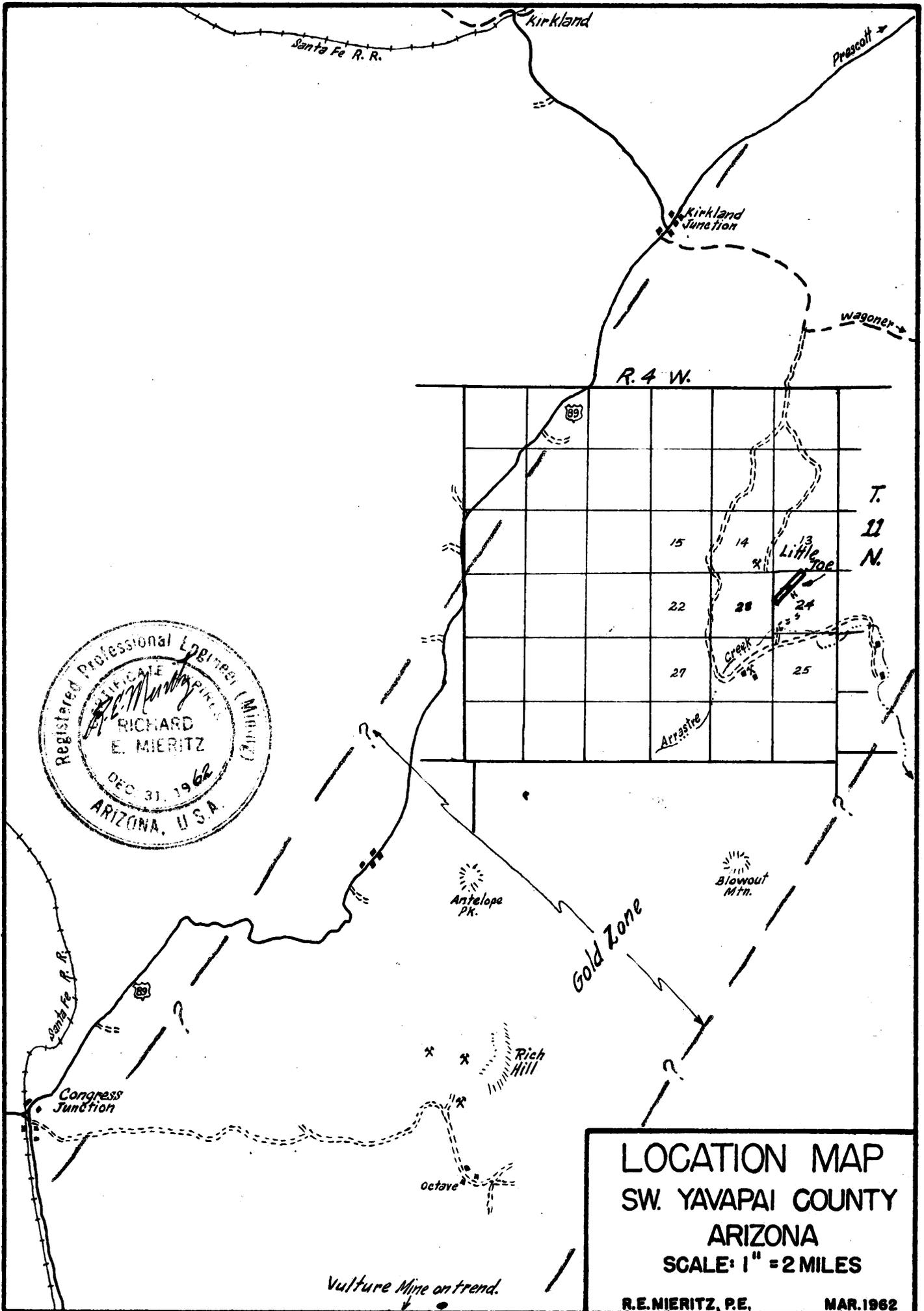


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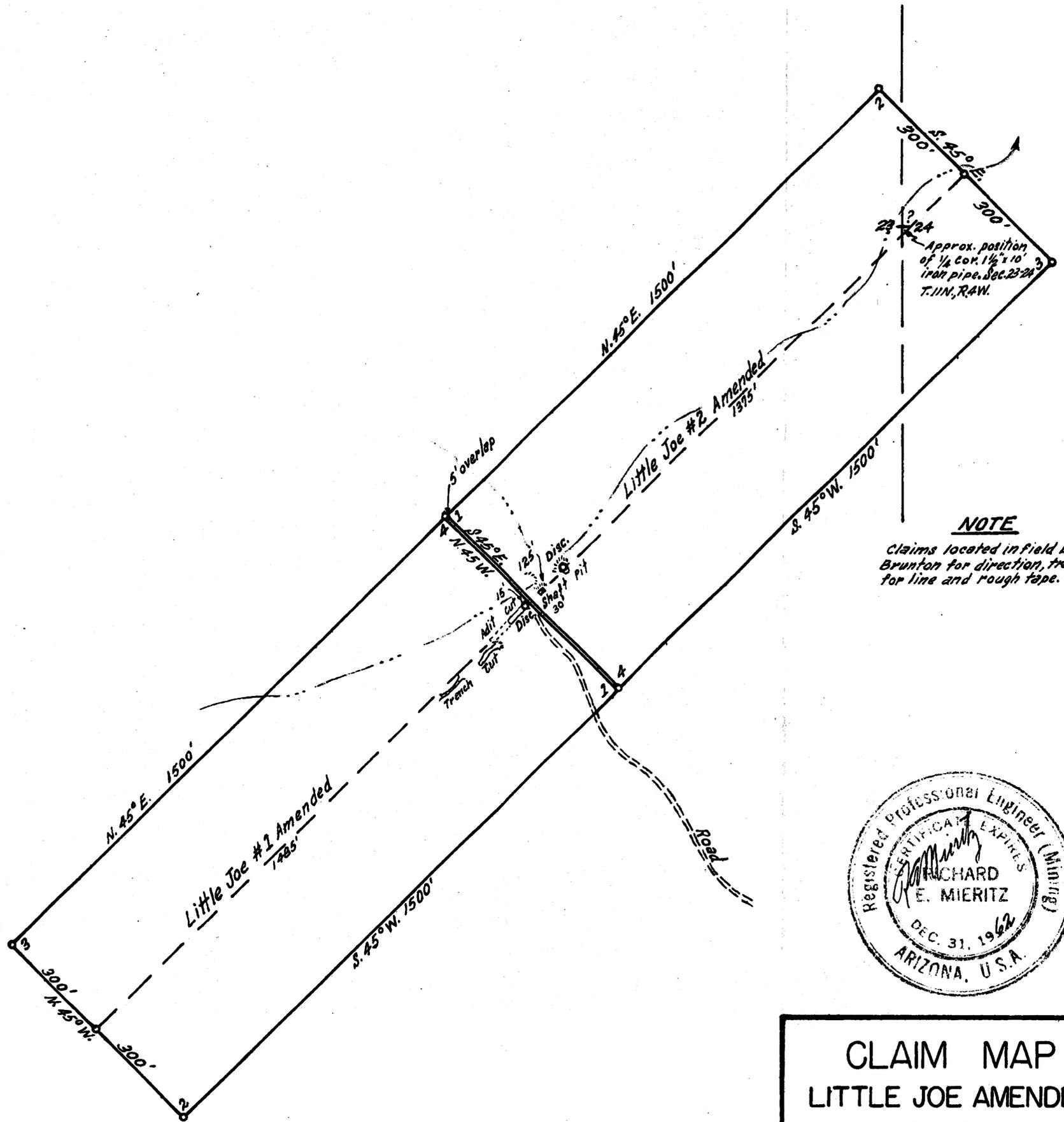
INDEX MAP  
CENTRAL ARIZ.

SCALE: 1" = 27 MI.

