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

INTRODUCTION

The Chico Mining Property consists of two patented lode claims (Little Boy, True Blue) and 49 contiguous unpatented lode claims, encompassing over one square mile in area.

Abundant data are available form the USGS Bulletins, US Bureau of Mines, Arizona Bureau of Mines and numerous independent geologists and engineers.

On the basis of surface observations and in the accessible old workings, plus facts provided by locat people of reputation, it is the opinion of Wm. Vanderwall, geologist, and Pacific Regional Operations, Inc., the property contains well developed structures with strong to moderate copper, lead, zinc, gold and silver mineralization. They also conclude, as do other geologists, the property may contain a large mass of low grade copper, lead and zinc mineralization containing gold, silver and other precious metals.

The Chico Property could then, at some later date, produce by either underground or surface mining methods. In either case, all information indicates adequate exploration will justify a major mining investment.

(602) 246-9573

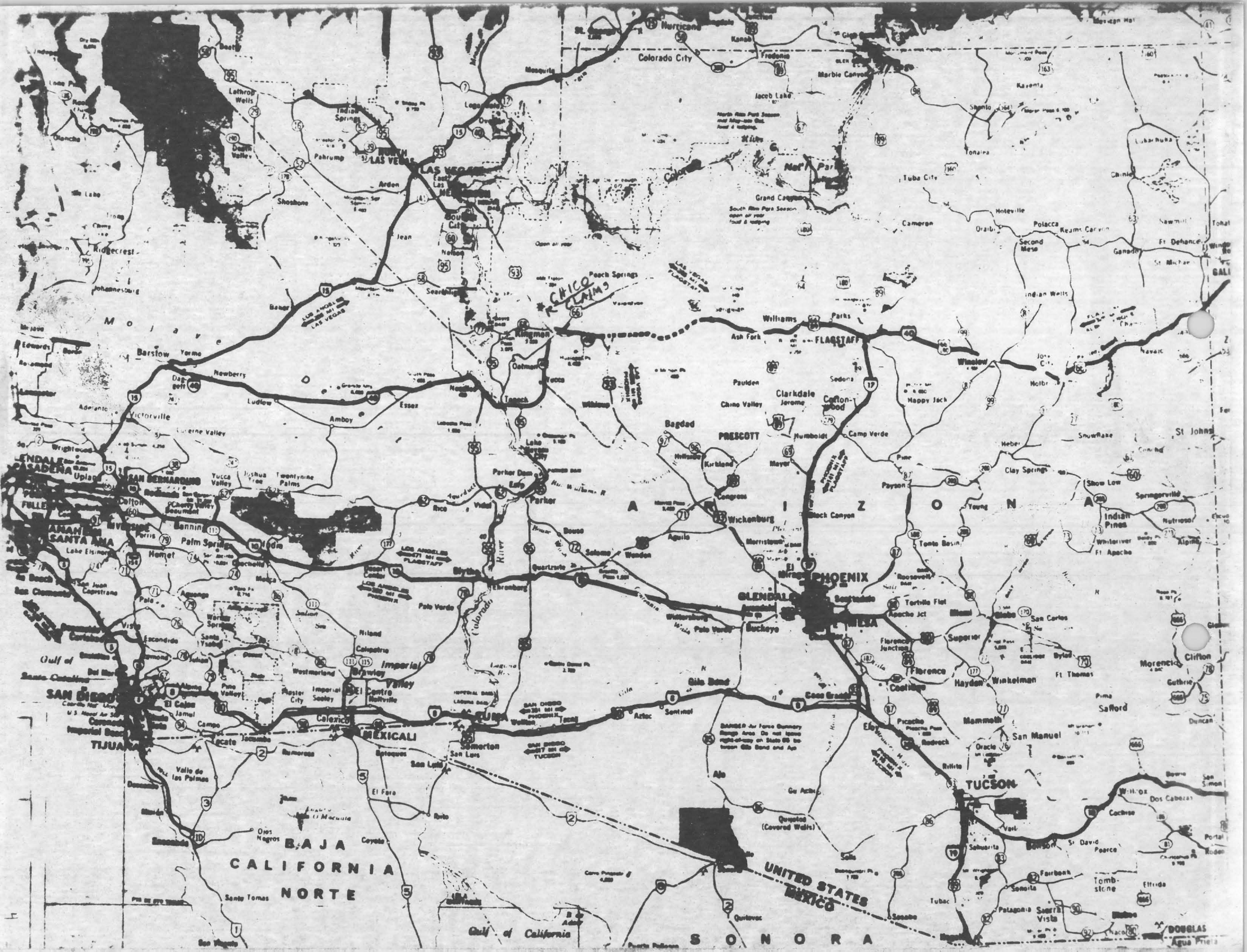
LOCATION AND ACCESSIBILITY

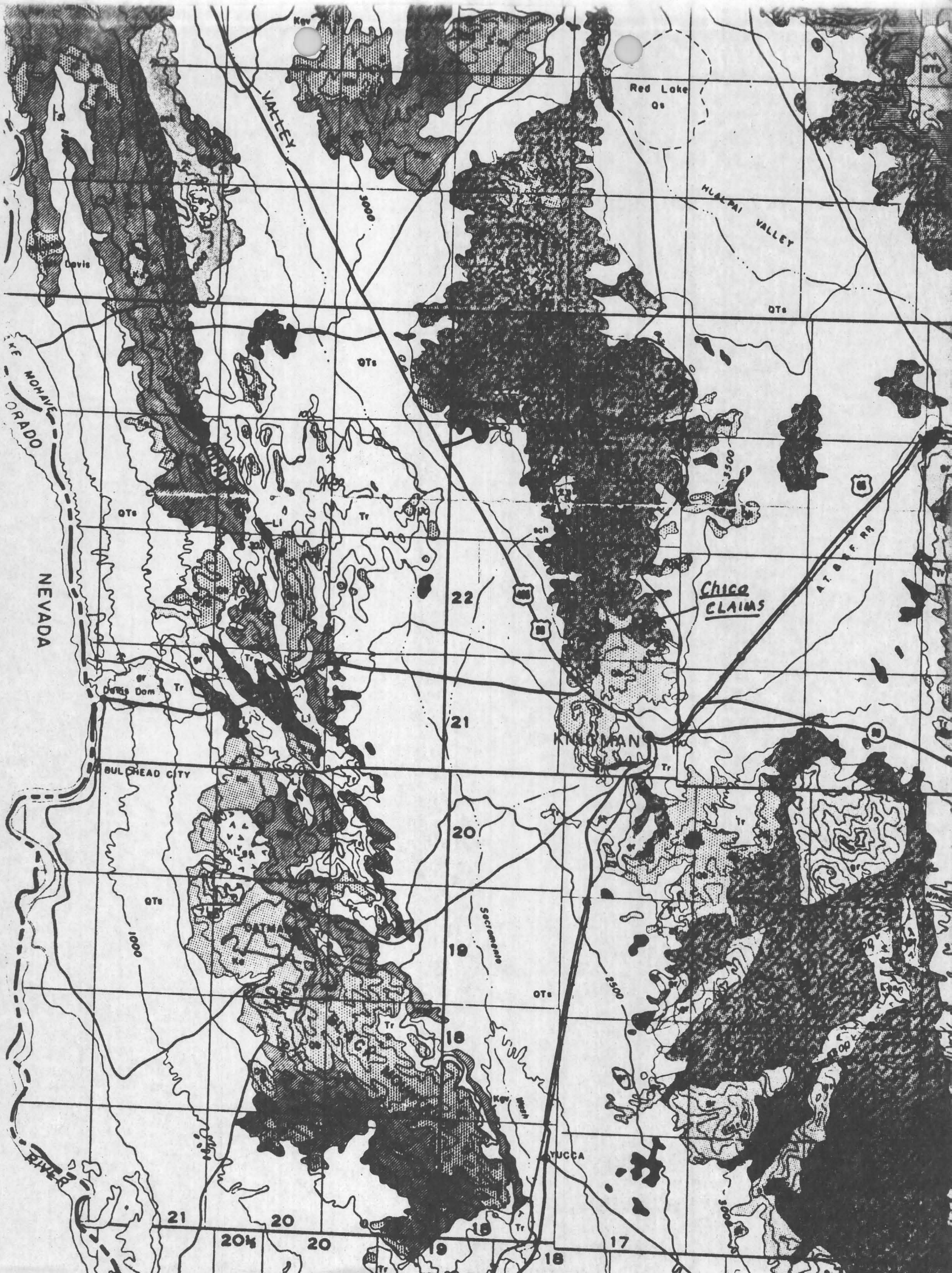
The Chico Mines Property lies in the central portion of the Cerbat Mountain Range, approximately 10 miles northwest of Kingman, and 200 miles northwest of Phoenix, Arizona.

The claims begin near the summit of the mountain range and fall to the foothills with a relief of 1,500 feet.

Located in Sections 29, 30 and 31 of Township 23 North, Range 17 West, and in Sections 5 and 6 of Township 22 North, Range 17 West, Gila and Salt River Base and Meridian, Mohave County, Arizona.

These claims are accessible via four miles of dirt county and private roads from US Highway 93 which runs between Kingman, Arizona and Las Vegas, Nevada.


A R I Z O N A
Mojave Desert
BAJA CALIFORNIA NORTE
SONORA
UNITED STATES
MEXICO
Gulf of California
Gulf of Santa Catalina
CHICO CLAIMS
LAS VEGAS
NORTH LAS VEGAS
PHOENIX
GLENDALE
MESA
TUCSON
FLAGSTAFF
PRESCOTT
SAN DIEGO
TIJUANA
MEXICALI
YUMA
SAN BERNARDINO
SANTA ANA
PASADENA
Kingman
Barstow
Needles
Williams
Winslow
Ash Fork
Seligman
Peach Springs
Grand Canyon
Colorado City
Hurricane
Kanab
Fredonia
Marble Canyon
Jacob Lake
Tuba City
Cameron
Hoteville
Oraibi
Polacca
Second Mesa
Keams Canyon
Ganado
Ft. Defiance
Indian Wells
Holbrook
St. Johns
Snowflake
Show Low
Springerville
Heber
Clay Springs
Payson
Pine
Camp Verde
Cottonwood
Clarkdale
Jerome
Sedona
Paulden
Chino Valley
Bagdad
Humboldt
Mayer
Kirkland
Congress
Wickenburg
Aguila
Wenden
Salome
Bouse
Quartzsite
Parker
Parker Dam
Blythe
Ehrenberg
Palo Verde
Tonto Basin
Roosevelt
Tortilla Flat
Apache Jct
Globe
Miami
San Carlos
Superior
Florence
Florence Junction
Coolidge
Casa Grande
Eloy
Picacho
Red Rock
Hayden
Winkelman
Mammoth
Oracle
San Manuel
Safford
Clifton
Morenci
Duncan
Willcox
Dos Cabezas
Cochise
Benson
St. David
Pearce
Tombstone
Sierra Vista
Patagonia
Sonoita
Nogales
Tubac
Sahuarita
Vail
Douglas
Agua Prieta
Gila Bend
Buckeye
Sentinel
Aztec
Tacna
Wellton
Somerton
San Luis
Ajo
Why
Quijotoa (Covered Wells)
Sells
El Centro
Holtville
Brawley
Imperial
Imperial Valley
Westmorland
Calipatria
Niland
Calexico
Salton Sea
Indio
Coachella
Palm Springs
Banning
Beaumont
Hemet
Perris
Yucca Valley
Joshua Tree
Twentynine Palms
Victorville
Adelanto
Lucerne Valley
Daggett
Yermo
Newberry
Ludlow
Amboy
Essex
Baker
Jean
Arden
Pahrump
Shoshone
Death Valley
Lathrop Wells
Indian Springs
Mesquite
Logandale
Overton
Searchlight
Nelson
Boulder City
Oatman
Topock
Lake Havasu City
Ridgecrest
Johannesburg
Olancha
Edwards
Boron
Lancaster
Upland
Colton
Riverside
Lake Elsinore
San Juan Capistrano
San Clemente
Pala
Vista
Escondido
Ramona
Julian
El Cajon
Alpine
Jamul
Pine Valley
Campo
Tecate
Jacumba
Ocotillo
Plaster City
Carlsbad
Coronado
Imperial Beach
Ensenada
Valle de las Palmas
Ojos Negros
El Faro
Coyote
Santo Tomas
San Vicente
Sonoyta
Quitovac



Red Lake
Qs
HUALPAI VALLEY
VALLEY
3000
Davis
QTs
MOHAVE
RADO
NEVADA
Li
Tr
sch
22
Chico
CLAIMS
3500
A.T. & S.F. RR
Davis Dam
21
KINGMAN
BULLHEAD CITY
20
OATMAN
1000
Sacramento
19
2500
Wash
18
YUCCA
RIVER
17

MINE REPORTS/ASSAYS

(602) 246-9573

D.K. MARTIN & ASSOCIATES
Mining Development & Administration

4728 N. 21ST AVENUE

HISTORY AND PRODUCTION

The Chico Mines Property lies centrally in an area rich and colorful in Arizona mining history. Bordering the claims on the east is the famous Silver Bonanza Ghost Camp of Stockton Hill, where rich silver discoveries brought miners to the area in 1863. Oxidized silver ores (up to 3,000 ounces per ton) were mined at Stockton Hill with the bulk of production during the 1870-1880 period. Bordering the claims to the south is the Golconda, whose namesake mine was reportedly "shot in" by its German owners at the outbreak of World War I. The owners abandoned the claims by returning to Germany. The Union Basin Mining Company immediately re-entered the Golconda, and their smelter receipts show the company producing more than three million dollars worth of zinc, gold and silver during the duration of the war. During this time, the Jamison, True Blue and Little Boy Mines (located on the Chico Claims) carried on minor operations and shipped ore to the Golconda Mill. A disasterous fire at the mill halted operations in 1919, and the Golconda has been dormant since.

During the second world war, premium prices for copper, lead and zinc renewed activity in the area. The Alpha Mine and the Summit Mine, both located immediately to the east on veins which cross the Chico Properties, shipped ore to the Tennessee Mill. The Tennessee-Schuylkill Mine, located 7 miles north of the Chico Claims, produced 150 tons per day of crude ore averaging 7% zinc, 3.5% lead and 20 ounces of silver per ton. For the duration of WW II, mill capacity limited development in the area.

The value of metals produced from the District during the years 1904 through 1948, (US Bureau of Mines, 1948 Annual Report) was about 22.5 million dollars at 1948 prices, (nearly one billion dollars at today's prices). Values were principally in lead and zinc, but with substantial amounts of copper, silver and gold.

During the 1950's and 1960's, there was sporadic development on the Chico Property when the government paid a bonus for silver. The Mint, Cashier and '98 Mines produced 20 to 50 ounces of silver per ton of ore. In this interim, the Jamison Mine was developed to the 400 foot level and stockpiled low grade copper, lead and zinc ore. A small mill was installed and operated for a brief time on the property, but production statistics are unavailable. Approximately 1,000 tons of ore remain stockpiled.

History and Production (continued)

Currently Pennzoil-Duval Corporation, bordering the Chico Property to the Northwest, is reportedly producing 18,000 to 20,000 tons per day of open pit ore averaging 0.5% copper and 0.045% molybdenum, plus other precious metals.

REGIONAL SETTING

The Cerbat Mountain Range constitutes one of the many north-south trending, fault block ranges of the southwestern desert. They consist primarily of metamorphosed pre-Cambrian igneous and sedimentary rocks, cut by later intrusions of Mesozoic(?) granite and monzonite porphyries, known locally as the Ithaca Peak Granite, and by Tertiary volcanic dikes. Centering around the Ithaca Peak intrusive, mineralization is typically copper and molybdenum sulfides, now being mined by Duval. Surrounding the intrusive is a zone several miles wide of lead-zinc-silver bearing veins which traditionally change into veins of intense silver mineralization.

CHICO MINES GEOLOGY

The vein type ore deposits occur in clefts or cracks in the country rock in which the mineral material precipitated from aqueous solution (hydrothermal fissure veins). It is probable that these fissures formed from forces accompanying the implacement of the Ithaca Peak intrusive.

Many veins, occuring in nearly vertical fault fissures, strike northwest and outcrop for considerable distances. The fault fissures are largely occupied by breccia with abundant shearing and some gouge. Ore lenses, or shoots, though not continuous, are numerous and tend to have greater vertical rather than horizontal extent. Concentrations of extremely high-grade ore appear to favor vein junctures.

Most of the veins appear to be associated with the Bronco Dike. The Dike is a prominant linear structure which traverses the Chico Property for three quarters of a mile. It varies from 20 to 70 feet in width, strikes North 10° East and dips 60° Southwest. The Dike is composed of a least four rock types and cuts all lithologic units in the area. It is composed primarily of Ithaca Peak granite, an equivalent of the Duval Ore-body. The Ithaca Peak

granite is, in turn, intruded by smaller dikes of rhyolite, andesite, quartz and diabase. Conditions of rock associations are reported to be similar throughout the 400 foot depth of present workings, now flooded, on the Dike. The open, permeable nature of the Dike is evidenced by the considerable alteration (chloritic, sericitic) of all major rock units composing the dike, which also enhances the probability of secondary enrichment. Geochemical sampling has shown the Dike to be anomolous in silver, lead and zinc. Electromagnetic surveying has also indicated anomolous areas centered on the Dike.

At least six major vein systems traverse the Chico Claims, trending northwest from Stockton Hill towards intersections with the Bronco Dike. They are the Summit Vein, the Alpha, the Nighthawk-Cashier, the Mint-'98, the Logas, and the Little Bon-Jemison veins. These veins are primarily composed of sheared, fractured, crushed and recemented quartz. They are generally less than six feet in width with an attendant gouge zone of clays one or two feet in thickness which favors the foot wall, but often as not, occurs on both walls of the vein. These veins are separate structures which contain known concentrations, shoots or lenses of high-grade ore. The concentrations are of limited tonnage, perhaps several thousands of tons each, and are randomly contained within the veins with a tendancy toward vein junctures with other structures, such as dikes or other veins. "Barren" quartz vein material is usually gray in color with pyrite laced microcrystalline chalcedony masses enclosing fragmented milky quartz. This "barren" material generally carries several ounces of silver per ton. Results from limited electromagnetic surveying are inconclusive, but suggest several anomolous areas which probably are indicative of shallow ore deposits along the vein.

The primary mineralization in the Chico Property is an assemblage of chalcopyrite, galena, sphalerite, argentite, pyrite and arsenopyrite together with a variety of sulfa salts and gangue minerals. The oxidized portion of the veins range from 50 to 300 feet in depth and may be very rich in silver chlorides, silver bromides and native silver with lesser concentrations of native gold.

ORE RESERVES

The Chico Property contains base metal silver veins, oxidized silver-gold veins and, possibly stockwork type copper. Data from past developments, publications and reports are insufficient, or unavailable to completely delineate the ore bodies for volumetric analysis. However, there is ore exposed in various underground workings and many places on the surface; prospect pits, trenches, dumps, etc.

More than 1,000 tons of base metal-silver ore has been stockpiled from the Bronco Dike and reportedly much more is exposed in the Jamison Mine which has been developed to the 400 foot level. Mill tests results reported by Denver Equipment Company's Ore Testing Division, averaged 0.03 ounces of gold, 6.0 ounces of silver per ton, 1.7% zinc, 0.92% lead and 9.5% iron. Results from laboratory batch selective floatation test show the ore can be beneficiated to recover nearly 90% of the copper, lead, zinc and silver and approximately 40% of the gold. High-grade shoots encountered in the Jamison Mine ran as high as 12 ounces gold per ton, 50 ounces silver, 12% copper, 6% lead and 2% zinc. The Dike traverses the property for nearly three-fourths of a mile. It could yield in excess of 10 million tons.

Numerous veins traverse the Chico Property. Oxidized portions of these veins are known to contain ore shoots rich in silver and gold. Assays imply these shoots can be surface worked for 20 ounces silver per ton. The shoots are generally less than three feet wide and extend to an average depth of 100 feet. Although some of these oxidized ore shoots have been completely mine out, many high-grade ore shoots remain, many of which may be traced on the surface. One ore shoot averaging 14 inches in width was traced by Wm. Vanderwall, geologist, for over a quarter mile. Surface assays averaged 27 ounces silver and 0.08 ounces gold per ton, Samples from the underground workings at the 50 foot level on this same vein, averaged 47 ounces silver and 1.9 ounces gold per ton. The extent and tenure of these underground workings is unknown since they are presently caved near the 50 foot level.

Previous mining operations on the Chico Claims have produced some sizable mine dumps. The possibility of precious metal recovery from these dumps should not be overlooked. Cursory examination indicates in excess of 150,000 tons of material averaging 0.02 ounces gold and 1.5 ounces silver per ton.

Rock equivalents of the Duval orebody are present on the Chico Property and abundant copper sulfate precipitate may be noted in the stream bed located in the west-central portion of the Property. This suggests the southward extension of the Duval orebody into the Chico Claims.

PACIFIC
REGIONAL
OPERATIONS, INC. P.O. Box 716 • Scottsdale, Arizona 85252 • (602) 994-3147

SUMMARY OF GEOLOGICAL REPORT
CHICO MINES PROPERTY
WALLAPAI DISTRICT, MOHAVE COUNTY, ARIZONA

The Chico Mines Property consists of 51 contiguous mining claims, two patented, located in Sections 29, 30 and 31, T23N, R17W, and Sections 5 and 6, T22N, R17W, GSRM, Mohave County, Arizona.

The property is bounded on the east by Stockton Hill Camp, a late 1800's silver bonanza, on the south by the Golconda Camp, once the largest lead-zinc-silver producer in the area and bounded on the north by the Pennzoil-Duval copper-moly porphyry, an active open pit mine.

The property is located in the central portion of the Cerbat Mountain Range, one of the many north-south trending, fault-block ranges of the southwest desert. Rocks exposed at the surface include metamorphosed pre-Cambrian igneous and sedimentary rocks cut by Mesozoic (?) intrusives and Tertiary extrusives.

The ore deposits on the Property may be of as many as three types; Vein deposits of primary base metal-silver sulfides; oxidized, near surface veins often greatly enriched in precious metals; and, copper-moly porphyry, an extention of the Duval orebody.

The most favorable loci for ore is at the junction of veins and randomly placed along the vein in shoots or lenses. Several major veins trend northwest and intersect with the northeast trending Broncho Dyke on the Chico Property.

Results of field reconnaissance indicate the following:

A.) Primary sulfide minerals, mostly pyrite, arsenopyrite, galena, sphalerite and chalcopyrite, are found in most of the accessible workings on the property.

B.) An oxidized zone, 50-300 feet deep, consisting of a vein swarm greatly enriched in precious metal, and representing a considerable amount of ore, is present in the southwest portion of the property bordering Stockton Hill. This zone may be minable by surface methods and amenable to cyanidation.

C.) Rock equivalents of the Duval orebody are present on the Chico Property and abundant copper sulfate precipitate may be noted in the stream bed located in the west-central portion of the Property. This suggests the southward extention of the Duval orebody into the Chico Claims.

D.) Previous mining operations on the Chico Claims have produced some sizable mine dumps. The possibility of precious metal recovery from these dumps should not be overlooked. Cursory examination indicates in excess of 150,000 tons of material averaging 0.02 ounces gold per ton and 1.5 ounces silver per ton.

CHICO PROPERTY AND ADJACENT MINES

There is a total of 161 patented mining claims and mill sites in the Wallapai District, most of which have either mines or are excellent prospects. Practically none of the mineralized area remains unclaimed by unpatented lode or placer locations.

The chief ore deposits in the District occur along fissure and veins as previously described. A comparison of the Chloride Camp, where the Tennessee-Schuylkill Mine is located, and the Golconda in the Mineral Park Camp, are very similar in the occurance, value and type of ore deposits.

The Golconda Mine was the the second largest producer of gold, silver, copper, lead and zinc in the District, and is less than one-half mile south of the main Chico block and is situated on the Bronco Dike Vein which passes through the center of the Chico Group.

It has been reported this mine had a maximum depth of 1400 feet, and the vein ranged between two and seven feet in width. No reference was available at this time pertaining to the amount of ore mined. Similar conditions should exist northward along the Bronco Dike where it passes through the Chico Claims.

The depths of the Golconda and Tennessee Mines indicate commercial ore holds with depth to 1600 feet or more. The deepest shaft on the Chico Property os 400 feet and is located on the Jamison-Little Boy Vein. The oxidized zone extends to about 200 feet with primarily sulphides below that depth.

