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2. Ranney, Charles R. Preliminary Report Chico Mines Property
   Dated: July1973
3. Mieritz, Richard E Letter Report
   Dated: February 21, 1967
4, Lytzen, W.W. Progress at the Jemison Mines
   Dated: September 18, 1917
5. Wickes, L. Webster Jemison Mine
   Dated: December 26, 1916
6. Gnaedinger, Ernest G, (Copy of) Jemison Mines Company
   Dated: December 26, 1916
7. Gnaedinger, Ernest G Jemison Mines Company
   Dated December 1, 1916

D.K. MARTIN & ASSOCIATES
Mining Development & Administration
4728 N. 21st Avenue
Phoenix, Arizona 85015

GEOLOGIC EVALUATION
BRONCO DIKE PROJECT

Prepared For:

Charles E. Goetz

14 JULY 1984

(602) 246-9573

GEOLOGIC EVALUATION

BRONCO DIKE PROJECT

CHICO MINING CLAIMS

GEOLOGY:

All the attendant geological features or conditions that have been responsible for the formation of economic ore deposits in the Wallapai Mining District are evidenced along the Bronco Dike.

The Dike is a prominant linear structure which traverses the Chico Property for three-fourths of a mile (see attached map). It is composed of at least three rock types and cuts all lithologic units in the area. The Dike varies from 20 to 70 feet in thickness, strikes N 10° E and dips 60° SW. Evidence of mineralization in the Dike is from iron and manganese stained gossan caps, in place mineralization underground and the number and extent of workings on the structure.

The Bronco Dike is primarily composed of Mesozoic (?) Ithaca Peak Granite, an equivalent of the Duval Mineral Park, copper porphyry orebody, which is itself a fissure filling in an older granite gneiss. The Ithaca Peak Granite is, in turn, intruded by smaller dikes of Tertiary rhyolite and diabase (?). Lastly, mineralized quartz-sulfide veins cut all rock units in the dike.

GEOLOGY (continued)

As a result of the stresses accompanying these intrusions, and repeated heating and cooling, the fissures were formed. That the fissures tapped the reservoir(s) from which these molten rocks originated not once but three times seems to be the case.

A considerable amount of primary sulfide minerals were carried up by ascending hot solutions of subsiding igneous activity is evidenced by the many small, fracture filling sulfide veinlets, ubiquitious in the granite fraction of the dike, and by quartz-sulfide veins randomly placed along the dike and at dike-vein intersections.

At least six major veins traverse the Chico Property trending northwest and intersecting with the Bronco Dike. Concentrations of ore appear to favor vein junctions.

Conditions of rock associations are reported to be similar throughout the 400-foot depth of present workings, now flooded, on the dike. Therefore, any precipitationg effects the country rock has on ascending (or decending) solutions are duplicated to a depth of at least 400 feet.

That the dike is highly altered (propylitically and silically) and saturated with water shows that was open to the action of mineralizing fluids and vapors during periods of thermal activity were favorable to ore deposition. At present the open, water filled nature of the dike enhances the possibility of secondary enrichment.

WORKINGS ON THE DIKE:

The Jamison Mine contains the most extensive workings on the dike. The mine is developed by a four-hundred foot shaft with extensive tunneling. The shaft is collared in the dike and the workings reportedly followed quartz-sulfide veins. The walls of the mine, where accessible, are composed of fractured granite containing quartz-pyrite veinlets which resemble stockwork type mineralization. The lower portions of the mine are flooded but reportedly the stockwork persists to the lowest mine workings. This report is substantiated by the character of the mine dump (Sample BD-JMD was taked from the Jamison Mine Dump). More than 2000 tons of low grade, base metal-silver ore has been stockpiled from the Jamison Mine and reportedly much more is exposed underground. Mill test results performed by Denver Equipment Company's Ore Testing Division, on stockpiled ore, averaged 0.03 ounces gold per ton, 6.0 ounces silver per ton, 1.9% copper, 1.7% zinc and 1.0% lead. Results from laboratory batch selective floatation tests show the ore can be beneficiated to recover nearly 90% of the silver, copper, lead and zinc and approximately 40% of the gold. High-grade shoots encountered in the Jamison Mine reportedly ran as high as 2 ounces gold per ton and 50 ounces of silver (sample BD-JMOS was taken from the remnants of an ore shoot in the upper workings).

The Owens inclined shaft is collared in the dike and is reported developed to a depth of 84 feet but is presently flooded. It is further reported that the shaft was sunk on a quartz vein which ran a quarter ounce of gold. The mine is collared in the wash and it appears the dump was washed away during a flood.

WORKINGS ON THE DIKE (continued)

The Bronco Dike Tunnel is located just across the wash from the Owens inclined shaft. The tunnel is flooded but partially accessible and appears to follow a quartz-sulfide stringer composed of pyrite, galena, chalcopyrite and sphalerite (sample BD-BDT was taken from this stringer). Two caved areas on trend with the tunnel appear to be where stopes from the tunnel broke through to the surface, abundant copper staining was noted in the vacinity of these cave-ins (samples BD-DC 1-5 were taken across the dike outcrop in a dozer cut above the stoped area).

The Logas Workings consist of three adits, all of which are in the dike. The southern-most adit is flooded and the entrance sealed with gypsum/anhydrite precipitate. The dump is composed of granite similar to the Jamison Dump described above. The middle adit is short with face, ribs and back in stockwork granite with pyrite veinlets identical to the dumps mentioned above (sample BD-LW was taken across the face). The northern-most adit enters the dike on the updip side heading southwest toward the southern adit. The adit enters in rhyolite and thirty feet from the portal, at the rhyolite-granite contact, a twelve inch wide, massive arsenopyrite vein intersects the tunnel obliquely (sample BD-LW aspy was collected from this vein). The adit continues on 80 feet through highly fractured and bleached granite to a cave-in where the tunnel passes under the road. The granite contains stockwork type quartz-pyrite veinlets and is extensively altered (sericitic?). The Logas Workings occur at the Alpha Arm branch of the Bronco Dike (See attached map).

WORKINGS ON THE DIKE (continued)

In addition to the above described workings, numerous exploration pits and trenches have been dug on the dike exposing small veins and stained areas which, when taken together, attest to the abundant mineral content of the dike.

RECOMMENDATIONS:

In addition to the low-grade, large tonnage deposit indicated to exist in the Bronco Dike, it is probable that several high-grade low tonnage ore shoots could be delineated within the larger deposit.

It is known that the most favorable loci for ore in the Wallapai District, is at vein flexures and junctions. Six major veins traverse the Chico Property toward intersections with the Bronco Dike, namely, the Little Boy-Jamison, the Mint-"98", the Nighthawk-Cashier, the Alpha, the Summit and the Logas. It is therefore recommended that these veins be carefully mapped to intersection with the dike, the intersection sampled and, if warranted, drilled to determine the size and tenor of values in the ore shoot.

Respectfully submitted,

Wm Vanderwall s/s

Wm. Vanderwall
Geologist, Az. Reg. GIT34

D.K. MARTIN & ASSOCIATES
Mining Development & Administration
4728 N. 21st Avenue
Phoenix, Arizona 85015

SAMPLE DESCRIPTIONS
BRONCO DIKE PROJECT
Chico Mining Claims
14 July 1984

BD-JMD	Grab sample from various portions of the Jamison Mine Dump, composed mostly of granite and rhyolite fragments with pyrite veinlets and blebs, minor quartz. Gold = 0.0006 oz/tn Silver = 0.000 oz/tn
BD-BDT	Select sample from 2" wide qtz, ccp, sp, ga vein in Jamison workings, remnant of ore shoot. Gold = 0.0360 oz/tn Silver = 8.760 oz/tn
BD-DC 1	4' channel across dozer cut, mostly granite Gold = 0.0010 oz/tn Silver = 0.196 oz/tn
BD-DC 2	4' channel across dozer cut, granite + rhyolite + contact Gold = 0.0009 oz/tn Silver = 0.269 oz/tn
BD-DC 3	4' channel across dozer cut, rhyolite Gold = 0.0010 oz/tn Silver = 3.420 oz/tn
BD-DC 4	4' channel across dozer cut, rhyolite Gold = 0.0020 oz/tn Silver = 5.640 oz/tn
BD-DC 5	4' channel across dozer cut, rhyolite + granite + contact Gold = 0.0015 oz/tn Silver = 0.575 oz/tn
BD-JMOS	Select sample across 14" wide qtz, ccp, sp, ga vein in Bronco Dike Gold = 0.0410 oz/tn Silver = 1.720 oz/tn
BD-LW	6' channel across face of Logas middle working, bleached granite with pyrite veinlets and blebs. Gold = 0.0009 oz/tn Silver = 0.000 oz/tn
BD-LW aspy	Select sample across 12" wide aspy vein in north Logas Adit. Gold = 0.0067 oz/tn Silver = 5.020 oz/tn

(602) 246-9573

F I N A L R E S U L T S

Job Number: MA-1502
Date: July 20, 1984

Client I.D.	Lab #	Geochemical Analysis	
		Au (ppm)	Ag (ppm)
Chico Property			
BD-BDT	1	1.24	300.0
BD-DC1	2	.04	6.7
BD-DC2	3	.03	9.2
BD-DC3	4	.04	117.0
BD-DC4	5	.06	193.0
BD-DC5	6	.05	19.7
BD-JMD	7	.02	<.2
BD-JMOS	8	1.39	59.0
BD-LW	9	.03	<.2
BD-LW-ASPY	10	.23	172.0

NORTH AMERICAN LABORATORIES, INC.
1022 West 23rd Street
Tempe, Arizona 85282
(602)894-0919

C E R T I F I C A T E O F A N A L Y S I S

Date:	July 20, 1984
Job Number:	MA-1502
Client Name:	D.K. Martin & Associates
Address:	4728 N. 21st Avenue Phoenix, AZ 85015
Telephone:	246-9573
Samples Submitted by:	Mr. Brown
Date Received:	July 17, 1984
Telephone Results:	to Mr. Brown by GAH on 7/20/84
Sample Preparation:	The entire sample was crushed to -1/4 inch, blended, split and the split pulverized to -200 mesh.
Geochemical:	Analyses performed by Atomic Absorption - Au, Ag

CHARLES R. RANNEY
MINING ENGINEER

PHONE 622-3688
BOX 99, SANTO TOMAS RTE
SANUARITA, ARIZONA

PHONE 793
AVE JUAREZ 331
CANANEA, SONORA, MEXICO

PRELIMINARY REPORT

CHICO MINES PROPERTY
Kingman, Arizona

by

Charles R. Ranney

July 1973

1/11

CHICO MINES PROPERTY
Kingman, Arizona

INDEX

MAP INDEX

2/11

P. O. Box 99
Wikieup, Arizona 85360

July 18, 1973

Mr. Charles E. Goetz
Mining-Exploration
P. O. Box 2228
Phoenix, Arizona 85002

Dear Mr. Goetz:

Please find my accompanying report on your Chico Mines Property.

I spent more time than anticipated because the property has more economic potential than I expected.

Please note my specific Conclusions and Recommendations.

Respectfully submitted,

Charles R. Ranney
Mining Engineer

CRR:lc

3/11

CHICO MINES PROPERTY
Kingman, Arizona

CONCLUSIONS

1. Because of recent increases in the price of metals, particularly silver and gold, the possibilities of developing a producing mine, or mines, at the Chico Mines property are excellent.

   Immediate exploration and development are recommended for the 4 major vein deposit systems.

2. The Chico Mines Claims along the northern boundary, possible favorable areas for a large porphyry copper type deposit, might better be farmed out to a large, well-financed organization.

4/11

CHICO MINES PROPERTY
Kingman, Arizona

INTRODUCTION

A. Location

The Chico Mines Property is situated in Mohave County, in the Hualapai Mining District of the Cerbat Mountain Range, in northwestern Arizona. The nearest railroad station is at Kingman on the Santa Fe railroad. It is reached from the property by about 5 miles of improved dirt road and 14 miles of pavement, U. S. Highway 93.

To the north, the Chico Property adjoins the claims of the open pit Ithaca Peak copper-molybdenum operation of Pennzoil-Duval Corporation, currently mining 18-20,000 tons of ore per day.

This preliminary report was prepared for the owner of the Chico Mines Property, Mr. Charles E. Goetz of Phoenix, Arizona.

B. Purpose of Investigation

Preliminary investigation of the Chico claims was undertaken to evaluate the economic possibilities of the property, both from the standpoint of a possible large disseminated copper-molybdenum producer, and as a medium sized base metal and gold silver producer.

Approximately 10 days were spent on the property. Considerable difficulties were encountered in correlating the claim posts in the field to the 'surveyed' claim maps. These maps are not correct for the patented claims as shown. Furthermore, most of the unpatented claims are not marked in the field. This omission should be corrected and a correct survey established.

I wish to thank Mr. Francis J. Denten for his very able assistance in the sampling and appraisal of the property.

Mr. Jack Owens and Mr. Denys Poyner also made valuable contributions.

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CHICO MINES PROPERTY
Kingman, Arizona

SUMMARY

1. The Chico Mines Property comprises 48 claims, 2 patented, located in Sections 31, 32, T. 23 N., R. 17 W., and Sections 5, 6, T. 22 N., R. 17 W., Gila and Salt River Meridian.

2. The claims, for the most part, are situated around the old Stockton Hill mining camp, and they border the Mineral Park Region. The Chico north claims' boundaries adjoin the Ithaca Peak Claims of the Pennzoil-Duval Corporation; to the south, the Chico Claims adjoin the Golconda Mines group, the second largest base metal producer in the Hualapai mining district.

3. Rocks exposed at the surface include granites, gneisses, schists, and amphibolites of pre-Cambrian age, intruded by the Ithaca Peak granite or quartz monzonite porphyry, the center of which lies north of the Chico claims. This intrusive, with related dykes and sills, is thought to be the source of most of the mineralization in the district. It has tentatively been assigned to the Mesozoic Era.

4. The ore mineralization on the Chico claims can be separated into two types. The first is represented by the vein deposits, occurring along fissures in all of the rock types. Most of the veins strike from N. 30 W. to N. 60 W., dipping steeply to the northeast. The northwest veins vary in width, averaging 3-4 feet, but they increase to up to 30 feet wide at vein junctures. Along the 'Broncho' dyke area, extending from the Golconda Mines workings past the most northerly Chico Claims' boundaries, ore mineralization strikes N. 10° E., and it dips approximately 60 degrees to the northwest. Junctures where the northwesterly trending vein systems intersect the Broncho dyke appear to be very favorable loci for ore.

5. Potentially favorable areas for a large commercial copper porphyry, quartz-sulphide stockwork, deposit lie along the northern boundary of the claims where monzonite porphyry outcrops occur as possible small cupolas. Drainage to the south of these outcrops shows abundant copper sulphate precipitation. The possibility of locating turquoise in connection with copper mineralization, as at Turquoise Mountain nearby, should not be overlooked. A limited geochemical sampling program should be considered as a guide to possible drilling.

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Summary (Cont'd.)

6. At least four major vein systems are exposed on the Chico Claims. They trend northwest from Stockton Hill to intersections with the manganese stained 'black dyke' (Broncho Dyke) which extends N. 10° E. from the Golconda Mines workings.

   Looking from northeast to southeast they are: (see map)

   1. The Alpha Vein.
   2. The Black Knight-Cashier Vein.
   3. The Little Boy-Mint Vein, with the '98' Vein possibly joining the Mint vein from the northeast.
   4. The Blackfoot Vein which appears to be joined by the Gold Reserve Vein below Stockton Hill.

   In addition, the Ithaca Peak porphyry tongue extending as a dyke southeastward to the Oro Plata Mine (Golconda Extension) continues along the Pasadena No. 1., the Mammoth No. 7., and the Mammoth No. 5. claims. (see map)

   The True Blue Vein (patented claim) extends northwesterly between the Broncho Dyke fissure system and the monzonite porphyry tongue fissure system. Intersections along both of these dyke fissure systems with the north west trending vein systems have been shown to be extremely favorable ore loci by present sampling and previous workings.

7. Results of recent spot check sampling are tabulated and shown on Map No. .

8. Because of recent increases in metal prices, and most particularly silver and gold, the probabilities of developing a producing mine, or mines, at the Chico property are greatly increased. Development work at the property during the past few years does not appear to have been conducted in a miner-like fashion.

   No mining operation in the United States today can be made to pay without mechanization. Mechanization is the answer to high labor costs. The development of trackless mining equipment for small and intermediate, as well as large scale, underground mining can be successfully applied at the Chico Mines property.

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CHICO MINES PROPERTY
Kingman, Arizona

RECOMMENDATIONS

1. The Chico property can be considered as two separate and distinct units. Each unit should be handled in a different manner.

   A. Unit A comprises areas along the northern boundary, the possible favorable areas where a large commercial porphyry copper type deposit might be found and developed. Preliminary geochem work could aid in delineating favorable areas for drilling. These areas might better be farmed out to a large well-financed organization for exploration and development.

   B. Unit B encompasses the vein deposits, comprising four major vein systems. Because of increases in metal prices, particularly silver and gold, the time is propitious for immediate exploration and development.

2. The proposed work on the vein system deposits should be undertaken in two phases, phase No. 2. being contingent upon the results of phase No. 1.

Phase No. 1.

This phase consists primarily of checking vein junctures, pumping and cleaning out old workings, bulk sampling, and development for the proving up of sufficient tonnages to justify and serve as a guide for a milling installation.

The use of an adequate bulldozer, preferably a D 8 H Caterpillar, or its equivalent, is a necessity.

The access tunnel on the Little Boy claim should be cleaned out and thoroughly checked. There is a very good possibility of mining high grade silver ore from this area. (see map)

The incline shaft near the northeast corner of the True Blue Claim, intersecting the "Broncho Dyke at shallow depth, should be pumped out and thoroughly sampled. Spot sample checks of dumps and dyke outcroppings showed around an ounce per ton of gold and 15 oz. /ton of silver. This incline was driven by Mr. Jack Owens who reports that very good gold values were discovered along the dyke.

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Recommendations (Cont'd.)

Other northwest vein junctures with the Broncho Dyke and the monzonite porphyry tongue to the west should be opened up with a bulldozer.

Phase No. 2.

Pursuant to the exploration and ore development accomplished in Phase No. 1., a new development incline should be driven to allow access to the most favorable areas of the major vein systems at depth.

This work must be undertaken with trackless mining equipment in order for a profitable mining operation to be carried on in the present high labor market.

2. Phase No. 2.

Selection and installation of milling equipment, pursuant to development and testing of stockpiled ore, might better be carried out in two phases also. A 100 ton initial milling unit should be adequate to handle the initial phase. Any addition should be dependent upon subsequent development.

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CHICO MINES PROPERTY
Kingman, Arizona

History and Production

From 1863-1900, oxidized portions of the fissure veins were prospected and mined. Very high grade concentrations of silver ore were reportedly discovered. No exact production figures are on record.

The value of metals produced during the years 1904-48, U. S. Bureau of Mines Report, was about $22,500,000. Values were principally in lead and zinc with subsidiary silver and gold. In 1943, the Tennessee Mine was reported as producing about 150 tons crude ore per day, averaging 7 per cent zinc, 3.5 per cent lead and 17 to 25 ounces of silver per ton.

Pennzoil-Duval Corporation is reportedly producing 18-20,000 tons of ore per day averaging around 0.50 percent copper and 0.045% molydenum, averaging around 12 dollars per ton.

The yearly Pennzoil-Duval production now amounts to more than the entire production of the Hualapai mining district previous to their operation.

Accessibility

The Cerbat Mountains rise sharply from the detritus filled valleys bordering them on the East and the West. Total relief is about 3500 feet.

The Chico Claims are easily accessible by a number of recently bulldozed roads, cutting and exposing the major vein systems.

Climate and Vegetation

The climate is arid, with mild winters and relatively hot summers.

Vegetation is sparse chiefly of the desert types. Scrub pinon and juniper is found at the higher elevations.

Water

Ample water for mining is found in the old workings.