R. E. MIERITZ, P. E. MAR., 1962

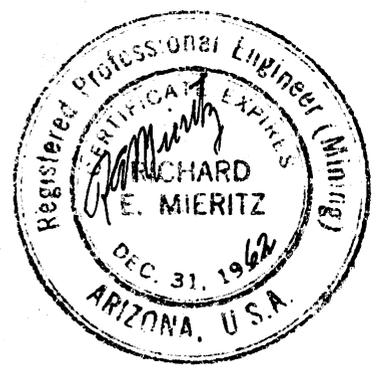


**LOCATION MAP**  
**SW. YAVAPAI COUNTY**  
**ARIZONA**  
**SCALE: 1" = 2 MILES**  
**R.E. MIERITZ, P.E. MAR. 1962**

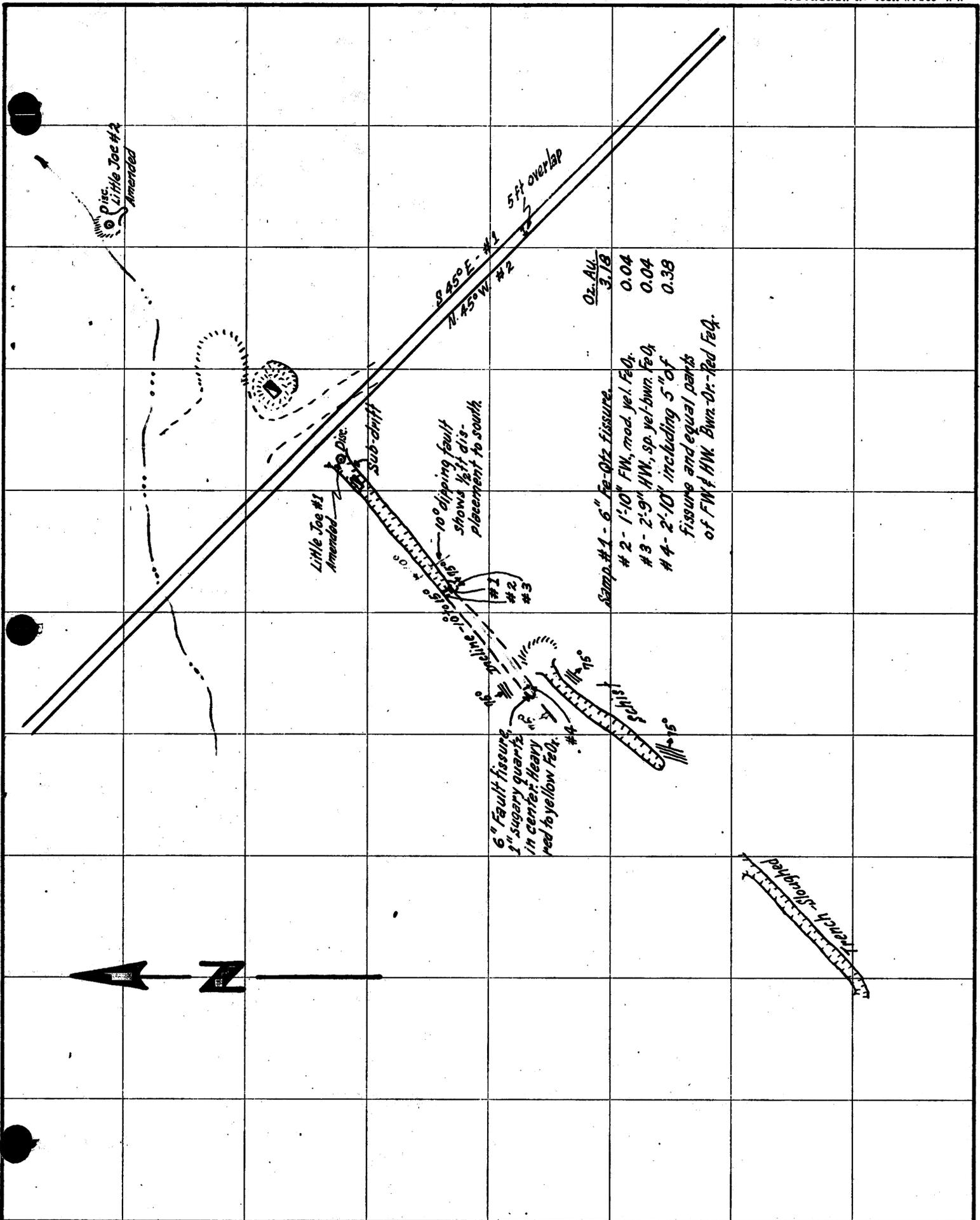


**NOTE**

Claims located in field by Brunton for direction, transit for line and rough tape.



**CLAIM MAP**  
**LITTLE JOE AMENDED**  
**GROUP**  
YAVAPAI COUNTY, ARIZ.  
SCALE: 1" = 300'  
R.E. MIERITZ, P.E. MAR., 1962



MINE "Little Joe" Amended LOCATION Sec. 23-T. 11 N., R. 4 W., Yavapai Co. LEVEL Surface  
 GEOLOGY BY R.E. Mieritz SURVEY Tape & Brunton SCALE 1" = 50 feet. DATE Mar., 1962



REPORT ON MINING CLAIMS  
of  
BRAGG ESTATE

G.M. Colvocoresses

June 21, 1924, Humboldt, Arizona

LOCATION AND GENERAL DESCRIPTION:

The property of the BRAGG ESTATE, which I have examined, consists of twenty (20) patented mining claims, listed below, comprising approximately 375 acres.

The long axis of the property is Northeast-Southwest, length nearly two miles; the width varies from 600 feet (one claim) to a maximum of 3,000 feet. (See Claim Map attached.)

This property is located in the Placerita Mining District, Yavapai County, Arizona, and in the foothills West of the Bradshaw Mountains. The surface consists of a series of ridges approximately 400 feet elevation above the gulches which separate them. The altitude is from 4200 feet to 4600 feet above sea level. There are no trees but the claims are covered with a heavy growth of brush, principally scrub oak, manzanite and buck brush, which has almost entirely obliterated the old roads and trails used some 20 years ago. The surface is quite worthless for agriculture, but a large flock of goats appeared to find it excellent pasture. Some water is found in French Gulch, also in Arastra Creek, to the East of the Bragg Claims, and there are a few little springs in this vicinity.

The nearest town is Kirkland, center of a ranching district, with a population of about 100; elevation 3,927 feet; located on the Prescott and Eastern Branch of the Santa Fe Railroad 30 miles from Prescott by rail and 25 miles by road.