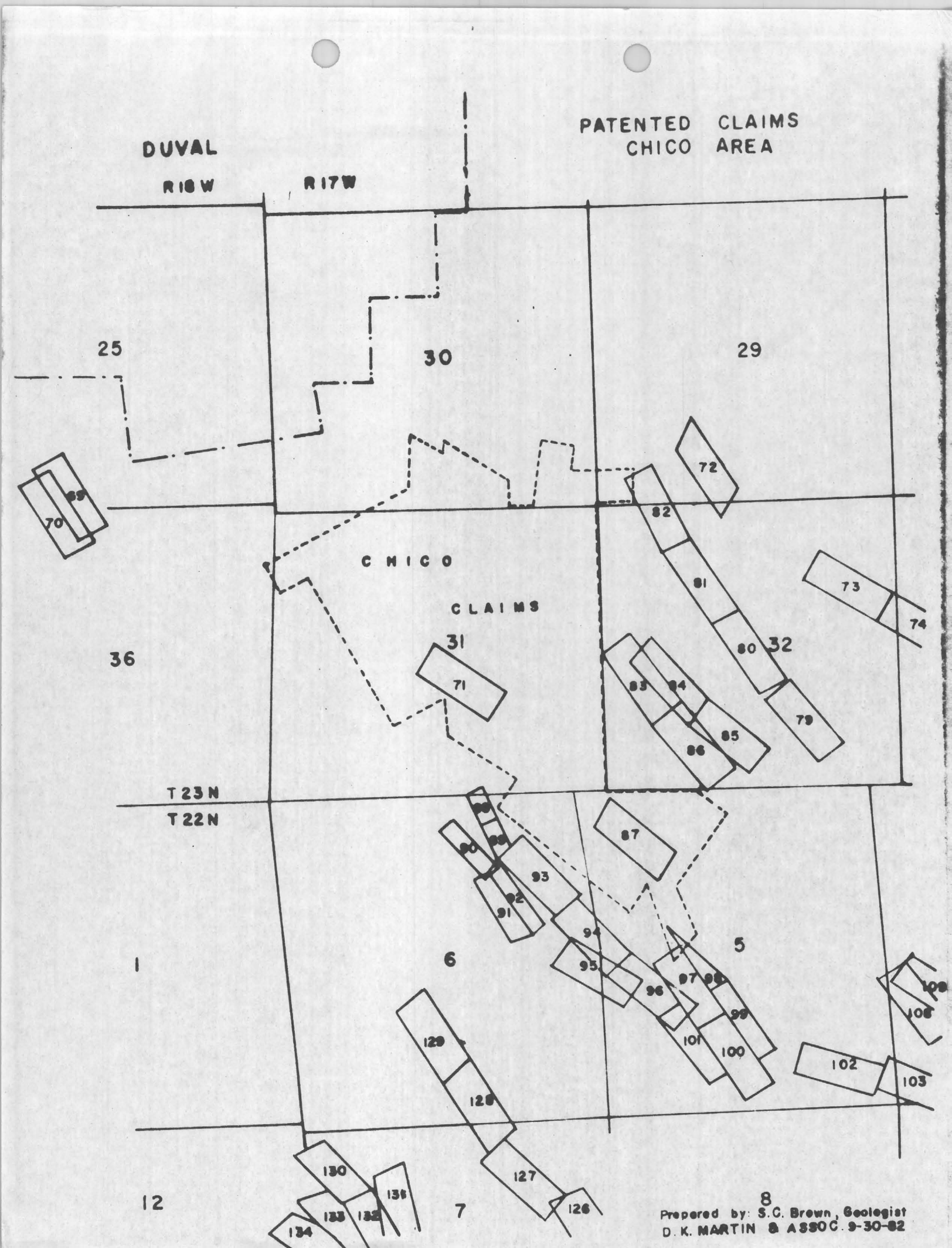
Approximately seven miles to the north is the Tennessee-Schuylkill Vein which is typically similar to those on the Chico. This mine is the largest and deepest in the Wallapai District, having a depth of about 1600 feet. Most of the other mines in the District have depths of 650 feet or less, with exception of the Golconda.

The total production of the Tennesee-Schuylkill Mine through 1948 with August 1982 values are as follows:

Gold	43,383 oz	$14,834,050
Silver	1,514,187 oz	10,599,309
Copper	839,837 lb	613,081
Lead	59,897,096 lb	16,771,186
Zinc	66,805,907 lb	24,718,185
		$67,535,811

Adjacent Mines (continued)

The Tennessee-Schuylkill Mine records from 1901 through August of 1944, indicate 599,058 tons of ore were mined. Through 1948, the total tonage mined would probably be between 600,000 and 700,000 tons. Most of the records of production on other mines in the District are quite brief or non-existant.


PATENTED CLAIMS
CHICO AREA
DUVAL
R18W
R17W
25
30
29
36
31
32
1
6
5
12
7
8
CHICO
CLAIMS
T23N
T22N
69
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Prepared by: S.C. Brown, Geologist
D.K. MARTIN & ASSOC. 9-30-82

PATENTED MINING CLAIMS

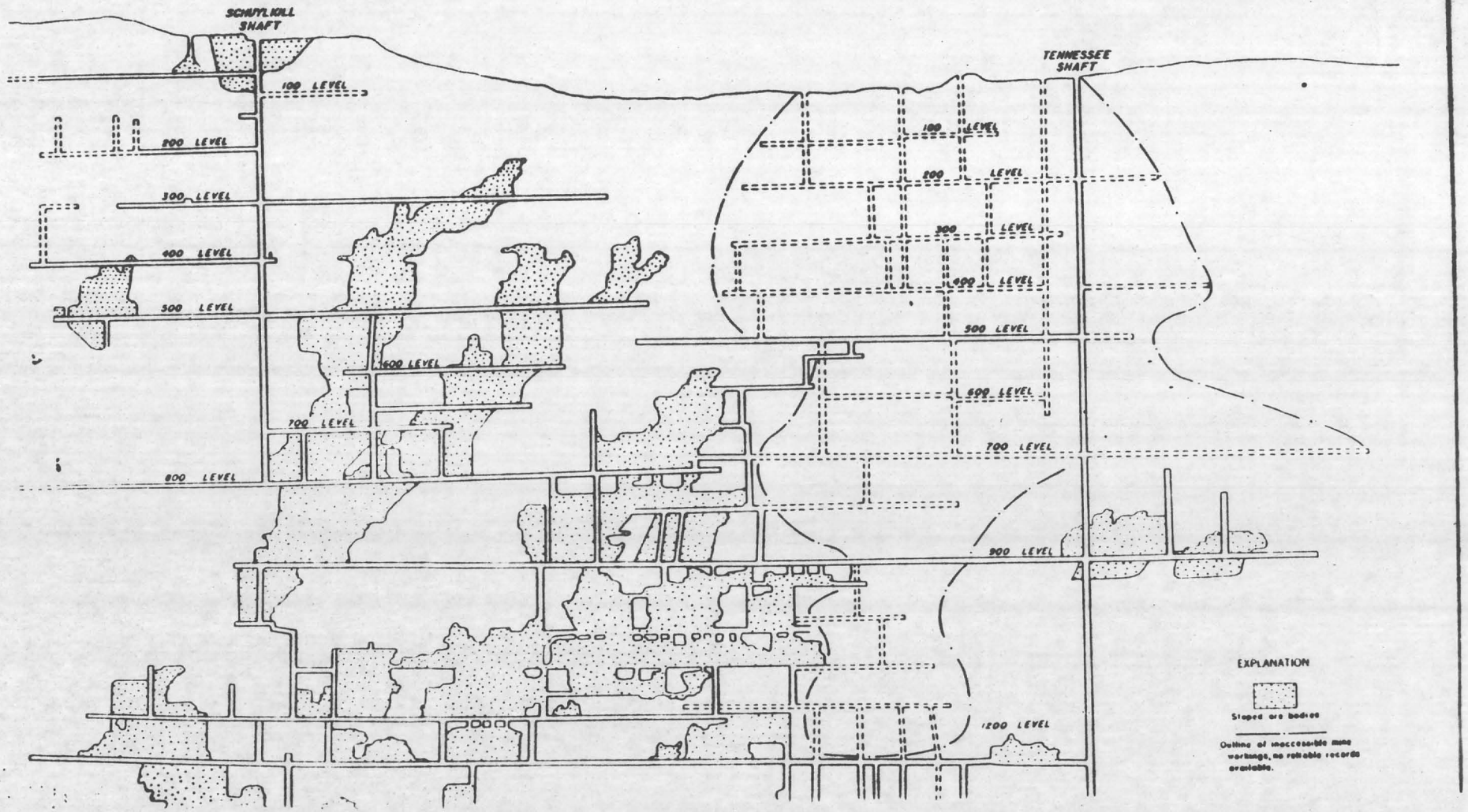
Chico Mine Area

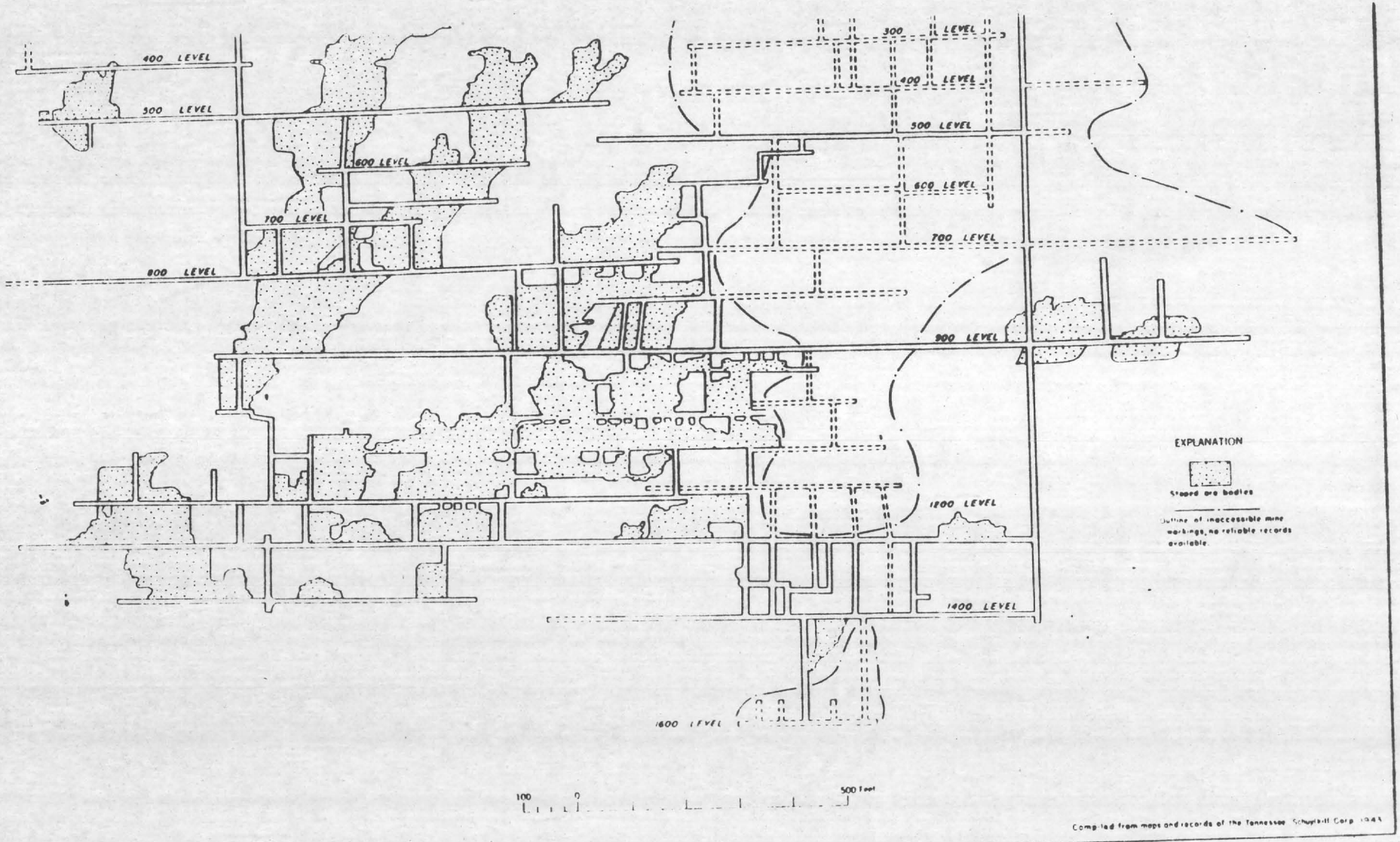
Wallapai Mining District

69	Ark	94	Golconda
70	Antone	95	Tub
71	True Blue	96	Virginia
72	Copper Apex	97	New Comstock
73	Gold	98	Western Scene
74	Silver	99	Mountain Top
79	Sky Scrapper	100	Side Hill
80	Silver Monster	101	Hill Side View
81	Summit	102	De La Fountaine
82	Fortunatus	103	Clearing House
83	Magnolia	108	Spangled Banner
84	Alpha	109	Fountain Head
85	Omega	126	Red Dog
86	Wallapai Queen	127	Cerbat
87	Little Boy	128	Juror #2
88	Mariposa 1st North Ext	129	Juror #1
89	Mariposa	130	Flores North #2
90	Todd	131	Gold Nugget
91	Big Bethel	132	Flores North
92	Silver	133	Ellen
93	Prosperity	134	Alma

GOLD, SILVER, COPPER, LEAD and ZINC RECOVERED FROM ORES
at the
TENNESSEE - SCHUYLKILL MINE
Chloride, Arizona
from
1901 to 1943

Year	TONS Ore	Conc	OUNCES Gold	Silver	Copper	POUNDS Lead	Zinc
1901	25,805		8.87	2,469		4,421,678	
1902	7,567		85.89	29,448		1,619,640	
1903	1,090		15.86	4,360		279,468	
1907	154		23.89	2,047	235	90,960	
1910	70	10	3.28	127		6,654	
1911	998	328	78.63	2,638	1,837	97,572	87,486
1912	1,358	988	266,67	13,127	2,361	459,771	260,966
1913	29,486	14,360	1,370,29	106,924	2,361	4,740,278	4,233,641
1914	22,081	12,671	739.15	74,748	11,981	3,657,302	4,932,108
1915	47,633	22,187	2,191.00	171,366	45,000	6,034,998	8,351,839
1916	47,013	19,777	1,564.00	135,158	32,285	5,086,177	7,517,627
1917	41,133	21,347	1,914.00	160,981	55,300	5,039,156	8,352,860
1926	164	71	12.71	819	435	32,024	32,697
1929	58	29	4.41	307	183	15,142	13,008
1936	12,233	3,239	2,870.00	40,850	24,300	1,433,000	1,000,000
1937	59,990	12,???	10,467.00	138,960	100,000	4,553,000	3,414,000
1938	54,092	11,340	9,642.56	107,720	86,500	3,792,450	5,449,656
1939	11,762	3,197	1,088.60	24,198	22,280	676,560	1,624,000
1940	55,577	17,581	3,249.51	132,775	19,880	4,607,740	9,543,100
1941	45,150	10,990	2,843.28	113,061	11,340	4,854,860	4,330,580
1942	40,055	7,552	2,278.08	100,194	17,160	3,284,880	3,383,980
1943	38,286	6,115	1,079.63	71,698	58,521	2,677,185	3,492,209
	541,755	163,406	41,796.65	1,433,975	506,166	57,460,495	66,019,758


SCHUYLKILL SHAFT
TENNESSEE SHAFT
100 LEVEL
200 LEVEL
300 LEVEL
400 LEVEL
500 LEVEL
600 LEVEL
700 LEVEL
800 LEVEL
900 LEVEL
1200 LEVEL
EXPLANATION
Stoped ore bodies
Outline of inaccessible mine workings, no reliable records available.



LONGITUDINAL VERTICAL SECTION OF TENNESSEE-SCHUYLKILL MINE, WALLAPAI DISTRICT, ARIZONA, THROUGH TENNESSEE AND SCHUYLKILL SHAFTS WITH PROJECTION OF MINE WORKINGS AND STOPED ORE BODIES

954714 D (In pocket)

TABLE 2.—*Production of gold, silver, copper, lead, and zinc of selected mines in the Wallapai district, Mohave County, Ariz., cumulative from 1901 through 1948, in terms of recovered metals*

[Compiled by Metal Economics Branch, U. S. Bureau of Mines, Salt Lake City, Utah]

Mine	Gold (oz.)	Silver (oz.)	Copper (lbs.)	Lead (lbs.)	Zinc (lbs.)
Alpha (m)	202	35,400	22,205	16,478	
Altata and Altata Extension (c)	[illegible]	36,604	120,646	7,601	....
Badger, Hercules, and Hercules group (c)	301	12,257	1,606	[illegible], 265	[illegible]
Banner group (s)	1,067	79,[illegible]	[illegible]	2,[illegible]	[illegible]
Blackfoot (cer)	150	11,[illegible]	10,017	[illegible]	[illegible]
Blue Bell (s)	400	[illegible]	44,270	[illegible], 001	....
Carbet (cer)	42	2,065	1,150	4,120	
Champion (cer)	[illegible]	[illegible]	14,[illegible]	[illegible]	[illegible]
C. O. D. (s)	1,[illegible]	151,[illegible]	[illegible]	[illegible], 672	[illegible]
Columbus-Monroe Doctrine (cer)	646	6,033	4,[illegible]	97,322	104,[illegible]
Copper Age (c)	3	1,082	[illegible]	24,575	
Dwarf (c)	[illegible]	55,883	1,[illegible]	140,[illegible]	
Elkhart (c)	[illegible]	10,386	7,[illegible]	203,100	
Empire and Silver Union (c)	1	2,475	128	....	
Eureka (c)	7	2,311	3,371	22,[illegible]	[illegible]
Flores (cer)	[illegible]	[illegible]	172	842	....
George Washington (m)	114	11,[illegible]	15,777	34	
Golconda (m)	20,722	830,100	364,700	2,004,710	[illegible]
Golden Eagle and Bobtail (m)	1,777	25,945	[illegible]	40,[illegible]	
Golden Gem (cer)	2,476	6,243	3,[illegible]	14,[illegible]	....
Hidden Treasure (c)	281	9,074	7,897	150,[illegible]	[illegible]
Idaho (cer)	[illegible]	6,[illegible]	4,742	9,[illegible]	51,[illegible]
Juno (s)	1,[illegible]	43,128	4,517	[illegible], 400	154,128
Keystone (m)	2,[illegible]	462,040	343,776	343,046	114,[illegible]
Little Chief (s)	301	[illegible], 281	2,670	111,825	....
Lucky Boy (s)	1,[illegible]	[illegible]	[illegible]	8,140	....
Mary Bell (c)	28	986	867	10,155	28,723
Midnight (c)	44	8,[illegible]	10,706	4,123	....
Minnesota-Connor (c)	2,[illegible]	229,120	[illegible], 700	169,722	71,008
Mint (m)	[illegible]	15,266	....	....	....
New London (cer)	13	2,[illegible]	1,[illegible]	120,[illegible]	31,243
Nighthawk group (m)	[illegible]	16,207	5,410	1,[illegible]	....
Old Colony (s)	21	3,[illegible]	[illegible]	6,370	....
Paymaster (cer)	[illegible]	25,[illegible]	....	....	....
Payroll (c)	128	4,104	11,[illegible]	[illegible]	192,137
Pinkham (c)	[illegible]	14,[illegible]	[illegible], 128	3,123	....
Rainbow (c)	2,[illegible]	34,[illegible]	4,706	313,271	22,626
Redemption (c)	[illegible]	4,[illegible]	11,[illegible]	....	
Rico (s)	1,140	15,[illegible]	1,[illegible]	2,[illegible]	....
Samson and Sampson (c)	4,[illegible]	57,[illegible]	4,454	[illegible], 377	67,[illegible]
St. Louis (cer)	[illegible]	11,142	1,[illegible]	[illegible], 941	1,[illegible]
Silver Age (s)	[illegible]	3,[illegible]	....	....	
Silver [illegible] ([illegible])	[illegible]	3,[illegible]	[illegible]	[illegible]	[illegible]
Tennessee and Schuylkill (c)	43,[illegible]	1,514,187	[illegible]	[illegible]	[illegible]
Towne (c)	146	6,[illegible]	2,[illegible]	5,[illegible]	....
Vanderbilt (cer)	1,012	2,110	[illegible]	2,[illegible]	....
Washington and Washington Extension (m)	[illegible]	2,[illegible]	1,[illegible]	1,[illegible]	....

c, Chloride camp; *m*, Mineral Park camp; *cer*, Cerbat camp; *s*, Stockton camp.

FUTURE ECONOMIC IMPORTANCE OF THE DISTRICT

It is believed that the future economic importance of the district will lie chiefly in the base-metal content of the fissure veins. Most of the veins have not been explored sufficiently at depth to test the base-metal content and particularly the zinc content. On the basis of a geologic study of the veins in the district there is no reason for assuming that any of several other veins will not be as productive of lead and zinc as the Tennessee or Golconda veins. Future development work, particularly at greater depths, on the many miles of veins in the district may disclose several that will prove to be their equal or better.

USGS Bulletin #978-E, 1951

Ref: Rural / Buckeye Mines
Wallapai Mining District
Mohave County, Arizona

Bendix

Field Engineering Corporation

Albuquerque District Office

2201 San Pedro Dr. N.E.
Building 3, Suite 220
Albuquerque, NM 87110

A Subsidiary of
The Bendix Corporation

August 10, 1979

Mr. Dick Genova
2608 N. Potrero
Phoenix, Az. 85006

Dear Dick,

Here are your long - awaited results of the analyses we promised you.

Sample # MGA-851 is from the road cut area near the Chico Mine where the scintillometer showed 2400 cps. Sample #MGA-852 is of the gossan above the Rural Mine. Sample #MGA-853 is the one we took from the vein exposed in the short, partially caved, adit at the Sky-scraper Mine.

The enclosed analyses are all expressed in parts per million. I have also included a copy of a conversion table that will enable you to convert the ppm values into per cent and, for the silver values, into troy ounces per short ton.

Regards to John, and good luck.

Sincerely,

Wade Corder
Geologic Technician

Encl. (2)

CHICO

BFEC SAMPLE NO.	MGA 851	MGA 852	MGA 853
LAB SAMPLE NO.			
U_3O_8 R (ppm)	80.4	7.2	1.3
U_3O_8 W (ppb)			
U_3O_8 S,SS (ppm)			
LOI S,SS (%)			
MEA (ppm)			
Ag	< 0.5	700.0	30.0
Al	60000	10000	30000
As	< 200	10000	3000
B	10	20	50
Ba	20	100	50
Be	10	5	15
Ca	150000	1000	1000
Co	5	10	10
Cr	200	50	500
Cu	< 10	2000	100
Fe	50000	150000	50000
La	700	50	< 20
Li	< 100	< 100	< 100
Mn	200	70	>5000
Mo	< 10	< 10	< 10
Na	2000	2000	5000
Nb	70	20	10
Ni	< 10	< 10	20
Pb	70	1000	1000
Sb	< 100	< 100	< 100
Sc	15	< 10	15
Sn	< 10	< 10	< 10
Sr	1000	< 100	< 100
Ti	7000	< 20	1500
V	30	10	30
W	< 100	< 100	< 100
Y	>200	< 10	10
Zn	< 200	1000	1500
Zr	>1000	< 10	20

Cut

Rural
20 ounces
Silver

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

RECOMMENDATIONS

(602) 246-9573

RECOMMENDATIONS

PHASE I

The first requirement for an exploration venture on this property is a detailed geological field study. This study would include the mapping of the types of rock outcrops, formation contacts, faults, vein systems, dips and strikes of the mineralized ore bodies, structural folds and any other conditions pertinent to ore deposits. During the preliminary field study, a drilling program would be proposed based upon assay results from surface samples and known values obtained from previous sampling. The shafts, drifts and adits which remain open should be investigated and mapped, while those which are inaccessable due to caving may be checked by drilling to substantiate previous known mineralized zones.

The results of this field study would determine the advisability of going into phases III and IV, although, all research to date indicates commercial ore may be found at depth. Regional studies indicate commercial ore will continue with depth which should be determined by deeper drilling.

PHASE II

It is further recommended that about 4000 feet of drilling be initiated. The drilling equipment sould be a down-the-hole hammer type, as diamond drilling would have difficulty penetrating and recovering adequate samples from the faulted, crushed and oxidized ore zones.

The drilling should be concentrated near the old workings (Jamison, Cashier, Mint, '98, True Blue), southerly towards the Golconda and northerly towards the Duval operations, to deliniate the depth, grade, width and dip of the known mineral bearing veins.

Some commercial ore may be blocked out with the drilling program. A few deeper holes will determine if the ore holds with depth as regional studies indicate.

PHASE III

Rehabilitation of the Jamison and Mint drifts should be accomplished in order to gain access to the exposed veins and mined ore bodies. Resampling and mapping should be accomplished.