Sufficient water for a moderate-sized milling operation can be developed in the fissure systems.

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CHICO MINES PROPERTY
Kingman, Arizona

General Geology

The Chico Area is underlain by pre-Cambrian schist, amphibolite and altered granite, cut by later intrusions of Mesozoic granite and monzonite phorphyries, known locally as the Ithaca Peak Granite. This intrusive, with related dykes and sills, is believed to have been the source of most of the mineralization of the Hualapai Mining District.

Outlying bodies of the Ithaca Peak granite are particularly abundant on the Chico Mines Area, extending from Mineral Park south into the former Stockton Hill and Cerbat Mining Camps.

Many veins occur in nearly vertical fault fissures that strike northwestward and outcrop for considerable distances. The fault fissures are largely occupied by breccia with abundant shearing and some gouge. Ore lenses, though not continuous, are numerous and tend to be of greater vertical than horizontal extent. The best ore shoots are discovered close to intersections and vein junctures. Most of the ore lenses now exposed contain quartz, sphalerite, galena and pyrite with a fair amount of gold and silver. High grade gold and silver is found not only at the higher elevations of the major vein systems but also along their intersections with the 'Broncho Dyke'.

Ore Reserves

There are no blocked out ore reserves on the property. However, there is ore exposed in the Mint tunnel and in many places on the surface, cuts, trenches, old dumps, Etc.

As previously mentioned, abundant copper Sulphate precipitation may be noted in drainage areas to the south of the northern Chico Claims which border the Pennzoil-Duval properties.

Charles R. Ranney
Mining Engineer

11/11

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Richard E. Mieritz

MINING CONSULTANT

GEOLOGY
EXPLORATION
EVALUATION
FEASIBILITY
OPERATION

February 21, 1967

Mr. Charles Goetz
Charles Goetz Mining
P. O. Box 2228
Phoenix, Arizona, 85001

Dear Mr. Goetz:

At your request through Mr. Alex Prohoroff and accompanied by him on February 18 and 19, 1967, I briefly examined the Chico group of lode claims south of the Duval Sulphur copper operation near Chloride, Mohave County, Arizona.

Mr. Prohoroff explained the purpose of the examination as being to provide you my ernstwhile and candid opinion of the property and if it was of sufficient "merit"; then to provide you my candid recommendations as to project procedure in the immediate future.

Mr. Roy Montague very cooperatively accompanied Mr. Prohoroff and myself over the property as well as pointing out many of the mineralized structures and providing the writer with many facts which he has gained from prospecting and working the property for a five year period. I found Mr. Montagues' facts and remarks very accurate and is a capable man.

The brief examination included observing all the accessible underground workings of the Jamison structure currently being drift developed about 80 feet lower in elevation than the main Adit level and a very fast "look-see" of most all other vein structure outcroppings within the claimed area.

On the basis of what was observed in the underground workings and surface exposures plus facts provided by Mr. Montague, it is my honest opinion that the property hosts well developed strong structures containing strong to moderate copper, zinc, lead, gold and silver mineralization. I also strongly opinionate that the property poessesses the potential of a large mass containing complex low grade mineralization as copper, zinc, lead, gold and silver.

Regardless of the type and mode of mineralization and a desire or thought to "operate" as soon as possible, exploration and development of the "veins" or low grade "mass" are a pre-requisite to <u>any</u> well planned profitable operation, that is to

say, before any mining and milling operation could be planned to provide a reasonable profit and return of capital investment required for such an operation whether it be underground mining or open pit mining.

Without going into all ramifications of geologic rock types, structural features, etc, as I am sure my predecessors have fully described, let me say that major mineralized structural features within the property generally strike N. 30° W. or S. 30° E. with very steep dips and other structures strike about North-South with flatter dips, usually to the west. These mineralized structures as exposed on the surface appear to be about 200 feet, or less, apart. The area can therefor be considered as one of moderately, majorly fracture patterned and was therefor very receptive to mineralization. An observation of particular importance is the fact that disseminated copper, zinc and lead mineralization is exposed in some of the Jamison underground workings. The degree and extent of such mineralization is difficult to evaluate with the limited amount of workings available.

In general, I am of the opinion that this property parallels to a great extent the geologic and structural features as the Duval property to the north.

The Chico property could produce at some future date either by (1) underground mining and milling of the strong, highly mineralized structures with limited small daily production, or (2) open pit mining and milling of low metallic content material but with large daily tonnage. In either case, adequate exploration and development must be done before high investments are made.

Exploration and development to assure adequate ore reserves (at least two years supply for underground mining) must be proved. Such exploration and development work by underground methods is slow and costly. I can not recommend this route at the moment.

The observance of disseminated mineralization in the Jamison workings suggests the potential presence of a low grade mineralized mass in this vicinity. This expression of disseminated mineralization is not however visible on the surface. None-the-less, its presence is of sufficient importance that it must be explored.

The dissemination is no doubt a result of and controlled by the major fissure or structural features in the area. Since most major structures in the area are very steep dipping in character, it is best to "explore" these and their intervening

areas by some means of crosscutting at as near a right angle as possible, both strike-wise and dip-wise. Such work must originate in the area of known mineralization, weak or strong, and in this case it is the exposure of dissemination on the Adit and 80 foot levels of the Jamison workings.

Diamond drilling is by far the most rapid and less expensive as compared to underground cross-cutting exploration. To this end I therefor recommend to you the following:

(1) Diamond drill two holes from an underground station near the face of the 80 foot level.
(2) The length of these holes should be 500 feet plus and directed approximately N. 75° E., collared on the east wall of the drift while the second hole should be directed approximately S. 45° W. and collared in the west wall of the drift.
(3) Both holes should be drilled at a -15° from the horizontal. The bottom of a 500 foot hole will then be approximately 130 feet below the elevation of the present 80 foot level. Drilling in the directions indicated in (2) will place the bottom of the holes approximately 100 feet ahead of the present face of the 80 foot level.
(4) Holes should be drilled BX and AX size if possible, if not, then AX and EX size.

Such drilling will then be exploring the area beneath the disseminated mineralization observed on the Adit level beyond the winze servicing the 80 foot level as well as cross-cutting an vein structures within the 500 foot distance.

If this exploration shows encouraging results it would be advantageous to move your surface diamond drill onto the property and commence an energetic, well planned, grid type, vertical hole program approaching 15 to 20,000 feet of drilling.

The initial underground drill program recommended should be contracted since time is of the essence and such program would cost approximately $10,000.00 plus including a contract price, sampling and assaying and professional supervision.

Taking of samples in the mine at this time is an expense which could not be justified, however, two samples were taken as follows: (1) material representing the mineralized rock (about 80 tons) Mr. Montague removed from the 80 foot level and has stock piled near the portal and (2) cuttings from a 20 foot long drill hole Mr. Montague drilled into the east wall about 50 feet from the present face on the 80 foot level. The results of these assays as completed by Valley Assay Office in Tempe are as follows: (next page)

	Oz. Au.	Oz. Ag.	% Cu	% Zn	% Pb.
Samp. 1 (stockpile)	0.08	16.8	6.5	5.10	6.05
Samp. 2 (cuttings)	Tr	0.10	Nil	Nil	Nil.

No disseminations were observed near the collar of the 20 foot drill hole which sample No. 2 represents. Washing of the cuttings did however show some pyrite mineralization.

It is hoped the above will provide you with adequate information on how to further proceed with the Chico project. If you have any questions, please call me.

Respectfully submitted,

R. E. Mieritz, P. E.
Mining Consultant.

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD E. MIERITZ
Dec. 31, 19[illegible]
ARIZONA, U.S.A.

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R E P O R T

ON THE PROGRESS AT THE JEMISON MINES

CERBAT MOUNTAINS. MOHAVE COUNTY.ARIZ.

BY

W.W.LYTZEN. E. M.

SEPTEMBER 18, 1917.

Lauzier Wolcott Company,
51 E. Broadway,
Butte, Montana.

Gentlemen:

This report is a continuation of my report on the same property submitted July 3, 1917.

PROGRESS:

The shaft has been sunk from 82 ' below the tunnel (100' level) to the 300' level, a distance of 108 feet. It has a uniform dip of 78 degrees to the S.W. and is along the foot wall of the vein in granite porphyry. The shaft is 290' below the collar.

The 100' level, or the main tunnel level has been advanced 110' to a total of 510' S.E. of the Broncho Dyke. A crosscut N.E. was run 20', 205' S. E. of the shaft.

The 200' level has been drifted on 75' and the vein is 15' S.W. of the shaft.

At the 300' level the vein is crosscut at a distance of 16' S.W. of the shaft, and is drifted on 20'.

The reader is referred to the accompanying map for a better understanding of this progress and to the following part of this report.

Also an auxiliary air compressor of 125 Cu. ft. capacity has been added to the mechanical equipment.

A shipment of ore made in August (8/25/17) to the Consolidated Arizona Smelting Company, Humbolt, Ariz., ran $6.60 Gold; 19.40 oz. Silver; 4.67% Copper, which after deducting smelter settlements has a net value per ton of $37.93. Silver was paid for at 87.42¢; Copper at 24.92¢; Gold $19.00 per oz.

GEOLOGY

That the vein is a true rock fracture I feel quite certain. It cuts both diabase and porphyritic rocks. That it is later than the diabase is shown by the fact that at the beginning of the vein on the underside of the rhyloite dyke it (the vein) has diabase for both walls.

The thickness is not definitely known on account of no openings at this point. The diabase wall rock is seamed with tiny veinlets of sulphides, most pyrite.

As the main tunnel (100' level) is followed southeasterly past the shaft the diabase is a mere shell, or casing for the vein, and also forming varying amounts of vein filling, having been replaced by quartz and sulphides in part.

This diabase casing is quite thin as in places it is an easy matter to pick through to porphyritic rock.

At 305' S.E. of the Dyke no more diabase is found on the hanging wall side, but it continues as the foot, and a crosscut run in 20' N.E. still has diabase in the face showing a condition much thicker horizontally than that indicated in my first examination.

The diabase in this crosscut is slightly pyritized and contains small seams of sphalerite (zinc sulphide).

At 460' S. E. of the dyke, at the tunnel level, the diabase contact with the porphyry swings N. E. out of the tunnel and from here on the tunnel is within porphyry walls to the face.

At the time of my examination in June, the face of the tunnel was 400' E.E. of the dyke and oxidized vein quartz was

just beginning to show itself. This oxidation has been present all along the vein up to the present face. A short shoot of ore about 20' long and 10 to 12 inches wide developed here which sampled 10" wide $0.80 gold; 31.52 oz. Silver, and 6.27% copper. Total value with copper at 18¢ and silver 65¢ of $43.85 and with 23½ and $1.00 prices, the total value is $60.80 per ton.

Beyond this both sulphides and quartz gradually pinch out and only a small clay seam is now in the face.

The porphyritic rock is roughly sheeted and dips to the N. E. from 70 to 80 degrees.

The vein conforms to this sheeted structure, as 25' back from the face a good wall of porphyritic rock with a clay quage has the same dip.

The change in dip makes it highly probable that this tunnel is on the same vein as the two upper tunnels are on (the vein containing the rich stope that was worked years ago by "Highgraders").

The relative position and dip correlates them very close. The present tunnel face is about 225' from the position of this stope, which is reported to have produced $50,000, and it is 220' underneath it, but there should be ore developed in the vein before that point is reached.

SHAFT, 200' and 300' LEVELS:

The shaft is being sunk in the foot wall of the vein in a granite porphyry rock. At the 200' level a brokenup condition was found where the vein was crosscut and large quantities of water had to be pumped beforethe water held in storage in the vein was drained off. There is evidence of movement along the foot wall and a cross fault throws the vein 2½' to the north.

The mineralization in this area is slight, but in the drift to the S. E. the vein is beginning to look very much better. It is about 5' wide and a 3.8' wide sample of friable quartz ran gold $4.40, silver 6.6 oz. and 1.53% copper.

The drift to be N. W. is also in a badly disturbed condition. A 3' sample of the back 12' N.W. of shaft ran gold $1.20; Silver 11.00 oz. and copper 2.30%, total value $16.63 with silver 65¢ and copper 18¢.

A sample of a 18" seam of sulphides on the hanging wall, 52' N.W. of the shaft ran gold $4.40, Silver 5.60 oz. and copper 0.48%. A composite of the 200' level samples ran only 1.90% zinc showing the inpoverishment in that metal at this level.

No.oxidation is visable on the 200' level. The vein has the strike and dip indicated by thework above on the 100' level. The country rock on the S.E. side of the shaft is granite porphyry. On the N.W. side on this level diabase is very prominent and forms both the hanging wall and part of the vein filling.

On the 300' level there are sulphides and quartz and decomposed porphyritic rock making up a vein for a width of 5', but pretty much scattered. A 10" seam on the hanging wall ran Gold $0.60; Silver 26 oz. copper 3.07% and zinc 2.37%. A 10" seam in the center of the vein ran gold $4.60, Silver 2.27 oz. a trace of copper, and 4.74% zinc.

These two 10" samples average gave gold $2.60, Silver 14.13 oz.; Copper 1.53%, zinc 3.55%. The total value exclusive of the zinc with silver at 65¢ and copper at 18¢ is $17.28 per ton, and with 23½¢ and $1.00 prices thevalue is $22.92 per ton.

The vein here is drifted on 20' and has the correct strike and dip as indicated above.

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No diabase is visable yet, the granite porphyry being on both sides of the vein.

SUMMARY:

The development on the 200 and 300 foot levels has shown a strong continuous vein with ore averaging $17.00 per ton with silver at 65¢ and copper at 18¢. But there has to be much more drifting done, especially N. W. towards the Broncho Dyke.

On the 300' level it will be about 300' from the shaft. The vein structure is good. There has been sulphide mineralization and vein quartz deposited wherever the vein has been followed.

All the attendant geological features or conditions that have been responsible for the formation of nearly all ore deposits occupying fissures in igneous rocks are here.

First, the veins at the Jemison occupy fissures in a granite porphyry which is itself intrusive into an older granite gneise. This porphyry is in turn intruded by rhyolite and diabase dykes.

As result of the stresses accompanying these intrusions, and the repeated heating and cooling the fissures were formed. That the fissures tapped the reservoir from which these molten rocks came not only once but most likely twice seems to be the case.

That considerable sulphides were carried up these fissures by the "after-effects" of subsiding igneous activity is seen in the ore body of the tunnel level.

Conditions of rock associations are the same on the 100 and 200' levels, and most likely is on the 300' level also. Therefore, any chemical effect that either the diabase or porphyry rock has on precipitating ore minerals from the uprising solutions

on the 100' level are duplicated on the levels below.

The vein structure is open and shows the action of mineralizing waters and vapors in the alteration of the porphyry wall rocks and replaced diabase.

That the vein is saturated with water shows it is not a tight fissure unfavorable to ore deposition, and the fact that the water drains off in a few days shows that we are not at water level yet The 200' level is practically dry now and the 300' level in 4 days time had dried up 50% as compared to the day the vein was cut.

All this goes to point that well directed prospecting will uncover ore bodies in this and other veins in the Jemison claims that will well repay the company.

Ore shoots are the exception and not the rule, and even when the most favorable combinations of influences exist, such as certain wall rocks, size of fissure, etc. sometimes no ore shoots are found.

It seems all the fovorable conditions are met in the Jemison: igneous intrussions, fissures, cutting both acidic and basic rocks, enough ore in the veins where opened to show that the fissure tapped the reservoirs that supplied the uprising solutions with their charge of ore minerals, and surrounded on all sides by mines of proved worth.

That ore shoots of value will not be found by very little more development is unbelievable.

That the richest part of this vein is to be looked for at depth greater than the 300' level is my opinion, based on the fact that veins of the same type in the neighboring producing mines

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are not big producers so close to the surface. This is brought out more fully in my first report on the Jemison.

Another ore showing that should be prospected is along the foot wall of the Broncho Dyke to the North of the Jemison tunnel. There are striking showings of mineralization along here for several hundred feet. Oxidized copper minerals, silicate and carbonates, coat brecciated diabase and much honey combed, iron stained vein quartz is found in place and as float.

A 10" sample of this outcropping quartz on the Mamouth Claim ran $0.40 gold, 6.86 oz. silver, 5.53% copper, and a 20" sample next to it ran $0.20 gold, 2.59 oz. silver, 1.58% copper. This portion of the dyke can be advantagiously prospected by extending the "water tunnel" N. 30 degrees E. 200 feet and attain a depth of about 92'.

The above samples of course were of leached outcropping quartz and the values are merely indicative of much higher values below.

On the hanging wall side of the Broncho Dyke there is a well defined vein outcropping about 4 feet wide showing abundent galena and oxidized minerals.

This will be prospected at depth, probably by a shaft on the vein.

Other claims to the East higher up the hill having good outcropping veins can be secured on very favorable terms as the Jemison holds the key for their development at depth.

They are inaccessible without the Jemison group as an outlet.

CONCLUSION:

Developments to date are satisfactory. The vein is continuous as to length, depth, and mineralization.

Veins having continuous and uniform ore are the exception. Lean or even barren portions are to be expected.

Conditions are good for this vein and the other veins to develop ore shoots of considerable size and richness.

RECOMMENDATIONS:

That the oreshowing on the Foot Wall of the dyke be prospected, also the lead vein referred to.

That thé 300' level be continued N.W. to the dyke and the contact there be prospected. Also as the 300' level is carried S. E. that occasional crosscuts be driven to prospect for parallel veins in the porphyritic rock that promises to be the country rock in this direction.

The porphyritic rock develops a sheeted condition and is very likely to be the receptical for ore deposition, arising from the diabase intrusion to the N.E.

Also, the shaft sinking should be continued.

Yours truly,

(signed) W. W. Lytzen, E. M.

Dated September 21, 1917.

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Jemison Mine,

Cerbat Mountains

Hualpai Mining District

Mohave County

Arizona.

REPORT OF L. WEBSTER WICKES.

Kingman, Arizona,

Dec. 26th, 1916.

Summary.

The Jemison is an exceptionally good prospect. There is less gamble than usual as to opening ore in quantity and in the metallic content of the ore. The physical condition of the metals is not as refractory as others in the district that are being successfully treated. Milling conditions are improving almost daily.

The vein is strong and like all the others of the Cerbat Mountains will undoubtedly continue to great depth. The bottom of the shoots have not yet been reached in any mine with which the writer is familiar. Two properties are developed over 1200 feet in depth. Two shoots on the Jemison are assured and adjoining ground will probably give others. It is true in the district, so far, that surface shoots have all continued in ore with deeper development and development has in several cases opened shoots of ore that were not indicated in the veins at the surface.

There is no tonnage blocked out, but 170 feet of drifting in the lower Jemison tunnel is on ore that will yield a good profit. Experiments so far made indicate that by means of gravity and flotation concentration, combined with partial roasting and magnetic separation of the iron from the zinc products will be made such that the operator of the Jemison will get paid for 80% or more of the metallic content of the ore.

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This property is in Mohave County, Arizona. It is on the West slope of the Cerbat Mountains, about half way between Kingman and Chloride. It is reached by road in seventeen miles from Kingman, which is on the main line of the Santa Fe Railroad. The mine is four miles from Mineral, a station on the branch railroad running from Kingman to Chloride.

The wagon road from Kingman is passable to automobiles but the last two miles to this property are very bad and would be unsuitable for trucks at present, being up a rocky gulch. The rise is 150 ft. to 200 ft. to the mile. This poor portion of the road is the branch from the main truck road to Golconda and serves at this time no other property than the Jemison. A suitable road for Ore hauling from the Junction of the Golconda road to the mine will cost about $3500.00. The present road, though subject to repeated washing out, is sufficiently good to handle all freight, etc., by teams and wagon during preliminary and development operations.

Telephone and electric power lines pass within a mile of the property. The nearest post-office is "Golconda," at the Golconda Mine about a mile and a half by foot trail to the south.

Kingman is the main supply point. It is a town of 5,000 people and the various stores and supply houses carry everything in stock that is necessary for all except the largest operations.