From Kirkland there is a fair automobile road for 13 miles to the Zonia Camp and the McMahon shaft, the latter located one-half mile from the North end of the Bragg Claims. From the McMahon shaft it is necessary to cover the Bragg Claims on foot and any mining operations would involve the construction of new roads at considerable expense. The cost of freighting by truck from Zonia to Kirkland may be taken as \$3.50 per ton.

The claims now belonging to the Bragg Estate are named as follows:

Contact Numbers 1 & 2; Navy, Numbers 1, 2, 3, & 4.  
Nugget; Slipper; Growler; Harrison; Hillside;  
Massachusetts, Big White; Blue Bird; Sentinel;  
Hornspoon; Morning Star; Sunshine; Morning Light;  
Black Bird.

Messrs. Norris and Norris, Attorneys of Prescott, Arizona, advise that the taxes on these claims have been paid for this year. They further advise in a letter dated June 11th, 1924, that at one time the Manazneta and Harrisonburg claims were included in negotiations, but upon their investigation of the title they concluded that these two claims had never belonged to the Bragg Estate.

HISTORY:

The Placerita District was active in the 80's and 90's, during which period the creek beds were dry-placered for Gold and it is stated that in the aggregate considerable value was recovered. The location of the lode claims in the vicinity of these creeks were

intended to cover the quartz veins from which the placer gold was supposed to have originated. Subsequent development and mining has failed to prove that any of these numerous veins contained workable deposits of ore.

As far as I can learn, the claims now owned by the Bragg Estate were located, or purchased, by Mr. Hise, who transferred, or sold, them to Mr. C. V. C. Bragg, and considerable development work was carried on from 1900 until 1904, mainly for the purpose of exploring the quartz veins which outcrop at several points on the property.