PHASE IV

Further metallurgical testing should be carried out on the dumps and stockpiles. Engineering studies should be carried out to evaluate the methods of treating this material. It is emphasized strongly that such studies have frequently a tendency to under-estimate the capital and operating cost along with over estimating the recoverable values. Heavy capital costs should not be incurred without a very healthy projected profit margin and it is felt that such margin will not be reached until good grade material has been opened by exploration and development.

From the available assays and reports, it seems likely that good commercial grade material exists in the undeveloped areas of the property.

The first two phases of the recommendations should be initiated at the onset, while phases III and IV could be carried out only if the drilling exploration results are positive.

EXPLORATION TARGETS

(Phase I)

There are several major veins on the property which were worked in the past. New ore can probably be discovered at depth, below the old workings and along the vein systems.

The discovery of oxide ores on the surface demand immediate attention. Oxide ores usually can be mined and processed by leaching methods at a fraction of the cost of sulphide ores. These areas should be thoroughly investigated and then drilled to determine grade and depth.

Again, it is advisable to correlate the known information of the past workings, project calculated directions of vein systems, as with the Jamison, '98, True Blue and Cashier, and extend from a point of beginning.

PHASE II
DRILLING CONTRACT

Clark-Oliver Mining Co., Inc.

Drilling & Mine Development

419 South 113th Place, Apache Junction, Arizona 85220
(602) 986-5681

THIS AGREEMENT, entered into this_____ day of _____198_____. by and between Clark-Oliver Mining Co. Inc., of Apache Junction, Arizona, hereinafter designated as CONTRACTOR, and_____ of_____hereinafter designated as LANDOWNER or his representative acting as his agent.

Contractor agrees to drill a 4½" diameter vertical prospect hole to a total depth of 4000 feet, for the price of:

$ 11,500 for first 1000 feet.
$ 33,000 for next 3000 feet.

Above price includes samples taken at 5 foot intervals and marked in 8X12" plastic bags.

Mobilization to be for the Lump Sum of $ 1,500.

IF UNEXPECTED CONDITIONS (As explained in attached schedule A) are encountered due to unpredictable subsoil conditions, the contractor has the option to place the remainder of that particular hole on an hourly basis, providing the Landowner is notified prior to continuing hole. If Landowner or his agent is unavailable the contractor is to charge only for footage drilled if hole is voided.

In case of legal action, any lien, attachment or otherwise, to be caused by Landowner, attorney's fees to be paid by Landowner.

IN WITNESS hereof, Contractor is in receipt of $ 22,000 dollars, signifying approximately 49 % of contract price. Remainder to be paid as follows As work progress beyond 49%.

Clark-Oliver Mining Co. Inc.
By-Frank H. Clark - Sec. Treas.

Landowner

Address

City and State

SCHEDULE "A"

Clark-Oliver Mining Co., Inc.

Drilling & Mine Development

419 South 113th Place, Apache Junction, Arizona 85220
(602) 986-5681

Additional charges are, but not limited to the following:

1. Stand-by-time: Stand-by-time is usually charged for consistent excessive layover time (more than 1 hour) between drill locations caused by the Landowner or his agent. The rate charged for this is $60.00 per hour.

2. Excessive distance between drill locations. $60.00 per hour for moves in excess of one mile. No charge for less than 1 mile when hole exceeds 50 L.F. in depth.

3. Hole set up and tear down for shallow drilling patterns of 50 L.F. or less , a fee of $60.00 per hole will be charged.

4. Unstable hole conditions. This is due to cave-ins in the hole. When this condition is encountered we place our drill rig and crew on a rental basis of $120.00 per hour for the remainder of that particular hole . The Landowner or his agent must decide at that time if he wishes to sign a tool guaranty and continue or void that particular problem hole.

5. Excessive hard rock Conditions. This condition is determined when the drilling cycle falls below 10 L.F. per hour, which represents a negative profit balance in regards to our fixed costs which would require a rental agreement or voiding deeper drilling of that particular hole. Rental will be at $120.00 per hour plus a bit wear provision.

6. Casing if and when required to be furnished at contractors cost plus $2.00 per L.F. additional for installation.

UNDERGROUND DEVELOPMENT

(Phase III)

The most favorable location for an initial mining operation is on the Little Boy and '98 Claims, located in the northwest quarter of Section 5, Township 22 North, Rnage 17 West. Several mineralized veins intersect in this area which show abnormally high gold and silver values.

The Little Boy, Goetz and '98 Shafts all penetrate mineralized veins, indicating considerable ore reserves. Values increase significantly with depth.

The '98 Shaft is approximately 100 feet in depth with short horizontal tunnels developed along the vein. Oxide ore is in place in the shaft and the tunnels are bordered by altered material. At the 100 foot level, the vein and altered material average about 3 feet in width. Assay samples across this zone gave values of 3.3 ounces gold and 23.0 ounces silver per ton. Surface exposures showed only a trace of gold and 0.78 ounces of silver, indicating increasing values with depth.

The Goetz shaft is on an extension of the '98 Vein and is reported to be about 220 feet in depth, but is caved at the 10 foot level. Assays of stockpiled ore from the 50 foot level showed values of gold ranged from 0.384 to 0.55 ounces per ton and silver ranged between 35.64 and 63.0 ounces per ton. The vein is oxidized to the 200 foot level where assay values showed gold to be 0.256 and silver 13.42 ounces per ton. At this level the vein is 2.5 feet in width. By contrast, surface samples at the Little Boy Vein had values of gold showing 0.15 and silver 1.79 ounces per ton. The vein at the surface is only one foot in width.

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

B I B L I O G R A P H Y

CHICO MINE PROPERTY

Wallapai Mining District

Mohave County, Arizona

(602) 246-9573

(602) 246-9573

D.K. MARTIN & ASSOCIATES
Mining Development & Administration

4728 N. 21ST AVENUE PHOENIX, ARIZONA 85015

ANNOTATED BIBLIOGRAPHY OF
WALLAPAI MINING DISTRICT
Mohave County, Arizona,
With Special Attention Given
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Bastin, E. S., 1924, Origin Of Certain Rich Silver Ores Near Cloride And Kingman, Arizona: United States Geological Survey (U.S.G.S.) Bulletin 750, pp. 17-39.

Includes general features of area, detailed description of major mines with petrographic examination of surface and sub-surface ores. Concludes proustite (Ag_3AsS_3), galena (PbS), sphalerite (ZnS), chalcopyrite ($CuFeS_2$), are primary (hypogene) ore minerals. Oxidation products giving rich silver values at surface are cerargyrite (AgCl) and native silver, which were caused by secondary enrichment. Rich primary silver ores warrant further exploration and development.

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Detailed description of geology, structures, ore deposits, mines and prospects. Production records from selected mines. Concludes future economic importance of district lies chiefly in base-metal sulfides. Author states discovery of large rich veins by proper exploration very probable. Deeper rich sulfide veins and/or disseminated porphyry type deposits also very probable.

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and development. Mine workings maps included. Concludes Wallapai District has substantial deep silver-lead-zinc reserves with considerable enrichment of copper, silver and minor gold in the shallow oxidized zone.

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Pye, W. D., 1976, Chico Mine And RMC Properties, Wallapai Mining District, Mohave County, Arizona: M.S., Ph.D. Geology, Consulting Geologist, 3418 N. Forgens Avenue, Tucson, Arizona, 85716. 10 p.

Brief description of properties and general facts in regards to feasibility of mining. Detailed geologic and structure description. Vein and mineralization described with porphyry copper vs. vein potential highlited. Evaluation states property lies in producing area with abundant evidence of well mineralized veins crosscutting property. Concludes good mineralization underlies property in the form of silver, gold, copper, lead and zinc; assays show properties can support mining operation; mill will be necessary and exploration is paramount. Recommends: Geologic mapping and sampling, geophysical exploration, drilling, exploratory mining.

Ranney, C. R., 1973, Chico Mines Property, Kingman, Arizona: Mining Engineer, Box 90, Santo Tomas Rte., Sanuarita, Arizona. 8 p.

Brief description of history, production, geology, ore deposits of general nature. Concludes possibilities of developing mine are excellent. Recommends exploration to delineate disseminated sulfide body to north and veins elsewhere.

Note: Jemison Mine was renamed Chico Mine when ownership changed hands.

<u>Privately Finaced Professional Reports Concerning the Pennzoil-Duval Orebody and Operation at Mineral Park, Arizona</u>

Schmitt, Harrison, A., 1962, The Porphyry Copper-Molybdenum Ore Deposits at Mineral Park, Arizona.

Brief account of geography and history. Discusses hypogene and supergene

phases of mineralization including the capping. States ore body is typical enriched chalcocite blanket. Gives size, tonnage, age, value and cu-mo ratio of ore body. Author describes sampling procedure. This paper presented at the Tucson meeting of the A.I.M.E. December 3, 1962. Selected references, 4 maps of ore body. Author states southern boundy of orebody has not been determined.

Gomez, Anthony, Jr., 1966, Description of Duval's Mineral Park Concentrator Presented Before The Mineral Dressing Division, Arizona Section, A.I.M.E., May 6, 1966.

Brief history of area, sampling program and geology. Detailed crushing, grinding, floatation, tailings disposal and concentrate handling. Metallurgy reportedly 0.460% Cu and 0.030% Mo. Reagents listed for floatation.

William Vanderwall
Geologist

ANNOTATED BIBLIOGRAPHY

SELECTED AREAS
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William Vanderwall
Geologist

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Mohave County, Arizona,

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ST.JOE
AMERICAN CORPORATION
2002 NORTH FORBES BOULEVARD
TUCSON, ARIZONA 85705
602-622-4766

March 15, 1982

Mr. William Vanderwall
Pacific Regional Operations, Inc.
P.O. Box 716
Scottsdale, Arizona 85252

Dear Mr. Vanderwall:

We have received and reviewed the assay results from Eugene Demeter's investigation of your company's Chico Claims in Mohave County, Arizona, together with the geologic data. The property does not appear to have sufficient large mine potential to be of further interest to St. Joe.

Thank you for considering us.

Sincerely,

Noel Cousins

Noel Cousins
Sr. Geologist

NC:jf

Noranda Exploration, Inc.
2601 North 1st Avenue
P. O. Box 50326
Tucson, Arizona 85703

noranda

Tel.: (602) 623-2505

2-9-82

William C. Vanderwall
Pacific Regional Operations, Inc.
P.O. Box 716
Scottsdale, AZ 85252

Dear Bill:

I apologize for not getting a letter off to you sooner, but I assume receiving these analyses has not been a top priority item with you. As you can see gold and silver are at or below the detection limit on all but the third sample. I have concluded from these data and from inspection of your property that metals have not moved into the wallrock and that adequate tonnage is not available. I have enclosed a short description of the samples with the analyses.

I very much appreciate your bringing this property to my attention. If in the future you encounter areas that might be of interest to Noranda don't hesitate to contact us.

Sincerely,

James F. DuBois

Bear Creek Mining Company

Exploration Division of Kennecott Corporation

Tucson Office

November 24, 1981

Mr. William Vanderwall
Pacific Regional Operations, Inc.
P.O. Box 716
Scottsdale, Arizona 85252

Dear Mr. Vanderwall:

Subject: Chico Property (Mint, Cashier and Jamison Mines), Mohave County, Arizona

We have reviewed the information that you sent us on your Chico Mines property and we have decided that this property is not of interest to us. Thank you for bringing this property to our attention. We are returning the data you sent us.

Sincerely,

D. C. Bulmer

DCB/ga

Enclosures: As stated

2502 NORTH HUACHUCA DRIVE • TUCSON, ARIZONA 85745 • TELEPHONE: 602-624-5547 • TWX: 910-952-1320

TELEPHONE
602-297-7281
TELEX
666-409

NEWMONT EXPLORATION LIMITED
A SUBSIDIARY OF NEWMONT MINING CORPORATION
200 WEST DESERT SKY ROAD
TUCSON, ARIZONA 85704

November 4, 1981

Mr. William Vanderwall
Pacific Regional Operations, Inc.
P. O. Box 716
Scottsdale, Arizona 85252

Re: Chico Mine Property
Mohave County, Arizona
File No. 3122

Dear Mr. Vanderwall:

This is to acknowledge receipt of your communication received today concerning the above property.

When Mr. Donald F. Hammer, Exploration Manager-Western Operations, has had opportunity to review your data, you may expect an early reply as to our evaluation of your submittal.

In the meantime, thank you for submitting your property to Newmont.

Very truly yours,

Emily M. Timmons

Emily M. Timmons
Librarian

/emt

Riocanex

May 19, 1981

Mr. William G. Kardos
Pacific Regional Operations, Inc.
P.O. Box 716
Scottsdale, Arizona 85252

Dear Bill:

I'm returning herewith the Dupont drill hole location map plus a spare copy of the Chico Prospect map on which I have plotted the sample locations for my assayed samples. The attached assay report from Skyline Labs reveals that sample #6 returned the most interesting values; i.e. 0.14% Cu and 110 ppm (3.2 oz) Ag from grabs over 20 feet. This sample, as well as #3, #4 and #5, was collected in the vicinity of the Jamison Mine near the Little Bay Vein.

Sample #10 from west of the Alpha Mine is anomalous in lead. I had high hopes for this area as the alteration seemed stronger and more extensive.

Management here is discouraged by the numerous Dupont drill holes which would likely have tested the possibility of widespread, low grade mineralization adjacent to the high grade mineralized veins. With this in mind, plus an appreciation of Dupont's exploration thoroughness, we felt that an approach to Dupont for permission to examine their data is unwarranted. Thus we must decline to participate in the exploration of the Chico claims.

Thank you for giving Rio Algom Corporation the opportunity to examine your property. The assistance and hospitality of you and your assistant Bill Vanderwall was greatly appreciated.

Yours very truly,

RW Shewman

R. W. Shewman
Senior Geologist

RWS/hh
Encl.

Eastern Canada Office:

RioTinto Canadian Exploration Limited
A subsidiary of Rio Algom Limited

120 Adelaide Street West, Toronto, Ontario M5H 1W5. (416) 367-4220. Telex 065-24134. Cable RIOCANEX

ARIZONA DEPARTMENT OF TRANSPORTATION

ADMINISTRATIVE SERVICES DIVISION

206 South Seventeenth Avenue Phoenix, Arizona 85007

BRUCE BABBITT
Governor

WILLIAM A. ORDWAY
Director

FRANK BOWMAN
Assistant Director

April 30, 1981

CERTIFIED MAIL

Mr. Douglas K. Martin
4728 North 21st Avenue
Phoenix, Arizona 85015

Dear Mr. Martin

Your attention is invited to the attached Findings of Fact and Conclusions pertaining to the Sign Violation Hearing you requested on Tuesday, March 10, 1981, relative to a sign on U.S. 93 N.B., at milepost 59.75.

I have ruled that the Arizona Department of Transportation acted properly and lawfully in issuing the Violation Notice and as you failed to appear I assume you agree with the notice and will remove the sign.

Very truly yours,

David L. Conner

DAVID L. CONNER
Hearing Officer

DLC:sp
Attachment
cc: Pete Gulatto
John Unten

FILE

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

March 21, 1981

Mr. John E. Unten
Maintenance Permit Engineer
Arizona Department of Transportation
Highway Division
206 South 17th Avenue
Phoenix, Arizona
85007

Re: Invoice #6-0229
Survey #N-26-M

Dear Mr. Unten:

I respectfully appologize for not attending the hearing which was set for March 10, 1981. This meeting was completely overlooked.

Thank you for your phone call, and as requested, I am submitting this letter as a request that a postponement be considered. I have forwarded your pink information sheets to Mrs. Lillian Bower, Covina, California.

To date I have not a reply, but feel it will be forthwith containing signatures making a rescheduling of a future hearing unnecessary.

I will either notify you in writing with necessary signed forms or telephone requesting the rescheduling of the hearing.

Very truly yours,

D.K. Martin

DKM/jer

cc: Goetz
Kardos, PRO

(602) 246-9573

F. A. THORNDIKE
4615 POST OAK PLACE SUITE 195 HOUSTON, TEXAS 77027 TELEPHONE 713/627-2400

August 22, 1980

Mr. William G. Kardos
Pacific Regional Operations, Inc.
P. O. Box 716
Scottsdale, Arizona 85252

Dear Mr. Kardos

Mr. Thorndike has asked that I return to you all of the material you sent him concerning the Mohave County, Arizona mining claims.

Sincerely,

C. Smith

C. Smith
Secretary to F. Thorndike

cs
Enclosure

394 28487

TEJAS HOU

0058283 1557 07/22

20407PE MORANTE
HOUSTON TEXAS
JULY 21, 1980

ATTN: MR F A THORNDIKE

FOLLOWING TELEX TRANSMITTED FROM TEJAS HOUSTON

RE: CHICO AND BLACKHAWK CLAIMS
MOHAVE COUNTY, ARIZONA

ADDITIONAL INFORMATION OBTAINED SINCE LAST REPORT OF JULY 10, 1980, WORTHY OF YOUR ATTENTION.

1. METALLURGICAL TESTING RESULTS FROM DENVER EQUIPMENT CO. TESTING DIV. REVEALS BASE METAL CONCENTRATES CONTAINING 85 TO 90 PERCENT OF ASSAY VALUES CAN BE PRODUCED . A COMPLETE REPORT AND FLOW DIAGRAM WAS ALSO PROVIDED.
2. ADDITIONAL GEOGOLICAL FIELD WORK HAS SAMPLED ORE SHOOTS IN THE SOUTHEAST QUARTER OF THE CHICO CLAIMS NEAR THE BLACKHAWK - HI CHICO BORDER. ASSAY RESULTS AVERAGE 2.230Z. GOLD PER TON AND 30 BZ SILVER PER TON.
3. CLAIMS SURROUNDING THE BLACKHAWK - CHICO GROUP ARE BEING JC ACTIVELY PURSUED BY REPUTAELE MINING COMPANIES.
   A. PENZOIL - DUVALL REPORTEDLY HAS PURCHASED 10 CLAIMS BORDERING THE CHICO GROUP ON THE WEST AND HAS APPROACHED THE GRANTOR OF OUR CHICO OPTION WITH THE SAME INTENTION.
   B. WORLD MINES, INC. A LYBIAN CONCERN, HAS ACQUIRED THE GOLCONDA GROUP 14 CONTIGUOUS CLAIMS IMMEDIATELY SOUTH OF THE CHICO GROUP. ACQUISITION PRICE REPORTEDLY $2,000,000.00 .
   C. REPUBLIC MINES, INC., HAS PURCHASED THE COLONEY GROUP OF PATENTED CLAIMS EAST OF THE BLACK HAWK GROUP AND HAS MADE AN OFFER FOR THE BLACK HAWK.

PLEASE ADVISE PACIFIC REGIONAL OPERATIONS, INC., SCOTTSDALE ARIZONE OFFICE (602) 994-3147 BY WEDNESDAY NOON, ARIZONA TIME JULY 23, 1980, AS TO YOUR INTENT IN REGARD TO THE CHICO - BLACK HAWK GROUP.

PACIFIC REGIONAL OPERATIONS, INC.

END OF TELEX BEINT TRANSMITTED FROM TEJAS HOUSTON

REGARDS
LORETTA

TEJAS HOU
MMMMMMM
005.3 MIN

ARIZONA REG'D MINING ENGINEER
1338 WEST THOMAS ROAD
PHOENIX, ARIZONA 85013
TELEPHONE 279-7354

REPLY TO:
5822 NORTH 22ND PLACE
PHOENIX, ARIZONA 85016
TELEPHONE 955-7353

Richard F. 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.

PACIFIC
REGIONAL
OPERATIONS, INC. P.O. Box 716 • Scottsdale, Arizona 85252 • (602) 994-3147

CHICO PROPERTY
ORE POTENTIAL
SUMMARY

All the attendant geological features or conditions which are responsible for the formation of economic ore deposits in the Wallapai Mining District occur on the Chico Property.

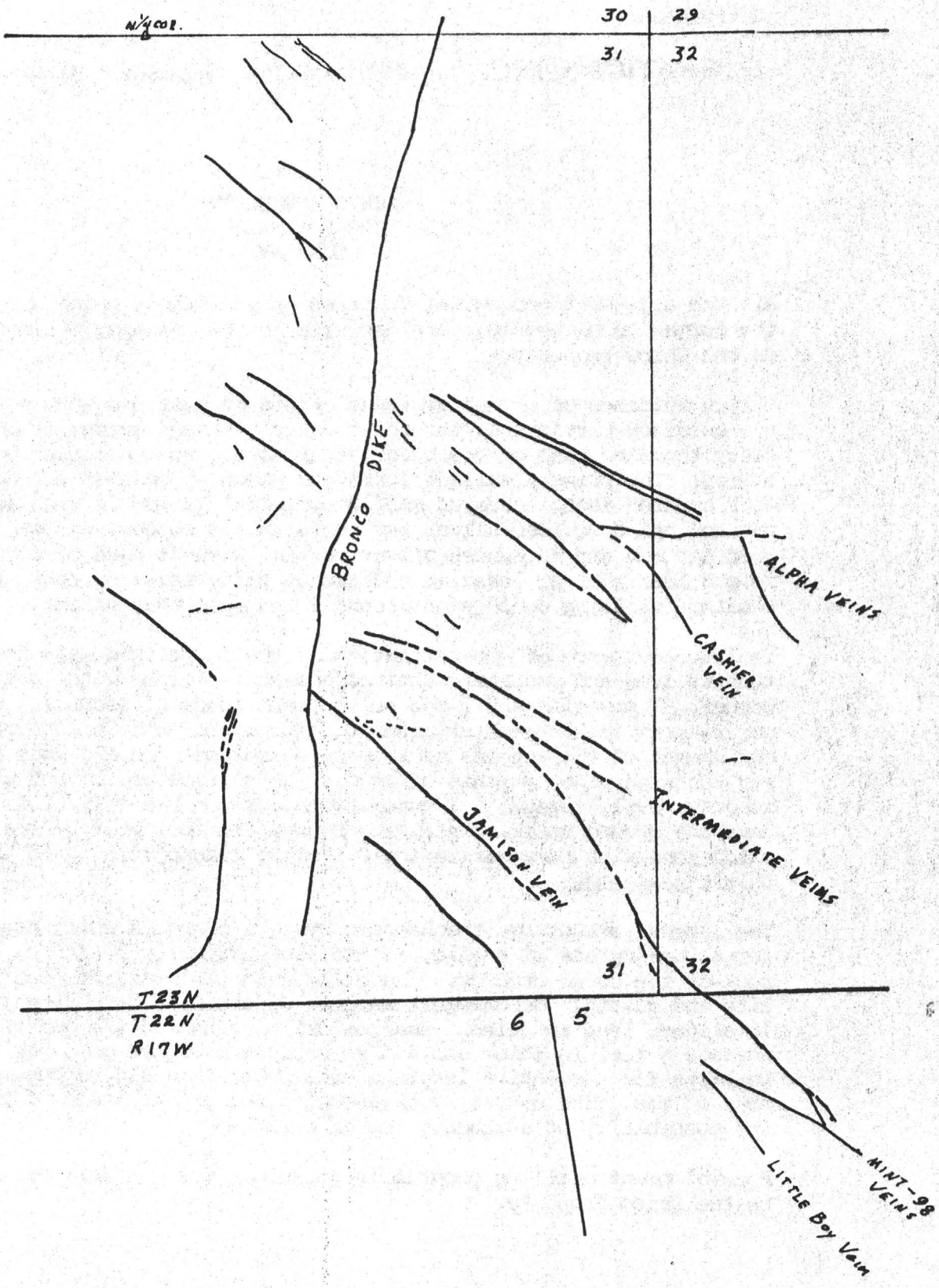
Direct evidence of ore underground exists in most old workings which exploited the oxidized portions of the veins. The size and extent of mine dumps suggest fifty thousand tons of ore have been removed from the upper portion of the ore-bodies. The primary sulfide zones are shown to persist for depths exceeding four hundred feet. Assayed sulfide material yields as high as 12 ounces gold per ton and 50 ounces silver per ton with 12% copper, average tenure is 0.5 ounces gold per ton and 10 ounces silver per ton with 2% each of copper, lead and zinc. We consider that at least an additional fifty thousand tons of such sulfide ore remains, drilling could significantly increase that estimate.

Indirect evidence of mineralization of the property exists in the form of extensive iron and manganese stained gossans, spring water testing 6.7 ppm copper, 87 ppm zinc and 2 ppb silver, and zones of secondary copper enrichment occuring in the largest structural component of the Chico Property. Silver enrichment of the gossans averages 3 ounces per ton and goes as high as 20 ounces per ton with minor amounts of gold. The sulfide equivalent of a gossan, drilled in July, 1981, assayed 1.3 ounces gold per ton but only 12.5 ounces silver. Perhaps the ground water, containing 80 ppm clorine, preferentially enriches the oxide zone with cerargarite (Ag Cl) while transporting gold in various aurochloro compounds.