There are several surveyors and assayers available doing custom work. Haff and Colwell, whose permanent address is Oatman, Arizona, are very reliable for anything in the way of surveying, and R. C. Jacobson, Kingman, is a careful and reliable assayer.

3/15

Throughout the section fuel oil or electricity from the Desert Power and Water Company is used for power. On small installations the former is usually the cheapest as the rate for current is 2-1/2 cents per Kilo-watt for small quantities, decreasing to 1-7/8¢ per kilo-watt on a consumption of 400,000 kilo-watts per month. This is roughly equivalent to $12.00 to $15.00 per H.P. per month. Timber is a serious item as "O.P." (Douglas Fir) costs $28.00 to $35.00 per M. in Kingman in carload lots. Fuel oil costs from 4-1/2¢ up, F.O.B. Kingman. Distillate for Hoists etc., ranges around 11¢ per gallon. For this particular case electricity would be the best for any preliminary operations due to the road conditions unless the mine is sufficiently developed when the time comes to put in machinery to warrant a permanent road. Depending on hauled fuel with the present road would be too uncertain.

There is available water on the ground for all domestic purposes for some time to come. All the mines in the district make water with depth, ranging up to 150 gallons per minute. The mines are the source of all water for milling purposes.

At present the principal producing properties of the district are the Golconda (Union Basin Mining Company) and the Tennessee (U.S.Smelting, Refining and Mining Company). The Golconda is about a mile, in an air line, south of the Jemison. It is developed to some 1200 feet in depth and is at present producing about 1800 tons monthly of zinc ore and concentrate running 40% zinc and carrying a little gold and silver.

The Banner mine of the Arizona Butte Mining Company

4/15

is producing little lead concentrate. Various other properties are making intermittent shipments.

The production of the district was originally almost entirely silver. The surface ores in numerous places were rich in native silver, horn silver and ruby silver. As depth was gained the precious metals decreased but large bodies of base metals were opened, principally zinc and lead with occasional copper bodies. It is these base metals that make the mines of today.

The Keystone mine has a mill under construction and there are two custom mills being talked about. One of the custom mills is being considered by the Zinc Concentrating Company, who will begin erection as soon as they are reasonably assured of tonnage. Their mill as outlined, will include roasting and magnetic separation as well as the usual wet methods. They are in the field for zinc product high in iron.

The Jemison group consists of four locations relatively situated as shown on the accompaning map. There are some seventy-five acres or so covered. The map shows the ground as it is monumented. The claims are all irregular and in the case of the "White and Blue" claim the location may be illegal. I would earnestly recommend that as soon as the mine work will warrant, amended locations be made and the claims brought within the legal limits as to size and that the exterior lines be made parallel and corner posts put up.

There are no permanent improvements on the ground. There are tents and camp equipment sufficient for five or six men. All work now is by hand, no machinery.

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ere have been numerous art cles published about the mines in the Cerbat Mountains, but the summary and the most reliable information given the general public is in U. S. Geological Survey Bulletin No.397 where Mr. F. C. Schrader gives the results of his study of the section made during the winter of 1906 and 1907. Mr. Schrader published a later article at page 1935 in the November 1916 Bulletin of the American Institute of Mining Engineers.

At the Jemison the country rock is the usual "Pre-Cambrian Complex" of the Cerbat Mountains. It exists here as a medium grained granite, with a little of the jointing and gneiss forming action. There have been two sets of intrusions; Mr. Schrader speaks of them as "Tertiary" and "Pre-Tertiary."

The "Pre-Tertiary" is represented on this ground by the "Broncho Dyke", which runs the lengths of the Mammoth and Mendocino claims. The dyke was the reason for locating and is the "vein" of these claims. It strikes nearly north and south and continues to the south well into the Golconda Extension holdings and to the north about 1000' beyond the end line of the Mammoth claim. It has a total length of some 4500 feet.

The Tertiary intrusives are not positively identified on this ground, though a latite (?) that appears near the common end line of the Mendocino and Mammoth claims and which strikes a little west of south from the Broncho Dyke probably belongs to this group. Just to the west of these claims is the Pasadena Dyke. It is one of the Tertiary rhyolites which strikes N. 10° to 30° W. and a similar one is seen at the top of the ridge of the range near the south east end of the Night Hawk.

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while no appreciable tonnage has been found on any of the dykes, values in gold and silver can be obtained almost any where along their strike and in places several tons have been taken out that are very rich. The indications, however, are that these pockets are purely surface enrichment.

The mines of the district are all on well defined veins that make out at sharp angles to the dykes. Mineralization has followed both sets of intrusions. Though it is by no means a proven fact, and further development and observation may prove otherwise, the present indications are that the veins making out from the Pre-Tertiary dykes are richer in copper, iron and gold, while those out from the Tertiary are richer in silver and lead. This does not apply, however, to a large area near Mineral Park where there is a disseminated pyrite carrying copper in a rhyolite porphyry that has produced a number of secondarily enriched copper deposits. The Galena usually gives way to iron and the iron to zinc. Due to heavy and rapid erosion the oxidized zone is shallow and primary sulphides are often found close to the surface. In many places the surface zone is that of secondard enrichment. Much ruby silver was found in the early days in the oxidized ore. Both in the oxidized and in the sulphide zones the various base metals showing are refractory mixtures of pyrite, chalcopyrite, blend and galena. In the past some of these ores have proven too refractory to handle. At present, however, unless the conditions are exceptional, almost any of the sulphides can be separated and marketed with a saving of better than 80%. By this is meant that various combinations of flotation with a partial roast and magnetic separation have given, both in practice and in experimental work, clean marketable products.

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It is well to remember that the so-called blend of the Cerbats is really not a straight zinc-sulphide, but is in fact a marmatite; that is an iron-zinc sulphide, the iron being chemically combined. The result is that a forty-five to forty-six per cent Zn concentrate is as rich as can ordinarily be made. The pure mineral runs but 51% Zn.

The promising showing of this ground is on the Jemison vein. This strikes S. 47° degrees E. and makes out from the Broncho Dyke at about the middle of the Mendocino claim. It is traceable definitely nearly to the S.E. end of the Jemison claim. At a point about 200 feet from the Broncho Dyke a branch vein takes off which strikes about S. 68 Degrees E.

A tunnel has been driven to the intersection of the dyke and vein and from the intersection is continued as a drift on the vein. On December 25th, 1916, it opened the vein for 170 feet. Values and sampling are indicated on the accompanying assay map. The face is still in very good looking ore. There are three upper tunnels that develop the vein to a certain extent. The two upper tunnels are in oxidized material entirely, though occasionally a speck or two of sulphide remains. An old stope near the face of the upper tunnels is reported to have produced several hundred tons of ore going $200.00, the values being mainly in gold. This stope, though caved, shows a shoot apparently about 40 ft. long. The tunnel is on the vein for nearly 300 feet before getting into the stope.

The lowest of these three upper tunnels is really a crosscut and evidently only reaches the branch vein mentioned above. The wein's width wherever mineralized is from two to five feet and so far averages 3.25 feet. The ore will evidently

occur in shoots. The one in the lower tunnel now being driven, so far is shown to be over 200 feet in length.

The shoot indicated in the upper tunnel by the old stope can be expected by comparison, as a little greater depth is attained, to be longer than the 40 feet now shown. It would be reasonable to expect, out of a length of vein of 1500 feet, that at least one third of it would be mineralized, and entirely possible that there would be even more. Barren zones will undoubtedly be encountered in drifting along the vein, but the croppings and the experience thruout the district would indicate that values would be found along one third of the vein's length. The Jemison vein is lost on the surface near the upper (S.E.) end of the claim, but the indications are that the vein showing on the Little Johnnie is the same.

At the present time there is nothing in any of the upper tunnels to be considered, except that a shoot of ore is quite positively indicated by the old caved stope. The middle or cross cut tunnel, so far only cuts the branch vein.

The showing that gives the property its principal value is in the Main or lower tunnel. As this leaves the dyke and penetrates the hill it gets more and more into the unaltered, primary, sulphides. The present face (12-24-16) shows very little oxidation. The ore is a mixture of Sulphide of Iron, Copper, Zinc, and Lead "i.e." Pyrite, Chalcopyrite, Blend and Galena. There are bunches of Arsenopyrite intermittently along the foot wall. The relative proportions of the minerals are best seen in the analyses on the assay map and particularly in the analyses of the dump samples. In places there are signs of secondary enrichment, but the zone is apparently thin. Some of the higher assays of copper are undoubtedly due to secondary glance. It is to be expected that the copper will

decrease as one gets farther from the dyke and also that it will decrease with depth. This has been the case at the Alpha and other properties in the vicinity, but it is true that none of them had as much chalcopyrite showing in their upper works as the Jemison.

There is nothing in the way of "Blocked out Ore" at present. One might stope a little but the backs are shallow and too near the oxidized and leached zone. In driving the present main tunnel, the mineral could be sorted carefully and approximately 15% of the ground broken would be available for shipping. The Jemison vein now averages 3.25 feet wide, which means 65 tons for each foot of depth on a shoot 200 feet long.

Driving three feet a day, would mean some 90 cu.ft. or about 8 tons, 15% of which or 1.2 tons is available for direct shipment, after hand sorting, as long as present conditions remain unchanged. This 1.2 tons would be about, as indicated by the sampling; Au. 0.15 oz., Ag 30.0 oz., Cu 7.0%, Pb 1.5%, Zn 6.5%, Fe 12.0 %. This would yield:

Au.		$3.00
Ag.	95% at 60¢	15.10
Cu.	7% gets paid for 120# at say 25¢ quoted less 2.5¢ for marketing charge	27.00

This is about a $45.00 ore:

Hauling to the railroad now would be at least $3.00, which with $7.00 frieght and $7.00 treatment or $45.00 less $17.00, would leave a balance of $28.00 as the value of the product on the dump. This indicates that for a while at least $30.00 to $35.00 could be realized a day. This would materially help, but would not pay all expenses, assuming

assuming han mining and hand sorting o three shifts. It would take especially good work to make three feet with hand steel. Bunches of arsenopyrite occur in a streak on the foot-wall and this product can be segregated in drifting and made to yield some return as it carries high gold values, averaging one and one half ounces. Its tonnage is, however, decidedly limited. A selected piece of the arsenopyrite gave 30 oz. gold per ton.

Depending on the policy of the operators, it might not be worth while at this time, to try to make any of the above segregations, but to put all the material on the dump to be handled later by mill or otherwise. It will be hard to save the material in dumps as there is no place that will be free from possible loss by freshets. The metal prices are more apt to decrease than to hold their present values.

The ore markets at present are Humbolt, Sasco and Hayden for Copper products, while the nearest lead smelters are Selby and El Paso. Zinc products of this section usually go to Bartletsville, Okla. Some products can be marketed at the Needles Concentrator of the U. S. Smelting, Refining and Mining Company. The latter plant takes some complex ores of the Cerbat Mountains when they are righer in lead, for a treatment charge of from $2.50 to $3.00. They buy the lead concentrate they make and hold the zinc concentrate or other product on "shippers order."

11/15

Milling costs, including developing and milling, can be reasonably estimated at $5.00 a ton on the Jemison. The Golconda is working at this figure and their conditions are exceptionally difficult. The Golconda mines their vein in places at a width of only 12 inches and yet keeps their average figure down to the above $5.00. They allow $1.25 of that for development. $1.25 is a fair allowance for putting the ore or concentrate on the cars, assuming a fair truck road. The usual figure for this section for freight and treatment on material of average grade is $14.00 for lead, iron and copper products. When Spelter is quoted at seven cents, 40% zinc products are worth $20.00 to $21.50 a ton loaded on the cars at Mohave County common points.

The Jemison will mine cheaply by comparison, as the width is good and the walls stand well. The vein being practically vertical also helps.

Of the surrounding ground, there is nothing of interest at present to the immediate west and north. To the south is the Ora Plata Mine of the Golconda Extension Company. It has a shaft 360 feet deep. The property has a number of cross breaks or veins out from the Broncho Dyke. They produced much high grade ore in the early days, its past production having been supposed to be $500,000.00. Some copper showed near the surface, but apparently not as much as at the Jemison. From the 100 to the 285 levels, the ore became very refractory, being a mixture of Pyrite, Galena and Blend, high in iron. It was high in total metal values, but hard to segregate. On the 360 foot level a marked decrease in the pyrite and increase in zinc occurred. The lead seemed to hold about the same. No ore was shipped or treated from the lower (360) foot level, but it was

seen by the w_ter just before it was allowed to fill with water and the showing was very attractive. At that time, January 1916, the property was under option to O. A. Tumner, who owing to financial difficulties was unable to hold the property and it eventually reverted to the owners, Mr. O. D. M. Gaddis, et al, of Kingman. It has been recently (Dec.1916) re-optioned and work of unwatering is being started. The old shaft is small and in bad condition so it is proposed to drive a long tunnel from hear the Golconda Road which will cut the old shaft between 300 and 325 feet. This tunnel will cross cuts a number of veins showing on the surface. The mine makes about 150 gallons of water a minute. It is described on page 100 of U.S.Geological Survey Bulletin No. 397.

The surrounding ground which is most interesting to the operators of the Jemison, is that which lies to the south east and east. I refer to the Clamp claims and the Night Hawk. Their relative position is shown on the accompanying maps. There is very little work that amounts to anything on the Clamp ground, but as has been said before, the Jemison vein is probably continued as the vein on the Little Johnnie Claim. The amended claims would have a common end line. There is every indication of a shoot near the middle of the Little Johnnie and beyond the Little Johnnie is the ground of the Nelson Bros. who have some high grade surface enrichment ore and every indication of two shoots, however, it is too far away to be of particular interest at this time.

The Night Hawk Mine consists of two claims, the Night Hawk and Rip Van Winkle. It is briefly described on Page 103 of U. S. Geol. Survey Bul. No.397. Some very high grade gold and silver ore has been taken out in the past and there is every indication of strength in the bottom of the present lowest

workings. It is now being worked by lessors, who shipped this fall (1916) a car of hand sorted material that netted them over $300.00 per ton. The Night Hawk has a long strong shoot and though it is narrow, being only about 18 inches to two feet wide, its higher values make it attractive. No systematic sampling has been done on the property as it is not so situated as to be readily handled as an individual property. There are two ways it could be worked; by a long tunnel from the north west end of the Scotty claim, owned by Paul White, which would be a drift, or by a cross cut from the Jemison, assuming that the Jemison tunnel is driven to or under Clamps Little Johnnie claim. This latter is the more attractive. In the natural course of events, the Jemison tunnel will reach the Clamp ground and from there the cross cut to the Night Hawk, will be over 1000 feet shorter than the drift from the Scotty. This would also cross cut the veins on Clamps Mint claim as well as several minor veins that show on the surface. It is true that only minor ore shoots are seen at the surface on this intervening ground, but it is much more promising than a drift with the country. The cross cut would also have a little greater depth. The whole question of the Night Hawk in connection with the Jemison, is one of the future, but it would be considered to a certain extent when figuring on possibilities. The control is in the hands of Mr. I. M. George, of Kingman, who will be found a very reasonable man with whom to do business.

Experiments have been made demonstrating the success of flotation and of partial roast and magnetic separation, as a means of treating the ores of the Cerbat Mountains.

Jig and table concentrates are made which take care of the lead. The middle product is given a partial roast

and then sent to a magnetic separator giving zinc and iron products. The copper will be with the iron and is shipped by itself. If the copper content is low, the iron is combined with the lead concentrate and sent to the lead smelters. The slimes and tailings from the above treatment are put thru flotation machines.

RECOMMENDATIONS.

The Fractions between the Jemison, Little Johnnie and Valley View No.1 claims, should be located at once. Clamp should locate the fraction between the Rip Van Winkle and the Mint.

An option should be obtained on the Clamp holdings.

Amended location notices and corner posts should be put up at once.

Additional and more substantial camp facilities should be provided and telephone communication established with Kingman, which latter can be done with three quarters of a mile of line to the Ora Plata.

Some ground on the slope a half mile to a mile west of the present camp should be located for a possible future Mill site.

The present lower tunnel should be pushed with all possible speed to prove the length of the present ore shoot and to open the ore at the other end of the claim. Whereas the present shoot near the Broncho dyke should be developed to a greater depth, it is the feeling that the horizontal extent and the existence and length of other shoots is the most important thing for the immediate future.

The installation of machinery is dependent on the policy and finances of the operators with regard to the terms of their option.

Copy of a report made by Mr. L.Webster Wicks

Jemison Mine,

Cerbat Mountains

Hualpai Mining District

Mohave County

Arizona.

Report for
Mr.Chas McKinnis,
Wallace,Idaho.

This report consists of twenty seven (27) pages of text,seven (7) maps and one photograph,each of which is initialed or signed. It is only to be considered in its entirety&

Respectfully submitted,

_____

Kingman,Arizona,
Dec.26th,1916.

1/28

Summary

The Jemison is an exceptionally good prospect. There is less gamble than usual as to opening ore in guantity and in the metallic content of the ore. The physical condition of the metals is not as refractory as others in the district that are being successfully treated. Milling conditions are improving almost daily.

The vein is strong and like all the others of the Cerbat Mountains will undoubtedly continue to great depth& The bottom of the shoots have not yet been reached in any mine with which the writer is familiar. Two troperties are developed over 1200 feet in depth. Two shoots on the Jemison are assured and adjoining ground will probably give others. It is true in the district, so far, that surface shoots have all continued in ore with deeper development and development has in several cases opened shoots of ore that were not indicated in the veins at the surface.

There is no tonnage blocked out, but 170 feet of drifting in the lower Jemison tunnel is in ore that will yield good profit. Experiments so far made indicate that by means of gravity and floatation

2/28

concentration, combined with partial roasting and m magnetic separation of the iron from the zinc products will be made such that the operaton of the Jemison will get paid for 80% or more of the metallic content of the ore.

3/28

This property is in Mohave County, Arizona. It is on the West slope of the Cerbat Mountains, about half way between Kingman and Chloride. It is reached by road in seventeen miles from Kingman, which is on the main line of the Santa Fe Railroad. The mine is four miles from Mineral, a station on the branch railroad running from Kingman to Chloride.

The wagon road from Kingman is passable to automobiles but the last two miles to this property are very bad and would be unsuitable for trucks at present, being up a rocky gulch. The rise is 150 ft. to 200 ft. to the mile. This poor portion of the road is the branch from the main truck road to Golconda and serves at this time no other property than the Jemison. A suitable road for Ore hauling from the Junction of the Golconda road to the mine will cost about $3500.00 The present road, though subject to repeated washing out, is sufficiently good to handle all freight etc., by teams and wagon during preliminary and development operations.

Telephone and electric power lines pass within a mile of the Property. The nearest post-office is "Golconda", at the Golconda Mine about a mile and a

half by foot trail to the south.

Kingman is the main supply point. It is a town of 5,000 people and the various stores and su supply houses carry everything in stock that is necessary of all except the largest operations.

There are several surveyors and assayers available doing custom work. Haff and Colwell, whose permanent address is Oatman,Arizona, are very reliable for anything in the way of surveying and R.C.Jacobson,Kingman,is a careful and reliable assayer.

Throughout the section fuel oil or electricity from the Desert Power and Water Company is used for power. On small installations the former is usually the cheapest as the rate for current is 2-1/2 cents per Kilo-watt for small quantities,decreasing to 1¢7/8¢ per kilo-watt on a consumption of 400,000 kilo-watts per month. This is roughly equivalent to $12.00 to $15.00 per *.O. per month. Timber is a serious item as "O.P." (Douglass Fir) costs $28.00 to $35.00 per M. in Kingman in carload lots. Fuel oil costs from 4¢1/2¢ up,F.O.B. Kingman. Distillate for Hoists etc., ranges around 11¢ per gallon. For this particular case electricity would be the best for any

5/28

preliminary operations due to the road conditions unless the mine is sufficiently developed when the time comes to put in Machinery to warrent a permanent road. Depending on hauled fuel with the present road would bee too uncertain.