Results of this development work were practically negative, except for a small production of Gold-bearing ore from the Massachusetts, Blue Bird and Black Bird claims, which was shipped to an old stamp mill, still standing, at Placerita. Ore from this mill, which has been idle some twenty years, was also procured from the Coral Mine and other properties in the vicinity.

Since work ceased on the Bragg claims, considerable development has been done at intervals in their vicinity - mainly on the McMahon and Zonia properties, where there are substantial indications of Copper, some of which extend on to the Bragg property. In 1911 and 1912 the Shannon Copper Company had options in this District and did some churn drilling with unsatisfactory results. From 1919 to 1922 the claims of the Zonia Company, McMahon and Bragg Estate were all optioned to the Spilsbury Syndicate, which was really the exploration department of the Anaconda Copper Company, and a very careful study of the general geology and surface showings was made by the Engineers of this Syndicate. They also sunk to a depth of 800 feet, the shaft on the McMahon claims, just North of the Bragg and did some drifting and cross-cutting but failed to find any commercial body of Copper ore. These people were working on the theory that a large deposit of disseminated Copper would be found in the porphyry which covers a portion of the Zonia, McMahon and Bragg properties, and that there would be a zone of secondary enrichment at a depth of from 400 to 800 feet, which might develop into a large low grade Copper mine. The work which they did gave unsatisfactory results, since the average of the disseminated area was only  $\frac{1}{2}$  of 1 per cent Copper. Accordingly the option on all these claims was dropped, but their work did not necessarily prove that smaller bodies of commercial ore may not be found under the individual out-crops.

#### GEOLOGY:

The geology of this country has been studied by the U. S. Geological Survey, and more especially by the Geologists of the Spilsbury Syndicate, and Mr. Spilsbury kindly gave me information concerning their conclusions, which was very helpful. The attached claims map will show the outlines of the various formations.

The main mass of country rock is classed as a Pre-Cambrian Diorite, which has been metamorphosed in parts to Chlorite and Sericite Schist. Through this Diorite other rocks have intruded and particularly a porphyry which varies from a granite porphyry to quartz monzonite. The latter formation is considered most favorable for the occurrence of Copper, which appears to have been derived from a deep-seated magma and to have impregnated the porphyry after this rock has been sheared to a very considerable extent.

The mineralization originally consisted of copper and iron pyrites, but near the surface there has been oxidation and leaching so that very small trace of these primary minerals is now found except in the drill holes and shafts on the Zonia and neighboring properties.

The northern portion of the Bragg Claims is partly covered by Gila conglomerate, of much later date than the Diorite, Schist or Porphyry, and apparently entirely barren of any metallic minerals.

Running through the older formations, (generally in a North-South direction), are numerous veins of Quartz, often highly stained with iron. Some of these - as on the Big White, and Massachusetts - have a width of 5 to 8 feet, but for the most part they are merely stringers from 3 to 12 inches in width, and can only be traced for a short length and a shallow depth. Small values in Gold are found in nearly all these veins and the more heavily mineralized were made the subject of the development work, and, in some cases, produced a small quantity of ore.

The area of porphyry which was considered likely to contain disseminated Copper on the Bragg claims, of the Bragg Estate, amounted to a total of slightly over eight acres.

Comparing the geological conditions on the Bragg property with those which are found elsewhere in Yavapai County, I do not consider them favorable for any large deposit of Gold or Copper ore. Small lenses of good values in Gold occur frequently in quartz stringers similar to those found here, but exploration and development during the past forty years has failed to prove up any worth while mine in veins of this character.

WORKINGS ON BRAGG CLAIMS:

The exploration and development work on the Bragg property was apparently intended to prove up the extent and value of the quartz veins mentioned and considering the character of the surface showings it has been very thorough. Unfortunately, most of the work which was done so many years ago is now difficult to examine. The sides of the trenches have fallen in, the timbers are all out of the shafts, the tunnels are mostly caved (excepting one on the Navy No. 2) and stopes are entirely inaccessible. Under these conditions it was impossible to gain access to many of the old workings or to sample, except near the surface and on the dumps. To thoroughly clean out the shafts and tunnels would involve an expenditure of probably \$3,000 to \$4,000 and I would not consider such expenditure justifiable.

Along the surface of the claims numerous trenches were cut across the formation and the quartz veins and cross-cut tunnels on the Hillside (now wholly caved), Blue Bird and Navy No. 2 were run to considerable distances, with the same object in view. As far as can now be determined, in some cases no quartz veins were cut at all, as they had pinched between the tunnel and the surface - elsewhere the quartz, when encountered, proved barren or too low grade to be worked with profit.

On the Navy No. 1 a shaft 75 feet deep followed down a quartz vein 4' wide on the surface and some stoping was done along side the shaft. Sample from this vein, taken at point marked "#2" on the map, showed no Silver and only \$0.60 Gold per ton.

Along the top of a ridge on the Black Bird and Blue Bird claims Copper stains were noted for some distance and in places small lenses one to three feet wide showed Carbonate and Sulphide Copper ore. A picked sample from one of these lenses (marked "#5" on the claim map) showed \$9.00 values in Gold and Silver per ton and 10.37% Copper but unfortunately all indications prevented the assumption that there was any substantial tonnage of this good ore.