The largest structure, the Broncho Dyke, a fracture which traverses the property for three-fourths of a mile, is infilled primarily by Ithica Peak Granite, host rock of the Duval orebody. The granite in turn was intruded by diabase, rhyolite and quartz. Geochemical samples of the Dyke have revealed areas anomolous in silver, lead and zinc. Shallow drilling showed the quartz in the Dyke to average 6 feet in thickness and to carry 0.3 ounces gold per ton. If the quartz persists for the entire length of the Dyke, it could represent over one million tons of ore. The nature, rock associations and attitude of the Dyke enhances the possibility of secondary copper enrichment.

A development drilling program is paramount for the delineation of ore reserves on the Chico Property.

September 18, 1981



D.K. MARTIN & ASSOCIATES

Mining Administration
and
Development

4729 North 21st Avenue
Phoenix, Arizona 85015
(602) 246-9533

DOUG MARTIN

WILLARD D. PYE
Consulting Geologist
3418 North Forgeus Avenue
Tucson, Arizona 85716

Telephone 327-2956

August 11, 1976

CHICO MINE AND RMC PROPERTIES

WALLAPAI MINING DISTRICT

MOHAVE COUNTY, ARIZONA

INTRODUCTION

Location

The RMC holdings are located primarily in Sec. 31, T. 23 N., R. 18 W., but extend short distances into the adjacent sections to the east and south. The general area of the occurrence of the claims is in the Wallapai Mining District, also known in whole or in part as the Chloride, Mineral Park and Cerbat Mining Districts.

The property is located about 7 miles southeast of Chloride or 10 miles northwest of Kingman, Mohave County, Arizona.

Property

The property held by RMC is reported to consist of 49 non-patented lode mining claims and two patented claims. Examination of ownership and title is beyond the scope of this report, but attached to this report is an Affidavit of Labor performed upon them for the Assessment Year 1974-75.

Topography and Relief

The claims lie in Lane Springs Basin and the upper portion of Todd Basin in the central portion of the Cerbat Mountains. They extend from near the western summit of the range to its lower portion. The topography is rugged and mountainous with a relief of over 1000 feet. An average elevation is about 4500 feet. The Cerbat 7½ minute Quadrangle Map of the U. S.

#2

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3418 North Forgeus Avenue
Tucson, Arizona 85716

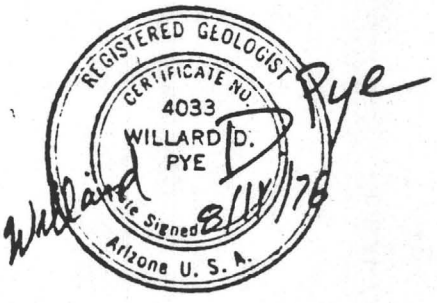
Telephone 327-2956

August 11, 1976

CHICO MINE AND RMC PROPERTIES

WALLAPAI MINING DISTRICT

MOHAVE COUNTY, ARIZONA



(#4)

RESUME

WILLARD D. PYE

PERSONAL DATA

Willard Dickison Pye

Office Address: 3418 N. Forgeus Ave., Tucson, Arizona 85716
Home Address: 3418 N. Forgeus Ave., Tucson, Arizona 85716

Born: February 20, 1915

TRAINING (College and University)

Oberlin College, Oberlin, Ohio
A.B., 1935

California Institute of Technology, Pasadena
M.S., 1937

University of Chicago, Ph.D., 1942

FIELDS OF SPECIALIZATION

Undergraduate: Geology and Mathematics majors; Physics and Chemistry minors.

Graduate (M.S.): Geophysics and Economic Geology (ore deposits)

Graduate (Ph.D.): Petroleum, Ore Deposits, and Sedimentation

SCHOLASTIC HONORS

President, Geology Club, 1934-35
Phi Beta Kappa, 1935
Sigma Xi, 1937
Virgil Kirkham Fellowship in Geology (University of Chicago) 1940-42

PROFESSIONAL LICENSES

Arizona State Board of Technical Registration (Consulting Geologist) No. 4033

California State Board of Registration for Geologists No. 2654

REFERENCES

Who's Who in America

American Men of Science

Who's Who in American Education

Various oil, geological, and other directories

various claims in the RMC holdings;

4. Assays by Mr. Kenney show areas where good values for various metals occur; detailed sampling might delimit good ore bodies based upon the location of the good assays obtained.

CONCLUSIONS

1. The property is well located in a well mineralized area.

2. There is good mineralization underlying the property in the form of silver, lead and zinc bearing veins with some associated gold.

3. The values in the veins were sufficiently good to support in the past, when metal prices were low to very low, a strong mining activity.

4. A mill will be necessary to concentrate the metal values and to eliminate waste material.

5. The extent and value of the mineralization remaining in the property area can only be determined and evaluated by additional exploration and assaying.

6. Future exploration and evaluation would take the form of:

   a. Geological mapping and sampling
   b. Geophysical exploration
   c. Drilling
   d. Mining exploration, blocking out and production of discovered ore.

Only those steps will be used on various portions of the property as will be most effective to determine the ore potenial and delimit its boundaries.

Willard D. Pye

Willard D. Pye
Consulting Geologist
Arizona State Board of
Technical Registration #4033
California Board of
Registration for Geologists
2654

The open pit operation at Mineral Park, about 2 miles to the northwest, is on a porphyry copper deposit developed in the Ithaca Peak stock. Equivalents of the Ithaca Peak stock granite are present in the RMC claim area. No evidence of disseminated copper deposition was observed in the brief time spent on the claims. However, exposures of this granite are extremely limited being covered by other rock types. It is quite possible that a branch of the Ithaca Peak stock could extend into the area and underlie the property and that it might carry disseminated copper deposits. To determine this possibility would take deep IP geophysical work followed by deep drilling where indicated by the geophysical results.

PAST EXPLORATION AND DEVELOPMENT

In 1974-75 some 65 drill holes were sunk on the property. Many of these were to test the mineralization associated with the Bronco Dike. Most of the holes were about 50 feet (inclined) in total length; rarely was a hole 150 feet or more in length. These have been discussed earlier.

Pits, cuts and shafts abound in the area. These range from a few feet deep to shafts over 400 feet deep (reportedly). Adits, tunnels and cross-cuts amounting to thousands of feet of underground workings, usually along a vein, are present. Many of these have been explored by Mr. Kenney and have been sampled and assyed to varying degrees. Many of the workings are no longer accessible. The results of his findings are included as part of this report.

EVALUATION

No tonnage evaluation nor dollar evaluation can be made for the RMC holdings in the Chico Mine area. There are two main reasons for this (1) time was insufficient to do this and (2) data from past developments were insufficient or unavailable to enable any type of calculation as to value to be made.

However, there are several positive factors which suggest a good value to the property:

1. The property lies in a mining district from which extensive tonnages and values for gold, silver, copper, lead and zinc have been obtained;

2. There is abundant evidence of well mineralized veins crossing the claims;

3. A number of good mines have been opened on

Surrounding the Mineral Park center is a zone several miles wide of lead-zinc-silver bearing veins and outside of that is a zone of silver mineralization. These zones do not have sharp boundaries and are gradational.

The subject claims are in the lead-zinc zone but do carry a small amount of copper and substantial amounts of silver. The mineralization occurs in veins of mesothermal type or veins which formed at moderate temperatures and pressures within the crust of the earth.

The primary mineralization is one of lead (galena), zinc (sphalerite) and silver (argentite) sulfides together with some arsenic and antimony bearing compounds (sulfo-salts). In addition small amounts of copper sulfides are present and reportedly there is minor native gold in the veins. In the area molybdenum, vanadium and tungsten bearing minerals have been found. Molybdenum usually is found with copper and very easily could be present throughout the area.

The primary silver minerals are the silver sulfides and silver sulfo-salts. However, much of the silver probably occurs with the lead as argentiferous galena.

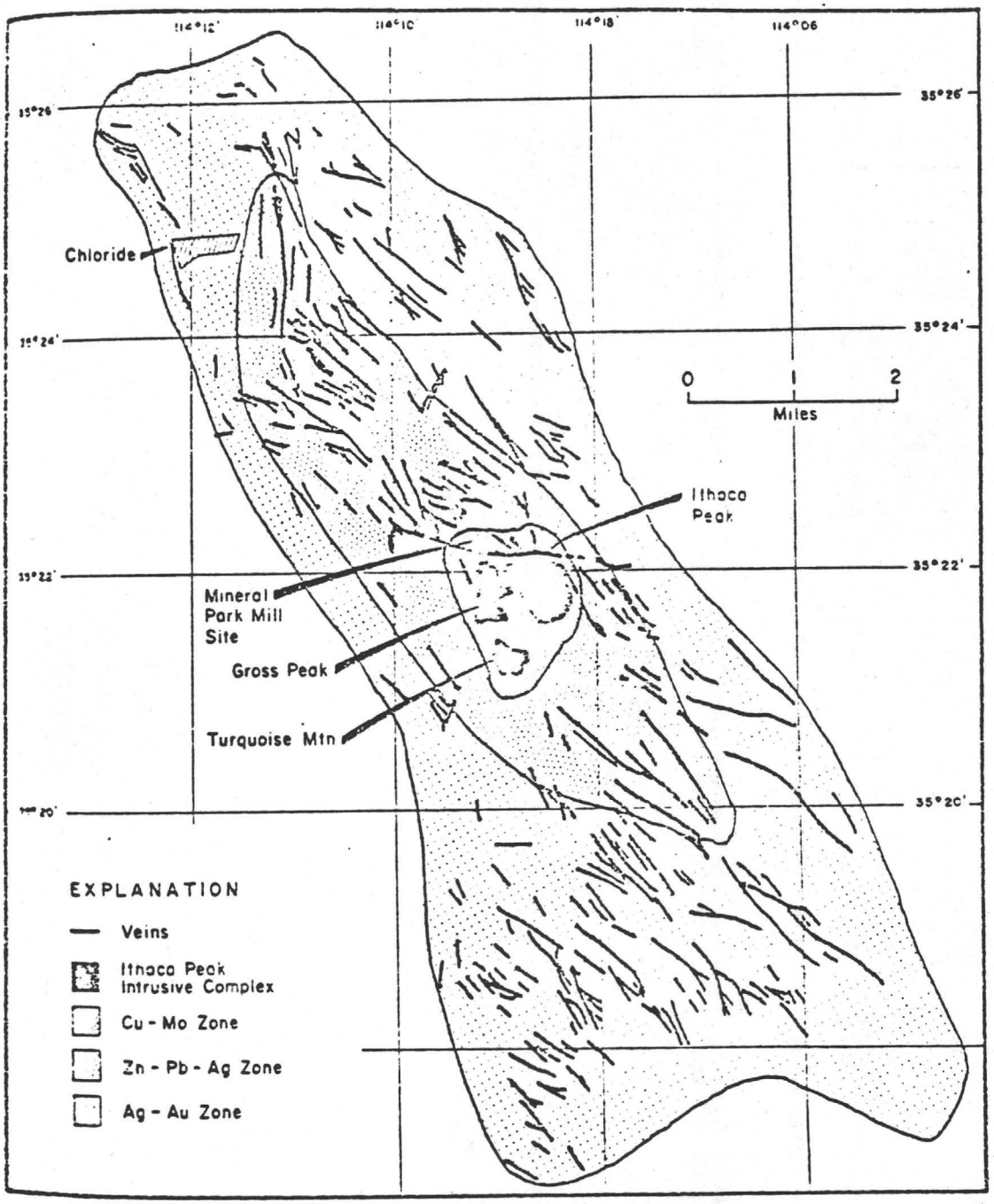
The secondary ore consists of the near-surface oxidized minerals of lead, zinc, silver and copper together with residual concentrations of gold. In these secondary minerals are found the native metals of silver, gold and some copper.

The rich silver deposits of the area were basically the silver chlorides, bromides and native silver developed on the oxidized portions of the veins.

Depth of oxidation ranges from a few feet to several hundreds of feet. The average depth is reported to be about 100 feet. The primary sulfides become the main ore minerals below the oxidized zone and at the base of the zone is the "zone of secondary enrichment" especially important in connection with oxidized copper bearing deposits.

Porphyry Copper Potential vs. Vein Potential

The RMC holdings around the Chico Mine are typically vein deposits. They are essentially lead-zinc types which at increasing depths probably will increase in copper content. Likewise, northward towards Mineral Park the copper content of the veins will probably increase. There is no question that the property lies in an area of excellent vein development and vein-ore potential.



Vein Distribution and Zoning in the Wallapai Mining District (adapted from Dings, 2, Plate 1).

Veins

Most of the veins are associated with the various dikes. It seems to make little difference whether they are basic or acidic in character, being found along both diabasic and rhyolitic dikes. However, not all of these dikes are mineralized. Likewise, the aplitic and pegmatitic dikes do not appear to carry mineralization.

The veins at the surface may be marked by yellow to brown or reddish zones which are quartz bearing or silicified. Elsewhere, they may be marked by resistant diabasic and rhyolitic dikes. Where the ore bearing solutions were especially active these dikes may be highly altered and bleached to a a light yellow or tan color.

The veins may range in length from a mile or more to only a few hundred feet. Their width ranges from a fraction of an inch to several tens of feet wide, but it is estimated that the average width is not more than 3 - 4 feet. However, the veins typically pinch and swell horizontally and reportedly follow the same pattern with depth.

The veins usually are separated from the wall-rock by a thin to thick clay or gouge zone. The gouge zone and vein may be along the hanging-wall, foot-wall, or intermediate in the dike. In places, the gouge only is present and there is no mineralization. Where clay or gouge is present, the vein material may be readily pealed off the wall-rock; where they are absent, the vein may be frozen to the wall. The type of wall-rock or country rock appears to make little difference in the mineralization in the vein. Dissemination of ore minerals into the country rock to any great extent was not noted.

Mineralization

The age of the mineralization is not definite but it is largely post- basic dike and granitic intrusion since the mineral veins cut these dikes and the mineral bearing solutions have altered them. Mineralization along the rhyolite dikes is short and spotty in most cases; it is probably post- rhyolite dike in age.

The mineralization centers around the Ithaca Peak intrusive in the Mineral Park area. At this locality mineralization is typically copper sulfides and associated minerals. Veins may occur, but the deposit is more typically a "porphyry copper" which is now being mined as an open pit disseminated copper deposit. Although veins of higher grade of mineralization occur in the deposit, it is typically a low grade, weakly disseminated copper sulfide occurrence with an oxidized copper capping.

folded structures which may exist in the area. Their evidence is fragmental in the Precambrian rocks, but indications are that probably during Precambrian time one or more periods of folding occurred which probably resulted in the beds standing almost vertically in possibly isoclinal folds.

Faults, Fractures and Shear Zones

Exclusive of the late Mesozoic(?) and Tertiary(?) igneous activity consisting primarily of the intrusion of granitic and related rocks and the associated acidic and basic dikes, the most important structural features in the area consist of a series of northwest-southeast trending faults. Although at present largely concealed by valley fill and alluvium, the most prominent and important faults are those which raised the Cerbat Mountains to their present elevation above the surrounding plains.

Within the range are a series of fracture systems. The magnitude of the movement on these is not known but probably ranges from a few feet in some of the shear zones to possibly several hundreds of feet in the more important fractures of the system. These fractures trend northwest to north-northwest and are relatively steep dipping. Reportedly most of the dips in the region are to the northeast, but some are to the southwest. However, the writer has observed some with dips as low as approximately 45°.

Although the fractures tend to be relatively parallel in strike, there are variations and some of the fractures have branches and may "horse-tail" and fade out. There are also some well defined transverse fractures but these do not appear to have off-set the northwest trending faults to any appreciable amount. Some of these transverse fractures may be simply gash breaks associated with the main faulting.

The age of the northwest fractures is later than the Precambrian rocks since they cut across them with little variation in character. The age is probably Paleozoic or Mesozoic, but pre-Ithaca Peak granite and related rock intrusions, since these intrusions have in places been guided by the northwest fault system. Later movement has occurred on some of the fractures as is indicated by brecciation ond off-sets of the fracture-filling material. At least some of the transverse faults and gash fractures are of the same approximate age as the northwest trending faults, namely, pre-Ithaca Peak and related intrusion time, since some of them are filled by intrusive materials. Others are definitely later since they off-set the filled faults and may contain no igneous rock filling.

Mesozoic(?) Rocks

A large mass or stock of coarsely to finely crystalline granitic to dioritic rock occupies the west-central portion of the Cerbat Mountains with its center at Mineral Park but with off-shoots extending into the claim area. This stock is known as the Ithica Peak granite. Its age has been considered to be Jurassic, Cretaceous or early Tertiary.

Associated with this stock are pegmatitic and aplitic dikes, granitic tongues, as well as basic dikes. None of these intrusives show metamorphism although some have been highly altered by later mineralizing solutions. Some of the dikes are very persistent, such as the Bronco dike which can be traced for a number of miles across the country and which passes through the RMC group of claims. These dikes can range from a few inches in thickness to over 50 feet and in places may be several hundred feet wide.

The dikes tend to be intruded parallel to the structural pattern of the area, namely trending northwest to north-northwest with some northeast trends. Dip is usually steep but may be as flat as 45°. The granitic masses, which often are somewhat porphyritic tend to be more irregular in pattern and shape.

Most of the above dikes are believed to be associated with the Ithaca Peak granite, although some of the diabasic and mare basic dikes may be older.

In addition to the above dikes, just south of the claim area and extending into it are numerous thick, well developed, persistent dark to light colored rhyolitic dikes. These may be related to the Ithaca Peak granite or may be considerably younger and related to the Tertiary volcanics.

Tertiary(?) and Quaternary Rocks

Outside of the claim area are extensive volcanic accumulations of lava, tuffs and related rocks. Some of the rhyolite dikes in the area may have been feeders to these volcanics. They are presumed to be of late Tertiary age.

Quaternary alluvium is locally present in some of the stream areas and thick accumulations are found in the valley fill at the foot of the mountains.

Structure

Folds

Time did not permit a close study of the details of the

the numbers on the holes and other data have been lost. Most of these holes were shallow being about 50 feet in depth; few are over 150 feet in depth. The drill logs and assays are inconclusive as to the location of specific veins. Many apparently sought for mineralization along the Bronco dike.

Substantial information on the Wallapai Mining District, Chloride District, Mineral Park District and so forth is available in the published literature and in other available reports from various sources. However, time restrictions for the present preliminary study of the RMC properties precluded no more than a brief review of some of the more important data.

GEOLOGY

Rock Formations

Precambrian Rocks

The Precambrian rocks consist of an old sequence of strongly metamorphosed (altered by heat and pressure) sedimentary (fragmental rocks derived from older rock types and usually deposited in water environments) and igneous (molten material at high temperature which has been injected into other rocks or flowed out on the surface of the ground) rocks. These metamorphosed older rocks are now represented by a variety of schists, amphibolites and gneisses. Intruded into these older rocks are one or more granitic masses together with associated basic (dark colored) and acidic (light colored) dikes and veins. The dikes and veins consist of fine grained aplites, coarse grained pegmatites and quartz veins.

The granitic masses range from coarse grained to fine grained and from very light color, possibly an alaskite, to a dark gray, possibly dioritic. Most of them are a light gray granitic type of rock. Most of them have been highly sheared and metamorphosed and now have a gneissic or somewhat banded structure, although shearing and gneissic structure are not always present.

The granitic rocks, whether gneissic or not, and to some extent the other Precambrian rocks have been intruded by irregular, in places highly contorted quartz veins ranging from an inch to several inches in thickness. These are in contrast to the more regular pegmatitic and aplitic dikes.

TABLE 2.—*Production of gold, silver, copper, lead, and zinc of selected mines in the Wallapai district, Mohave County, Ariz., cumulative from 1901 through 1948, in terms of recovered metals*

[Compiled by Metal Economics Branch, U. S. Bureau of Mines, Salt Lake City, Utah]

Mine	Gold (oz.)	Silver (oz.)	Copper (lbs.)	Lead (lbs.)	Zinc (lbs.)
→ Alpha (*m*)	292	35,499	22,265	16,476	
Altata and Altata Extension (*c*)	382	36,024	136,616	7,691	
Badger, Hercules, and Hercules group (*c*)	561	12,257	1,418	331,365	52,524
Banner group (*s*)	1,697	79,382	21,603	2,195,985	39,948
Blackfoot (*cer*)	158	11,856	19,617	101,565	144,369
Blue Bell (*s*)	469	50,954	44,274	182,031	
Cerbat (*cer*)	42	2,055	1,153	4,120	
Champion (*cer*)	982	22,699	14,931	$25,998	335,391
C. O. D. (*s*)	1,550	151,263	23,924	348,872	28,188
Columbus-Monroe Doctrine (*cer*)	646	5,053	4,370	17,322	154,533
Copper Age (*c*)	3	1,062	266	24,575	
Distaff (*c*)	93	55,883	1,392	149,630	
Elkhart (*c*)	662	10,385	7,482	245,199	
Empire and Silver Union (*c*)	1	2,475	122		
Eureka (*c*)	*	2,311	3,371	23,861	42,714
Flores (*cer*)	422	396	172	512	
→ George Washington (*m*)	114	11,058	18,777	31	
→ Golconda (*m*)	20,752	510,189	354,703	2,031,719	86,226,020
→ Golden Eagle and Bobtail (*m*)	1,777	25,845	890	40,026	
Golden Gem (*cer*)	2,478	8,243	3,365	14,980	
Hidden Treasure (*c*)	251	2,074	7,897	159,861	231,345
Idaho (*cer*)	280	5,285	4,742	9,348	51,900
Juno (*c*)	1,239	43,128	4,317	235,408	154,138
→ Keystone (*m*)	2,703	452,049	340,778	348,845	114,963
Little Chief (*s*)	391	68,351	2,070	111,827	
Lucky Boy (*c*)	1,923	40,438	930	8,140	
Mary Bell (*c*)	26	955	557	19,155	28,732
Midnight (*c*)	44	8,533	10,746	4,122	
Minnesota-Connor (*c*)	2,590	228,129	50,702	169,722	71,053
→ Mint (*m*)	222	15,265			
New London (*cer*)	13	3,268	1,558	136,699	31,243
→ Nighthawk group (*m*)	324	16,297	5,410	1,589	
Old Colony (*s*)	21	2,630	654	4,370	
Paymaster (*cer*)	99	25,090			
Payroll (*c*)	128	4,104	11,694	30,928	192,137
Pinkham (*c*)	56	14,665	55,136	3,133	
Rainbow (*c*)	2,400	34,582	4,748	313,271	22,426
Redemption (*c*)	21	4,012	11,449		
Rico (*s*)	1,149	15,309	1,449	2,620	
Santa and Samoan (*c*)	4,480	57,891	4,454	656,377	67,886
St. Louis (*cer*)	24	11,142	1,030	855,841	1,496
Silver Age (*c*)	24	3,550			
Silver Hill (*c*)	708	8,842	10,722	229,919	143,594
Tennessee and Schuylkill (*c*)	42,383	1,514,187	839,857	59,897,096	66,805,807
Towne (*c*)	141	6,286	2,108	5,510	
Vanderbilt (*cer*)	1,012	2,119	327	2,568	
→ Washington and Washington Extension (*m*)	58	2,205	1,610	1,700	

c, Chloride camp; *m*, Mineral Park camp; *cer*, Cerbat camp; *s*, Stockton camp.

→ Mines in or near the Chico and RMC claims.