There is available water on the ground for all domestic purposes for some time to come . All the mines in the district make water with depth,ranging up to 150 gallons per minute. The mines are the source of all water for milling purposes.

At present the principal producing properties of the district are the Golconda (Union Basin Mining Company) and the Yennessee (U.S.Smelting,Refining and Mining Company). The Golconda is about a mile, in an air line,south of the Jemison. It is developed to some 1200 feet in depth and is at present producing about 1800 tons monthly of zinc ore and concentrate running 40% zinc and carrying a little gold and silver.

The Banner mine of the Arizona Butte Mining Company is producing a little lead concentrate. Various other properties are making intermittent shipments.

The production of the district was originally almost entirely silver. The surface ores in numerous places were rich in native silver,horn silver and ruby silver. As depth was gained the precious metals decreased but large bodies of base metals were opened, principally zinc and lead with occasional copper bodies. It is these base metals that make the mines of to-day.

The Keystone mine has a mill under construction and there are two custom mills being talked about. One of the custom mills is being considered by the Zinc Concentrating Company,who will begin erection as

7/28

soon as they are reasonably assured of tonnage. Their mill as outlined, will include roasting and magnetic separation as well as the usual wer methods. They are in the feild for zinc product high in iron.

The Jemison group consists of four locations relatively situated as shown on the accompanying map. There are some seventy-five acres or so covered. The map shows the ground as it is monumented. The claims are all irregular and in the case of the "White and Blue" claim the location may be illegal. I would earnestly recommend that as soon as the mine work will warrant, amended locations be made and the claims brought within the legal limits as to size and that the exterior lines be made parallel and corner posts put up.

There are no permanent improvements on the ground. There are tents and camp equipment sufficient for five or six men. All work now is by hand, no machinery.

9/28

There have been numerous articles published about the mines in the Cerbar Mountains, but the summary and the most reliable information given the general public is the U.S.Geological Survey Bulletin No.397 where Mr.!.?.$chrader gives the results of his study of the section made during the winter of 1906 and 1907. Mr.Schrader published a later article at page 1935 in the November 1916 Bulletin of the American Institute of Mining Engineers.

At the Jemison the country rock is the usual Pre-Cambrian "Complex" of the Cergat Mountains. It exists here as a medium grained granite, with a little of the jointing and gneise forming action. There have been two sets of intrusions; Mr.Schrader speaks of them as "Tertiary" and "Pre-Teritary".

The "Pre-Teritary" is bepresented on this ground by the "Broncho Dyke", which runs the lengths of the Mammoth and Mendocino claims. The dyke was the reason for locating and is the "vein" of these claims. It strikes nearly north and south and continues to the south well into the Golconda Extension holdings and to the north about 1000' beyond the end line of the Mammoth claim. It has a total length of some 4500 feet.

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The Tertiary intrusives are not positively identified on this ground, though a latite(?) that appears near the common end line of the Mendocino and Mammoth claims and which strikes a little west of south from the Broncho Dyke probably belongs to this group. Just to the west of these claims is the Pasadena Dyke. It is one of the Tertiary rhy rhyolites which strikes N.10 to 30 W. and a similar one is seen at the top of the ridge of the range near the south east end of the Night Hawk.

While no appreciable tonnage has been found on any of the dykes, values in gold and silver can be obtained almost anywhere along their strikes and in places several tons have been taken out that are very rich. The indications however, are that these pockets are purely surface enrichment.

The mines of the district are all on well defined veins that make out at sharp angles to the dykes. Mineralization that ization has followed both sets of intrusions. Though it is by no means a proven fact, and further development and observation may prove otherwise, the present indications are that the veins making out from the Pre-Tertiary dykes are richer in copper, iron and gold, while those out from the Tertiary are richer in silver and lead. This does not apply, however,

11/28

To a large area near Mineral Park where there is a disseminated pyrite carrying copper in a rhyolite porphyry that has produced a number of secondarily enriched copper deposits. The Galena usually gives way to iron and the iron to zinc. Due to heavy and rapid errosion ~~and~~ the oxidized zone is shallow and primary sulphides are often found close to the s aurface. In many places the surface zone is that of secondary enrichment. Much ruby silver was found in the early days in the oxidized ore. Both in the oxidized and in the sulphide zones the various base metals showings are refactory mixtures of pyrite, chalcopyrite,blend and galena. In the past some of these ores have proven too refractory to handle. At present,however,unless the conditions are exceptional, almost any suplhides can be separated and marketed with a saving of better than 80%. By this is meant that various combinations of flotation with a partial roast and magnetic separation have given both in practice and in experimental work clean marketable products.

It is well to remember that the so-called blend of the Cerbats is really not a straight zinc,sulphide, but is in fact a marmatite; that is an iron-zinc s sulphide,the iron being chemically combined. The

12/28

result is that a forty-five to forty-six per cent Zn concentrate is as rich as can ordinarily be made. The pure mineral runs but 51% Zn.

The promising showing of this ground is on the Jemison vein. This strikes S.47 degrees E. and m makes out from the Broncho Dyke at about the middle of the Mendocino claim. It is traceable definitely nearly to the S.E. end of the Jemison claim. At a point about 200 feet from the Broncho Dyke a branch vein takes off which strikes about S.68 Degrees E.

A tunnel has been driven to the intersection of the dyke and vein and from the intersection is continued as a drift on the vein. On December 25th, 1916, it opened the vein for 170 feet. Values and sampling are indicated on the accompanying assay map. The face is still in very good looking ore. There are three upper tunnels that develop the vein to a certain extent. The two upper tunnels are in oxidized material entirely though occassionally a speck or two of sulphide remains. An old stope near the face of the upper tunnels is reported to have produced several hundred tons of ore going $200.00, the values being mainly in gold. This stope, though caved, shows a shoot apparently about 40 ft. long. The tunnel is on the vein for nearly 300 feet before getting into the stope.

14/28

The lowest of these three upper tunnels is really a crosscut and evidently only reaches the branch vein mentioned above. The vein width wherever mineralized is from two to five feet wide and so f far averages 3.25 feet. The ore will evidently occur in shoots. The one in the lower tunnel now being driven, so far is shown to be over 200 feet in length.

The shoot indicated in the upper tunnel by the old stope can be expected by comparison, as a little greater depth is attained, to be longer tha than the 40 feet now shown. It would be reasonable to expect, out of a length of vein of 1500 feet, that at least one third of it would be mineralized, and entirely possible that there would be even more. Barren zones will unboubtedly be encountered in drifting along the vein, but the croppings and the experience thruout the district would indicate that values would be found along one third of the veins length. The Jemison vein is lost on the surface near the upper (S.E.) end of the claim, but the indications are that the vein showing on the Little Johnnie is the same.

At present time there is nothing in any of the upper tunnels to be considered, except that a shoot of ore is quite positively indicated by the old caved stope. The middle or cross cut tunnel, so far only cuts the branch vein.

The showing that gives the property its principal value is in the Main or lower tunnel. As this leaves the dyke and penetrates the hill it gets more and more into the unaltered ,primary, sulphides. The present face (12-24-16) shows very little oxidation. The ore is a mixture of sulphies of iron, Copper, Zinc, and Lead "i.e." Pyride, Chalcopyrite, Blend and Galena. There are bunches of Arsenopyrite intermittently along the foot wall. The relative proportions of the minerals are best seen in the analyses on the assay map and particularly in the analyses of the dump samples. In places there are signs of secondary enrichment, but the zone is apparently thin. Some of the higher assays of copper are undoubtedly due to secondary glance. It is to be expected that the copper will decrease as one gets farther from the dyke and also that it will decrease with depth. This has been the case at the Alpha and other properties in the vicinity, but it

is true that none of them had as much chalcopyrite showing in their upper works as the Jemison.

There is nothing in the was of "Blocked out Ore" at present. One might stope a little but the backs are shallow and two near the oxidized and leached gone. In driving the present main tunnel-the material could be sorted carefully and approximately 15% of the ground broken would be available for shipping. The Jemison vein now averages 3.25 feet wide,which means 65 tons each foot of depth on a shoot 200 feet long.

Driving three feet a day,would mean some 90 cu. ft. or about 8 tons,15% of which or 1.2 tons is available for direct shipment,after hand sorting, as long as present conditions remain unchanged. This 1.2 tons would be about,as indicated by the sampling; AU.0.15 oz, Ag 30.0 oz, Cu. 7.0%, Pb 1.5%, Zn.6.5% FE 12.0%. This would yeild;

AU.		$ 3.00
Ag.	95% at 60¢	15.10
Cu.	7% gets paid for 120 lbs at say 25¢ quoted less 2.5¢ for marketing charge	27.00

This is about a $45.00 ore:

Hauling to the railroad now would be at least $3.00,which with $7.00 freight and $7.00 treatment

17/28

or $45.00 less $17.00, would leave a balance of $28.00 as the value of the product on the dump. This indicates that for a while at least $30.00 to $35.00 could be realized a day. This would ma materially help, but would not pay all expenses, assuming hand mining and hand sorting on three shif shifts. It would take expecially good work to make three feet with hand steel. Bunches of arsenopyrite occur in a streak on the footwall and this product can be segregated in drifting and made to yeild some return as it carries hight gold values, averaging one and one half ounces. Its tonnage is however, decidedly limited. A selected piece of the arsenopyrite gave 30 ounces gold per ton.

Depending on the policy of the operators, it might not be worth while at this time, to try to make any of the above segregations, but to put all the material on the dump to be handled later by mill or otherwise. It will be hard to save the material in dumps as there is no place that will be free fro from possible loss by freshets. The metal prices are more apt to decrease than to hold their present values.

The ore markets at present are Humbolt, Sasco and Hayden for Copper products, while the nearest lead smelters are Selby and El Paso. Zinc products of this section usually go to Bartletsville,Okla. Some products can be marketed at the Needles Concentrator of the U&S&Smelting,refining and Mining Company. The latter plant takes some complex ores of the Cerbat Mountains when they are richer in lead , for a treatment charge of from $2.50 to $3.00 They buy the lead concentrate they make and hold the zinc concentrate or other product on "shippers order"

Mining costs, including developing and milling, can be reasonably estimated at $5.00 a ton on the Jemison. The Golconda is working at this figure and their conditions are exceptionally difficult. The Golconda mines their vein in places at a width of only 12 onches and yet keep their average figure down to the above $5.00. They allow $1.25 of that for development. $1.25 is a fair allowance for putting the ore or concentrate on the cars, assuming a fair truck road. The usual figure for this section for freight and treatment on material of average grade is $14.00 for lead, iron and copper products. When Spelter is quoted at seven cents, 40% zinc prod products are worth $20.00 to $21.00 a ton loaded on the cars at Mohave County common points.

The Jemison will mine cheaply by comparison, as the width is good and the walls stand well. The vein being practically vertical also helps.

Of the surrounding ground,there is nothing of interest at present to the immediate west and north. To the south is the Ora Plata Mine of the Golconda Extension Company. It has a shaft 360 feet deep. The property has a number of cross breaks or veins out from the Broncho Dyke. They produced much high grade ore in the early days,its past production having been supposed to be $500,000.00. Some copper showed near the surface,but apparently not as much as at the Jemison. From the 100 to the 285 levels, the ore became ver refractory,being a mixture of Pyrite,Galena and Blend,high in iron. It was high in total metal values,but hard to segregate. On the 360 foot lebel a marked decrease in the pyrite and increase in zinc occurred. The lead seemed to hold about the same. No ore was hipped or treated from the lower (360) foot level,but it was seen by the writer just before it was allowed to fill with water and the showing was very attractive. At that time, January 1916,the propesty was under option to O.A.Turner who owing to financial difficulties was unable to hold the property and it eventually reverted to the owners,Mr.O.D.M.Gaddis,et al,

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of Kingman. It has been recently (Dec.1916) re-optioned and work of unwatering is being started. The old shaft is small and in bad condition so it is proposed to drive a long tunnel from near the Golconda Road which will cut the old shaft between 300 and 325 feet. This tunnel cross cuts a number of veins showing on the surface. The mine makes about QTP gallons of water a minute. It is described on page 100 of U.S.Geological Survey Bulletin No.397.

The surrounding ground which is most interesting to the operators of the Jemison, is that which lies to the south east and east. I refer to the Clamp claims and the Night Hawk. Their relative position is whown on the accompanying maps. There is very little work that amounts to anything on the Clamp ground, but as has been said before, the Jemison vein is probably contined as the vein on the Little Johnnie Claim. The amended claims would have a common end line. There is every indication of a shoot near the middle of the Little Johnnie and beyond the Little Johnnie is the ground of the Nelson Bros. who have some high grade surface enrichment ore and every indication of two shoots, however, it is too far a sway to be of particular interest at this time.

The Night Hawk Mine consists of two claims, the Night Hawk and Rip Van Winkle. It is briefly described on Page 103 of U.S. Geol. Survey Bul. No. 397. Some very high grade gold and silver ore has been taken out in the past and there is every indication of strength in the bottom of the present lowest workings. It is now being worked by leasers, who shipped this fall (1916) a car of hand sorted material

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that netted them over $300.00 per ton. The Night Hawk has a long strong shoot and though it is narrow, being only about 18 inches to two feet wide, its higher values make it attractive. No systematic sampling has been done on the property as it is not so situated as to be readily handled as an individual property. There are two ways it could be worked; by long tunnel from the north west end of the Scotty claim, owned by Paul White, which would be a drift, ir by a cross cut from the Jemison, assuming that the Jemison tunnel is driven to or under Clamps Little Johnnie claim. This latter is the more attractive. In the natural course of events, the Jemison tunnel will reach the Clamp ground and from there the cross cut to the Night Hawk, will be over 1000 feet shorter than the drift from the Scotty. This would also cross cut the veins on Clamps Mint claim as well as several minor veins that show on the surface. It is true that only minor ore shoots are seen at the surface on this intervening ground, but it is much more promising than a drift with the country. The cross cut would also have a little greater depth. The whole question of the Night Hawk in connection with the Jemison, is one

of the future, but it should be considered to a certain extent when figuring on possibilities. The control is in the hands of Mr.I.M.George of Kingman, who will be found a very reasonable man with whom to do business.

Experiments have been made demonstrating the success of floatation and of partial roast and magnetic separation, as a means of treating the ores of the Cerbat Mountains.

Jig and table concentrates are made which take care of the lead. The middle product is given a partial roast and then sent to a megnetic separator giving zinc and iron products. The copper will be with the iron and is shipped by itself. If the copper content is low, the iron is conbined with the lead concentrate and sent to the lead smelters. The slimes and tailings from the above treatment are put thru floatation machines.

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Some ground on the slope a half mile to a mile west of the present camp should be located for a possible future Mill site.

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The installation of machinery is dependent on the policy and finances of the operators with regard to the terms of their option.

N O T E

It is found that the name "Clamp" in the text and on the Maps, should be "Klemp". The gentlemans name is _eo. Klemp.

EXHIBIT "L"

R E P O R T

ON PROPERTY - - - -OF THE

JEMISON MINES COMPANY

CERBAT MOUNTAINS

HUALPAI MINING DISTRICT

MOHAVE COUNTY

ARIZONA.

BY

ERNEST G. GNAEDINGER

WALLACE, IDAHO,

DECEMBER 1, 1916.

1/5

In submitting this report on the Jemison Mine for your consideration, I must reming you that my examination was necessarily hurried, and I was able in my two days at the property, to cover only the country in the immediate vicinity of the mine. Among the various properties, however, that I have examined for yourself, as well as others, I find the Jemison the first one, for some time, that I can sincerely recommend; believing that a personal inspection yourself, as well as reports of other engineers you may employ, will but bear out the impression this prospect left with me. I can heartily recommend it to your further investigation and exploitation.

The LOCATION of the property is about fifteen miles northerly from Kingman, in the Hualpai Mining District, Mohave County, Arizona; in a range of comparatively low hills known as the Cerbat Range. It is reached by auto road (about 17 miles) from Kingman, and is about three and one-half miles from the nearest shipping point, Mineral, on the Kingman-Chloride Branch of the Santa Fe Railroad. Kingman is the supply center, a substantial town on the main line of the Santa Fe. The general topography is typical of the Arizona desert land, sparse vegetation and no continuous running streams. Timber must be shipped in, and water for mining purposes secured from springs or the mines themselves. In this regard I will state that I saw one mine operating a 250 ton mill with ease, by the aid of the mine water alone. For domestic purposes numerous springs of good water are available and the Jemison itself has several such on its own property. As regards timber, the rock in the various openings visited, stood well and, with a back-filling system of mining, a comparatively small amount of timber should be necessary.

TRANSPORTATION from the mine must be by auto truck, and the cost should not exceed Two Dollars a ton, which might and probably would decrease to about One Dollar in handling any

quantity.

The PROPERTY of the Jemison Mines Company consists of four practically full claims:- the White and Blue, Mammoth, Mendocino and Jemison Lodes, with some small fractions in addition. These claims lie well up the slope of the main range and can be developed to great extent by tunnels, though shaft-work will be immediately necessary in the event of opening a mine. The claims are so located as to include over three thousand feet along a dyke later described herein, and a full fifteen hundred feet along the main vein exposed.

The GEOLOGY of the country has been described by F. C. Shrader in Bulletin No. 397 of the U.S. Geological Survey. The main range rock in the make-up of the Cerbat Range is granite, somewhat gneissic in character. This granite or gneiss is cut by innumerable masses and dykes of the colcanics consisting principally of granite porphyry, rhyolites and andesites. Numerous true fissure veins occur throughout the Range, striking off from these dykes and closely correlated to them. On the Jemison property I found such a dyke, from 40 to 70 feet in width, traversing the Mendocino and Mammoth claims and is the "vein" of these claims, and extends beyond them in both directions along a general course of N.10°W. with a dip of about 55° to the West. Several veins have been developed on the property, all closely related to the dyke. The principal one of these is the Jemison Vein, through there is also a very promising galena vein exposed in a small way on the Mammoth claim. The Jemison Vein is well defined along its outcrop for a thousand feet. This vein was worked years ago through two tunnels about 600 feet East of the present workings, and a cave stope shows that ore was shipped that is reported to have run very high in copper and gold.

The WORKINGS at present open and being used consist of a tunnel and a winze from a short cross-cut tunnel. This winze

was sunk on the vein about half way between the upper gold-silver ore shoot and the mount of the main working tunnel. The winze in its fifty feet of depth shows a marked improvement in appearance of the vein and ore-content, and at the bottom shows three feet of good sulphide ore. The main working tunnel entered the vein along the course of the dyke, as this tunnel first crosscuts then follows the dyke. At 190 feet from the mouth the vein leaves the dyke and takes its permanent course of S.55°E. From this point to the face, about 155 feet, there is a well banded shoot of ore containing, continuously, the sulphides of iron and copper, though the face shows two feet of sphalerite that would assay f to 7% zinc. This shoot of ore at this time (Nov.17, 1916) is 150 feet long, with an average width of 3½ feet; but from the appearance of the ore itself and also the presence of the first sulphide ore in the winze, 60 feet ahead, which is only about 10 feet above this level, I would say there is no stopeable ore yet developed. The last sixty feet of this drift however, shows an average width of four feet and at the face it measured 5 feet and 8 inches, the last 30 feet of which included a well banded seam of arsenopurite, about 7 inches thick, that my sampling showed to average 1.74 oz. Gold, with a sample from the face running as high as 5.40 oz. My sampling from the face outward, show a length of 60 feet, 4 feet wide assaying (average) 3.5% Copper, 0.4 oz. Gold and 16 oz. Silver, The balance of the drift shows a smaller width of ore till it dies out in the dyke but for 100 feet would average 2½ ft. wide with the same copper content, though a probable lower ratio of gold and silver.

The SURROUNDING MINES include the Golconda now profitably operating, and which lies about one-half mile from the Jemison claim and its vein must be either the same as the Jemison, or one closely paralleling it. The Golconda Central, also within one-half mile, but more to the South, is also working and shipping. The LaPlatte or Golconda Extension to the South, with a

4/5

rich production to its credit; The Night Hawk lying about East of the Jemison reported to have some very high grade ore; besides a great many more smaller properties.