On the Harrison claim a twenty five foot shaft was sunk on a fourfoot quartz vein and some ore had been mined. Samples taken here (at points marked "#3" and "#4" on the map) averaged \$7.80 per ton in Gold and trace of Silver.

On the Nugget claim a deep shaft in Chlorite Schist shows a quartz vein 2' wide and samples (at point "#1" on the map), showed value of \$2.20 in Gold and Silver.

On the Massachusetts claim was found the best surface showing on the property - a strong quartz vein 5' wide. A shaft 45' deep - now partly filled with water - was sunk on this vein which near the collar of the shaft (marked "#6" on the map), assayed \$15.60 per ton in Gold.

A short distance down the shaft the vein appeared to cut off and did not look nearly as strong as on the surface. The so-called Massachusetts Tunnel - now entirely caved in - on the Hillside claim (Marked "B"), was evidently started with a view to cutting this vein in depth but was not driven far enough to accomplish this result.

On the Big White claim a strong quartz outcrop can be traced for some distance, width 5 to 8 feet, and showing iron olivine and epidote. A sample ("#7" on the map), taken from pits on this vein showed it to contain only \$0.60 in gold and no silver or copper.

The above detailed description covers only the showings and workings which appeared to be the more important. Numerous other workings, consisting of surface trenches, shallow pits, tunnels and open-cuts were noted and examined, insofar as they were accessible. In none of them did there appear any ore that might be considered valuable under any condition or any indications favorable to the finding of such ore. Samples taken from some of the iron-stained quartz outcroppings showed only a trace of precious metals.

#### NEIGHBORING CLAIMS:

Under the circumstances it seemed advisable to pay special attention to the results which had been obtained through development work on the adjacent properties.

To the Southwest of the Bragg claims a small Gold Mine, known as the Coral, had been opened up by a shaft sunk on a quartz vein in schist and said to be 400' deep. This mine produced some high grade ore from small pockets and lenses but was abandoned some twenty years ago and presumably the work was not profitable to the owners. A sample taken from the dump showed a value of \$9.70 per ton in Gold and Silver.

Considerable development work was done on the Harrisonburg, which, together with the Manzanita, is now said to be owned by the Isabella Mining Company. Work here had also been abandoned many years ago and all indications pointed to the results having been entirely unsuccessful.

North and West of the Bragg property lie the Zonia, McMahon and Howard Groups, all three of which have attracted considerable attention as possible Copper producers. On the Zonia and McMahon there are surface outcrops of oxidized Copper Ore from which a small tonnage was shipped at intervals to the smelters and when the price of Copper was high a little profit was realized by the owners. Shafts on both these properties have indicated a continuation of the Oxidized ore for some distance downwards but have so far failed to develop any substantial body of Sulphides below and although these properties have, at times, been developed under option by operating Companies, including

the Shamon and the Anaconda, the Engineers who conducted the work have not felt that the claims were sufficiently attractive to merit any attempt to open them as producing mines. In other words, such development and exploration as was carried on gave unsatisfactory results.

In spite of the unfavorable history, I am inclined to think that some day (but probably several years in the future), the Zonia and McMahon properties will be worked for Copper and it is quite possible that the ore bodies may extend over on to the Bragg Claims, although since practically no development work has been done on the North end of the Bragg claims, it is impossible to make this statement as anything more than an opinion. Should the Zonia - McMahon Group, be taken over and operated at a later date, it is provable that the parties conducting this work might also desire to explore and possibly to acquire the Bragg claims and the prospective value of all these Groups seem to rest upon the chance of their becoming Copper producers, rather than on any likelihood of working Gold ore with profit.

CONCLUSION:

It is apparent that no commercial body of either Gold or Copper ore has yet been developed or indicated on the Bragg property and therefore the problem is to decide whether or not the chances of finding such an ore body justify further expenditure and development. Future work - if undertaken - would logically be confined to the better showings on the Black Bird and Massachusetts and to prospecting for Copper by shaft or drills, the porphyry area in the Northern part of the property. Such work could not result in ultimate financial profit unless it disclosed either a high grade vein of Gold ore (averaging say \$20.00 or better, per ton,) or a large body of lower grade Gold ore (say \$8.00 or better per ton,) or of Copper ore (averaging 3% or better). The present evidence is against the probability of accomplishing any of these results and, under present conditions, no fair trial of the possibilities could be made with an expenditure of less than \$25,000.00 to \$30,000.00. This outlay would be a mining gamble, pure and simple, and in my judgment the chances of success do not justify the venture.

Considering the results of former prospecting and development in this District and it's mining history to date; considering the geological formation and the record of work done elsewhere under similar conditions; considering especially the lack of favorable surface indications and of pay values in practically all the present showings, as determined by examination and samples, I cannot advise that any further development work should be undertaken at present, or any effort made to search for ore bodies which may not exist.

RECOMMENDATION:

It is my advice that this property be held with no expense other than the small amount involved in paying taxes, in the expectation that sooner or later, with improvement in the Copper market, other parties will undertake to develop the Zonia and McMahon claims and to open up the District on a substantial scale. If such work should result favorably, advantage could be taken of the opportunity, either to carry on further development on the Bragg claims, under more favorable working conditions and in the light of subsequent discoveries, or more probably this group of claims might be disposed of, with advantage, to parties who might have undertaken mining operations in their vicinity.