TABLE 1.—*Production of gold, silver, copper, lead, and zinc in the Wallapai district, Mohave County, Ariz., 1904–48, in terms of recovered metals*

[Compiled by Metal Economics Branch, U. S. Bureau of Mines, Salt Lake City, Utah]

Year	Crude ore produced (dry tons)	Gold (oz.)	Silver (oz.)	Copper (lbs.)	Lead (lbs.)	Zinc (lbs.)	Value (dollars)
1904	1,531	1,592.42	64,335	1,459	6,036	------	------
1905	5,848	1,137.09	56,751	173	112,266	------	64,2[illegible]
1906	9,946	2,772.00	125,231	114,592	964,590	------	------
1907	13,013	5,358.62	58,895	62,917	1,229,654	30,666	222,[illegible]
1908	2,179	1,193.13	29,931	11,920	249,328	505,133	76,[illegible]
1909	11,675	2,310.77	69,966	1,774	113,112	5,204,121	374,[illegible]
1910	1,109	421.33	48,309	29,341	235,268	------	47,[illegible]
1911	12,092	2,735.75	71,233	27,428	2,394,629	900,097	[illegible]
1912	4,472	1,401.87	43,761	7,828	1,350,620	759,219	174,[illegible]
1913	32,933	2,588.27	177,853	30,782	5,171,958	4,233,642	[illegible]
1914	22,492	1,205.41	88,951	18,267	3,768,192	4,932,108	472,[illegible]
1915	85,635	5,262.75	243,919	46,171	6,472,406	17,382,849	2,[illegible]
1916	104,658	6,10[illegible]	229,237	190,807	5,825,791	17,024,026	3,[illegible]
1917	101,562	7,012.38	234,137	84,384	6,087,742	17,127,596	2,[illegible]
1918	4,739	957.82	42,068	91,590	593,402	82,553	[illegible]
1919	3,372	872.91	41,731	90,000	504,065	------	111,[illegible]
1920	2,369	682.81	37,500	11,100	358,023	------	84,[illegible]
1921	10,206	1,008.88	82,947	15,875	278,321	------	118,[illegible]
1922	3,455	553.94	42,099	22,058	84,142	------	61,2[illegible]
1923	1,150	235.81	23,843	21,550	11,620	------	30,[illegible]
1924	358	165.30	5,027	6,400	172,098	------	21,[illegible]
1925	3,169	758.29	28,744	26,046	541,046	174,703	89,[illegible]
1926	10,056	2,034.39	75,470	80,728	647,805	1,069,206	251,[illegible]
1927	19,289	837.17	49,4[illegible]	37,220	695,090	1,184,454	[illegible]
1928	865	198.45	10,770	10,430	43,791	150,319	23,[illegible]
1929	1,849	208.74	10,224	19,388	64,206	133,414	27,[illegible]
1930	342	103.06	4,181	2,411	37,040	35,104	7,[illegible]
1931	103	15.88	253	581	------	------	[illegible]
1932	236	193.55	3,555	2,323	17,800	------	8,[illegible]
1933	353	236.11	3,517	1,422	56,946	11,024	9,[illegible]
1934	1,057	223.69	4,718	2,737	11,514	10,608	11,[illegible]
1935	14,775	1,655.20	76,519	26,566	140,725	133,205	[illegible]
1936	39,185	5,782.60	193,763	167,859	1,681,478	1,647,900	[illegible]
1937	119,246	15,348.00	528,640	400,182	4,978,220	3,428,354	1,[illegible]
1938	109,810	15,027.[illegible]	559,538	311,163	4,607,249	3,319,812	1,2[illegible]
1939	58,716	9,301.66	451,925	146,077	1,405,558	1,739,092	[illegible]
1940	76,317	8,135.06	284,760	224,221	4,467,450	5,586,000	1,[illegible]
1941	70,398	7,500.00	212,577	132,700	4,816,200	4,092,000	1,[illegible]
1942	70,533	5,406.00	157,112	[illegible]	3,312,000	4,487,700	[illegible]
1943	43,724	1,922.00	88,685	235,[illegible]	2,784,800	3,084,000	[illegible]
1944	33,579	895.00	57,856	1,0[illegible]	1,587,000	2,031,000	[illegible]
1945	24,462	1,063.00	49,708	474,800	1,593,000	1,367,000	[illegible]
1946	34,889	730.00	38,229	380,[illegible]	737,000	971,000	[illegible]
1947	46,224	474.00	45,253	456,100	1,365,000	1,713,200	[illegible]
1948	51,731	691.00	32,659	621,400	891,100	1,344,700	[illegible]
Total	1,276,266	124,491.40	4,863,757	5,712,992	71,473,292	109,520,515	22,472,[illegible]

About $ 98,790,000 at today's prices

underground miners are advancing in years. The current mining operations at Mineral Park are open pit rather than underground. However, adequate man-power is available in the general area.

Housing is absent on the property but is available at Kingman with some additional units at Chloride and elsewhere.

Local supplies are available at Kingman, but most mining supplies and equipment will have to come from Las Vegas, Phoenix or other distant centers.

Milling and Smelting

There is presently no mill in the area. One is available at Wikieup some 75 miles to the southeast. Reportedly Mohave County is considering building a mill in the general Kingman area, but as yet there are no definite plans. This is not a direct shipping ore, therefore, milling facilities will have to be provided.

There is no smelter in the area. Concentrates from the mill can be shipped to El Paso, to Pacific Coast or even foreign smelters.

Scope of Report

The present report is based upon two days in the field examining the property and on the writer's general and specific knowledge of the area from previous work in the region. The purpose of the visit to the property was to familiarize the writer with the specific claims and the work done by Mr. Kevin M. Kenney who has spent considerable time on them. Since Mr. Kenney has examined and taken samples from most of the accessible mines, the writer did no underground examination. Time was spent on the surface geology, exposed mineralization, and vein relationships. The writer determined the accuracy of Mr. Kenney's observations and fully approves of his work and findings and has included his summary report as a portion of this report. From notes and recorded observations Mr. Kenney can substantially expand his reported findings should that become necessary in the future.

Drilling was done on the property during the 1974-75 assessment year, but the results of that drilling have not been included as part of this evaluation because of lack of knowledge of the location of the holes and their correlation with the available records. Several of the holes were observed while in the field, but

Geological Survey depicts the topography of the area.

Accessibility

Approximately 12 miles northwest of Kingman a well graded road branches from Interstate I-10 and leads to the Duval Mining operations at Mineral Park. From this, a County road leads into the claim area and eventually over the Cerbat Mountain crest and ultimately back into Kingman. This road is steep and mountainous but readily passable except after flash floods when portions of it may be washed out. Local mine trails lead off from this road and may not be passable if recent work has not been done on them.

The main line of the Santa Fe Railroad passes through Kingman.

Power and Water

Although electric power at one time extended through the area and power poles are still present, wires have now been removed. The nearest power would be the Mineral Park areaabout 2 miles to the northwest.

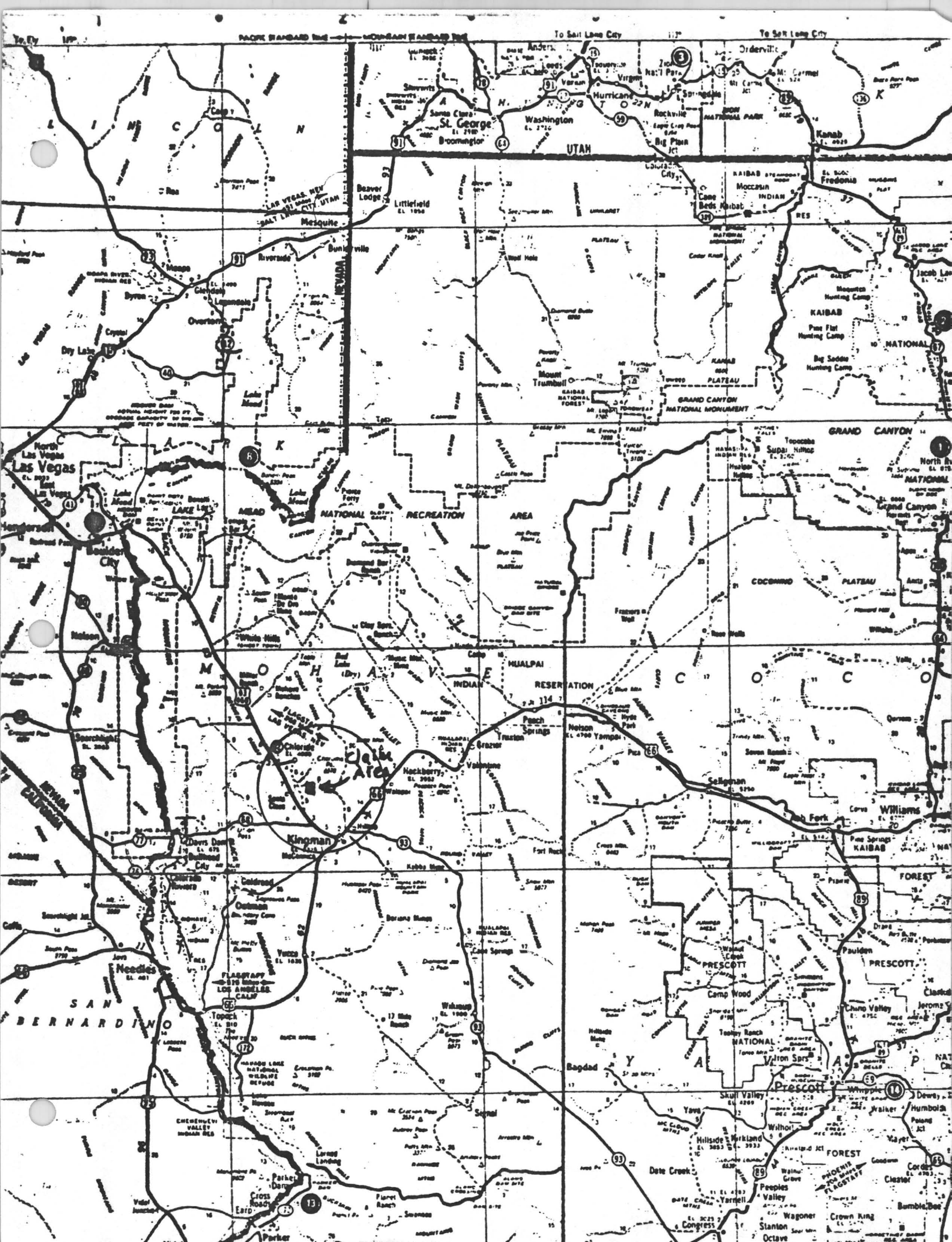
Water is foundin some of the mine shafts and could be used for limited purposes. Run-off after rains would be rapid and only limited storage would be possible. Wells would also probably have only a limited capacity. If large quantities of water are necessary, as for a mill, it may be necessary to import the water from the Sacramento Valley at the base of the Cerbat Mountains or locate the mill in the valley.

Climate

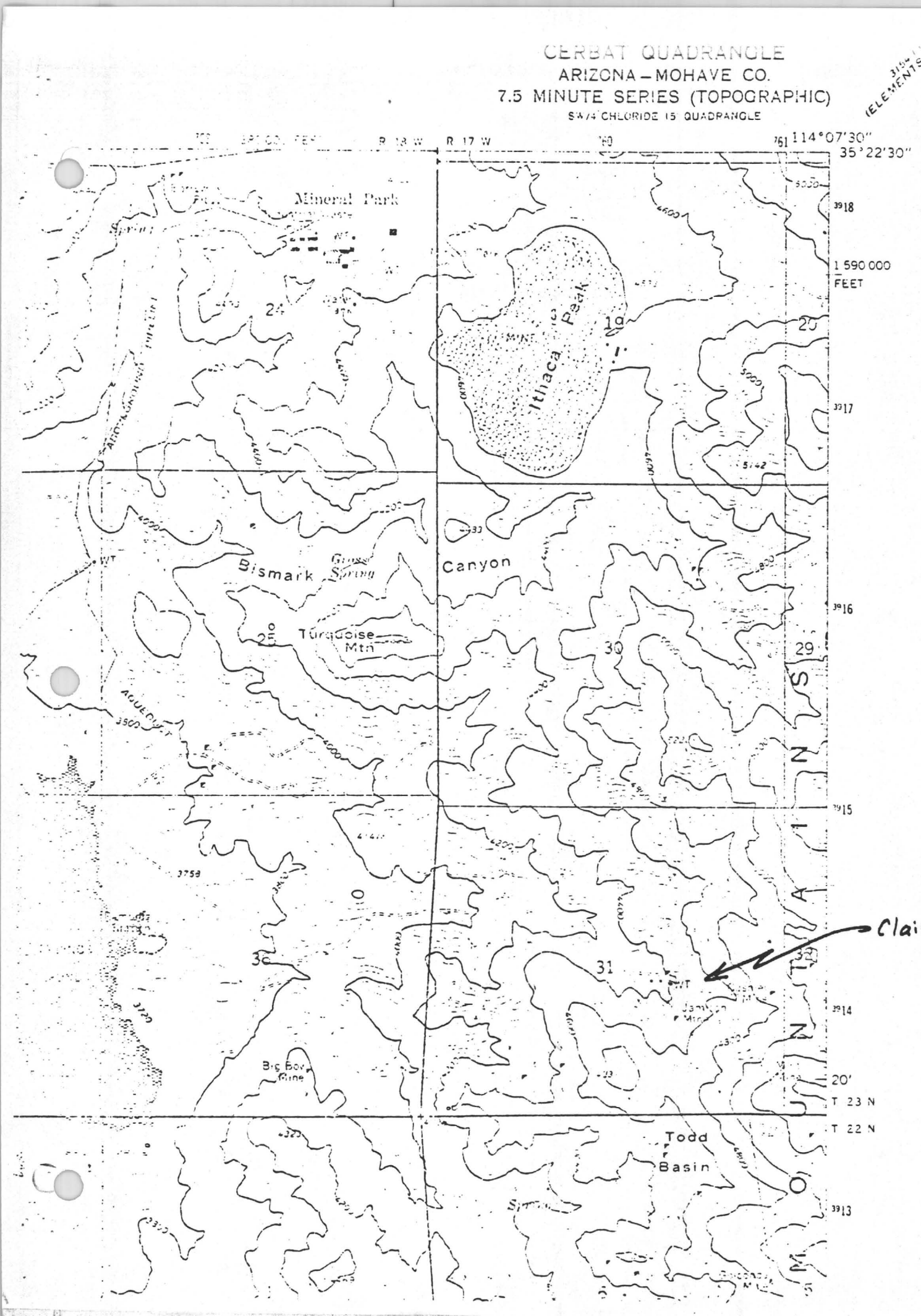
The climate is typically semi-arid with warm to hot and dry summers and moderate to cool winters. Snow would not be a problem. Rainfall occurs in the winter and as thunderstorms in the summer. The latter may produce flash floods because of the rapid run-off and may cause temporary local problems with roads and structures in the bottoms of the valleys and washes. Otherwise climate should offer no problems as to mining.

Labor, Housing and Supplies

The property is located in a mining area and, therefore, numerous people are present who know mining from the days when the mines were active. However, operations on these claims will essentially be all underground and



To Ely
PACIFIC STANDARD TIME
MOUNTAIN STANDARD TIME
To Salt Lake City
To Salt Lake City
Orderville
Mt. Carmel
Kanab
Fredonia
Moccasin
INDIAN
RES
Zion Nat'l Park
Springdale
Rockville
Virgin
Hurricane
Toquerville
Leeds
Santa Clara
St. George
Bloomington
Washington
Big Plain Jct
UTAH
Colorado City
Cane Beds
Kaibab
Pipe Spring National Monument
Beaver Dam Lodge
Littlefield
Mesquite
Bunkerville
Riverside
Moapa
Glendale
Logandale
Overton
Crystal
Dry Lake
NEVADA
L I N C O L N
C L A R K
Las Vegas
North Las Vegas
Henderson
Boulder City
Lake Mead
LAKE MEAD NATIONAL RECREATION AREA
Mount Trumbull
GRAND CANYON NATIONAL MONUMENT
KAIBAB PLATEAU
KAIBAB NATIONAL
GRAND CANYON
Supai
North Rim
Grand Canyon
COCONINO PLATEAU
HUALPAI INDIAN RESERVATION
M O H A V E
C O C O N I N O
Peach Springs
Nelson
Yampai
Truxton
Valentine
Hackberry
Chloride
Claim Area
Kingman
McConnico
Seligman
Williams
Ash Fork
KAIBAB FOREST
Searchlight
Nelson
NEVADA
CALIFORNIA
Davis Dam
Bullhead City
Oatman
Needles
Topock
Yucca
Wikieup
Bagdad
Skull Valley
Yava
Hillside
Kirkland
Date Creek
Congress
Yarnell
Peeples Valley
Wilhoit
Prescott
PRESCOTT NATIONAL FOREST
Camp Wood
Iron Spgs
Paulden
Chino Valley
Jerome
Dewey
Humboldt
Mayer
Cordes
Cleator
Crown King
Bumble Bee
Stanton
Octave
Wagoner
Parker Dam
Parker
Cross Roads
Earp
Vidal Junction
CHEMEHUEVI VALLEY INDIAN RES
SAN BERNARDINO
Y A V A P A I
FLAGSTAFF 235 Miles LOS ANGELES CALIF
PHOENIX 204 Miles FLAGSTAFF
Seligman
Fort Rock
Cane Springs
Burro Creek
Signal


CERBAT QUADRANGLE
ARIZONA – MOHAVE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SITGREAVES 15' QUADRANGLE
114°07'30"
35°22'30"
R 18 W
R 17 W
Mineral Park
Ithaca Peak
Bismark Spring
Canyon
Turquoise Mtn
AQUEDUCT
Big Bov Mine
Todd Basin
1 590 000 FEET
T 23 N
T 22 N
Claim Area

Consulting Geologist
3418 North Forgeus Avenue
Tucson, Arizona 85716

Telephone 327-2956

August 11, 1976

CHICO MINE AND RMC PROPERTIES

WALLAPAI MINING DISTRICT

MOHAVE COUNTY, ARIZONA

INTRODUCTION

Location

The RMC holdings are located primarily in Sec. 31, T. 23 N., R. 18 W., but extend short distances into the adjacent sections to the east and south. The general area of the occurrence of the claims is in the Wallapai Mining District, also known in whole or in part as the Chloride, Mineral Park and Cerbat Mining Districts.

The property is located about 7 miles southeast of Chloride or 10 miles northwest of Kingman, Mohave County, Arizona.

Property

The property held by RMC is reported to consist of 49 non-patented lode mining claims and two patented claims. Examination of ownership and title is beyond the scope of this report, but attached to this report is an Affidavit of Labor performed upon them for the Assessment Year 1974-75.

Topography and Relief

The claims lie in Lane Springs Basin and the upper portion of Todd Basin in the central portion of the Cerbat Mountains. They extend from near the western summit of the range to its lower portion. The topography is rugged and mountainous with a relief of over 1000 feet. An average elevation is about 4500 feet. The Cerbat 7½ minute Quadrangle Map of the U. S.

CHICO MINE PROPERTIES

Parcel # 67

Wallapai Mining District

Mohave County, Arizona

WILLARD D. PYE
Consulting Geologist
3418 North Forgeus Avenue
Tucson, Arizona 85716

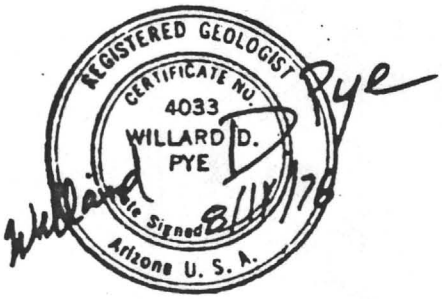
Telephone 327-2956

August 11, 1976

CHICO MINE AND RMC PROPERTIES

WALLAPAI MINING DISTRICT

MOHAVE COUNTY, ARIZONA



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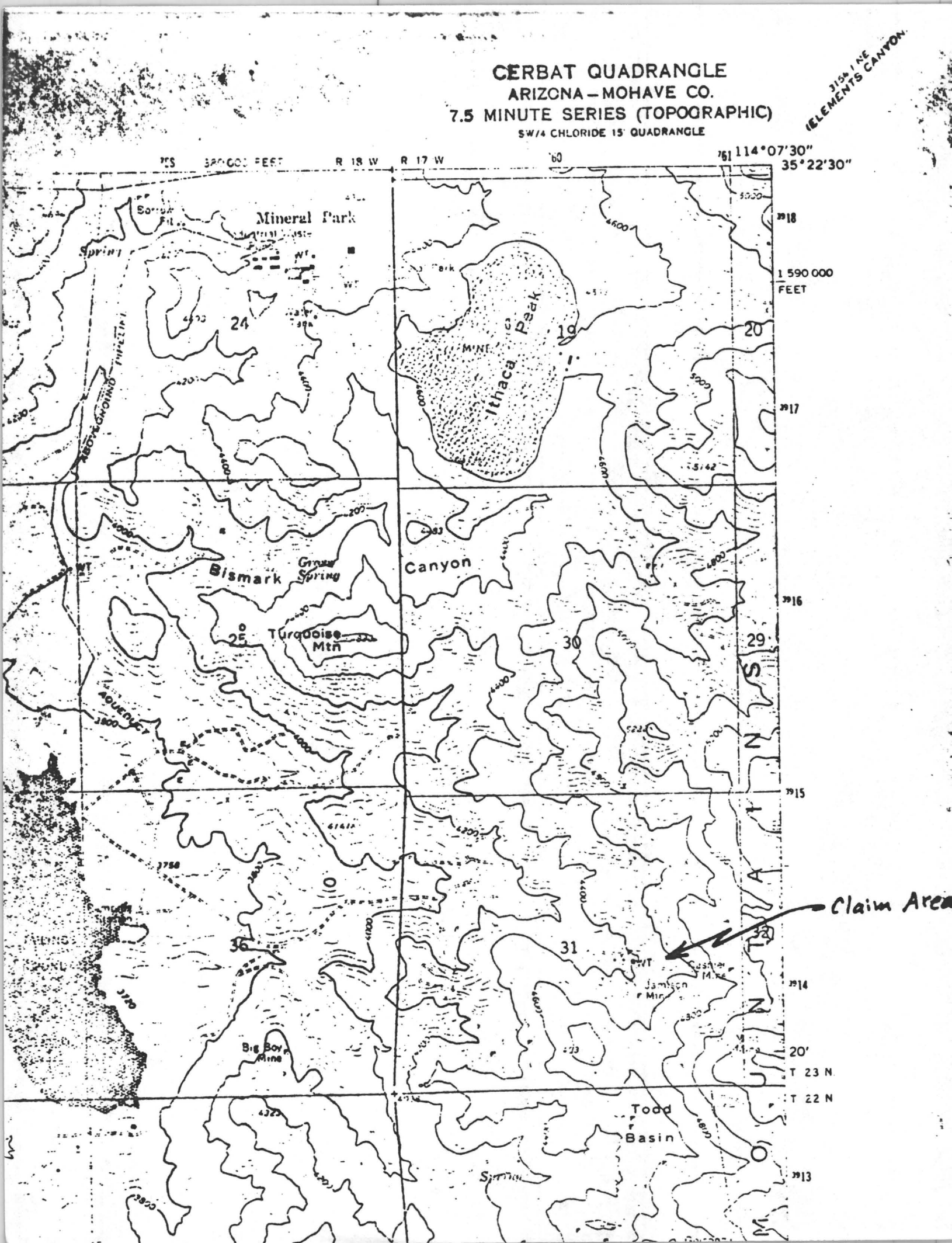
CERBAT QUADRANGLE
ARIZONA – MOHAVE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW/4 CHLORIDE 15' QUADRANGLE
3154 I NE
(ELEMENTS CANYON)
114°07'30"
35°22'30"
R 18 W
R 17 W
Mineral Park
Ithaca Peak
Bismark
Canyon
Turquoise Mtn
Big Boy Mine
Todd Basin
Claim Area
1 590 000 FEET
T 23 N
T 22 N

TABLE 2.—*Production of gold, silver, copper, lead, and zinc of selected mines in the Wallapai district, Mohave County, Ariz., cumulative from 1901 through 1948, in terms of recovered metals*

[Compiled by Metal Economics Branch, U. S. Bureau of Mines, Salt Lake City, Utah]

Mine	Gold (oz.)	Silver (oz.)	Copper (lbs.)	Lead (lbs.)	Zinc (lbs.)
→Alpha (*m*)	292	35,499	22,265	16,476	
Altata and Altata Extension (*c*)	382	56,024	136,616	7,694	
Badger, Hercules, and Hercules group (*c*)	561	12,257	1,418	331,365	52,724
Banner group (*s*)	1,697	79,382	21,693	2,195,985	39,948
Blackfoot (*cer*)	158	11,856	19,617	101,565	144,369
Blue Bell (*s*)	469	50,654	44,274	1b2,601	
Cerbat (*cer*)	42	2,075	1,153	4,120	
Champion (*cer*)	952	22,459	14,981	525,998	335,201
C. O. D. (*s*)	1,550	152,268	23,924	348,872	23,188
Columbus-Monroe Doctrine (*cer*)	646	5,053	4,370	17,322	154,533
Copper Age (*c*)	3	1,002	266	24,575	
Distaff (*c*)	93	55,883	1,392	149,630	
Elkhart (*c*)	662	10,385	7,482	245,199	
Empire and Silver Union (*c*)	1	2,475	122		
Eureka (*c*)	7	2,311	3,371	23,861	42,714
Flores (*cer*)	422	306	172	512	
→George Washington (*m*)	114	11,079	15,777	34	
→Golconda (*m*)	20,752	510,180	354,703	2,031,719	56,226,020
→Golden Eagle and Bobtail (*m*)	1,777	25,845	890	40,056	
Golden Gem (*cer*)	2,478	6,243	3,365	14,980	
Hidden Treasure (*c*)	251	9,074	7,897	159,861	231,345
Idaho (*cer*)	280	5,285	4,742	9,348	51,980
Juno (*c*)	1,239	43,128	4,317	235,488	184,138
→Keystone (*m*)	2,703	452,049	340,778	316,845	114,963
Little Chief (*s*)	391	66,351	2,070	111,827	
Lucky Boy (*c*)	1,923	60,438	280	8,140	
Mary Bell (*c*)	26	955	557	19,155	26,733
Midnight (*c*)	44	8,538	10,746	4,122	
Minnesota-Connor (*c*)	2,890	228,129	50,702	169,722	71,053
→Mint (*m*)	222	15,265			
New Jamion (*cer*)	13	3,298	1,558	136,689	31,243
→Nighthawk group (*m*)	324	16,297	5,410	1,589	
Old Colony (*s*)	21	2,979	654	4,370	
Paymaster (*cer*)	99	25,080			
Payrail (*c*)	128	4,104	11,694	39,928	192,137
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St. Louis (*cer*)	24	11,142	1,050	535,841	1,496
Silver Axe (*c*)	24	3,550			
Silver Hill (*c*)	708	8,842	10,722	229,919	143,594
Tennessee and Schuylkill (*c*)	42,403	1,514,167	649,537	59,567,096	66,605,907
Towne (*c*)	144	6,256	2,108	5,516	
Vanderbilt (*cer*)	1,012	2,119	327	2,568	
→Washington and Washington Extension (*m*)	86	2,205	1,610	1,700	

c, Chloride camp; *m*, Mineral Park camp; *cer*, Cerbat camp; *s*, Stockton camp.