The immediate future DEVELOPMENT will be comparatively simple, as well as cheap. This should consist of following the ore and the vein to at least get under the old worked stope. As the rock has all the appearance of breaking well, this drifting should not be very expensive. I neglected to state earlier in this report that electric power is available for more extensive work, and the power line may be tapped in about one mile of pole line. After it is determined how long an ore shoot or how many are present, it will be necessary to sink both to develop as well as to aid the surface poant and disposition of buildings, waste, etc.

The Jemison is not yet a mine, in spite of its past shipping history and the development lately of this new shoot; for there is no real ore in sight or blocked out, nor a long enough ore shoot developed to be able to figure on anything certain. But with the ore that has been developed, showing, in its comparatively shallow depth such a marked improvement in the tenure of ore and size, together with the presence of another or the same shoot 500 ti 600 feet ahead, the top of which has already produced some rich ore, the Jemison may certainly be termed a very fine prospect.

(Signed) ERNEST G. GNAEDINGER,
Mining Engineer.

D.K. MARTIN & ASSOCIATES
Mining Development & Administration
4728 N. 21st Avenue
Phoenix, Arizona 85015

GEOLOGIC EVALUATION
BRONCO DIKE PROJECT

Prepared For:

Charles E. Goetz

14 JULY 1984

(602) 246-9573

GEOLOGIC EVALUATION

BRONCO DIKE PROJECT

CHICO MINING CLAIMS

GEOLOGY:

All the attendant geological features or conditions that have been responsible for the formation of economic ore deposits in the Wallapai Mining District are evidenced along the Bronco Dike.

The Dike is a prominant linear structure which traverses the Chico Property for three-fourths of a mile (see attached map). It is composed of at least three rock types and cuts all litholgic units in the area. The Dike varies from 20 to 70 feet in thickness, strikes N 10° E and dips 60° SW. Evidence of mineralization in the Dike is from iron and manganese stained gossan caps, in place mineralization underground and the number and extent of workings on the structure.

The Bronco Dike is primarily composed of Mesozoic (?) Ithaca Peak Granite, an equivalent of the Duval Mineral Park, copper porphyry orebody, which is itself a fissure filling in an older granite gneiss. The Ithaca Peak Granite is, in turn, intruded by smaller dikes of Tertiary rhyolite and diabase (?). Lastly, mineralized quartz-sulfide veins cut all rock units in the dike.

GEOLOGY (continued)

As a result of the stresses accompanying these intrusions, and repeated heating and cooling, the fissures were formed. That the fissures tapped the reservoir(s) from which these molten rocks originated not once but three times seems to be the case.

A considerable amount of primary sulfide minerals were carried up by ascending hot solutions of subsiding igneous activity is evidenced by the many small, fracture filling sulfide veinlets, ubiquitious in the granite fraction of the dike, and by quartz-sulfide veins randomly placed along the dike and at dike-vein intersections.

At least six major veins traverse the Chico Property trending northwest and intersecting with the Bronco Dike. Concentrations of ore appear to favor vein junctions.

Conditions of rock associations are reported to be similar throughout the 400-foot depth of present workings, now flooded, on the dike. Therefore, any precipitationg effects the country rock has on ascending (or decending) solutions are duplicated to a depth of at least 400 feet.

That the dike is highly altered (propylitically and silically) and saturated with water shows that was open to the action of mineralizing fluids and vapors during periods of thermal activity were favorable to ore deposition. At present the open, water filled nature of the dike enhances the possibility of secondary enrichment.

WORKINGS ON THE DIKE:

The Jamison Mine contains the most extensive workings on the dike. The mine is developed by a four-hundred foot shaft with extensive tunneling. The shaft is collared in the dike and the workings reportedly followed quartz-sulfide veins. The walls of the mine, where accessible, are composed of fractured granite containing quartz-pyrite veinlets which resemble stockwork type mineralization. The lower portions of the mine are flooded but reportedly the stockwork persists to the lowest mine workings. This report is substantiated by the character of the mine dump (Sample BD-JMD was taked from the Jamison Mine Dump). More than 2000 tons of low grade, base metal-silver ore has been stockpiled from the Jamison Mine and reportedly much more is exposed underground. Mill test results performed by Denver Equipment Company's Ore Testing Division, on stockpiled ore, averaged 0.03 ounces gold per ton, 6.0 ounces silver per ton, 1.9% copper, 1.7% zinc and 1.0% lead. Results from laboratory batch selective floatation tests show the ore can be beneficiated to recover nearly 90% of the silver, copper, lead and zinc and approximately 40% of the gold. High-grade shoots encountered in the Jamison Mine reportedly ran as high as 2 ounces gold per ton and 50 ounces of silver (sample BD-JMOS was taken from the remnants of an ore shoot in the upper workings).

The Owens inclined shaft is collared in the dike and is reported developed to a depth of 84 feet but is presently flooded. It is further reported that the shaft was sunk on a quartz vein which ran a quarter ounce of gold. The mine is collared in the wash and it appears the dump was washed away during a flood.

WORKINGS ON THE DIKE (continued)

The Bronco Dike Tunnel is located just across the wash from the Owens inclined shaft. The tunnel is flooded but partially accessible and appears to follow a quartz-sulfide stringer composed of pyrite, galena, chalcopyrite and sphalerite (sample BD-BDT was taken from this stringer). Two caved areas on trend with the tunnel appear to be where stopes from the tunnel broke through to the surface, abundant copper staining was noted in the vacinity of these cave-ins (samples BD-DC 1-5 were taken across the dike outcrop in a dozer cut above the stoped area).

The Logas Workings consist of three adits, all of which are in the dike. The southern-most adit is flooded and the entrance sealed with gypsum/anhydrite precipitate. The dump is composed of granite similar to the Jamison Dump described above. The middle adit is short with face, ribs and back in stockwork granite with pyrite veinlets identical to the dumps mentioned above (sample BD-LW was taken across the face). The northern-most adit enters the dike on the updip side heading southwest toward the southern adit. The adit enters in rhyolite and thirty feet from the portal, at the rhyolite-granite contact, a twelve inch wide, massive arsenopyrite vein intersects the tunnel obliquely (sample BD-LW aspy was collected from this vein). The adit continues on 80 feet through highly fractured and bleached granite to a cave-in where the tunnel passes under the road. The granite contains stockwork type quartz-pyrite veinlets and is extensively altered (sericitic?). The Logas Workings occur at the Alpha Arm branch of the Bronco Dike (See attached map).

WORKINGS ON THE DIKE (continued)

In addition to the above described workings, numerous exploration pits and trenches have been dug on the dike exposing small veins and stained areas which, when taken together, attest to the abundant mineral content of the dike.

RECOMMENDATIONS:

In addition to the low-grade, large tonnage deposit indicated to exist in the Bronco Dike, it is probable that several high-grade low tonnage ore shoots could be delineated within the larger deposit.

It is known that the most favorable loci for ore in the Wallapai District, is at vein flexures and junctions. Six major veins traverse the Chico Property toward intersections with the Bronco Dike, namely, the Little Boy-Jamison, the Mint-"98", the Nighthawk-Cashier, the Alpha, the Summit and the Logas. It is therefore recommended that these veins be carefully mapped to intersection with the dike, the intersection sampled and, if warranted, drilled to determine the size and tenor of values in the ore shoot.

Respectfully submitted,

Wm Vanderwall s/s

Wm. Vanderwall
Geologist, Az. Reg. GIT34

D.K. MARTIN & ASSOCIATES
Mining Development & Administration
4728 N. 21st Avenue
Phoenix, Arizona 85015

SAMPLE DESCRIPTIONS
BRONCO DIKE PROJECT
Chico Mining Claims
14 July 1984

BD-JMD	Grab sample from various portions of the Jamison Mine Dump, composed mostly of granite and rhyolite fragments with pyrite veinlets and blebs, minor quartz. Gold = 0.0006 oz/tn Silver = 0.000 oz/tn
BD-BDT	Select sample from 2" wide qtz, ccp, sp, ga vein in Jamison workings, remnant of ore shoot. Gold = 0.0360 oz/tn Silver = 8.760 oz/tn
BD-DC 1	4' channel across dozer cut, mostly granite Gold = 0.0010 oz/tn Silver = 0.196 oz/tn
BD-DC 2	4' channel across dozer cut, granite + rhyolite + contact Gold = 0.0009 oz/tn Silver = 0.269 oz/tn
BD-DC 3	4' channel across dozer cut, rhyolite Gold = 0.0010 oz/tn Silver = 3.420 oz/tn
BD-DC 4	4' channel across dozer cut, rhyolite Gold = 0.0020 oz/tn Silver = 5.640 oz/tn
BD-DC 5	4' channel across dozer cut, rhyolite + granite + contact Gold = 0.0015 oz/tn Silver = 0.575 oz/tn
BD-JMOS	Select sample across 14" wide qtz, ccp, sp, ga vein in Bronco Dike Gold = 0.0410 oz/tn Silver = 1.720 oz/tn
BD-LW	6' channel across face of Logas middle working, bleached granite with pyrite veinlets and blebs. Gold = 0.0009 oz/tn Silver = 0.000 oz/tn
BD-LW aspy	Select sample across 12" wide aspy vein in north Logas Adit. Gold = 0.0067 oz/tn Silver = 5.020 oz/tn

(602) 246-9573

NORTH AMERICAN LABORATORIES, INC.
1022 West 23rd Street
Tempe, Arizona 85282
(602)894-0919

C E R T I F I C A T E O F A N A L Y S I S

Date:	July 20, 1984
Job Number:	MA-1502
Client Name:	D.K. Martin & Associates
Address:	4728 N. 21st Avenue Phoenix, AZ 85015
Telephone:	246-9573
Samples Submitted by:	Mr. Brown
Date Received:	July 17, 1984
Telephone Results:	to Mr. Brown by GAH on 7/20/84
Sample Preparation:	The entire sample was crushed to -1/4 inch, blended, split and the split pulverized to -200 mesh.
Geochemical:	Analyses performed by Atomic Absorption - Au, Ag

CHARLES R. RANNEY
MINING ENGINEER

PHONE 622-3609
BOX 89, SANTO TOMAS RTE
SAHUARITA, ARIZONA

PHONE 703
AVE JUAREZ 231
CANANEA, SONORA, MEXICO

PRELIMINARY REPORT

CHICO MINES PROPERTY
Kingman, Arizona

by

Charles R. Ranney

July 1973

CHICO MINES PROPERTY
Kingman, Arizona

INDEX

MAP INDEX

P.O. Box 99
Wikieup, Arizona 85360

July 18, 1973

Mr. Charles E. Goetz
Mining-Exploration
P.O. Box 2228
Phoenix, Arizona 85002

Dear Mr. Goetz:

Please find my accompanying report on your Chico Mines Property.

I spent more time than anticipated because the property has more economic potential than I expected.

Please note my specific Conclusions and Recommendations.

Respectfully submitted,

Charles R. Ranney
Mining Engineer

CRR:lc

CHICO MINES PROPERTY
Kingman, Arizona

CONCLUSIONS

1. Because of recent increases in the price of metals, particularly silver and gold, the possibilities of developing a producing mine, or mines, at the Chico Mines property are excellent.

   Immediate exploration and development are recommended for the 4 major vein deposit systems.

2. The Chico Mines Claims along the northern boundary, possible favorable areas for a large porphyry copper type deposit, might better be farmed out to a large, well-financed organization.

CHICO MINES PROPERTY
Kingman, Arizona

INTRODUCTION

A. Location

The Chico Mines Property is situated in Mohave County, in the Hualapai Mining District of the Cerbat Mountain Range, in northwestern Arizona. The nearest railroad station is at Kingman on the Santa Fe railroad. It is reached from the property by about 5 miles of improved dirt road and 14 miles of pavement, U. S. Highway 93.

To the north, the Chico Property adjoins the claims of the open pit Ithaca Peak copper-molybdenum operation of Pennzoil-Duval Corporation, currently mining 18-20,000 tons of ore per day.

This preliminary report was prepared for the owner of the Chico Mines Property, Mr. Charles E. Goetz of Phoenix, Arizona.

B. Purpose of Investigation

Preliminary investigation of the Chico claims was undertaken to evaluate the economic possibilities of the property, both from the standpoint of a possible large disseminated copper-molybdenum producer, and as a medium sized base metal and gold silver producer.

Approximately 10 days were spent on the property. Considerable difficulties were encountered in correlating the claim posts in the field to the 'surveyed' claim maps. These maps are not correct for the patented claims as shown. Furthermore, most of the unpatented claims are not marked in the field. This omission should be corrected and a correct survey established.

I wish to thank Mr. Francis J. Denten for his very able assistance in the sampling and appraisal of the property.

Mr. Jack Owens and Mr. Denys Poyner also made valuable contributions.

CHICO MINES PROPERTY
Kingman, Arizona

SUMMARY

1. The Chico Mines Property comprises 48 claims, 2 patented, located in Sections 31, 32, T. 23 N., R. 17 W., and Sections 5, 6, T. 22 N., R. 17 W., Gila and Salt River Meridian.

2. The claims, for the most part, are situated around the old Stockton Hill mining camp, and they border the Mineral Park Region. The Chico north claims' boundaries adjoin the Ithaca Peak Claims of the Pennzoil-Duval Corporation; to the south, the Chico Claims adjoin the Golconda Mines group, the second largest base metal producer in the Hualapai mining district.

3. Rocks exposed at the surface include granites, gneisses, schists, and amphibolites of pre-Cambrian age, intruded by the Ithaca Peak granite or quartz monzonite porphyry, the center of which lies north of the Chico claims. This intrusive, with related dykes and sills, is thought to be the source of most of the mineralization in the district. It has tentatively been assigned to the Mesozoic Era.

4. The ore mineralization on the Chico claims can be separated into two types. The first is represented by the vein deposits, occurring along fissures in all of the rock types. Most of the veins strike from N. 30 W. to N. 60 W., dipping steeply to the northeast. The northwest veins vary in width, averaging 3-4 feet, but they increase to up to 30 feet wide at vein junctures. Along the 'Broncho' dyke area, extending from the Golconda Mines workings past the most northerly Chico Claims' boundaries, ore mineralization strikes N. 10° E., and it dips approximately 60 degrees to the northwest. Junctures where the northwesterly trending vein systems intersect the Broncho dyke appear to be very favorable loci for ore.

5. Potentially favorable areas for a large commercial copper porphyry, quartz-sulphide stockwork, deposit lie along the northern boundary of the claims where monzonite porphyry outcrops occur as possible small cupolas. Drainage to the south of these outcrops shows abundant copper sulphate precipitation. The possibility of locating turquoise in connection with copper mineralization, as at Turquoise Mountain nearby, should not be overlooked. A limited geochemical sampling program should be considered as a guide to possible drilling.

Summary (Cont'd.)

6. At least four major vein systems are exposed on the Chico Claims. They trend northwest from Stockton Hill to intersections with the manganese stained 'black dyke' (Broncho Dyke) which extends N. 10° E. from the Golconda Mines workings.

   Looking from northeast to southeast they are: (see map)

   1. The Alpha Vein.
   2. The Black Knight-Cashier Vein.
   3. The Little Boy-Mint Vein, with the '98' Vein possibly joining the Mint vein from the northeast.
   4. The Blackfoot Vein which appears to be joined by the Gold Reserve Vein below Stockton Hill.

   In addition, the Ithaca Peak porphyry tongue extending as a dyke southeastward to the Oro Plata Mine (Golconda Extension) continues along the Pasadena No. 1., the Mammoth No. 7., and the Mammoth No. 5. claims. (see map)

   The True Blue Vein (patented claim) extends northwesterly between the Broncho Dyke fissure system and the monzonite porphyry tongue fissure system. Intersections along both of these dyke fissure systems with the north west trending vein systems have been shown to be extremely favorable ore loci by present sampling and previous workings.

7. Results of recent spot check sampling are tabulated and shown on Map No. .

8. Because of recent increases in metal prices, and most particularly silver and gold, the probabilities of developing a producing mine, or mines, at the Chico property are greatly increased. Development work at the property during the past few years does not appear to have been conducted in a miner-like fashion.

   No mining operation in the United States today can be made to pay without mechanization. Mechanization is the answer to high labor costs. The development of trackless mining equipment for small and intermediate, as well as large scale, underground mining can be successfully applied at the Chico Mines property.

CHICO MINES PROPERTY
Kingman, Arizona

RECOMMENDATIONS

1. The Chico property can be considered as two separate and distinct units. Each unit should be handled in a different manner.

   A. Unit A comprises areas along the northern boundary, the possible favorable areas where a large commercial porphyry copper type deposit might be found and developed. Preliminary geochem work could aid in delineating favorable areas for drilling. These areas might better be farmed out to a large well-financed organization for exploration and development.

   B. Unit B encompasses the vein deposits, comprising four major vein systems. Because of increases in metal prices, particularly silver and gold, the time is propitious for immediate exploration and development.

2. The proposed work on the vein system deposits should be undertaken in two phases, phase No. 2. being contingent upon the results of phase No. 1.

Phase No. 1.

This phase consists primarily of checking vein junctures, pumping and cleaning out old workings, bulk sampling, and development for the proving up of sufficient tonnages to justify and serve as a guide for a milling installation.

The use of an adequate bulldozer, preferably a D 8 H Caterpillar, or its equivalent, is a necessity.

The access tunnel on the Little Boy claim should be cleaned out and thoroughly checked. There is a very good possibility of mining high grade silver ore from this area. (see map)

The incline shaft near the northeast corner of the True Blue Claim, intersecting the "Broncho Dyke at shallow depth, should be pumped out and thoroughly sampled. Spot sample checks of dumps and dyke outcroppings showed around an ounce per ton of gold and 15 oz./ton of silver. This incline was driven by Mr. Jack Owens who reports that very good gold values were discovered along the dyke.

Recommendations (Cont'd.)

Other northwest vein junctures with the Broncho Dyke and the monzonite porphyry tongue to the west should be opened up with a bulldozer.

Phase No. 2.

Pursuant to the exploration and ore development accomplished in Phase No. 1., a new development incline should be driven to allow access to the most favorable areas of the major vein systems at depth.

This work must be undertaken with trackless mining equipment in order for a profitable mining operation to be carried on in the present high labor market.

2. Phase No. 2.

Selection and installation of milling equipment, pursuant to development and testing of stockpiled ore, might better be carried out in two phases also. A 100 ton initial milling unit should be adequate to handle the initial phase. Any addition should be dependent upon subsequent development.

CHICO MINES PROPERTY
Kingman, Arizona

History and Production

From 1863-1900, oxidized portions of the fissure veins were prospected and mined. Very high grade concentrations of silver ore were reportedly discovered. No exact production figures are on record.

The value of metals produced during the years 1904-48, U. S. Bureau of Mines Report, was about $22,500,000. Values were principally in lead and zinc with subsidiary silver and gold. In 1943, the Tennessee Mine was reported as producing about 150 tons crude ore per day, averaging 7 per cent zinc, 3.5 per cent lead and 17 to 25 ounces of silver per ton.

Pennzoil-Duval Corporation is reportedly producing 18-20,000 tons of ore per day averaging around 0.50 percent copper and 0.045% molydenum, averaging around 12 dollars per ton.

The yearly Pennzoil-Duval production now amounts to more than the entire production of the Hualapai mining district previous to their operation.

Accessibility

The Cerbat Mountains rise sharply from the detritus filled valleys bordering them on the East and the West. Total relief is about 3500 feet.

The Chico Claims are easily accessible by a number of recently bulldozed roads, cutting and exposing the major vein systems.

Climate and Vegetation

The climate is arid, with mild winters and relatively hot summers.

Vegetation is sparse chiefly of the desert types. Scrub pinon and juniper is found at the higher elevations.

Water

Ample water for mining is found in the old workings.

Sufficient water for a moderate-sized milling operation can be developed in the fissure systems.