(signed) G.M. Colvocoresses

Mining Engineer  
Humboldt, Arizona  
June 21st, 1924.

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In spite of the unfavorable history, I am inclined to think that some day (but probably several years in the future), the Zonia and McMahon properties will be worked for Copper and it is quite possible that the ore bodies may extend over on to the Bragg Claims, although since practically no development work has been done on the North end of the Bragg claims, it is impossible to make this statement as anything more than an opinion. Should the Zonia - McMahon Group, be taken over and operated at a later date, it is provable that the parties conducting this work might also desire to explore and possibly to acquire the Bragg claims and the prospective value of all these Groups seem to rest upon the chance of their becoming Copper producers, rather than on any likelihood of working Gold ore with profit.

CONCLUSION:

It is apparent that no commercial body of either Gold or Copper ore has yet been developed or indicated on the Bragg property and therefore the problem is to decide whether or not the chances of finding such an ore body justify further expenditure and development. Future work - if undertaken - would logically be confined to the better showings on the Black Bird and Massachusetts and to prospecting for Copper by shaft or drills, the porphyry area in the Northern part of the property. Such work could not result in ultimate financial profit unless it disclosed either a high grade vein of Gold ore (averaging say \$20.00 or better, per ton,) or a large body of lower grade Gold ore (say \$8.00 or better per ton,) or of Copper ore (averaging 3% or better). The present evidence is against the probability of accomplishing any of these results and, under present conditions, no fair trial of the possibilities could be made with an expenditure of less than \$25,000.00 to \$30,000.00. This outlay would be a mining gamble, pure and simple, and in my judgment the chances of success do not justify the venture.

Considering the results of former prospecting and development in this District and it's mining history to date; considering the geological formation and the record of work done elsewhere under similar conditions; considering especially the lack of favorable surface indications and of pay values in practically all the present showings, as determined by examination and samples, I cannot advise that any further development work should be undertaken at present, or any effort made to search for ore bodies which may not exist.

RECOMMENDATION:

It is my advice that this property be held with no expense other than the small amount involved in paying taxes, in the expectation that sooner or later, with improvement in the Copper market, other parties will undertake to develop the Zonia and McMahon claims and to open up the District on a substantial scale. If such work should result favorably, advantage could be taken of the opportunity, either to carry on further development on the Bragg claims, under more favorable working conditions and in the light of subsequent discoveries, or more probably this group of claims might be disposed of, with advantage, to parties who might have undertaken mining operations in their vicinity.

(signed) G.M. Colvocoresses

Mining Engineer  
Humboldt, Arizona  
June 21st, 1924.

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REPORT ON MINING CLAIMS  
of  
BRAGG ESTATE

G.M. Colvocoresses

June 21, 1924, Humboldt, Arizona

LOCATION AND GENERAL DESCRIPTION:

The property of the BRAGG ESTATE, which I have examined, consists of twenty (20) patented mining claims, listed below, comprising approximately 375 acres.

The long axis of the property is Northeast-Southwest, length nearly two miles; the width varies from 600 feet (one claim) to a maximum of 3,000 feet. (See Claim Map attached.)

This property is located in the Placerita Mining District, Yavapai County, Arizona, and in the foothills West of the Bradshaw Mountains. The surface consists of a series of ridges approximately 400 feet elevation above the gulches which separate them. The altitude is from 4200 feet to 4600 feet above sea level. There are no trees but the claims are covered with a heavy growth of brush, principally scrub oak, manzanite and buck brush, which has almost entirely obliterated the old roads and trails used some 20 years ago. The surface is quite worthless for agriculture, but a large flock of goats appeared to find it excellent pasture. Some water is found in French Gulch, also in Arastra Creek, to the East of the Bragg Claims, and there are a few little springs in this vicinity.

The nearest town is Kirkland, center of a ranching district, with a population of about 100; elevation 3,927 feet; located on the Prescott and Eastern Branch of the Santa Fe Railroad 30 miles from Prescott by rail and 25 miles by road.

From Kirkland there is a fair automobile road for 13 miles to the Zonia Camp and the McMahon shaft, the latter located one-half mile from the North end of the Bragg Claims. From the McMahon shaft it is necessary to cover the Bragg Claims on foot and any mining operations would involve the construction of new roads at considerable expense. The cost of freighting by truck from Zonia to Kirkland may be taken as \$3.50 per ton.

The claims now belonging to the Bragg Estate are named as follows:

- Contact Numbers 1 & 2; Navy, Numbers 1, 2, 3, & 4.
- Nugget; Slipper; Growler; Harrison; Hillside;
- Massachusetts, Big White; Blue Bird; Sentinel;
- Hornspoon; Morning Star; Sunshine; Morning Light;
- Black Bird.

Messrs. Norris and Norris, Attorneys of Prescott, Arizona, advise that the taxes on these claims have been paid for this year. They further advise in a letter dated June 11th, 1924, that at one time the Manazneta and Harrisonburg claims were included in negotiations, but upon their investigation of the title they concluded that these two claims had never belonged to the Bragg Estate.

HISTORY:

The Placerita District was active in the 80's and 90's, during which period the creek beds were dry-placered for Gold and it is stated that in the aggregate considerable value was recovered. The location of the lode claims in the vicinity of these creeks were

intended to cover the quartz veins from which the placer gold was supposed to have originated. Subsequent development and mining has failed to prove that any of these numerous veins contained workable deposits of ore.