→ Mines in or near the Chico and RMC claims.

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Year	Crude ore produced (dry tons)	Gold (oz.)	Silver (oz.)	Copper (lbs.)	Lead (lbs.)	Zinc (lbs.)	Value (dollars)
1904	1,531	1,592.42	64,335	1,459	6,036	----------	----------
1905	3,808	1,137.09	58,751	173	112,266	----------	61,2[illegible]
1906	9,616	2,772.00	125,231	114,502	904,380	----------	----------
1907	13,013	5,378.62	58,895	12,917	1,229,654	30,666	229,[illegible]
1908	2,179	1,193.13	29,931	11,929	249,329	505,133	76,[illegible]
1909	11,678	2,370.77	69,946	1,774	113,112	5,264,121	371,[illegible]
1910	1,106	421.32	48,509	20,341	235,368	----------	47,[illegible]
1911	12,092	2,735.75	71,233	27,429	2,391,629	960,097	[illegible]
1912	4,472	1,401.87	43,761	7,828	1,350,920	799,219	174,[illegible]
1913	32,933	2,588.27	177,853	30,752	5,171,988	4,233,612	[illegible]
1914	22,492	1,263.41	88,961	18,257	3,708,192	4,932,108	47[illegible]
1915	65,635	5,202.75	243,919	46,171	6,472,406	17,392,849	2,[illegible]
1916	104,638	6,10[illegible]	279,237	190,807	5,527,791	17,024,026	3,[illegible]
1917	101,362	7,012.38	294,187	84,284	6,087,742	17,127,596	2,[illegible]
1918	4,739	957.82	42,068	91,[illegible]	553,432	82,553	[illegible]
1919	3,372	872.91	41,731	[illegible]	504,[illegible]	----------	111,[illegible]
1920	2,399	662.81	37,540	11,1[illegible]	338,623	----------	[illegible]
1921	10,206	1,009.55	82,947	15,575	278,321	----------	118,[illegible]
1922	3,455	554.91	42,099	22,[illegible]	84,142	----------	[illegible]
1923	1,150	235.81	25,843	21,570	11,020	----------	[illegible]
1924	985	163.30	5,027	6,460	172,098	----------	21,[illegible]
1925	3,169	758.29	98,744	26,646	541,646	174,703	[illegible]
1926	10,058	2,031.39	78,170	89,728	647,[illegible]	1,609,266	[illegible]
1927	19,269	837.17	49,4[illegible]	37,22[illegible]	[illegible]	1,181,454	[illegible]
1928	995	198.45	10,770	10,450	43,791	150,219	[illegible]
1929	1,849	298.54	10,224	18,353	64,296	133,414	[illegible]
1930	342	103.06	4,181	2,411	37,040	35,104	[illegible]
1931	103	15.88	233	581	----------	----------	4,[illegible]
1932	296	163.55	3,353	2,323	17,500	----------	[illegible]
1933	333	236.11	3,517	1,422	56,946	11,024	[illegible]
1934	1,057	223.69	4,718	2,737	11,514	10,669	11,[illegible]
1935	14,775	1,663.20	76,519	26,366	140,727	133,205	125,[illegible]
1936	84,185	5,752.00	193,703	167,839	1,081,478	1,617,960	401,[illegible]
1937	119,246	15,348.00	528,640	400,192	4,578,230	3,428,354	1,[illegible]
1938	109,810	13,027.[illegible]	[illegible]	311,163	4,667,249	3,319,812	1,2[illegible]
1939	58,716	9,201.66	451,327	146,077	1,4[illegible]	1,539,692	[illegible]
1940	78,317	8,135.00	284,700	221,221	4,[illegible],450	5,580,000	1,[illegible]
1941	70,398	7,500.00	212,577	[illegible]	4,[illegible]	4,092,646	[illegible]
1942	70,533	5,406.00	157,112	[illegible]	3,312,000	4,487,700	[illegible]
1943	43,724	1,922.00	88,635	[illegible]	2,781,800	3,084,000	[illegible]
1944	38,879	805.00	57,[illegible]	1,16[illegible]	1,[illegible]	2,001,000	[illegible]
1945	24,462	1,063.00	49,708	4[illegible]	1,[illegible]	1,367,000	4[illegible]
1946	34,809	730.00	38,229	[illegible]	757,[illegible]	971,000	31[illegible]
1947	46,224	474.00	45,233	476,[illegible]	1,3[illegible]	1,713,200	[illegible]
1948	51,731	601.00	32,059	621,40[illegible]	551,100	1,344,700	[illegible]
Total	1,276,266	124,491.40	4,863,757	3,712,992	71,473,292	109,520,515	22,472,[illegible]

About $ 98,790,000 at today's prices

Geological Survey depicts the topography of the area.

Accessibility

Approximately 12 miles northwest of Kingman a well graded road branches from Interstate I-10 and leads to the Duval Mining operations at Mineral Park. From this, a County road leads into the claim area and eventually over the Cerbat Mountain crest and ultimately back into Kingman. This road is steep and mountainous but readily passable except after flash floods when portions of it may be washed out. Local mine trails lead off from this road and may not be passable if recent work has not been done on them.

The main line of the Santa Fe Railroad passes through Kingman.

Power and Water

Although electric power at one time extended through the area and power poles are still present, wires have now been removed. The nearest power would be the Mineral Park area about 2 miles to the northwest.

Water is found in some of the mine shafts and could be used for limited purposes. Run-off after rains would be rapid and only limited storage would be possible. Wells would also probably have only a limited capacity. If large quantities of water are necessary, as for a mill, it may be necessary to import the water from the Sacramento Valley at the base of the Cerbat Mountains or locate the mill in the valley.

Climate

The climate is typically semi-arid with warm to hot and dry summers and moderate to cool winters. Snow would not be a problem. Rainfall occurs in the winter and as thunderstorms in the summer. The latter may produce flash floods because of the rapid run-off and may cause temporary local problems with roads and structures in the bottoms of the valleys and washes. Otherwise climate should offer no problems as to mining.

Labor, Housing and Supplies

The property is located in a mining area and, therefore, numerous people are present who know mining from the days when the mines were active. However, operations on these claims will essentially be all underground and

underground miners are advancing in years. The current mining operations at Mineral Park are open pit rather than underground. However, adequate man-power is available in the general area.

Housing is absent on the property but is available at Kingman with some additional units at Chloride and elsewhere.

Local supplies are available at Kingman, but most mining supplies and equipment will have to come from Las Vegas, Phoenix or other distant centers.

Milling and Smelting

There is presently no mill in the area. One is available at Wikieup some 75 miles to the southeast. Reportedly Mohave County is considering building a mill in the general Kingman area, but as yet there are no definite plans. This is not a direct shipping ore, therefore, milling facilities will have to be provided.

There is no smelter in the area. Concentrates from the mill can be shipped to El Paso, to Pacific Coast or even foreign smelters.

Scope of Report

The present report is based upon two days in the field examining the property and on the writer's general and specific knowledge of the area from previous work in the region. The purpose of the visit to the property was to familiarize the writer with the specific claims and the work done by Mr. Kevin M. Kenney who has spent considerable time on them. Since Mr. Kenney has examined and taken samples from most of the accessible mines, the writer did no underground examination. Time was spent on the surface geology, exposed mineralization, and vein relationships. The writer determined the accuracy of Mr. Kenney's observations and fully approves of his work and findings and has included his summary report as a portion of this report. From notes and recorded observations Mr. Kenney can substantially expand his reported findings should that become necessary in the future.

Drilling was done on the property during the 1974-75 assessment year, but the results of that drilling have not been included as part of this evaluation because of lack of knowledge of the location of the holes and their correlation with the available records. Several of the holes were observed while in the field, but

the numbers on the holes and other data have been lost. Most of these holes were shallow being about 50 feet in depth; few are over 150 feet in depth. The drill logs and assays are inconclusive as to the location of specific veins. Many apparently sought for mineralization along the Bronco dike.

Substantial information on the Wallapai Mining District, Chloride District, Mineral Park District and so forth is available in the published literature and in other available reports from various sources. However, time restrictions for the present preliminary study of the RMC properties precluded no more than a brief review of some of the more important data.

GEOLOGY

Rock Formations

Precambrian Rocks

The Precambrian rocks consist of an old sequence of strongly metamorphosed (altered by heat and pressure) sedimentary (fragmental rocks derived from older rock types and usually deposited in water environments) and igneous (molten material at high temperature which has been injected into other rocks or flowed out on the surface of the ground) rocks. These metamorphosed older rocks are now represented by a variety of schists, amphibolites and gneisses. Intruded into these older rocks are one or more granitic masses together with associated basic (dark colored) and acidic (light colored) dikes and veins. The dikes and veins consist of fine grained aplites, coarse grained pegmatites and quartz veins.

The granitic masses range from coarse grained to fine grained and from very light color, possibly an alaskite, to a dark gray, possibly dioritic. Most of them are a light gray granitic type of rock. Most of them have been highly sheared and metamorphosed and now have a gneissic or somewhat banded structure, although shearing and gneissic structure are not always present.

The granitic rocks, whether gneissic or not, and to some extent the other Precambrian rocks have been intruded by irregular, in places highly contorted quartz veins ranging from an inch to several inches in thickness. These are in contrast to the more regular pegmatitic and aplitic dikes.

Mesozoic(?) Rocks

A large mass or stock of coarsely to finely crystalline granitic to dioritic rock occupies the west-central portion of the Cerbat Mountains with its center at Mineral Park but with off-shoots extending into the claim area. This stock is known as the Ithica Peak granite. Its age has been considered to be Jurassic, Cretaceous or early Tertiary.

Associated with this stock are pegmatitic and aplitic dikes, granitic tongues, as well as basic dikes. None of these intrusives show metamorphism although some have been highly altered by later mineralizing solutions. Some of the dikes are very persistent, such as the Bronco dike which can be traced for a number of miles across the country and which passes through the RMC group of claims. These dikes can range from a few inches in thickness to over 50 feet and in places may be several hundred feet wide.

The dikes tend to be intruded parallel to the structural pattern of the area, namely trending northwest to north-northwest with some northeast trends. Dip is usually steep but may be as flat as 45°. The granitic masses, which often are somewhat porphyritic tend to be more irregular in pattern and shape.

Most of the above dikes are believed to be associated with the Ithaca Peak granite, although some of the diabasic and mare basic dikes may be older.

In addition to the above dikes, just south of the claim area and extending into it are numerous thick, well developed, persistent dark to light colored rhyolitic dikes. These may be related to the Ithaca Peak granite or may be considerably younger and related to the Tertiary volcanics.

Tertiary(?) and Quaternary Rocks

Outside of the claim area are extensive volcanic accumulations of lava, tuffs and related rocks. Some of the rhyolite dikes in the area may have been feeders to these volcanics. They are presumed to be of late Tertiary age.

Quaternary alluvium is locally present in some of the stream areas and thick accumulations are found in the valley fill at the foot of the mountains.

Structure

Folds

Time did not permit a close study of the details of the

folded structures which may exist in the area. Their evidence is fragmental in the Precambrian rocks, but indications are that probably during Precambrian time one or more periods of folding occurred which probably resulted in the beds standing almost vertically in possibly isoclinal folds.

Faults, Fractures and Shear Zones

Exclusive of the late Mesozoic(?) and Tertiary(?) igneous activity consisting primarily of the intrusion of granitic and related rocks and the associated acidic and basic dikes, the most important structural features in the area consist of a series of northwest-southeast trending faults. Although at present largely concealed by valley fill and alluvium, the most prominent and important faults are those which raised the Cerbat Mountains to their present elevation above the surrounding plains.

Within the range are a series of fracture systems. The magnitude of the movement on these is not known but probably ranges from a few feet in some of the shear zones to possibly several hundreds of feet in the more important fractures of the system. These fractures trend northwest to north-northwest and are relatively steep dipping. Reportedly most of the dips in the region are to the northeast, but some are to the southwest. However, the writer has observed some with dips as low as approximately 45°.

Although the fractures tend to be relatively parallel in strike, there are variations and some of the fractures have branches and may "horse-tail" and fade out. There are also some well defined transverse fractures but these do not appear to have off-set the northwest trending faults to any appreciable amount. Some of these transverse fractures may be simply gash breaks associated with the main faulting.

The age of the northwest fractures is later than the Precambrian rocks since they cut across them with little variation in character. The age is probably Paleozoic or Mesozoic, but pre-Ithaca Peak granite and related rock intrusions, since these intrusions have in places been guided by the northwest fault system. Later movement has occurred on some of the fractures as is indicated by brecciation ond off-sets of the fracture-filling material. At least some of the transverse faults and gash fractures are of the same approximate age as the northwest trending faults, namely, pre-Ithaca Peak and related intrusion time, since some of them are filled by intrusive materials. Others are definitely later since they off-set the filled faults and may contain no igneous rock filling.

Veins

Most of the veins are associated with the various dikes. It seems to make little difference whether they are basic or acidic in character, being found along both diabasic and rhyolitic dikes. However, not all of these dikes are mineralized. Likewise, the aplitic and pegmatitic dikes do not appear to carry mineralization.

The veins at the surface may be marked by yellow to brown or reddish zones which are quartz bearing or silicified. Elsewhere, they may be marked by resistant diabasic and rhyolitic dikes. Where the ore bearing solutions were especially active these dikes may be highly altered and bleached to a a light yellow or tan color.

The veins may range in length from a mile or more to only a few hundred feet. Their width ranges from a fraction of an inch to several tens of feet wide, but it is estimated that the average width is not more than 3 - 4 feet. However, the veins typically pinch and swell horizontally and reportedly follow the same pattern with depth.

The veins usually are separated from the wall-rock by a thin to thick clay or gouge zone. The gouge zone and vein may be along the hanging-wall, foot-wall, or intermediate in the dike. In places, the gouge only is present and there is no mineralization. Where clay or gouge is present, the vein material may be readily pealed off the wall-rock; where they are absent, the vein may be frozen to the wall. The type of wall-rock or country rock appears to make little difference in the mineralization in the vein. Dissemination of ore minerals into the country rock to any great extent was not noted.

Mineralization

The age of the mineralization is not definite but it is largely post- basic dike and granitic intrusion since the mineral veins cut these dikes and the mineral bearing solutions have altered them. Mineralization along the rhyolite dikes is short and spotty in most cases; it is probably post- rhyolite dike in age.

The mineralization centers around the Ithaca Peak intrusive in the Mineral Park area. At this locality mineralization is typically copper sulfides and associated minerals. Veins may occur, but the deposit is more typically a "porphyry copper" which is now being mined as an open pit disseminated copper deposit. Although veins of higher grade of mineralization occur in the deposit, it is typically a low grade, weakly disseminated copper sulfide occurrence with an oxidized copper capping.

Surrounding the Mineral Park center is a zone several miles wide of lead-zinc-silver bearing veins and outside of that is a zone of silver mineralization. These zones do not have sharp boundaries and are gradational.

The subject claims are in the lead-zinc zone but do carry a small amount of copper and substantial amounts of silver. The mineralization occurs in veins of mesothermal type or veins which formed at moderate temperatures and pressures within the crust of the earth.

The primary mineralization is one of lead (galena), zinc (sphalerite) and silver (argentite) sulfides together with some arsenic and antimony bearing compounds (sulfo-salts). In addition small amounts of copper sulfides are present and reportedly there is minor native gold in the veins. In the area molybdenum, vanadium and tungsten bearing minerals have been found. Molybdenum usually is found with copper and very easily could be present throughout the area.

The primary silver minerals are the silver sulfides and silver sulfo-salts. However, much of the silver probably occurs with the lead as argentiferous galena.

The secondary ore consists of the near-surface oxidized minerals of lead, zinc, silver and copper together with residual concentrations of gold. In these secondary minerals are found the native metals of silver, gold and some copper.

The rich silver deposits of the area were basically the silver chlorides, bromides and native silver developed on the oxidized portions of the veins.

Depth of oxidation ranges from a few feet to several hundreds of feet. The average depth is reported to be about 100 feet. The primary sulfides become the main ore minerals below the oxidized zone and at the base of the zone is the "zone of secondary enrichment" especially important in connection with oxidized copper bearing deposits.

Porphyry Copper Potential vs. Vein Potential

The RMC holdings around the Chico Mine are typically vein deposits. They are essentially lead-zinc types which at increasing depths probably will increase in copper content. Likewise, northward towards Mineral Park the copper content of the veins will probably increase. There is no question that the property lies in an area of excellent vein development and vein-ore potential.

The open pit operation at Mineral Park, about 2 miles to the northwest, is on a porphyry copper deposit developed in the Ithaca Peak stock. Equivalents of the Ithaca Peak stock granite are present in the RMC claim area. No evidence of disseminated copper deposition was observed in the brief time spent on the claims. However, exposures of this granite are extremely limited being covered by other rock types. It is quite possible that a branch of the Ithaca Peak stock could extend into the area and underlie the property and that it might carry disseminated copper deposits. To determine this possibility would take deep IP geophysical work followed by deep drilling where indicated by the geophysical results.

PAST EXPLORATION AND DEVELOPMENT

In 1974-75 some 65 drill holes were sunk on the property. Many of these were to test the mineralization associated with the Bronco Dike. Most of the holes were about 50 feet (inclined) in total length; rarely was a hole 150 feet or more in length. These have been discussed earlier.

Pits, cuts and shafts abound in the area. These range from a few feet deep to shafts over 400 feet deep (reportedly). Adits, tunnels and cross-cuts amounting to thousands of feet of underground workings, usually along a vein, are present. Many of these have been explored by Mr. Kenney and have been sampled and assyed to varying degrees. Many of the workings are no longer accessible. The results of his findings are included as part of this report.

EVALUATION

No tonnage evaluation nor dollar evaluation can be made for the RMC holdings in the Chico Mine area. There are two main reasons for this (1) time was insufficient to do this and (2) data from past developments were insufficient or unavailable to enable any type of calculation as to value to be made.

However, there are several positive factors which suggest a good value to the property:

1. The property lies in a mining district from which extensive tonnages and values for gold, silver, copper, lead and zinc have been obtained;

2. There is abundant evidence of well mineralized veins crossing the claims;

3. A number of good mines have been opened on

various claims in the RMC holdings;

4. Assays by Mr. Kenney show areas where good values for various metals occur; detailed sampling might delimit good ore bodies based upon the location of the good assays obtained.

CONCLUSIONS

1. The property is well located in a well mineralized area.

2. There is good mineralization underlying the property in the form of silver, lead and zinc bearing veins with some associated gold.

3. The values in the veins were sufficiently good to support in the past, when metal prices were low to very low, a strong mining activity.

4. A mill will be necessary to concentrate the metal values and to eliminate waste material.

5. The extent and value of the mineralization remaining in the property area can only be determined and evaluated by additional exploration and assaying.

6. Future exploration and evaluation would take the form of:

   a. Geological mapping and sampling
   b. Geophysical exploration
   c. Drilling
   d. Mining exploration, blocking out and production of discovered ore.

Only those steps will be used on various portions of the property as will be most effective to determine the ore potenial and delimit its boundaries.

Willard D. Pye

Willard D. Pye
Consulting Geologist
Arizona State Board of
Technical Registration #4033
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Registration for Geologists
2654

WILLARD D. PYE
Consulting Geologist
3418 NORTH FORGEUS AVENUE
TUCSON, ARIZONA 85716

TELEPHONE 327-2956

August 11, 1976

Mr. H. G. Williams
250 Yerba Buena Place
Los Altos, Calif. 94022

Dear Mr. Williams:

My report on the RMC Chico Mine properties located to the northwest of Kingman, Mohave County, Arizona is completed. Last week Mr. Kenney left his report and maps which will be included with my report as agreed upon.

Mr. Kenney is now in Rolla, Missouri. He asked that I retain his report and not send it until his account with you has been cleared. He needs the money for school. Have you completed settlement on that portion of his bill covering his work on the Chico Mining properties?

Although my report ran to $2078.70, including expenses at Kingman, you informed me that $1800.00 would be the maximum amount available for the report according to your budget. Therefore, this is the amount shown on the attached statement listed all as "Professional Services". This will permit it to be all included as assessment expenditures.

There are a number of items I would have liked to have included in the investigations and in my report, but budget limitations unfortunately precluded this. At some future date you may wish this to be done together with preparing an exploration program and so forth.

It was a pleasure meeting you and examining the property for you. I shall be glad to assist you further if you should so desire.

Yours very truly,

Willard D. Pye

Willard D. Pye

Since compiling my report I secured three miscellaneous assays on the claims.

You might wish to include them as an appendix. The molybdenum content is interesting. I mentioned the possibility of moly in my report but did not know that moly has actually been found in the veins.

W. D. Pye

8/20/76

The Assessment papers have been sent to Wickstrom in Phoenix as instructed.

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,

CRR:lc

Charles R. Ranney
Mining Engineer

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MINING ENGINEER

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PRELIMINARY REPORT

CHICO MINES PROPERTY
Kingman, Arizona

by

Charles R. Ranney

July 1973

CHICO MINES PROPERTY
Kingman, Arizona

INDEX

MAP INDEX

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Mining Engineer

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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

Radioactivity, though fairly extensive, is generally weak. No evidence of secondary uranium minerals could be found, and identity of the primary mineral is not known, but it is presumed to be uraninite.

UNITED STATES ATOMIC ENERGY COMMISSION

RME-4026

PRELIMINARY REPORT ON URANIUM-BEARING DEPOSITS IN MOHAVE COUNTY, ARIZONA

By
Olin M. Hart
D. L. Hetland

June 1953
[Site Issuance Date]

Division of Raw Materials, AEC

Technical Information Service, Oak Ridge, Tennessee

uranium occurs in a vein a definite porosity is noted, and where a decrease or absence of radioactivity is apparent, the vein matter is tight or not shattered.

Although radioactivity can be noted in gouge material along a uranium-bearing vein, the gouge generally records less radioactivity than the vein proper. An exception occurs in the hanging-wall gouge at the Detroit mine. Pinches and swells in the gouge, caused by slight changes in strike and dip of the fault fissure, show higher radioactivity than normal, but these are immediately in contact with the highly radioactive, porous, sphalerite-rich parts of the vein. This relation is repeated at the Bobtail mine adjacent to the Detroit group of claims.

DESCRIPTION OF INDIVIDUAL PROPERTIES

Detroit Group

Introduction

Interest in uranium at the Detroit group (Hudson tunnel) first developed on discovery of uranium in three shipments of zinc ore to the American Smelting and Refining Company smelter in Salt Lake City. Atomic Energy Commission geologists examined this group in June, 1952, and mapped and sampled the Hudson and New York tunnels. Significant radioactivity was found in the underhand stope in the south drift on the 100 level, where up to 1500 c.p.s. was recorded on a Halross Scintillometer, with a background of 5 c.p.s.

Location and ownership

The Detroit group is located in the Wallapai Mining District, Mohave County, in Sec. 36, T. 23 N., R. 18 W., Gila and Salt River Base Meridian. The property is on the western flank of the Cerbat Range in moderately steep terrain, 18 miles northwest from Kingman, though easily accessible by a good all-weather dirt road. The group consists of 4 claims owned by I. M. George, Kingman, Arizona, leased to Adrion Skinner of Kingman.