CHICO MINES PROPERTY
Kingman, Arizona

General Geology

The Chico Area is underlain by pre-Cambrian schist, amphibolite and altered granite, cut by later intrusions of Mesozoic granite and monzonite phorphyries, known locally as the Ithaca Peak Granite. This intrusive, with related dykes and sills, is believed to have been the source of most of the mineralization of the Hualapai Mining District.

Outlying bodies of the Ithaca Peak granite are particularly abundant on the Chico Mines Area, extending from Mineral Park south into the former Stockton Hill and Cerbat Mining Camps.

Many veins occur in nearly vertical fault fissures that strike northwestward and outcrop for considerable distances. The fault fissures are largely occupied by breccia with abundant shearing and some gouge. Ore lenses, though not continuous, are numerous and tend to be of greater vertical than horizontal extent. The best ore shoots are discovered close to intersections and vein junctures. Most of the ore lenses now exposed contain quartz, sphalerite, galena and pyrite with a fair amount of gold and silver. High grade gold and silver is found not only at the higher elevations of the major vein systems but also along their intersections with the 'Broncho Dyke'.

Ore Reserves

There are no blocked out ore reserves on the property. However, there is ore exposed in the Mint tunnel and in many places on the surface, cuts, trenches, old dumps, Etc.

As previously mentioned, abundant copper Sulphate precipitation may be noted in drainage areas to the south of the northern Chico Claims which border the Pennzoil-Duval properties.

Charles R. Ranney
Mining Engineer

ARIZONA REG'D MINING ENGINEER
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TELEPHONE 955-7353

Richard E. Mieritz
MINING CONSULTANT

GEOLOGY
EXPLORATION
EVALUATION
FEASIBILITY
OPERATION

February 21, 1967

Mr. Charles Goetz
Charles Goetz Mining
P. O. Box 2228
Phoenix, Arizona, 85001

Dear Mr. Goetz:

At your request through Mr. Alex Prohoroff and accompanied by him on February 18 and 19, 1967, I briefly examined the Chico group of lode claims south of the Duval Sulphur copper operation near Chloride, Mohave County, Arizona.

Mr. Prohoroff explained the purpose of the examination as being to provide you my ernstwhile and candid opinion of the property and if it was of sufficient "merit"; then to provide you my candid recommendations as to project procedure in the immediate future.

Mr. Roy Montague very cooperatively accompanied Mr. Prohoroff and myself over the property as well as pointing out many of the mineralized structures and providing the writer with many facts which he has gained from prospecting and working the property for a five year period. I found Mr. Montagues' facts and remarks very accurate and is a capable man.

The brief examination included observing all the accessible underground workings of the Jamison structure currently being drift developed about 80 feet lower in elevation than the main Adit level and a very fast "look-see" of most all other vein structure outcroppings within the claimed area.

On the basis of what was observed in the underground workings and surface exposures plus facts provided by Mr. Montague, it is my honest opinion that the property hosts well developed strong structures containing strong to moderate copper, zinc, lead, gold and silver mineralization. I also strongly opinionate that the property poessesses the potential of a large mass containing complex low grade mineralization as copper, zinc, lead, gold and silver.

Regardless of the type and mode of mineralization and a desire or thought to "operate" as soon as possible, exploration and development of the "veins" or low grade "mass" are a pre-requisite to <u>any</u> well planned profitable operation, that is to

say, before any mining and milling operation could be planned to provide a reasonable profit and return of capital investment required for such an operation whether it be underground mining or open pit mining.

Without going into all ramifications of geologic rock types, structural features, etc, as I am sure my predecessors have fully described, let me say that major mineralized structural features within the property generally strike N. 30° W. or S. 30° E. with very steep dips and other structures strike about North-South with flatter dips, usually to the west. These mineralized structures as exposed on the surface appear to be about 200 feet, or less, apart. The area can therefor be considered as one of moderately, majorly fracture patterned and was therefor very receptive to mineralization. An observation of particular importance is the fact that disseminated copper, zinc and lead mineralization is exposed in some of the Jamison underground workings. The degree and extent of such mineralization is difficult to evaluate with the limited amount of workings available.

In general, I am of the opinion that this property parallels to a great extent the geologic and structural features as the Duval property to the north.

The Chico property could produce at some future date either by (1) underground mining and milling of the strong, highly mineralized structures with limited small daily production, or (2) open pit mining and milling of low metallic content material but with large daily tonnage. In either case, adequate exploration and development must be done before high investments are made.

Exploration and development to assure adequate ore reserves (at least two years supply for underground mining) must be proved. Such exploration and development work by underground methods is slow and costly. I can not recommend this route at the moment.

The observance of disseminated mineralization in the Jamison workings suggests the potential presence of a low grade mineralized mass in this vicinity. This expression of disseminated mineralization is not however visible on the surface. None-the-less, its presence is of sufficient importance that it must be explored.

The dissemination is no doubt a result of and controlled by the major fissure or structural features in the area. Since most major structures in the area are very steep dipping in character, it is best to "explore" these and their intervening

areas by some means of crosscutting at as near a right angle as possible, both strike-wise and dip-wise. Such work must originate in the area of known mineralization, weak or strong, and in this case it is the exposure of dissemination on the Adit and 80 foot levels of the Jamison workings.

Diamond drilling is by far the most rapid and less expensive as compared to underground cross-cutting exploration. To this end I therefor recommend to you the following:

(1) Diamond drill two holes from an underground station near the face of the 80 foot level.
(2) The length of these holes should be 500 feet plus and directed approximately N. 75° E., collared on the east wall of the drift while the second hole should be directed approximately S. 45° W. and collared in the west wall of the drift.
(3) Both holes should be drilled at a -15° from the horizontal. The bottom of a 500 foot hole will then be approximately 130 feet below the elevation of the present 80 foot level. Drilling in the directions indicated in (2) will place the bottom of the holes approximately 100 feet ahead of the present face of the 80 foot level.
(4) Holes should be drilled BX and AX size if possible, if not, then AX and EX size.

Such drilling will then be exploring the area beneath the disseminated mineralization observed on the Adit level beyond the winze servicing the 80 foot level as well as cross-cutting an vein structures within the 500 foot distance.

If this exploration shows encouraging results it would be advantageous to move your surface diamond drill onto the property and commence an energetic, well planned, grid type, vertical hole program approaching 15 to 20,000 feet of drilling.

The initial underground drill program recommended should be contracted since time is of the essence and such program would cost approximately $10,000.00 plus including a contract price, sampling and assaying and professional supervision.

Taking of samples in the mine at this time is an expense which could not be justified, however, two samples were taken as follows: (1) material representing the mineralized rock (about 80 tons) Mr. Montague removed from the 80 foot level and has stock piled near the portal and (2) cuttings from a 20 foot long drill hole Mr. Montague drilled into the east wall about 50 feet from the present face on the 80 foot level. The results of these assays as completed by Valley Assay Office in Tempe are as follows: (next page)

	Oz. Au	Oz. Ag.	% Cu	% Zn	% Pb.
Samp. 1 (stockpile)	0.08	16.8	6.6	0.10	0.05
Samp. 2 (cuttings)	Tr	0.10	Nil	Nil	Nil.

No disseminations were observed near the collar of the 20 foot drill hole which sample No. 2 represents. Washing of the cuttings did however show some pyrite mineralization.

It is hoped the above will provide you with adequate information on how to further proceed with the Chico project. If you have any questions, please call me.

Respectfully submitted,

R. E. Mieritz, P. E.
Mining Consultant.

Registered Professional Engineer and Land Surveyor
CERTIFICATE EXPIRES
RICHARD E. MIERITZ
DEC. 31, 1961
ARIZONA, U.S.A.

R E P O R T

ON THE PROGRESS AT THE JEMISON MINES

CERBAT MOUNTAINS. MOHAVE COUNTY.ARIZ.

BY

W.W.LYTZEN. E. M.

SEPTEMBER 18, 1917,

Lauzier Wolcott Company,
51 E. Broadway,
Butte, Montana.

Gentlemen:

This report is a continuation of my report on the same property submitted July 3, 1917.

PROGRESS:

The shaft has been sunk from 82 ' below the tunnel (100' level) to the 300' level, a distance of 108 feet. It has a uniform dip of 78 degrees to the S.W. and is along the foot wall of the vein in granite porphyry. The shaft is 290' below the collar.

The 100' level, or the main tunnel level has been advanced 110' to a total of 510' S.E. of the Broncho Dyke. A crosscut N.E. was run 20', 205' S. E. of the shaft.

The 200' level has been drifted on 75' and the vein is 15' S.W. of the shaft.

At the 300' level the vein is crosscut at a distance of 16' S.W. of the shaft, and is drifted on 20'.

The reader is referred to the accompanying map for a better understanding of this progress and to the following part of this report.

Also an auxiliary air compressor of 125 Cu. ft. capacity has been added to the mechanical equipment.

A shipment of ore made in August (8/25/17) to the Consolidated Arizona Smelting Company, Humbolt, Ariz., ran: $6.60 Gold; 19.40 oz. Silver; 4.67% Copper, which after deducting smelter settlements has a net value per ton of $37.93. Silver was paid for at 87.42¢; Copper at 24.92¢; Gold $19.00 per oz.

GEOLOGY

That the vein is a true rock fracture I feel quite certain. It cuts both diabase and porphyritic rocks. That it is later than the diabase is shown by the fact that at the beginning of the vein on the underside of the rhyloite dyke it (the vein) has diabase for both walls.

The thickness is not definitely known on account of no openings at this point. The diabase wall rock is seamed with tiny veinlets of sulphides, most pyrite.

As the main tunnel (100' level) is followed southeasterly past the shaft the diabase is a mere shell, or casing for the vein, and also forming varying amounts of vein filling, having been replaced by quartz and sulphides in part.

This diabase casing is quite thin as in places it is an easy matter to pick through to porphyritic rock.

At 305' S.E. of the Dyke no more diabase is found on the hanging wall side, but it continues as the foot, and a crosscut run in 20' N.E. still has diabase in the face showing a condition much thicker horizontally than that indicated in my first examination.

The diabase in this crosscut is slightly pyritized and contains small seams of sphalerite (zinc sulphide).

At 460' S. E. of the dyke, at the tunnel level, the diabase contact with the porphyry swings N. E. out of the tunnel and from here on the tunnel is within porphyry walls to the face.

At the time of my examination in June, the face of the tunnel was 400' E.E. of the dyke and oxidized vein quartz was

just beginning to show itself. This oxidation has been present all along the vein up to the present face. A short shoot of ore about 20' long and 10 to 12 inches wide developed here which sampled 10" wide $0.80 gold; 31.52 oz. Silver, and 6.27% copper. Total value with copper at 18¢ and silver 65¢ of $43.85 and with 23½ and $1.00 prices, the total value is $60.80 per ton.

Beyond this both sulphides and quartz gradually pinch out and only a small clay seam is now in the face.

The porphyritic rock is roughly sheeted and dips to the N. E. from 70 to 80 degrees.

The vein conforms to this sheeted structure, as 25' back from the face a good wall of porphyritic rock with a clay quage has the same dip.

The change in dip makes it highly probable that this tunnel is on the same vein as the two upper tunnels are on (the vein containing the rich stope that was worked years ago by "Highgraders").

The relative position and dip correlates them very close. The present tunnel face is about 225' from the position of this stope, which is reported to have produced $50,000, and it is 220' underneath it, but there should be ore developed in the vein before that point is reached.

SHAFT, 200' and 300' LEVELS:

The shaft is being sunk in the foot wall of the vein in a granite porphyry rock. At the 200' level a brokenup condition was found where the veh was crosscut and large quantities of water had to be pumped beforethe water held in storage in the vein was drained off. There is evidence of movement along the foot wall and a cross fault throws the vein 2½' to the north.

The mineralization in this area is slight, but in the drift to the S. E. the vein is beginning to look very much better. It is about 5' wide and a 3.8' wide sample of friable quartz ran gold $4.40, silver 6.6 oz. and 1.53% copper.

The drift to be N. W. is also in a badly disturbed condition. A 3' sample of the back 12' N.W. of shaft ran gold $1.20; Silver 11.00 oz. and copper 2.30%, total value $16.63 with silver 65¢ and copper 18¢.

A sample of a 18" seam of sulphides on the hanging wall, 52' N.W. of the shaft ran gold $4.40, Silver 5.60 oz. and copper 0.48%. A composite of the 200' level samples ran only 1.90% zinc showing the inpoverishment in that metal at this level.

No.oxidation is visable on the 200' level. The vein has the strike and dip indicated by thework above on the 100' level. The country rock on the S.E. side of the shaft is granite porphyry. On the N.W. side on this level diabase is very prominent and forms both the hanging wall and part of the vein filling.

On the 300' level there are sulphides and quartz and decomposed porphyritic rock making up a vein for a width of 5', but pretty much scattered. A 10" seam on the hanging wall ran Gold $0.60; Silver 26 oz. copper 3.07% and zinc 2.37%. A 10" seam in the center of the vein ran gold $4.60, Silver 2.27 oz. a trace of copper, and 4.74% zinc.

These two 10" samples average gave gold $2.60, Silver 14.13 oz.; Copper 1.53%, zinc 3.55%. The total value exclusive of the zinc with silver at 65¢ and copper at 18¢ is $17.28 per ton, and with 23½¢ and $1.00 prices thevalue is $22.92 per ton.

The vein here is drifted on 20' and has the correct strike and dip as indicated above.

No diabase is visable yet, the granite porphyry being on both sides of the vein.

SUMMARY:

The development on the 200 and 300 foot levels has shown a strong continuous vein with ore averaging $17.00 per ton with silver at 65¢ and copper at 18¢. But there has to be much more drifting done, especially N. W. towards the Broncho Dyke.

On the 300' level it will be about 300' from the shaft. The vein structure is good. There has been sulphide mineralization and vein quartz deposited wherever the vein has been followed.

All the attendant geological features or conditions that have been responsible for the formation of nearly all ore deposits occupying fissures in igneous rocks are here.

First, the veins at the Jemison occupy fissures in a granite porphyry which is itself intrusive into an older granite gneise. This porphyry is in turn intruded by rhyolite and diabase dykes.

As result of the stresses accompanying these intrusions, and the repeated heating and cooling the fissures were formed. That the fissures tapped the reservoir from which these molten rocks came not only once but most likely twice seems to be the case.

That considerable sulphides were carried up these fissures by the "after-effects" of subsiding igneous activity is seen in the ore body of the tunnel level.

Conditions of rock associations are the same on the 100 and 200' levels, and most likely is on the 300' level also. Therefore, any chemical effect that either the diabase or porphyry rock has on precipitating ore minerals from the uprising solutions

on the 100' level are duplicated on the levels below.

The vein structure is open and shows the action of mineralizing waters and vapors in the alteration of the porphyry wall rocks and replaced diabase.

That the vein is saturated with water shows it is not a tight fissure unfavorable to ore deposition, and the fact that the water drains off in a few days shows that we are not at water level yet The 200' level is practically dry now and the 300' level in 4 days time had dried up 50% as compared to the day the vein was cut.

All this goes to point that well directed prospecting will uncover ore bodies in this and other veins in the Jemison claims that will well repay the company.

Ore shoots are the exception and not the rule, and even when the most favorable combinations of influences exist, such as certain wall rocks, size of fissure, etc. sometimes no ore shoots are found.

It seems all the fovorable conditions are met in the Jemison: igneous intrussions, fissures, cutting both acidic and basic rocks, enough ore in the veins where opened to show that the fissure tapped the reservoirs that supplied the uprising solutions with their charge of ore minerals, and surrounded on all sides by mines of proved worth.

That ore shoots of value will not be found by very little more development is unbelievable.

That the richest part of this vein is to be looked for at depth greater than the 300' level is my opinion, based on the fact that veins of the same type in the neighboring producing mines

are not big producers so close to the surface. This is brought out more fully in my first report on the Jemison.

Another ore showing that should be prospected is along the foot wall of the Broncho Dyke to the North of the Jemison tunnel. There are striking showings of mineralization along here for several hundred feet. Oxidized copper minerals, silicate and carbonates, coat brecciated diabase and much honey combed, iron stained vein quartz is found in place and as float.

A 10" sample of this outcropping quartz on the Mamouth Claim ran $0.40 gold, 6.86 oz. silver, 5.53% copper, and a 20" sample next to it ran $0.20 gold, 2.59 oz. silver, 1.58% copper. This portion of the dyke can be advantagiously prospected by extending the "water tunnel" N. 30 degrees E. 200 feet and attain a depth of about 92'.

The above samples of course were of leached outcropping quartz and the values are merely indicative of much higher values below.

On the hanging wall side of the Broncho Dyke there is a well defined vein outcropping about 4 feet wide showing abundent galena and oxidized minerals.

This will be prospected at depth, probably by a shaft on the vein.

Other claims to the East higher up the hill having good outcropping veins can be secured on very favorable terms as the Jemison holds the key for their development at depth.

They are inaccessible without the Jemison group as an outlet.

CONCLUSION:

Developments to date are satisfactory. The vein is continuous as to length, depth, and mineralization.

Veins having continuous and uniform ore are the exception. Lean or even barren portions are to be expected.

Conditions are good for this vein and the other veins to develop ore shoots of considerable size and richness.

RECOMMENDATIONS:

That the oreshowing on the Foot Wall of the dyke be prospected, also the lead vein referred to.

That the 300' level be continued N.W. to the dyke and the contact there be prospected. Also as the 300' level is carried S. E. that occasional crosscuts be driven to prospect for parallel veins in the porphyritic rock that promises to be the country rock in this direction.

The porphyritic rock develops a sheeted condition and is very likely to be the receptical for ore deposition, arising from the diabase intrusion to the N.E.

Also, the shaft sinking should be continued.

Yours truly,

(signed) W. W. Lytzen, E. M.

Dated September 21, 1917.

Jemison Mine,

Cerbat Mountains

Hualpai Mining District

Mohave County

Arizona.

REPORT OF L. WEBSTER WICKES.

Kingman, Arizona,

Dec. 26th, 1916.

Summary.

The Jemison is an exceptionally good prospect. There is less gamble than usual as to opening ore in quantity and in the metallic content of the ore. The physical condition of the metals is not as refractory as others in the district that are being successfully treated. Milling conditions are improving almost daily.

The vein is strong and like all the others of the Cerbat Mountains will undoubtedly continue to great depth. The bottom of the shoots have not yet been reached in any mine with which the writer is familiar. Two properties are developed over 1200 feet in depth. Two shoots on the Jemison are assured and adjoining ground will probably give others. It is true in the district, so far, that surface shoots have all continued in ore with deeper development and development has in several cases opened shoots of ore that were not indicated in the veins at the surface.

There is no tonnage blocked out, but 170 feet of drifting in the lower Jemison tunnel is on ore that will yield a good profit. Experiments so far made indicate that by means of gravity and flotation concentration, combined with partial roasting and magnetic separation of the iron from the zinc products will be made such that the operator of the Jemison will get paid for 80% or more of the metallic content of the ore.

This property is in Mohave County, Arizona. It is on the West slope of the Cerbat Mountains, about half way between Kingman and Chloride. It is reached by road in seventeen miles from Kingman, which is on the main line of the Santa Fe Railroad. The mine is four miles from Mineral, a station on the branch railroad running from Kingman to Chloride.

The wagon road from Kingman is passable to automobiles but the last two miles to this property are very bad and would be unsuitable for trucks at present, being up a rocky gulch. The rise is 150 ft. to 200 ft. to the mile. This poor portion of the road is the branch from the main truck road to Golconda and serves at this time no other property than the Jemison. A suitable road for Ore hauling from the Junction of the Golconda road to the mine will cost about $3500.00. The present road, though subject to repeated washing out, is sufficiently good to handle all freight, etc., by teams and wagon during preliminary and development operations.

Telephone and electric power lines pass within a mile of the property. The nearest post-office is "Golconda," at the Golconda Mine about a mile and a half by foot trail to the south.