As far as I can learn, the claims now owned by the Bragg Estate were located, or purchased, by Mr. Hise, who transferred, or sold, them to Mr. C. V. C. Bragg, and considerable development work was carried on from 1900 until 1904, mainly for the purpose of exploring the quartz veins which outcrop at several points on the property.

Results of this development work were practically negative, except for a small production of Gold-bearing ore from the Massachusetts, Blue Bird and Black Bird claims, which was shipped to an old stamp mill, still standing, at Placerita. Ore from this mill, which has been idle some twenty years, was also procured from the Coral Mine and other properties in the vicinity.

Since work ceased on the Bragg claims, considerable development has been done at intervals in their vicinity - mainly on the McMahon and Zonia properties, where there are substantial indications of Copper, some of which extend on to the Bragg property. In 1911 and 1912 the Shannon Copper Company had options in this District and did some churn drilling with unsatisfactory results. From 1919 to 1922 the claims of the Zonia Company, McMahon and Bragg Estate were all optioned to the Spilsbury Syndicate, which was really the exploration department of the Anaconda Copper Company, and a very careful study of the general geology and surface showings was made by the Engineers of this Syndicate. They also sunk to a depth of 800 feet, the shaft on the McMahon claims, just North of the Bragg and did some drifting and cross-cutting but failed to find any commercial body of Copper ore. These people were working on the theory that a large deposit of disseminated Copper would be found in the porphyry which covers a portion of the Zonia, McMahon and Bragg properties, and that there would be a zone of secondary enrichment at a depth of from 400 to 800 feet, which might develop into a large low grade Copper mine. The work which they did gave unsatisfactory results, since the average of the disseminated area was only  $\frac{1}{2}$  of 1 per cent Copper. Accordingly the option on all these claims was dropped, but their work did not necessarily prove that smaller bodies of commercial ore may not be found under the individual out-crops.

#### GEOLOGY:

The geology of this country has been studied by the U. S. Geological Survey, and more especially by the Geologists of the Spilsbury Syndicate, and Mr. Spilsbury kindly gave me information concerning their conclusions, which was very helpful. The attached claims map will show the outlines of the various formations.

The main mass of country rock is classed as a Pre-Cambrian Diorite, which has been metamorphosed in parts to Chlorite and Sericite Schist. Through this Diorite other rocks have intruded and particularly a porphyry which varies from a granite porphyry to quartz monzonite. The latter formation is considered most favorable for the occurrence of Copper, which appears to have been derived from a deep-seated magma and to have impregnated the porphyry after this rock has been sheared to a very considerable extent.

The mineralization originally consisted of copper and iron pyrites, but near the surface there has been oxidation and leaching so that very small trace of these primary minerals is now found except in the drill holes and shafts on the Zonia and neighboring properties.

The Northern portion of the Bragg Claims is partly covered by Gila conglomerate, of much later date than the Diorite, Schist or Porphyry, and apparently entirely barren of any metallic minerals.

Running through the older formations, (generally in a North-South direction), are numerous veins of quartz, often highly stained with iron. Some of these - as on the Big White, and Massachusetts - have a width of 5 to 8 feet, but for the most part they are merely stringers from 3 to 12 inches in width, and can only be traced for a short length and a shallow depth. Small values in Gold are found in nearly all these veins and the more heavily mineralized were made the subject of the development work, and, in some cases, produced a small quantity of ore.

The area of porphyry which was considered likely to contain disseminated Copper on the Navy claims, of the Bragg Estate, amounted to a total of slightly over eight acres.

Comparing the geological conditions on the Bragg property with those which are found elsewhere in Yavapai County, I do not consider them favorable for any large deposit of Gold or Copper ore. Small lenses of good values in Gold occur frequently in quartz stringers similar to those found here, but exploration and development during the past forty years has failed to prove up any worth while mine in veins of this character.

#### WORKINGS ON BRAGG CLAIMS:

The exploration and development work on the Bragg property was apparently intended to prove up the extent and value of the quartz veins mentioned and considering the character of the surface showings it has been very thorough. Unfortunately, most of the work which was done so many years ago is now difficult to examine. The sides of the trenches have fallen in, the timbers are all out of the shafts, the tunnels are mostly caved (excepting one on the Navy No. 2) and stopes are entirely inaccessible. Under these conditions it was impossible to gain access to many of the old workings or to sample, except near the surface and on the dumps. To thoroughly clean out the shafts and tunnels would involve an expenditure of probably \$3,000 to \$4,000 and I would not consider such expenditure justifiable.

Along the surface of the claims numerous trenches were cut across the formation and the quartz veins and cross-cut tunnels on the Hillside (now wholly caved), Blue Bird and Navy No. 2 were run to considerable distances, with the same object in view. As far as can now be determined, in some cases no quartz veins were cut at all, as they had pinched between the tunnel and the surface - elsewhere the quartz, when encountered, proved barren or too low grade to be worked with profit.

On the Navy No. 1 a shaft 75 feet deep followed down a quartz vein 4' wide on the surface and some stoping was done along side the shaft. Sample from this vein, taken at point marked "#2" on the map, showed no Silver and only \$0.60 Gold per ton.

Along the top of a ridge on the Black Bird and Blue Bird claims Copper stains were noted for some distance and in places small lenses one to three feet wide showed Carbonate and Sulphide Copper ore. A picked sample from one of these lenses (marked "#5" on the claim map) showed \$9.00 values in Gold and Silver per ton and 10.37% Copper but unfortunately all indications prevented the assumption that there was any substantial tonnage of this good ore.