History

The first work at the Detroit group was in the 1860's for the exploration and extraction of gold and silver ores in the oxidized portion of the vein. The claims had been abandoned but were relocated in 1948.

Development

A crosscut adit driven 335 feet southwesterly intersects the vein 270 feet from the portal at about 100 feet below outcrop (Fig. 2). A 110-foot drift starting southerly from the crosscut exposes two parallel veins, one of copper ore, the other zinc ore, both of which show significant radioactivity. A stope about 30 feet high was made on the copper vein, and an underhand stope about 20 feet deep was made on the zinc vein. A 100-foot winze, inclined 75° to the west, was sunk from this level (Fig. 3) and has at its bottom 95 feet of accessible drift to the south and 35 feet of accessible drift to the north (Fig. 4). An old shaft about 50 feet deep, on the outcrop

of the vein over the south drift, and few surface trenches comprise the development on the surface.

General geology and mineralogy

The Detroit vein occurs in a fault fissure in pre-Cambrian (?) granite, gneiss, and schist. It outcrops for a length of 200 feet and is 3 to 14 feet wide, striking N. 35° W. and dipping 75° to southwest. Fishure filling consists of breccia fragments and gouge originating from quartz, granite, gneiss, and schist wall rock. Hydrothermal mineralization occurs along footwall and hanging wall, leaving barren material in the middle of this fissure zone. One to four feet of black sphalerite (marmatite ?), galena, chalcopyrite, pyrite, and a little quartz was emplaced along the hanging wall, and one to four feet of chalcopyrite, copper sulphate, pyrite, with only a small amount of quartz, was disseminated through the fissure along the footwall. This barren zone between the two mineralized portions of the vein appears to be diminishing in width with depth, but it is believed that this zone will continue to separate the two mineralized portions of the vein, though changes in its width can be expected.

Mineral associations of this and other properties in the district are classified as mesothermal according to Lindgren's classification of ore deposits.

Outcrops and exposure of the vein in the old shaft on the surface show that the vein is heavily weathered and oxidized to a depth

of 50 feet or more, and sulphides are generally absent in this zone. The effect of alteration on the 100 level has been extensive, but the effect of percolating surface waters on the vein, particularly on the footwall side of the fissure zone, prevents an interpretation of alteration. The portion of the vein exposed for observation on the 200 level was limited by lagging and caved ground.

The hanging wall vein was crosscut by this drift south from the shaft station as it swings into the footwall (Fig. 4). This vein is one foot wide of nearly solid black sphalerite (marmatite), with very small amounts of quartz, chalcopyrite, and pyrite. The footwall vein, where it can be observed, is massive, white, vein quartz with blobs of sphalerite scattered through it, ranging from one to three feet wide.

Primary uraninite (?) occurs as a finely disseminated powder in the incipient fractures and porous zones in the sphalerite-rich vein on the hanging wall. Porosity of the vein was a prerequisite for the deposition of uranium. The porous zones of the vein were caused by recurrent movement along the vein structure, causing shattering of the deposited vein matter. The later uranium mineralization was deposited in these shattered zones.

A relationship is apparent between uranium and sphalerite of this vein, in the sense that uranium occurs in highest concentration within shattered sphalerite in the hanging-wall portion of the vein structure. Less uranium occurs in the footwall vein, but this por-

tion has been more heavily affected by percolating ground waters and it is possible that uranium has been removed. On the 200 level, the footwall vein shows higher radioactivity than the hanging-wall vein, but limited exposures of both veins prevent definite conclusions regarding this relationship.

De La Fontaine Mine

Location and ownership

The De La Fontaine mine is situated near the summit of the Cerbat Range, in the Wallapai Mining District, about 15 miles by road north of Kingman. It is in Secs. 5 and 8, T. 23 N., R. 17 W. A dirt road leads to this property which the county road crew keeps in good condition. Owner is the C. A. & R. Mines, Inc., of Kingman, Arizona. At the time of this examination the mine was not operating.

Development

The main adit of the mine is on a steep mountain slope on the west side of the Cerbat Range. It is reported that four levels were opened during the course of early mining. Only one is now accessible and this is the main haulage level (Fig. 5). The owners report that the main tunnel extends 1500 feet and at one time was open at both ends. It is now caved about 900 feet from the west portal, and the east portal is caved. The main shaft is inclined about 68° to the north and is flooded 143 feet below the sill of the main adit. Most of the stopes were inaccessible and were not examined.

Fig. 5 - Map of De La Fontaine Mine, adit level

(See page 49)

This mine was an early-day base-metal producer of principally lead and zinc. Production figures were not available.

General geology and mineralogy

Rock types exposed at surface and underground consist of pre-Cambrian pink and gray gneissic granite, locally grading into schist or pegmatite.

The vein is well exposed at surface; it strikes about N. 46° W. and dips 60° E. It is a hydrothermal fissure vein, presumably mesothermal. Gangue mineral is quartz and gouge. Sphalerite and galena are the main sulphides, with minor chalcopyrite, pyrite, and arsenopyrite, which are usually accompanied by fault gouge.

Significant radioactivity in the tunnel is first noticed about 115 feet from the portal, and continues in to where the tunnel is caved. Highest radioactivity was found about 440 feet from the portal in the vein near the main shaft. The radioactive minerals appear to be closely associated with lead and zinc, especially where the vein is porous and vuggy. It is believed that the uranium mineral is the primary oxide uraninite. Minor amounts of autunite can be found in the vein and disseminated in the wall rock. No other secondary uranium minerals were indicated.

Radioactivity decreases with depth down the main shaft. However, this is not significant, since only the footwall of the vein is exposed. Radiometric and chemical assays indicate that the uranium ore is not in equilibrium; chemical assays show higher uranium than the corresponding radiometric assays.

Prosperity Claim

Introduction

Slight radioactivity was noted on the dumps of the Prosperity tunnel during a brief visit by an Atomic Energy Commission field team in July 1952.

Although only a small part of the vein proved to be appreciably radioactive, some detailed work was considered advisable since this property is situated between the Detroit and the De La Fontaine mines, which are known to contain radioactive minerals.

Location and ownership

The mine is situated in the Wallapai Mining District, in Sec. 6, T. 22 N., R. 17 W., 18 miles by road north of Kingman. It consists of one unpatented claim and is part of the Golconda group. The owner is John Sherman Bagg, of Kingman. The mine has not been operated for several years. Production figures were not available.

Development

This mine was developed by several hundred feet of drifts and crosscuts (Fig. 6). The main drift, which is caved about 800 feet from the portal, reportedly joined one of the levels of the Golconda mine. A crosscut starting at 620 feet from the portal extends 125 feet to the northeast and intersects the Primrose vein. This vein was drifted on for about 100 feet to the north and 85 feet south. A 120-foot raise in the north drift about 70 feet from the crosscut connects this drift with the main Primrose tunnel.

Fig. 6 Geologic Map Prosperity tunnel, Chloride, Arizona

(See page 51)

General geology and mineralogy

The country rock exposed underground consists mainly of gneissic granite with some brown and green schists. Pre-vein basic and rhyolite dikes intersect the country rock at random.

Two veins are prominent on this claim. The main adit drifts on the weaker vein, which strikes N. 45° W. and dips N. at an average of 65°. This vein is a hydrothermal quartz vein, varying from 12 inches wide at the portal to 3 feet wide at 140 feet inside, and pinches out at 270 feet from the portal. It carries minor amounts of galena, sphalerite, chalcopyrite, and pyrite. Insignificant radioactivity was found to occur along this vein.

At 350 feet from the portal, the adit swings sharply to the south for about 60 feet, where it intersects the main Prosperity vein. This also is a hydrothermal fissure-filling quartz vein. It strikes N. 62° W., dips at an average of 60° N., and is about 9 feet wide. It is brecciated quartz showing at least two stages of quartz deposition. Sulphides are pyrite, chalcopyrite, galena, and sphalerite, with limonite and manganese stain. The entire vein is also covered with a heavy coating of white hydro-zincite.

The hanging wall is not exposed in the main drift; the footwall is indicated by one to six inches of gray fault gouge. The vein appears to be brecciated most heavily near the hanging-wall side, the fragments varying from one-eighth to five inches in diameter. These brecciated fragments are recemented with silica, gouge, and siderite (?).

significant radioactivity was found along that level. Drifting 180 feet along a crosscutting structure carrying little mineralization was expected to connect with the bottom of the Bobtail shaft, but was not completed. Drifting 150 feet northward along the main north-south vein, with a little stoping, showed insignificant radioactivity.

General geology and mineralogy

The vein strikes north-south, dipping 85° E., in a host rock of pre-Cambrian (?) granite, gneiss, and schist. It is composed of quartz with sphalerite, galena, chalcopyrite, pyrite, hematite, and limonite, with local occurrences of cerussite and copper sulphate. The vein is 4.5 to 5 feet wide and has a prominant shear traversing down its center. The footwall has been brecciated and recemented with fine white and black cryptocrystalline quartz, having several small drusy vugs lined with tiny quartz crystals between the breccia fragments. The hanging wall of the vein proper has been sheared, but the granite-gneiss wall rock has been more strongly sheared by re-occurring movement along the fault.

Alteration is more intense along the hanging wall than on the footwall. Feldspars have been kaolinized and all mafics removed along a zone one to three feet wide; in the footwall only the feldspars are moderately altered. Weathering has penetrated only a few feet below surface. The vein is a hydrothermal fissure-filling type in a fault fissure.

Affidavit of Labor Performed and Improvements Made

STATE OF ARIZONA, County of Mohave } ss.

C. B. Patterson being duly sworn, deposes and says that he is a citizen of the United States and more than twenty-one years of age, and resides at Chloride in Mohave Co County, State of Arizona, and is personally acquainted with the mining claim known as

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mining claim, situate in Wallapai Mining District, County of Mohave, State of Arizona; that between the 1 day of aug A. D. 1981, and the 30 day of aug A. D. 1981, at least 100.00 dollars worth of work and improvements were done and performed upon said claim, not including the location work of said claim. Such work and improvements were made by and at the expense of Donnie Levy & C. B. Patterson owner of said claim for the purpose of complying with the laws of the United States pertaining to assessment of annual work, and Jasper Hagen & C. B. Patterson were the men employed by said owner and who labored upon said claim, did said work and improvements, the same being as follows, to-wit:

Drill one fifty Foot Hole

Claim Located in Section 22 - Range 23 north 18 West S.E. 1/4 a.M.C. 90056

C. B. Patterson

Subscribed and sworn to before me this 27 day of Nov., A. D. 1981.

My Commission Expires May 6, 1983

(My commission expires _____) Notary Public

Filed and recorded at request of C B Patterson

NOV 27 1981 -1 30 PM, A. D. 19___, at _____ o'clock _____ M., Book 764 of OFFICIAL RECORDS ~~Proof of Labor~~, pages 55, Records of Mohave County, Arizona.

JOAN McCALL
County Recorder 3.00

By _____ Deputy Recorder

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81-42557

WV

PACIFIC
REGIONAL
OPERATIONS, INC. P.O. Box 716 • Scottsdale, Arizona 85252 • (602) 994-3147

1. Bright & Company - G.L. Richards; contacted June '80, option period too short.

2. Santa Maria Corporation - F. Thorndike; contacted June '80, package returned August '80, properties in S. America politically tied up and unable to proceed at this time.

3. Consultants International - A.A. McCollum; contacted September '80; unable to place with mining principal. No blocked out reserves.

4. Gene Birch; contacted August '80; toured property November 17, 1980; submitted package and personal report to Knowles Group; Harold Earls, Oklahoma City and Saudi Arabian Prince. Follow up by Knowles.

5. Knowles Group; contacted October '80; toured property October 8, 1980; four packages sent December '80; became officially involved February 5, 1981; presented package to New York investment group-declined; presented package to group of Pittsburgh Doctors-declined-high risk.

6. Duval Corporation - Mark Miller, Mineral Park Manager - contacted February 20, 1981; not interested at this time.

7. Rio Algom - Bob Shewman; contacted March '81, toured property April 9 and 10, 1981; declined involvment May 19, 1981 due to Dupont exploration in '74.

8. Stan West Corporation; Scott Norris; contacted May 5, 1981; no response presumably because operations in central Arizona monopolized budget.

9. Consolidated Equity Corporation - Bob Hughes - Toured Property May 15, 1981 for Kentucky coal group, not interested due to no blocked ore.

10. Julius Schmidt - Bob Knowles; toured property May 15, 1981; collected samples for metalurgical testing - could not easily distroy sulfides - lost interest.

11. Tom Baumgardner - Nevada Mining Company - contacted June 18, 1981; not interested due to lack of blocked out ore.

12. Duval Corporation - Tuscon VP contacted by R. Darling (Knowles Group) June 24, 1981; not interested at this time.

13. Exchecker Corporation - Dick Hall; contacted August 13, 1981, toured property September 14, 1981, sent ore reserve potential summary September 19, 1981; involvment pending.

14. Mat Allen - contacted September 18, 1981; toured property for M. Miguel October 17, 1981 - involvment pending.

15. Fischer Watt Mining Company; Pete Dubeck; contacted October 20, 1981; toured property November 4, 1981; retoured property November 19, 1981; involvment pending.

16. Noranda Mining Company; Jim DuBois, contacted September 9, 1981; toured property November 10, 1981; involvement pending assay results.

17. Bear Creek Mining Company; D.C. Bulmer; contacted November 2, 1981; Reply November 24, 1981, not interested at this time.

18. Freeport Minerals; Mike Ward; contacted November '81; involvement pending.

19. Newmont Exploration; Don Hammer; contacted November '81; expressed great interest in Wallapai District; involvement pending.

20. St. Joe American Corporation; Noel Cousins; skeleton package sent November '81; waiting for response.

- KAATERSKILL Expl. - PRESCOTT
- OXFORD Explor. - PRESCOTT
- CALLAHAN - PHOENIX
- Mike Miguel - Hamilton NY
- Phelps Dodge

International Resources &
Mineral Development Inc.
3710 East Arbor Circle
Mesa, Arizona 85206
602-832-0967

GENE B. STOWE, President

June 9, 1988

Dear Sir:

Enclosed is a portion of the information we have available on the Chico Mines.

1. Chico mining claims is being presented by International Resources & Mineral Development, Inc., 3710 East Arbor Circle, Mesa, Arizona 85206.

2. An option ot purchase the Chico claims is presently held by Gene B. Stowe, President of IR&MD.

3. Any offer in regards to the property should be addressed to the above company.

4. There are 51 claims, 2 of which are patented (see enclosed map).

5. There has been limited past production.

6. There are several shafts, tunnels and drill holes which produce ample water for milling.

7. The adjacent property north is the open pit mine developed by Duval, Pennzoil, now owned by Cyprus Mines.

8. In addition to the enclosed information there are hundreds of pages of reports and dozens of maps, available to prospective buyers at our corporate office.

No projections have been made by IR&MD as to the volume and grade of reserves, since each mining company, will determine a cut-off point suitable to their own operating plant design. The price is negotiable, depending on the time schedule of the buyer.

Gene B. Stowe
President

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EXPLORATION PROGRAM

Pacific Regional Operations, Inc. (PRO) is exploring for precious metals northwest of Kingman, Arizona. High-grade silver and gold ore and substantial amounts of copper, lead and zinc have been produced from this area. Mining activity began in the 1860's, with the majority of the production occuring prior to 1920. Current production is restricted primarily to the Duval open-pit mine which produces 18,000-20,000 tons per day of low-grade copper and molybdenum ore as well as other metals.

A literature search confirmed by PRO's field work, suggests the presence of substantial ore reserves. To prove the ore reserves required for large scale mining operations, detailed exploration (core drilling, geochemical and geological studies) will be necessary.

Option To Purchase - 51 Claims

PRO has an Option To Purchase 51 contiguous mining claims, located adjacent to the Duval mine. Several mines located on the property aid in the delineation of reserves and indicate an increase in volume and value of ore with depth.

Three types of ore deposits on this property are: Vein deposits of base-metal silver ore which may extend to depths in excess of 1,400 feet; near surface veins enriched in precious metal, known to carry as much as 2 ounces gold and 60 ounces silver per ton; and, a major mineralized zone which intersects the above veins. Volumetric analysis indicates in excess of 10,000,000 tons of ore. (Stockpiled ore on the property averages in excess of $100/ton.)

PRO Staked Claims

Adjacent to the Duval mine, and overlapping the above claims, PRO has staked 22 unpatented lode mining claims which contain vein deposits of base-metal silver ore and rock equivalents of the Duval orebody. The Duval Corporation is drilling exploration holes, offsetting these PRO claims, in an effort to extend their open-pit mining operation.

Current Activity

PRO is conducting field geological studies, sampling and assaying mineralized areas, and doing a literature search on patented mining claims, state land and federal lands in this area. These lands have been shown to contain numerous, high grade-low tonnage vein deposits which, when combined, could support a major mining venture. PRO will acquire options, exploration permits and/or mineral leases on any properties which justify exploitation.

ESTIMATED EXPLORATION COSTS

Claim Acquisitions

51 Claims Payment 7-1-81	$ 15,000
Payments to 2-82 for 51 Claims (est.)	30,000
5 Projects to be acquired from current activity-1st year cost	25,000
	$ 70,000

Exploration

Drilling coreholes	$
51 Claims	175,000
Other Claims	80,000
Geological, Geochemical, Geophysical	
51 Claims	100,000
Other Claims	50,000
Engineering, Dewatering, Roadwork	
51 Claims	60,000
Other Claims	30,000
Surveying	
51 Claims	10,000
Other Claims	10,000
	$515,000

Management	$ 65,000
TOTAL COSTS	$650,000

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ECONOMIC EVALUATION
HEAP LEACH PROJECT
CHICO MINING CLAIMS

A favorable location for a mining operation on the Chico Claims is on the Little Boy and '98 claims located in the NW/4 of Section 5; Twp. 22N; Range 17W (See Area A on attached project map). Here several mineralized veins, assaying abnormally high in gold and silver, intersect in an area amenable to surface mining methods. The veins are highly oxidized which should allow precious metal extraction by cyanide "heap" leaching techniques.

The surface geology of the Little Boy patented claim (stippled on project map) and the '98 unpatented claim can be characterized by an area of rocky terrain consisting of Pre-Cambrain granite and amphibolite cross cut by several mineralized veins. The Little Boy shaft, the Goetz shaft and the '98 shaft all penetrate the mineralized veins and indicate a considerable ore reserve in this area (Area A on attached cross section and map).

The '98 mine is a simple vertical shaft, approximately 100 feet deep with two, short, horizontal tunnels developed in the plane of the vein. There is oxide ore in place in the shaft and tunnels, bordered by greenish alteration. At the 100 foot level the vein plus alteration is nearly three feet wide. An assay sample, taken by this author, across the vein plus zone of alteration gave values per ton of 3.3 oz gold and 23.0 oz silver. Surface exposure of this vein, approximately 18 inches wide, gave a trace of gold and 0.78 oz silver per ton.

The Goetz shaft is collared in an extnesion of the '98 vein approximately 180 feet from the '98 shaft. This shaft reportedly extends some 50 feet below the surface but it is presently caved at the 10 foot level and inaccessible. Assays from a small stockpile of 50' - level ore gave 0.384 to 0.550 oz/ton gold and 35.64 to 63.0 ozs/ton silver.

The Little Boy shaft is presently in an extremely dangerous condition. However, it has been reported by Kenney (unpublished paper 1978) that the Little Boy mine has produced considerable quantities of ore. The shaft reportedly descends 220 feet to a large stoped and tunneled area. The vein is oxidized to the 200 foot level and assay results (Kenney 1978) show it to contain 0.256 oz/ton gold and 13.42 ozs/ton silver; at this level it is approximately 2.5 feet wide. At the surface the Little Boy vein is a foot wide and assays .150 oz/ton gold and 1.79 ozs./ton silver.

These mineralized veins, partially exposed by the three shafts, can supply sufficient ore to a cyanide leach operation located on the patented Little Boy claim. The veins in this area are generally oxidized to a depth of 200 feet, they double in width from the surface to 200 feet and values increase significantly with depth. Sufficient water can be developed from the various flooded mines in the vacinity and electricity will have to be generated on the property.

William Vanderwall
Geologist
May 29, 1981

Area A (yellow on attached project map) consists of a vein juncture accompanied by some horsetailing and several subsidiary veins. It is proposed that 50 feet on either side of hte junction be surface mined to a depth of 100 feet. The average vein thickness, excluding subsidiary veins, is two feet and, due to coloration, vein material can be crudely sorted from country rock during excavation thereby limiting dilution to a ratio of 1.5:1, waste to ore.

CALCULATIONS

3 veins x 100' deep x 2' wide x 100' long = 60,000 feet ^{3} = 2,222 yard^3
2,222 yard^3 x 1.5 tons per yard = 3,333 tons of ore
3,333 tons of ore + 5,000 tons of waste = 8,333 tons of Leach material.
Mined at 50 ton per day rate gives 8.33 months of operation.

	Average Ore Tenure	
'98 shaft (surface)	Trace Au per ton	0.78 ozs Ag per ton
'98 shaft (50' level)	3.3	23.0
Goetz shaft (surface)	Trace	0.90
Goetz shaft (50' level)	.47	49.32
Cashier vein (surface)	.03	2.5
	0.76 ozs Au/T	15.3 ozs Ag/T

Dilution Factor 1.5:1 gives average ore tenure as 0.30 ozs Au/T and 6.12 ozs Ag/T

Revenue of Monthly Operation	
.30 ozs. Au/T x $450/oz x 50T/D x 20D/M =	$135,000/month
6.12 ozs. Ag/T x $10/oz x 50T/D x 20D/M =	61,200/month
Less 10% recovery factor -	19,620
Less 10% price stability -	19,620
Less 50% operations cost (see Appendix 1)	98,100
Approximate Net Revenue	$58,860/month

Area B (orange on attached project map) consists of a single major vein paralleled by two smaller veins. It is proposed that a zone 600 feet long be surface mined to a depth of 100 feet. The average vein thickness is 2 feet and, due to coloration, vein material can be crudely sorted in the same way as with Area A. No assays or measurements have been taken on the smaller veins.

CALCULATIONS

600' long x 2' wide x 100' deep = 4,444 yard^3
4,444 yard^3 x 1.5 tons/yard^3 = 6,667 tons ore
6,667 tons ore + 10,000 tons waste = 16,667 tons of Leach material.
Mined at 50 tons per day rate gives 16.67 months of operation.

Average Ore Tenure

Surface exposure	.03 ozs/ton Au	20.0 ozs/ton Ag
Goetz shaft (50' level)	.47	49.32
Average	.25 ozs/ton Au	34.66 ozs Ag/ton

Dilution Factor 1.5:1 gives average ore tenure as 13.9 ozs/ton Ag and .10 ozs per ton Au.