Kingman is the main supply point. It is a town of 5,000 people and the various stores and supply houses carry everything in stock that is necessary for all except the largest operations.

There are several surveyors and assayers available doing custom work. Haff and Colwell, whose permanent address is Oatman, Arizona, are very reliable for anything in the way of surveying, and R. C. Jacobson, Kingman, is a careful and reliable assayer.

Throughout the section fuel oil or electricity from the Desert Power and Water Company is used for power. On small installations the former is usually the cheapest as the rate for current is 2-1/2 cents per Kilo-watt for small quantities, decreasing to 1-7/8¢ per kilo-watt on a consumption of 400,000 kilo-watts per month. This is roughly equivalent to $12.00 to $15.00 per H.P. per month. Timber is a serious item as "O.P." (Douglas Fir) costs $28.00 to $35.00 per M. in Kingman in carload lots. Fuel oil costs from 4-1/2¢ up, F.O.B. Kingman. Distillate for Hoists etc., ranges around 11¢ per gallon. For this particular case electricity would be the best for any preliminary operations due to the road conditions unless the mine is sufficiently developed when the time comes to put in machinery to warrant a permanent road. Depending on hauled fuel with the present road would be too uncertain.

There is available water on the ground for all domestic purposes for some time to come. All the mines in the district make water with depth, ranging up to 150 gallons per minute. The mines are the source of all water for milling purposes.

At present the principal producing properties of the district are the Golconda (Union Basin Mining Company) and the Tennessee (U.S.Smelting, Refining and Mining Company). The Golconda is about a mile, in an air line, south of the Jemison. It is developed to some 1200 feet in depth and is at present producing about 1800 tons monthly of zinc ore and concentrate running 40% zinc and carrying a little gold and silver.

The Banner mine of the Arizona Butte Mining Company

is producing a little lead concentrate. Various other properties are making intermittent shipments.

The production of the district was originally almost entirely silver. The surface ores in numerous places were rich in native silver, horn silver and ruby silver. As depth was gained the precious metals decreased but large bodies of base metals were opened, principally zinc and lead with occasional copper bodies. It is these base metals that make the mines of today.

The Keystone mine has a mill under construction and there are two custom mills being talked about. One of the custom mills is being considered by the Zinc Concentrating Company, who will begin erection as soon as they are reasonably assured of tonnage. Their mill as outlined, will include roasting and magnetic separation as well as the usual wet methods. They are in the field for zinc product high in iron.

The Jemison group consists of four locations relatively situated as shown on the accompaning map. There are some seventy-five acres or so covered. The map shows the ground as it is monumented. The claims are all irregular and in the case of the "White and Blue" claim the location may be illegal. I would earnestly recommend that as soon as the mine work will warrant, amended locations be made and the claims brought within the legal limits as to size and that the exterior lines be made parallel and corner posts put up.

There are no permanent improvements on the ground. There are tents and camp equipment sufficient for five or six men. All work now is by hand, no machinery.

There have been numerous articles published about the mines in the Cerbat Mountains, but the summary and the most reliable information given the general public is in U. S. Geological Survey Bulletin No.397 where Mr. F. C. Schrader gives the results of his study of the section made during the winter of 1906 and 1907. Mr. Schrader published a later article at page 1935 in the November 1916 Bulletin of the American Institute of Mining Engineers.

At the Jemison the country rock is the usual "Pre-Cambrian Complex" of the Cerbat Mountains. It exists here as a medium grained granite, with a little of the jointing and gneiss forming action. There have been two sets of intrusions; Mr. Schrader speaks of them as "Tertiary" and "Pre-Tertiary."

The "Pre-Tertiary" is represented on this ground by the "Broncho Dyke", which runs the lengths of the Mammoth and Mendocino claims. The dyke was the reason for locating and is the "vein" of these claims. It strikes nearly north and south and continues to the south well into the Golconda Extension holdings and to the north about 1000' beyond the end line of the Mammoth claim. It has a total length of some 4500 feet.

The Tertiary intrusives are not positively identified on this ground, though a latite (?) that appears near the common end line of the Mendocino and Mammoth claims and which strikes a little west of south from the Broncho Dyke probably belongs to this group. Just to the west of these claims is the Pasadena Dyke. It is one of the Tertiary rhyolites which strikes N. 10° to 30° W. and a similar one is seen at the top of the ridge of the range near the south east end of the Night Hawk.

While no appreciable tonnage has been found on any of the dykes, values in gold and silver can be obtained almost any where along their strike and in places several tons have been taken out that are very rich. The indications, however, are that these pockets are purely surface enrichment.

The mines of the district are all on well defined veins that make out at sharp angles to the dykes. Mineralization has followed both sets of intrusions. Though it is by no means a proven fact, and further development and observation may prove otherwise, the present indications are that the veins making out from the Pre-Tertiary dykes are richer in copper, iron and gold, while those out from the Tertiary are richer in silver and lead. This does not apply, however, to a large area near Mineral Park where there is a disseminated pyrite carrying copper in a rhyolite porphyry that has produced a number of secondarily enriched copper deposits. The Galena usually gives way to iron and the iron to zinc. Due to heavy and rapid erosion the oxidized zone is shallow and primary sulphides are often found close to the surface. In many places the surface zone is that of secondard enrichment. Much ruby silver was found in the early days in the oxidized ore. Both in the oxidized and in the sulphide zones the various base metals showing are refractory mixtures of pyrite, chalcopyrite, blend and galena. In the past some of these ores have proven too refractory to handle. At present, however, unless the conditions are exceptional, almost any of the sulphides can be separated and marketed with a saving of better than 80%. By this is meant that various combinations of flotation with a partial roast and magnetic separation have given, both in practice and in experimental work, clean marketable products.

It is well to remember that the so-called blend or the Cerbats is really not a straight zinc-sulphide, but is in fact a marmatite; that is an iron-zinc sulphide, the iron being chemically combined. The result is that a forty-five to forty-six per cent Zn concentrate is as rich as can ordinarily be made. The pure mineral runs but 51% Zn.

The promising showing of this ground is on the Jemison vein. This strikes S. 47° degrees E. and makes out from the Broncho Dyke at about the middle of the Mendocino claim. It is traceable definitely nearly to the S.E. end of the Jemison claim. At a point about 200 feet from the Broncho Dyke a branch vein takes off which strikes about S. 68 Degrees E.

A tunnel has been driven to the intersection of the dyke and vein and from the intersection is continued as a drift on the vein. On December 25th, 1916, it opened the vein for 170 feet. Values and sampling are indicated on the accompanying assay map. The face is still in very good looking ore. There are three upper tunnels that develop the vein to a certain extent. The two upper tunnels are in oxidized material entirely, though occasionally a speck or two of sulphide remains. An old stope near the face of the upper tunnels is reported to have produced several hundred tons of ore going $200.00, the values being mainly in gold. This stope, though caved, shows a shoot apparently about 40 ft. long. The tunnel is on the vein for nearly 300 feet before getting into the stope.

The lowest of these three upper tunnels is really a crosscut and evidently only reaches the branch vein mentioned above. The wein's width wherever mineralized is from two to five feet and so far averages 3.25 feet. The ore will evidently

occur in shoots. The one in the lower tunnel now being driven, so far is shown to be over 200 feet in length.

The shoot indicated in the upper tunnel by the old stope can be expected by comparison, as a little greater depth is attained, to be longer than the 40 feet now shown. It would be reasonable to expect, out of a length of vein of 1500 feet, that at least one third of it would be mineralized, and entirely possible that there would be even more. Barren zones will undoubtedly be encountered in drifting along the vein, but the croppings and the experience thruout the district would indicate that values would be found along one third of the vein's length. The Jemison vein is lost on the surface near the upper (S.E.) end of the claim, but the indications are that the vein showing on the Little Johnnie is the same.

At the present time there is nothing in any of the upper tunnels to be considered, except that a shoot of ore is quite positively indicated by the old caved stope. The middle or cross cut tunnel, so far only cuts the branch vein.

The showing that gives the property its principal value is in the Main or lower tunnel. As this leaves the dyke and penetrates the hill it gets more and more into the unaltered, primary, sulphides. The present face (12-24-16) shows very little oxidation. The ore is a mixture of Sulphide of Iron, Copper, Zinc, and Lead "i.e." Pyrite, Chalcopyrite, Blend and Galena. There are bunches of Arsenopyrite intermittently along the foot wall. The relative proportions of the minerals are best seen in the analyses on the assay map and particularly in the analyses of the dump samples. In places there are signs of secondary enrichment, but the zone is apparently thin. Some of the higher assays of copper are undoubtedly due to secondary glance. It is to be expected that the copper will

decrease as one gets farther from the dyke and also that it will decrease with depth. This has been the case at the Alpha and other properties in the vicinity, but it is true that none of them had as much chalcopyrite showing in their upper works as the Jemison.

There is nothing in the way of "Blocked out Ore" at present. One might stope a little but the backs are shallow and too near the oxidized and leached zone. In driving the present main tunnel, the mineral could be sorted carefully and approximately 15% of the ground broken would be available for shipping. The Jemison vein now averages 3.25 feet wide, which means 65 tons for each foot of depth on a shoot 200 feet long.

Driving three feet a day, would mean some 90 cu.ft. or about 8 tons, 15% of which or 1.2 tons is available for direct shipment, after hand sorting, as long as present conditions remain unchanged. This 1.2 tons would be about, as indicated by the sampling; Au. 0.15 oz., Ag 30.0 oz., Cu 7.0%, Pb 1.5%, Zn 6.5%, Fe 12.0 %. This would yield:

Au.		$3.00
Ag.	95% at 60¢	15.10
Cu.	7% gets paid for 120# at say 25¢ quoted less 2.5¢ for marketing charge	27.00

This is about a $45.00 ore:

Hauling to the railroad now would be at least $3.00, which with $7.00 frieght and $7.00 treatment or $45.00 less $17.00, would leave a balance of $28.00 as the value of the product on the dump. This indicates that for a while at least $30.00 to $35.00 could be realized a day. This would materially help, but would not pay all expenses, assuming

assuming hand mining and hand sorting on three shifts. It would take especially good work to make three feet with hand steel. Bunches of arsenopyrite occur in a streak on the foot-wall and this product can be segregated in drifting and made to yield some return as it carries high gold values, averaging one and one half ounces. Its tonnage is, however, decidedly limited. A selected piece of the arsenopyrite gave 30 oz. gold per ton.

Depending on the policy of the operators, it might not be worth while at this time, to try to make any of the above segregations, but to put all the material on the dump to be handled later by mill or otherwise. It will be hard to save the material in dumps as there is no place that will be free from possible loss by freshets. The metal prices are more apt to decrease than to hold their present values.

The ore markets at present are Humbolt, Sasco and Hayden for Copper products, while the nearest lead smelters are Selby and El Paso. Zinc products of this section usually go to Bartletsville, Okla. Some products can be marketed at the Needles Concentrator of the U. S. Smelting, Refining and Mining Company. The latter plant takes some complex ores of the Cerbat Mountains when they are righer in lead, for a treatment charge of from $2.50 to $3.00. They buy the lead concentrate they make and hold the zinc concentrate or other product on "shippers order."

Milling costs, including developing and milling, can be reasonably estimated at $5.00 a ton on the Jemison. The Golconda is working at this figure and their conditions are exceptionally difficult. The Golconda mines their vein in places at a width of only 12 inches and yet keeps their average figure down to the above $5.00. They allow $1.25 of that for development. $1.25 is a fair allowance for putting the ore or concentrate on the cars, assuming a fair truck road. The usual figure for this section for freight and treatment on material of average grade is $14.00 for lead, iron and copper products. When Spelter is quoted at seven cents, 40% zinc products are worth $20.00 to $21.50 a ton loaded on the cars at Mohave County common points.

The Jemison will mine cheaply by comparison, as the width is good and the walls stand well. The vein being practically vertical also helps.

Of the surrounding ground, there is nothing of interest at present to the immediate west and north. To the south is the Ora Plata Mine of the Golconda Extension Company. It has a shaft 360 feet deep. The property has a number of cross breaks or veins out from the Broncho Dyke. They produced much high grade ore in the early days, its past production having been supposed to be $500,000.00. Some copper showed near the surface, but apparently not as much as at the Jemison. From the 100 to the 285 levels, the ore became very refractory, being a mixture of Pyrite, Galena and Blend, high in iron. It was high in total metal values, but hard to segregate. On the 360 foot level a marked decrease in the pyrite and increase in zinc occurred. The lead seemed to hold about the same. No ore was shipped or treated from the lower (360) foot level, but it was

seen by the writer just before it was allowed to fill with water and the showing was very attractive. At that time, January 1916, the property was under option to O. A. Tumner, who owing to financial difficulties was unable to hold the property and it eventually reverted to the owners, Mr. O. D. M. Gaddis, et al, of Kingman. It has been recently (Dec.1916) re-optioned and work of unwatering is being started. The old shaft is small and in bad condition so it is proposed to drive a long tunnel from hear the Golconda Road which will cut the old shaft between 300 and 325 feet. This tunnel c cross cuts a number of veins showing on the surface. The mine makes about 150 gallons of water a minute. It is described on page 100 of U.S.Geological Survey Bulletin No. 397.

The surrounding ground which is most interesting to the operators of the Jemison, is that which lies to the south east and east. I refer to the Clamp claims and the Night Hawk. Their relative position is shown on the accompanying maps. There is very little work that amounts to anything on the Clamp ground, but as has been said before, the Jemison vein is probably continued as the vein on the Little Johnnie Claim. The amended claims would have a common end line. There is every indication of a shoot near the middle of the Little Johnnie and beyond the Little Johnnie is the ground of the Nelson Bros. who have some high grade surface enrichment ore and every indication of two shoots, however, it is too far away to be of particular interest at this time.

The Night Hawk Mine consists of two claims, the Night Hawk and Rip Van Winkle. It is briefly described on Page 103 of U. S. Geol. Survey Bul. No.397. Some very high grade gold and silver ore has been taken out in the past and there is every indication of strength in the bottom of the present lowest

workings. It is now being worked by leasers, who shipped this fall (1916) a car of hand sorted material that netted them over $300.00 per ton. The Night Hawk has a long strong shoot and though it is narrow, being only about 18 inches to two feet wide, its higher values make it attractive. No systematic sampling has been done on the property as it is not so situated as to be readily handled as an individual property. There are two ways it could be worked; by a long tunnel from the north west end of the Scotty claim, owned by Paul White, which would be a drift, or by a cross cut from the Jemison, assuming that the Jemison tunnel is driven to or under Clamps Little Johnnie claim. This latter is the more attractive. In the natural course of events, the Jemison tunnel will reach the Clamp ground and from there the cross cut to the Night Hawk, will be over 1000 feet shorter than the drift from the Scotty. This would also cross cut the veins on Clamps Mint claim as well as several minor veins that show on the surface. It is true that only minor ore shoots are seen at the surface on this intervening ground, but it is much more promising than a drift with the country. The cross cut would also have a little greater depth. The whole question of the Night Hawk in connection with the Jemison, is one of the future, but it would be considered to a certain extent when figuring on possibilities. The control is in the hands of Mr. I. M. George, of Kingman, who will be found a very reasonable man with whom to do business.

Experiments have been made demonstrating the success of flotation and of partial roast and magnetic separation, as a means of treating the ores of the Cerbat Mountains.

Jig and table concentrates are made which take care of the lead. The middle product is given a partial roast

and then sent to a magnetic separator giving zinc and iron products. The copper will be with the iron and is shipped by itself. If the copper content is low, the iron is combined with the lead concentrate and sent to the lead smelters. The slimes and tailings from the above treatment are put thru flotation machines.

RECOMMENDATIONS.

The Fractions between the Jemison, Little Johnnie and Valley View No.1 claims, should be located at once. Clamp should locate the fraction between the Rip Van Winkle and the Mint.

An option should be obtained on the Clamp holdings.

Amended location notices and corner posts should be put up at once.

Additional and more substantial camp facilities should be provided and telephone communication established with Kingman, which latter can be done with three quarters of a mile of line to the Ora Plata.

Some ground on the slope a half mile to a mile west of the present camp should be located for a possible future Mill site.

The present lower tunnel should be pushed with all possible speed to prove the length of the present ore shoot and to open the ore at the other end of the claim. Whereas the present shoot near the Broncho dyke should be developed to a greater depth, it is the feeling that the horizontal extent and the existence and length of other shoots is the most important thing for the immediate future.

The installation of machinery is dependent on the policy and finances of the operators with regard to the terms of their option.

Copy of a report made by Mr. L.Webster Wicks

Jemison Mine,

Cerbat Mountains

Hualpai Mining District

Mohave County

Arizona.

Report for
Mr.Chas McKinnis,
Wallace,Idaho.

This report consists of twenty seven (27) pages of text,seven (7) maps and one photograph,each of which is initialed or signed. It is only to be considered in its entirety&

Respectfully submitted,

L. Webster Wicks

Kingman,Arizona,
Dec.26th,1916.

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Kingman is the main supply point. It is a town of 5,000 people and the various stores and su supply houses carry everything in stock that is necessary of all except the largest operations.

There are several surveyors and assayers available doing custom work. Haff and Colwell, whose permanent address is Oatman,Arizona, are very reliable for anything in the way of surveying and R.C.Jacobson,Kingman,is a careful and reliable assayer.

Throughout the section fuel oil or electricity from the Desert Power and Water Company is used for power. On small installations the former is usually the cheapest as the rate for current is 2-1/2 cents per Kilo-watt for small quantities,decreasing to 1¢7/8¢ per kilo-watt on a consumption of 400,000 kilo-watts per month. This is roughly equivalent to $12.00 to $15.00 per *.O. per month. Timber is a serious item as "O.P." (Douglass Fir) costs $28.00 to $35.00 per M. in Kingman in carload lots. Fuel oil costs from 4¢1/2¢ up,F.O.B. Kingman. Distillate for Hoists etc., ranges around 11¢ per gallon. For this particular case electricity would be the best for any

preliminary operations due to the road conditions unless the mine is sufficiently developed when the time comes to put in Machinery to warrent a permanent road. Depending on hauled fuel with the present road would bee too uncertain.

There is available water on the ground for all domestic purposes for some time to come . All the mines in the district make water with depth, ranging up to 150 gallons per minute. The mines are the source of all water for milling purposes.

At present the principal producing properties of the district are the Golconda (Union Basin Mining Company) and the Yennessee (U.S.Smelting,Refining and Mining Company). The Golconda is about a mile, in an air line,south of the Jemison. It is developed to some 1200 feet in depth and is at present producing about 1800 tons monthly of zinc ore and concentrate running 40% zinc and carrying a little gold and silver.

The Banner mine of the Arizona Butte Mining Company is producing a little lead concentrate. Various other properties are making intermittent shipments.

The production of the district was originally almost entirely silver. The surface ores in numerous places were rich in native silver,horn silver and ruby silver. As depth was gained the precious metals decreased but large bodies of base metals were opened, principally zinc and lead with occasional copper bodies. It is these base metals that make the mines of to-day.

The Keystone mine has a mill under construction and there are two custom mills being talked about. One of the custom mills is being considered by the Zinc Concentrating Company,who will begin erection as

soon as they are reasonably assured of tonnage. Their mill as outlined,will include roasting and magnetic separation as well as the usual wer methods. They are in the feild for zinc product high in iron.

The Jemison group consists of four locations relatively situated as shown on the accompanying map. There are some seventy-five acres or so covered. The map shows the ground as it is monumented. The claims are all irregular and in the case of the "White and Blue" claim the location may be illegal. I would earnestly recommend that as soon as the mine work will warrant, amended locations be made and the claims brought within the legal limits as to size and that the exterior lines be made parallel and corner posts put up.

There are no permanent improvements on the ground. There are tents and camp equipment sufficient for five or six men. All work now is by hand, no machinery.

There have been numerous articles published about the mines in the Cerbar Mountains, but the summary and the most reliable information given the general public is the U.S.Geological Survey Bulletin No.397 where Mr.!.?.$chrader gives the results of his study of the section made during the winter of 1906 and 1907. Mr.Schrader published a later article at page 1935 in the November 1916 Bulletin of the American Institute of Mining Engineers.