On the Harrison claim a twenty five foot shaft was sunk on a fourfoot quartz vein and some ore had been mined. Samples taken here (at points marked "#3" and "#4" on the map) averaged \$7.80 per ton in Gold and trace of Silver.

On the Nugget claim a deep shaft in Chlorite Schist shows a quartz vein 2' wide and samples (at point "#1" on the map), showed value of \$2.20 in Gold and Silver.

On the Massachusetts claim was found the best surface showing on the property - a strong quartz vein 5' wide. A shaft 45' deep - now partly filled with water - was sunk on this vein which near the collar of the shaft (marked "#6" on the map), assayed \$15.60 per ton in Gold.

A short distance down the shaft the vein appeared to cut off and did not look nearly as strong as on the surface. The so-called Massachusetts Tunnel - now entirely caved in - on the Hillside claim (Marked "B"), was evidently started with a view to cutting this vein in depth but was not driven far enough to accomplish this result.

On the Big White claim a strong quartz outcrop can be traced for some distance, width 5 to 8 feet, and showing iron olivine and epidote. A sample ("#7" on the map), taken from pits on this vein showed it to contain only \$0.60 in gold and no silver or copper.

The above detailed description covers only the showings and workings which appeared to be the more important. Numerous other workings, consisting of surface trenches, shallow pits, tunnels and open-cuts were noted and examined, insofar as they were accessible. In none of them did there appear any ore that might be considered valuable under any condition or any indications favorable to the finding of such ore. Samples taken from some of the iron-stained quartz outcroppings showed only a trace of precious metals.

#### NEIGHBORING CLAIMS:

Under the circumstances it seemed advisable to pay special attention to the results which had been obtained through development work on the adjacent properties.

To the Southwest of the Bragg claims a small Gold Mine, known as the Coral, had been opened up by a shaft sunk on a quartz vein in schist and said to be 400' deep. This mine produced some high grade ore from small pockets and lenses but was abandoned some twenty years ago and presumably the work was not profitable to the owners. A sample taken from the dump showed a value of \$9.70 per ton in Gold and Silver.

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North and West of the Bragg property lie the Zonia, McMahon and Howard Groups, all three of which have attracted considerable attention as possible Copper producers. On the Zonia and McMahon there are surface outcrops of oxidized Copper Ore from which a small tonnage was shipped at intervals to the smelters and when the price of Copper was high a little profit was realized by the owners. Shafts on both these properties have indicated a continuation of the Oxidized ore for some distance downwards but have so far failed to develop any substantial body of Sulphides below and although these properties have, at times, been developed under option by operating Companies, including

the Shannon and the Anaconda, the Engineers who conducted the work have not felt that the claims were sufficiently attractive to merit any attempt to open them as producing mines. In other words, such development and exploration as was carried on gave unsatisfactory results.

In spite of the unfavorable history, I am inclined to think that some day (but probably several years in the future), the Zonia and McMahon properties will be worked for Copper and it is quite possible that the ore bodies may extend over on to the Bragg Claims, although since practically no development work has been done on the North end of the Bragg claims, it is impossible to make this statement as anything more than an opinion. Should the Zonia - McMahon Group, be taken over and operated at a later date, it is provable that the parties conducting this work might also desire to explore and possibly to acquire the Bragg claims and the prospective value of all these Groups seem to rest upon the chance of their becoming Copper producers, rather than on any likelihood of working Gold ore with profit.

#### CONCLUSION:

It is apparent that no commercial body of either Gold or Copper ore has yet been developed or indicated on the Bragg property and therefore the problem is to decide whether or not the chances of finding such an ore body justify further expenditure and development. Future work - if undertaken - would logically be confined to the better showings on the Black Bird and Massachusetts and to prospecting for Copper by shaft or drills, the porphyry area in the Northern part of the property. Such work could not result in ultimate financial profit unless it disclosed either a high grade vein of Gold ore (averaging say \$20.00 or better, per ton,) or a large body of lower grade Gold ore (say \$8.00 or better per ton,) or of Copper ore (averaging 3% or better). The present evidence is against the probability of accomplishing any of these results and, under present conditions, no fair trial of the possibilities could be made with an expenditure of less than \$25,000.00 to \$30,000.00. This outlay would be a mining gamble, pure and simple, and in my judgment the chances of success do not justify the venture.

Considering the results of former prospecting and development in this District and it's mining history to date; considering the geological formation and the record of work done elsewhere under similar conditions; considering especially the lack of favorable surface indications and of pay values in practically all the present showings, as determined by examination and samples, I cannot advise that any further development work should be undertaken at present, or any effort made to search for ore bodies which may not exist.

#### RECOMMENDATION:

It is my advice that this property be held with no expense other than the small amount involved in paying taxes, in the expectation that sooner or later, with improvement in the Copper market, other parties will undertake to develop the Zonia and McMahon claims and to open up the District on a substantial scale. If such work should result favorably, advantage could be taken of the opportunity, either to carry on further development on the Bragg claims, under more favorable working conditions and in the light of subsequent discoveries, or more probably this group of claims might be disposed of, with advantage, to parties who might have undertaken mining operations in their vicinity.

(signed) G.M. Colvocoresses

Mining Engineer  
Humboldt, Arizona  
June 21st, 1924.