At the Jemison the country rock is the usual Pre-Cambrian "Complex" of the Cergat Mountains. It exists here as a medium grained granite, with a little of the jointing and gneise forming action. There have been two sets of intrusions; Mr.Schrader speaks of them as "Tertiary" and "Pre-Teritary".

The "Pre-Teritary" is represented on this ground by the "Broncho Dyke", which runs the lengths of the Mammoth and Mendocino claims. The dyke was the reason for locating and is the "vein" of these claims. It strikes nearly north and south and continues to the south well into the Golconda Extension holdings and to the north about 1000' beyond the end line of the Mammoth claim. It has a total length of some 4500 feet.

The Tertiary intrusives are not positively identified on this ground, though a latite(?) that appears near the common end line of the Mendocino and Mammoth claims and which strikes a little west of south from the Broncho Dyke probably belongs to this group. Just to the west of these claims is the Pasadena Dyke. It is one of the Tertiary rhy rhyolites which strikes N.10 to 30 W. and a similar one is seen at the top of the ridge of the range near the south east end of the Night Hawk.

While no appreciable tonnage has been found on any of the dykes, values in gold and silver can be obtained almost anywhere along their strikes and in places several tons have been taken out that are very rich. The indications however, are that these pockets are purely surface enrichment.

The mines of the district are all on well defined veins that make out at sharp angles to the dykes. Mineralization has followed both sets of intrusions. Though it is by no means a proven fact, and further development and observation may prove otherwise, the present indications are that the veins making out from the Pre-Tertiary dykes are richer in copper, iron and gold, while those out from the Tertiary are richer in silver and lead. This does not apply, however,

To a large area near Mineral Park where there is a disseminated pyrite carrying copper in a rhyolite porphyry that has produced a number of secondarily enriched copper deposits. The Galena usually gives way to iron and the iron to zinc. Due to heavy and rapid errosion ~~and~~ the oxidized zone is shallow and primary sulphides are often found close to the s aurface. In many places the surface zone is that of secondary enrichment. Much ruby silver was found in the early days in the oxidized ore. Both in the oxidized and in the sulphide zones the various base metals showings are refactory mixtures of pyrite, chalcopyrite,blend and galena. In the past some of these ores have proven too refractory to handle. At present,however,unless the conditions are exceptional, almost any suplhides can be separated and marketed with a saving of better than 80%. By this is meant that various combinations of flotation with a partial roast and magnetic separation have given both in practice and in experimental work clean marketable products.

It is well to remember that the so-called blend of the Cerbats is really not a straight zinc,sulphide, but is in fact a marmatite; that is an iron-zinc s sulphide,the iron being chemically combined. The

result is that a forty-five to forty-six per cent Zn concentrate is as rich as can ordinarily be made. The pure mineral runs but 51% Zn.

The promising showing of this ground is on the Jemison vein. This strikes S.47 degrees E. and m makes out from the Broncho Dyke at about the middle of the Mendocino claim. It is traceable definitely nearly to the S.E. end of the Jemison claim. At a point about 200 feet from the Broncho Dyke a branch vein takes off which strikes about S.68 Degrees E.

A tunnel has been driven to the intersection of the dyke and vein and from the intersection is continued as a drift on the vein. On December 25th, 1916, it opened the vein for 170 feet. Values and sampling are indicated on the accompanying assay map. The face is still in very good looking ore. There are three upper tunnels that develop the vein to a certain extent. The two upper tunnels are in oxidized material entirely though occassionally a speck or two of sulphide remains. An old stope near the face of the upper tunnels is reported to have produced several hundred tons of ore going $200.00, the values being mainly in gold. This stope, though caved, shows a shoot apparently about 40 ft. long. The tunnel is on the vein for nearly 300 feet before getting into the stope.

The lowest of these three upper tunnels is really a crosscut and evidently only reaches the branch vein mentioned above. The vein width wherever mineralized is from two to five feet wide and so f far averages 3.25 feet. The ore will evidently occur in shoots. The one in the lower tunnel now being driven, so far is shown to be over 200 feet in length.

The shoot indicated in the upper tunnel by the old stope can be expected by comparison, as a little greater depth is attained, to be longer tha than the 40 feet now shown. It would be reasonable to expect, out of a length of vein of 1500 feet, that at least one third of it would be mineralized, and entirely possible that there would be even more. Barren zones will unboubtedly be encountered in drifting along the vein, but the croppings and the experience thruout the district would indicate that values would be found along one third of the veins length. The Jemison vein is lost on the surface near the upper (S.E.) end of the claim, but the indications are that the vein showing on the Little Johnnie is the same.

At present time there is nothing in any of the upper tunnels to be considered, except that a shoot of ore is quite positively indicated by the old caved stope. The middle or cross cut tunnel, so far only cuts the branch vein.

The showing that gives the property its principal value is in the Main or lower tunnel. As this leaves the dyke and penetrates the hill it gets more and more into the unaltered ,primary, sulphides. The present face (12-24-16) shows very little oxidation. The ore is a mixture of sulphies of iron, Copper, Zinc, and Lead "i.e." Pyride, Chalcopyrite, Blend and Galena. There are bunches of Arsenopyrite intermittently along the foot wall. The relative proportions of the minerals are best seen in the analyses on the assay map and particularly in the analyses of the dump samples. In places there are signs of secondary enrichment, but the zone is apparently thin. Some of the higher assays of copper are undoubtedly due to secondary glance. It is to be expected that the copper will decrease as one gets farther from the dyke and also that it will decrease with depth. This has been the case at the Alpha and other properties in the vicinity, but it

is true that none of them had as much chalcopyrite showing in their upper works as the Jemison.

There is nothing in the was of "Blocked out Ore" at present. One might stope a little but the backs are shallow and two near the oxidized and leached gone. In driving the present main tunnel-the material could be sorted carefully and approximately 15% of the ground broken would be available for shipping. The Jemison vein now averages 3.25 feet wide,which means 65 tons each foot of depth on a shoot 200 feet long.

Driving three feet a day,would mean some 90 cu. ft. or about 8 tons,15% of which or 1.2 tons is available for direct shipment,after hand sorting, as long as present conditions remain unchanged. This 1.2 tons would be about,as indicated by the sampling; AU.0.15 oz, Ag 30.0 oz, Cu. 7.0%, Pb 1.5%, Zn.6.5% FE 12.0%. This would yeild;

AU.		$ 3.00
Ag.	95% at 60¢	15.10
Cu.	7% gets paid for 120 lbs at say 25¢ quoted less 2.5¢ for marketing charge	27.00

This is about a $45.00 ore:

Hauling to the railroad now would be at least $3.00,which with $7.00 freight and $7.00 treatment

or $45.00 less $17.00, would leave a balance of $28.00 as the value of the product on the dump. This indicates that for a while at least $30.00 to $35.00 could be realized a day. This would ma materially help, but would not pay all expenses, assuming hand mining and hand sorting on three shif shifts. It would take expecially good work to make three feet with hand steel. Bunches of arsenopyrite occur in a streak on the footwall and this product can be segregated in drifting and made to yeild some return as it carries hight gold values, averaging one and one half ounces. Its tonnage is however, decidedly limited. A selected piece of the arsenopyrite gave 30 ounces gold per ton.

Depending on the policy of the operators, it might not be worth while at this time, to try to make any of the above segregations, but to put all the material on the dump to be handled later by mill or otherwise. It will be hard to save the material in dumps as there is no place that will be free fro from possible loss by freshets. The metal prices are more apt to decrease than to hold their present values.

The ore markets at present are Humbolt, Sasco and Hayden for Copper products, while the nearest lead smelters are Selby and El Paso. Zinc products of this section usually go to Bartletsville,Okla. Some products can be marketed at the Needles Concentrator of the U&S&Smelting,refining and Mining Company. The latter plant takes some complex ores of the Cerbat Mountains when they are richer in lead , for a treatment charge of from $2.50 to $3.00 They buy the lead concentrate they make and hold the zinc concentrate or other product on "shippers order"

Mining costs, including developing and milling, can be reasonably estimated at $5.00 a ton on the Jemison. The Golconda is working at this figure and their conditions are exceptionally difficult. The Golconda mines their vein in places at a width of only 12 onches and yet keep their average figure down to the above $5.00. They allow $1.25 of that for development. $1.25 is a fair allowance for putting the ore or concentrate on the cars, assuming a fair truck road. The usual figure for this section for freight and treatment on material of average grade is $14.00 for lead, iron and copper products. When Spelter is quoted at seven cents, 40% zinc prod products are worth $20.00 to $21.00 a ton loaded on the cars at Mohave County common points.

The Jemison will mine cheaply by comparison, as the width is good and the walls stand well. The vein being practically vertical also helps.

Of the surrounding ground,there is nothing of interest at present to the immediate west and north. To the south is the Ora Plata Mine of the Golconda Extension Company. It has a shaft 360 feet deep. The property has a number of cross breaks or veins out from the Broncho Dyke. They produced much high grade ore in the early days,its past production having been supposed to be $500,000.00. Some copper showed near the surface,but apparently not as much as at the Jemison. From the 100 to the 285 levels, the ore became ver refractory,being a mixture of Pyrite,Galena and Blend,high in iron. It was high in total metal values,but hard to segregate. On the 360 foot lebel a marked decrease in the pyrite and increase in zinc occurred. The lead seemed to hold about the same. No ore was hipped or treated from the lower (360) foot level,but it was seen by the writer just before it was allowed to fill with water and the showing was very attractive. At that time, January 1916,the propeerty was under option to O.A.Turner who owing to financial difficulties was unable to hold the property and it eventually reverted to the owners,Mr.O.D.M.Gaddis,et al,

of Kingman. It has been recently (Dec.1916) re-optioned and work of unwatering is being started. The old shaft is small and in bad condition so it is proposed to drive a long tunnel from near the Golconda Road which will cut the old shaft between 300 and 325 feet. This tunnel cross cuts a number of veins showing on the surface. The mine makes about QTP gallons of water a minute. It is described on page 100 of U.S.Geological Survey Bulletin No.397.

The surrounding ground which is most interesting to the operators of the Jemison,is that which lies to the south east and east. I refer to the Clamp claims and the Night Hawk. Their relative position is whown on the accompanying maps. There is very little work that amounts to anything on the Clamp ground,but as has been said before,the Jemison vein is probably contined as the vein on the Little Johnnie Claim. The amended claims would have a common end line. There is every indication of a shoot near the middle of the Little Johnnie and beyond the Little Johnnie is the ground of the Nelson Bros. who have some high grade surface enrichment ore and every indication of two shoots,however,it is too far a sway to be of particular interest at this time.

The Night Hawk Mine consists of two claims,the Night Hawk and Rip Van Winkle. It is briefly described on Page 103 of U.S. Geol.Survey Bul. No.397. Some very high grade gold and silver ore has been taken out in the past and there is every indication of strength in the bottom of the present lowest workings. It is now being worked by leasers,who shipped this fall(1916) a car of hand sorted material

that netted them over $300.00 per ton. The Night Hawk has a long strong shoot and though it is narrow, being only about 18 inches to two feet wide, its higher values make it attractive. No systematic sampling has been done on the property as it is not so situated as to be readily handled as an individual property. There are two ways it could be worked; by long tunnel from the north west end of the Scotty claim, owned by Paul White, which would be a drift, ir by a cross cut from the Jemison, assuming that the Jemison tunnel is driven to or under Clamps Little Johnnie claim. This latter is the more attractive. In the natural course of events, the Jemison tunnel will reach the Clamp ground, and from there the cross cut to the Night Hawk, will be over 1000 feet shorter than the drift from the Scotty. This would also cross cut the veins on Clamps Mint claim as well as several minor veins that show on the surface. It is true that only minor ore shoots are seen at the surface on this intervening ground, but it is much more promising than a drift with the country. The cross cut would also have a little greater depth. The whole question of the Night Hawk in connection with the Jemison, is one

of the future, but it should be considered to a certain extent when figuring on possibilities. The control is in the hands of Mr.I.M.George of Kingman, who will be found a very reasonable man with whom to do business.

Experiments have been made demonstrating the success of floatation and of partial roast and magnetic separation, as a means of treating the ores of the Cerbat Mountains.

Jig and table concentrates are made which take care of the lead. The middle product is given a partial roast and then sent to a megnetic separator giving zinc and iron products. The copper will be with the iron and is shipped by itself. If the copper content is low, the iron is conbined with the lead concentrate and sent to the lead smelters. The slimes and tailings from the above treatment are put thru floatation machines.

The Fractions between the Jmeison,Little Johnnie and Valley View No.1 claims,whould be located at once. Clamp should locate the fraction between the Rip Van Winkle and the Mint.

An option should be obtained on the Clamp holdings.

Amended location notices and corner posts should be put up at once.

Additional and more substantial camp facilities should be provided and telephone communication established with Kingman,which latter can be done wit with three quarters of a mile of line to the Ora Plata.

Some ground on the slope a half mile to a mile west of the present camp should be located for a possible future Mill site.

The present lower tunnel should be pushed with all possible speed to prove the length of the present ore shoot and to open the ore at the other end of the claim. Whereas the present shoot near the Broncho Dyke should be developed to a greater depth, it is the feeling that the horinzontal extent and the existance and length of other shoots is the mostmost important thing for the immediate future.

The installation of machinery is dependent on the policy and finances of the operators with regard to the terms of their option.

N_O_T_E

It is found that the name "Clamp" in the text and on the Maps, should be "Klemp". The gentlemans name is _eo. Klemp.

EXHIBIT "L"

R E P O R T

ON PROPERTY - - - -OF THE

JEMISON MINES COMPANY

CERBAT MOUNTAINS

HUALPAI MINING DISTRICT

MOHAVE COUNTY

ARIZONA.

BY

ERNEST G. GNAEDINGER

WALLACE, IDAHO,

DECEMBER 1, 1916.

In submitting this report on the Jemison Mine for your consideration, I must reming you that my examination was necessarily hurried, and I was able in my two days at the property, to cover only the country in the immediate vicinity of the mine. Among the various properties, however, that I have examined for yourself, as well as others, I find the Jemison the first one, for some time, that I can sincerely recommend; believing that a personal inspection yourself, as well as reports of other engineers you may employ, will but bear out the impression this prospect left with me. I can heartily recommend it to your further investigation and exploitation.

The LOCATION of the property is about fifteen miles northerly from Kingman, in the Hualpai Mining District, Mohave County, Arizona; in a range of comparatively low hills known as the Cerbat Range. It is reached by auto road (about 17 miles) from Kingman, and is about three and one-half miles from the nearest shipping point, Mineral, on the Kingman-Chloride Branch of the Santa Fe Railroad. Kingman is the supply center, a substantial town on the main line of the Santa Fe. The general topography is typical of the Arizona desert land, sparse vegetation and no continuous running streams. Timber must be shipped in, and water for mining purposes secured from springs or the mines themselves. In this regard I will state that I saw one mine operating a 250 ton mill with ease, by the aid of the mine water alone. For domestic purposes numerous springs of good water are available and the Jemison itself has several such on its own property. As regards timber, the rock in the various openings visited, stood well and, with a back-filling system of mining, a comparatively small amount of timber should be necessary.

TRANSPORTATION from the mine must be by auto truck, and the cost should not exceed Two Dollars a ton, which might and probably would decrease to about One Dollar in handling any

quantity.

The PROPERTY of the Jemison Mines Company consists of four practically full claims:- the White and Blue, Mammoth, Mendocino and Jemison Lodes, with some small fractions in addition. These claims lie well up the slope of the main range and can be developed to great extent by tunnels, though shaft-work will be immediately necessary in the event of opening a mine. The claims are so located as to include over three thousand feet along a dyke later described herein, and a full fifteen hundred feet along the main vein exposed.

The GEOLOGY of the country has been described by F. C. Shrader in Bulletin No. 397 of the U.S. Geological Survey. The main range rock in the make-up of the Cerbat Range is granite, somewhat gneissic in character. This granite or gneiss is cut by innumerable masses and dykes of the colcanics consisting principally of granite porphyry, rhyolites and andesites. Numerous true fissure veins occur throughout the Range, striking off from these dykes and closely correlated to them. On the Jemison property I found such a dyke, from 40 to 70 feet in width, traversing the Mendocino and Mammoth claims and is the "vein" of these claims, and extends beyond them in both directions along a general course of N.10°W. with a dip of about 55° to the West. Several veins have been developed on the property, all closely related to the dyke. The principal one of these is the Jemison Vein, through there is also a very promising galena vein exposed in a small way on the Mammoth claim. The Jemison Vein is well defined along its outcrop for a thousand feet. This vein was worked years ago through two tunnels about 600 feet East of the present workings, and a cave stope shows that ore was shipped that is reported to have run very high in copper and gold.

The WORKINGS at present open and being used consist of a tunnel and a winze from a short cross-cut tunnel. This winze

was sunk on the vein about half way between the upper gold-silver ore shoot and the mount of the main working tunnel. The winze in its fifty feet of depth shows a marked improvement in appearance of the vein and ore-content, and at the bottom shows three feet of good sulphide ore. The main working tunnel entered the vein along the course of the dyke, as this tunnel first crosscuts then follows the dyke. At 190 feet from the mouth the vein leaves the dyke and takes its permanent course of S.55°E. From this point to the face, about 155 feet, there is a well banded shoot of ore containing, continuously, the sulphides of iron and copper, though the face shows two feet of sphalerite that would assay f to 7% zinc. This shoot of ore at this time (Nov.17, 1916) is 150 feet long, with an average width of 3½ feet; but from the appearance of the ore itself and also the presence of the first sulphide ore in the winze, 60 feet ahead, which is only about 10 feet above this level, I would say there is no stopeable ore yet developed. The last sixty feet of this drift however, shows an average width of four feet and at the face it measured 5 feet and 8 inches, the last 30 feet of which included a well banded seam of arsenopurite, about 7 inches thick, that my sampling showed to average 1.74 oz. Gold, with a sample from the face running as high as 5.40 oz. My sampling from the face outward, show a length of 60 feet, 4 feet wide assaying (average) 3.5% Copper, 0.4 oz. Gold and 16 oz. Silver, The balance of the drift shows a smaller width of ore till it dies out in the dyke but for 100 feet would average 2½ ft. wide with the same copper content, though a probable lower ratio of gold and silver.

The SURROUNDING MINES include the Golconda now profitably operating, and which lies about one-half mile from the Jemison claim and its vein must be either the same as the Jemison, or one closely paralleling it. The Golconda Central, also within one-half mile, but more to the South, is also working and shipping. The LaPlatte or Golconda Extension to the South, with a

rich production to its credit; The Night H r lying about East of the Jemison reported to have some very high grade ore; besides a great many more smaller properties.

The immediate future DEVELOPMENT will be comparatively simple, as well as cheap. This should consist of following the ore and the vein to at least get under the old worked stope. As the rock has all the appearance of breaking well, this drifting should not be very expensive. I neglected to state earlier in this report that electric power is available for more extensive work, and the power line may be tapped in about one mile of pole line. After it is determined how long an ore shoot or how many are present, it will be necessary to sink both to develop as well as to aid the surface poant and disposition of buildings, waste, etc.

The Jemison is not yet a mine, in spite of its past shipping history and the development lately of this new shoot; for there is no real ore in sight or blocked out, nor a long enough ore shoot developed to be able to figure on anything certain. But with the ore that has been developed, showing, in its comparatively shallow depth such a marked improvement in the tenure of ore and size, together with the presence of another or the same shoot 500 ti 600 feet ahead, the top of which has already produced some rich ore, the Jemison may certainly be termed a very fine prospect.

(Signed) ERNEST G. GNAEDINGER,

Mining Engineer.

May 27, 1957

JEMISON MINES COMPANY MOHAVE COUNTY

This property idle.

See: Nighthawk Mine (file) Mohave - article from Mohave County Miner dated 9/5/74

MARK GEMMILL