Revenue of Monthly Operations

.10 ozs Au/T x $450/oz x 50 T/D x 20 D/Month	= $45,000/month
13.9 ozs Ag/T x $10/oz x 50 T/D x 20 D/Month	= 139,000/month
Less 10% recovery factor	- 18,400
Less 10% price stability	- 18,400
Less 50% operations (see Appendix 1)	- 92,000
Approximate Net Revenue	$55,200/month

APPENDIX 1

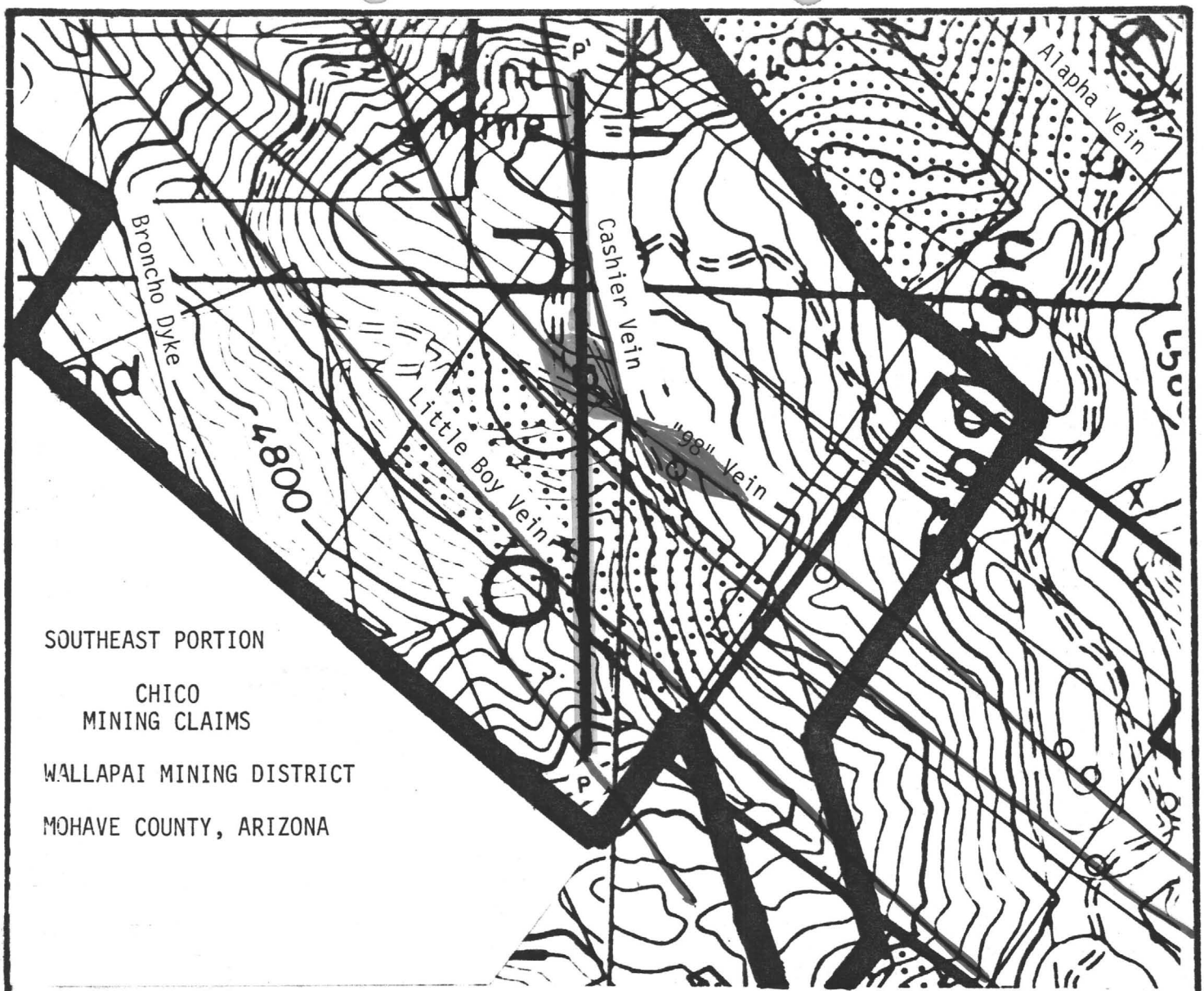
Estimated Costs

Estimated Start-Up costs

Engineering	$15,000
Survey	5,000
Metallurgical Pilot Plant	50,000
Leach Facility (complete)	125,000
	$195,000

Estimated Monthly Operations

Labor	$22,000
Insurance	5,000
Equipment Lease	30,000
Chemicals, Explosives, Lab Supplies	8,000
General Administrative	10,000
Fuel	5,000
Contingency	10,000
	$90,000

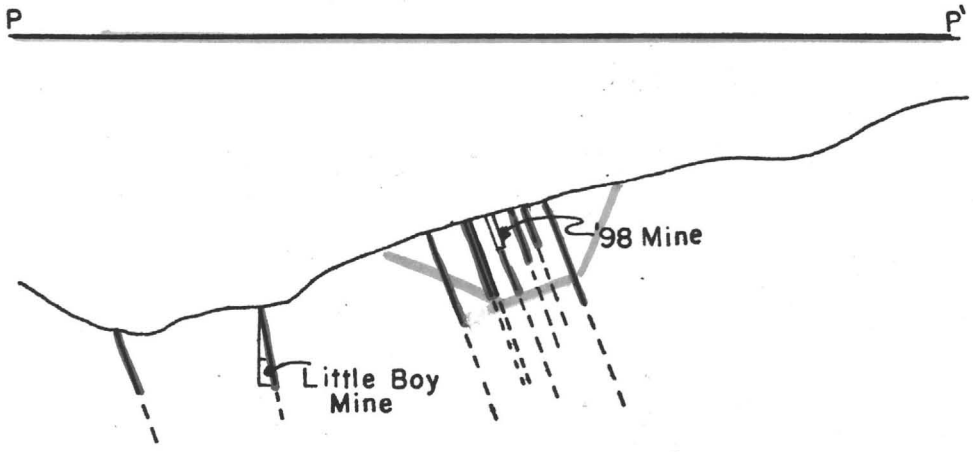


SOUTHEAST PORTION

CHICO
MINING CLAIMS

WALLAPAI MINING DISTRICT

MOHAVE COUNTY, ARIZONA



Vein
Area A
Area B

1"=600'

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OPERATIONS, INC. P.O. Box 716 • Scottsdale, Arizona 85252 • (602) 994-3147

August 7, 1980

CHICO MINING CLAIMS
INITIAL MINING PROPOSAL

The most favorable location for an initial mining operation on the Chico Claims is on the Little Boy and '98 claims located in the NW/4 of Section 5; Twp. 22N; Range 17W (See Area A on attached project map). Here several mineralized veins, assaying abnormally high in gold and silver, intersect in an area amenable to surface mining methods. The veins are highly oxidized and contain only small amounts of copper and zinc which should allow precious metal extraction by cyanide "heap" leaching techniques.

The surface geology of the Little Boy patented claim (stippled on project map) and the '98 unpatented claim can be characterized by an area of rocky terrain consisting of pre-Cambrian amphibolite cross cut by several mineralized veins. The Little Boy shaft, the Goetz shaft and the '98 shaft all penetrate the mineralized veins and indicate a considerable ore reserve in this area (Area A on attached cross section and map).

The '98 mine is a simple vertical shaft, approximately 100 feet deep with two, short, horizontal tunnels developed in the plane of the vein. There is oxide ore in place in the shaft and tunnels, bordered by greenish alteration. At the 100 foot level the vein plus alteration is nearly three feet thick. An assay sample, taken by this author, across the vein plus zone of alteration gave values per ton of 3.3 oz gold and 23.0 oz. silver. Surface exposure of this vein gave a trace of gold and 0.78 oz. silver per ton.

The Goetz shaft is collared in an extension of the '98 vein approximately 80 feet from the '98 shaft. This shaft reportedly extends some 50 feet below the surface but it is presently caved at the 10 foot level and inaccessible. Assays from stockpiled, 50'-level ore gave 0.384 to 0.550 oz/ton gold and 35.64 to 63.0 ozs/ton silver. The Little Boy shaft was not visited by this author. However, it has been reported by Kenney (1978) that the Little Boy mine has produced considerable quantities of ore. The shaft reportedly descends 220 feet to a large stoped and tunneled area. The vein is oxidized to the 200 foot level and assay results (Kenney 1978) show it to contain 0.256 oz/ton gold and 13.42 oz/ton silver; at this level it is approximately 2.5 feet wide. At the surface the Little Boy vein is a foot wide and assays .150 oz/ton gold and 1.79 ozs./ton silver.

These mineralized veins, partially exposed by the three shafts, can supply sufficient ore to a cyanide leach operation located on the patented Little Boy claim. Generally the veins are oxidized to a depth of 200 feet, they double in thickness from the surface to 200' and values increase significantly with depth.

ECONOMIC EVALUATION FOR AREA "A"

Area A (see attached project map) projections (see Appendix 1) result in 12 months of ore, at 50 tons/day, containing 0.77 ozs./ton Au and 22.94 ozs./ton Ag, yielding a net income of $176,318 per month until payout.

ECONOMIC EVALUATION FOR AREA "B"

Area B (see attached project map) projections (see Appendix 2) result in 12 months of ore, at 100 tons/day, containing 0.25 ozs./ton Au and 30.20 ozs./ton Ag, yielding a net income of $215,840, until payout.

RESULTS FROM CASH FLOW ANALYSIS

1.) Estimated minimum return - one year's supply of ore at 50 ton/day (Area A) payout (except land purchase) in ten months; $750,000 profit at ore depletion.

2.) Extend mining operation in "1", above, an additional 50 feet along the veins; 1-1/2 year's supply of ore; payout as above; 2.5:1 return on investment.

3.) In addition to "1" and "2", above, conduct operations in Area B; 28 month supply of ore; payout as above; 5.5:1 return on investment.

Since the above involves only two of the 51 Chico mining claims, additional exploration funds, not included in the Cash Flow Analysis, will be necessary to define the economics of mining other areas on the remainder of the claims.

PACIFIC REGIONAL OPERATIONS, INC.

William C. Vanderwall
Geologist

APPENDIX 1

AREA A

Area A consists of a vein swarm containing at least 3 major veins, the oxide zone extends to a depth of 200' in this area. It is proposed that 50 feet on either side of the vein junction be strip mined, average vein thickness is 1.75 feet.

3 veins x 200' deep x 1.75' wide x 100' long = 105,000 ft.^{3} = 3,889 yd.^{3}
3.889 yds.^{3} x 3.0 tons/yd.^{3} = 11,667 tons of ore.
11,667 tons ÷ 50 tons/day = 233 days = 12 months.

AVERAGE ORE TENURE (0' 200')

'98 shaft		1.65 ozs./ton Au	11.89 ozs./ton
Little Boy shaft		0.20	7.61
Goetz shaft		0.47	49.32
	Average	0.77	22.94

ECONOMICS OF OPERATION

0.77 ozs./ton Au x $600/oz. x 1,000 tons/month = $464,000/month
22.94 ozs./ton Ag x $15/oz. x 1,000 tons/month = 344,100/month

Total $806,100

Less 20% recovery factor	=	$644,880
Less 20% price adjustments	=	488,660
Less 20% price stability	=	322,440

Monthly revenue $322,440

APPENDIX 2

AREA B

Area B consists of a single major vein paralleled by two small veins. Area B is 600 feet long. In this zone the major vein is presumed to be oxidized to a depth of 200 feet. Average vein width is 1.75 feet. No assays or measurements have been taken on the smaller veins.

600' long x 1.75' wide x 200' deep = 7,778 $yd.^3$
7,778 $yd.^3$ x 3.0 tons/$yd.^3$ = 23.333 tons
23,333 ÷ 100 tons/day = 283 days = 12 months.

AVERAGE ORE TENURE

Surface exposure	.03 oz./ton Au	20.0 ozs./ton Ag
Goetz Shaft 50' Level	.55	63.0
Little Boy Shaft	.20	7.61
Average	0.26 oz./ton Au	30.20 ozs./ton Ag

ECONOMICS OF OPERATION

0.26 ox./ton Au x $600/oz. x 2,000 ton/month =	$312,000/month
30.2 ozs./ton Ag x $15/oz. x 2,000 tons/month =	906,000/month
	$1,218,000
Less 60% various sales and recovery factors =	$487,200
Monthly revenue	$487,200

APPENDIX 3

ESTIMATED COSTS

Estimated Startup Costs

Engineering	$ 15,000
Legal and Title	10,000
Survey	5,000
Equipment Purchase	50,000
Metallurgical Pilot Plant	50,000
Leach Facility	500,000
Trade Consideration and Geology	60,000
Contingency	8,500
	$698,500

Estimated Monthly Operations

Labor	$22,000
Insurance	5,000
Equipment Lease	20,000
Chemicals, Explosives & Supplies	8,000
General Administrative	10,000
Fuel	5,000
Contingency	10,000
	$80,000

United States Department of the Interior

IN REPLY REFER TO
3809 (KRA)
MN-81-K-18

BUREAU OF LAND MANAGEMENT
Kingman Resource Area
2475 Beverly Avenue
Kingman, Arizona 86401

July 20, 1981

Mr. William C. Vanderwall
Pacific Regional Operations, Inc.
Post Office Box 716
Scottsdale, Arizona 85252

Dear Mr. Vanderwall:

Upon reviewing your Notice of Intent to conduct annual assessment work on the claims known as the Chico Group, we found that those claims located in Section 32, T. 23 N., R. 17 W., are on lands and minerals owned by the State of Arizona. With the exception of patented mining claims, Section 32 was deeded to the State of Arizona by State Grant on April 15, 1919. We suggest you contact the Arizona State Minerals Department in Phoenix at 1624 West Adams (phone 255-4628), regarding your claims in Section 32.

We have determined that your noitce is complete and meets the requirements as set forth in 43 CFR 3809.1-3. In the future, should you decide to increase mining activities that will disturb greater than five (5) acres in a calendar year, we will be happy to assist you in developing a Plan of Operations as required under 43 CFR 3809.1-4.

Sincerely,

Michael J. Thompson
Acting Area Manager

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

C H I C O M I N E S P R O P E R T Y

WALLAPAI MINING DISTRICT

Mohave County, Arizona

Produced for:

Charles E. Goetz
Owner

28 September 1982

(602) 246-9573

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

9 June 1982

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

RE: Chico Mine Property

Dear Mr. Goetz:

I have had several conversations with Mr. Bill Kardos of P.R.O., and today met with Mr. Ben Pearson.

As a summation, the relinquishment by PRO of the Chico Property has progressed as follows:

1. Pearson to draw up Mutual Release Agreement
2. Goetz and Kardos to sign Mutual Release Agreement
3. Pearson to file Mutual Release Agreement with county
4. Doug to file Mutual Release Agreement with BLM
5. Doug to locate original quit claim papers
6. Pearson to file Quit Claim Deed from PRO to Goetz
7. Doug to obtain listing & map of overstaked claims
8. Pearson to draw up & file new quit claim deed
9. Doug to file new quit claim deed with BLM
10. Goetz to sign letter authorizing Doug to receipt delivery of data from PRO
11. Doug to meet with PRO and receive data, maps, etc.
12. Goetz to furnish Doug copy of letter from PRO stating work accomplished by PRO's exploration on Chico
13. Doug to complete Affidavit of Labor with PRO's assistance, if possible.

We all are pressing for an orderly transfer as quickly as possible.

The authorization letter is enclosed. Please sign and return in the attached envelope.

Very truly yours,

Douglas K. Martin

Douglas K. Martin

DKM:dm
cc: B. Pearson
B. Kardos

(602) 246-9573

Marshall Newton - Devel. Mgr.
Jack Knudson Project Coordinator Minerals
O. David Dykes Devel. Dept. Real Estate Division
Howard F. Bartlett Geologist
Deponent in 1974

1. calling 1974
~~Sitting talk Mr. Goetz~~ - Concerning Deponts' Chico Study in Mohave Co. Ariz.
You talked to Bill Vandervall - of our office - I had requested both Bill

Mr. Zell -

2. we ~~have~~ purchased claims from Mr. Goetz and are trying to get ~~the~~
all data available prior to doing a drilling program - not wanting
to repeat what already is avail.
3. Mr. Goetz agreed to supply us with all data - because of
his age we ~~have~~ tried thru Bill Vandervall - and accordingly
to Mr. Goetz he also wrote

I gotten back to Bill
testing metallurgical reports from all analysis
Silver & gold - not surficial logged
vein intercepts - 6000 feet holes & angles for
rough x sections - main thrust into avail
Notebooks destroyed April 28 destroyed
Mt. State Reports - kept Clear

1. Czel - say with Goetz
2. he said like map - Mr. Goetz to furnish

LEWIS CZEL
1-302-774-5831

Telephone Conv. 6-22-81

LEWIS J. CZEL - DuPont Geologist - 302-774-5831

DUPONT MANAGEMENT AMENABLE TO DEALING FOR CHICO - WILL HAVE TO TAKE INFO AS IS - NO INTERPRETATION - DRILLED 6144' OF HOLES - 5' SAMPLES FIRE ASSAY - PROJECT FUNDED BY EXPLOSIVES DIVISION WHO HAVE KEPT MOST OF ASSAYS AND ROCK FABRIC DATA - Czel WAITING FOR THAT INFO NOW - WILL CALL SOON AS PACKAGE IS Complete - SO FAR HAS SOME ASSAYS, X Sections SURFACE GEO., AND SOME ADDITIONAL (?) INFO.

DKM 246-9573

DRILLER IN KINGMAN THIS WEEK - IF CAN SCEDULE ASSESSMENT WORK FOR NEXT WEEK CAN SAVE $1000 IN TRANSPORTATION FEES - COST $9.00 per foot; WILL PAY FOR TAILLIGHTS on JEEP.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

MC-42
SPECIAL

Mine Cashier Date July 29, 1940

District Wallapai, Mohave County, Ariz. Engineer Elgin B. Holt
P.O. Box 288
Kingman, Ariz.

Subject:

SYNOPSIS REPORT

OWNERS: Bert Abelman, J. A. Bell and A. A. Rose.
Bert Abelman, Agent, Chloride, Arizona.

LOCATION: Property is located on the west side of the Cerbat range at an approximate elevation of 4,500 feet.

METALS: Gold, Silver, Lead, Zinc and Copper; Silver and Gold predominating.

GEOLOGY: The rocks of this area are essentially of the pre-Cambrian complex, consisting of granite, gneiss and dark schists. These older rocks are intruded by younger masses of granite-porphyry.

AREA: The Cashier group consists of 5 mining claims, covering three or four prominent veins, including the Alpha vein, which traverses the Cashier claim for 1,500 feet; this claim being the northwest extension of the Alpha mine.

DEVELOPMENT WORK consists of a crosscut tunnel 1,000 feet in length, the object of which was to cut the Cashier, Alpha, Summit, and many other veins. The tunnel was driven many years ago; but was never completed. About 75 feet from face of tunnel a vein was intersected, which may or may not be the Cashier vein. This vein is 5 feet wide and an 18-inch pay streak from which less than a carload of ore was shipped, assaying $23 per ton in gold and silver.

By driving the Cashier tunnel an additional 250 feet it should intersect the Alpha vein 800 feet below the surface and at a point 50 feet northwest of the northwest end of the Alpha claim. Also, should this tunnel be continued about 2,200 feet beyond the Alpha vein, the Summit vein should be cut at a depth of approximately 2,000 feet from the surface, Also there are a number of undeveloped ore-bearing veins between the Alpha and Summit veins. Hence if this tunnel could be driven an additional distance of 2,500 or 3,000 feet a vast amount of commercial ore should be exposed in the various veins it would open up.

Work on surface outcrop of the Cashier vein consists of open cuts, showing vein to be 3 feet wide, from which 3 lots of ore were shipped, assaying as follows: One car of 30 tons, $48 per ton; 1/2 car of 20 tons, $64 per ton; 1/2 car of 20 tons, $51 per ton; two other cars were shipped; but the assay results of these are not available. This data was furnished by Mr. Abelman.

WATER now flowing from the Cashier tunnel fills a 1.5-inch pipe. It is believed that after the Alpha and other veins are cut by this tunnel a great deal more water will be encountered sufficient to supply a large milling plant which could be located directly below the portal of said tunnel.

NOTE: As the Alpha vein traverses Cashier ground for 1,500 feet, as above set forth, a brief description of the Alpha property is submitted, as follows:

The ALPHA MINE is located on the west side of the Corbat range, at an elevation of 5,300 feet, more or less, at a point about 2,200 feet south-southwest of the Summit property. It was worked up to 1939 by the Alpha-Keystone Mines, Inc., and ore produced, averaging around $12 per ton in gold and silver alone, was hauled to the Keystone mill for treatment.

The Alpha property is opened by tunnels on vein, striking south 30 deg. east. The croppings are a prominent roof of black iron and manganese stained quartz. The vein ranges from 4 to 20 feet wide and ore contains silver sulphide, assaying up to 1,000 ounces silver to the ton. Iron pyrite, galena, zinc blende and chalcopyrite are also present in the ore. Hence all values can readily be recovered by selective flotation.

The mine has been an excellent producer of shipping and milling ores through the years and a great deal of money has been made out of it by various owners.

According to F. C. Schrader (1909): "A consignment of 400 tons of ore, shipped from Alpha mine, is reported to have netted $125 per ton.

In Conclusion, the Cashier property is recommended to anyone looking for an attractive development setup on which to spend some money, with the end in view of opening up a large amount of mill tonnage out of which considerable money should be made. However, any company taking over the Cashier group should also secure, if possible, both the Alpha and Summit properties.

(SIGNED) Elgin B. Holt.

PACIFIC
REGIONAL
OPERATIONS, INC. P.O. Box 716 • Scottsdale, Arizona 85252 • (602) 994-3147

ECONOMIC EVALUATION
MINING CLAIMS
WALLAPAI DISTRICT, MOHAVE COUNTY, ARIZONA

REVENUE:

The ore tenure is averaged ore tenure found in the shallow zones of the Jamison Mine as reported by Gnaedinger, 1916, pp. 9 and Lytzen, 197, pp. 17. Their reports, see Bibliography, indicate 0.15 oz. gold per ton; 30.0 ozs. silver per ton; 7.0% copper per ton; 1.5% lead per ton and 6.5% zinc per ton. Assume processing of 50 ton of ore per day, 20 days per month, and 50% of the gold and silver valued at current prices results in the following:

0.075 oz/ton Au	x	$663.50/oz	x	1,000 tons/month	=	$ 49,763
15 oz/ton Ag	x	16.75/oz	x	1,000 tons/month	=	251,250
140 lbs/ton Cu	x	0.98/lb	x	1,000 tons/month	=	137,200
30 lbs/ton Pb	x	0.35/lb	x	1,000 tons/month	=	10,500
130 lbs/ton Zn	x	0.355/lb	x	1,000 tons/month	=	46,150
						$494,863
Less 20% refinery discount and/or penalties						$(98,973)
Less 20% metal price stability discount						(98,973)
						$296,917
Refinery Fee: $40/ton x 400 tons/month concentrate						(16,000)
Monthly Revenue						$280,917

COSTS:

ESTIMATED INITIAL COSTS/AREA

	Black Hawk	Chico	Both
Purchase down payment	$ 58,000	$ 25,000	$ 83,000
Legal, title search	5,000	5,000	10,000
Surveying	4,500	14,500	19,000
Equipment purchase	50,000	50,000	50,000
Mill purchase	85,000	85,000	85,000
Mill assembly	50,000	50,000	50,000
Metallurical Pilot Plant	50,000	50,000	50,000
Contingency	7,500	7,500	15,000
	$310,000	$287,000	$362,000
Geology, lease bonus consideration	40,000	33,000	73,000
	$350,000	$320,000	$435,000

ECONOMIC EVALUATION
MINING CLAIMS
WALLAPAI DISTRICT, MOHAVE COUNTY, ARIZONA

ESTIMATED EXPLORATION COSTS/AREA

	Black Hawk	Chico	Both
Geophysics	$15,000	$ 30,000	$ 30,000
Drilling 500' tests (3)	75,000	75,000	75,000
Drilling 1,000' + tests (6)	-	500,000	500,000
	$90,000	$605,000	$605,000

ESTIMATED MONTHLY OPERATIONS COST/AREA

Labor and supervision and insurance		$ 25,000/month
Equipment lease and fuel		16,000/month
Milling and concentrating and shipping		45,000/month
Sampling, ore control and assay		5,000/month
General and administrative		10,000/month
Contingency		9,000/month
	Total	$110,000/month

ANALYSIS OF MONTHLY NET INCOME TO PAYOUT OF CLAIM PURCHASES

	Black Hawk		Chico
Revenue	$280,917	Revenue	$280,917
Royalty 10% 1)	- 28,092	Royalty 3%	- 8,428
	$252,825		$272,489
Operations	-110,000	Operations	-110,000
	$142,825		$162,489
Retained interest 2)	- 28,565	Land payment 3)	- 50,000
Net income	$114,260	Net income	$112,489

1) Effective until payout of $200,000 from royalty within 10 years.

2) 20% carried working interest to payout of investment.
40% working interest after payout.

3) Land Contract for $2.5 MM payable $25,000 monthly September-December 1980; $50,000 monthly January-June, 1981; $75,000 monthly July-December 1981. At payout of investment, PRO has option to either increase royalty to 10% or receive a 25% working interest.

CASH FLOW ANALYSIS
BLACK HAWK AND CHICO

	August	September	October	1980 November	December
Revenue					
Black Hawk					252,825
Chico					
Total					252,825
Expenses					
Initial Cost Black Hawk	350,000				
Initial Cost Chico		85,000			
Geophysics			15,000	15,000	
Drilling					75,000
Monthly Operations		110,000	110,000	110,000	220,000
Increase Mill to 10-T/Day				40,000	
Land Payment Chico			25,000	25,000	25,000
Retained Interest					28,565
Total	350,000	195,000	150,000	190,000	348,565
Net Cash Flow	(350,000)	(195,000)	(150,000)	(190,000)	(95,740
Cumulative Cash Flow	(350,000)	(545,000)	(695,000)	(885,000)	(980,740

	January	February	March	1981 April	May	June	July
5	252,825	252,825	252,825	252,825	252,825	252,825	252,825
				272,489	272,489	272,489	272,489
5	252,825	252,825	252,825	525,314	525,314	525,314	525,314
0	250,000	250,000					
0	220,000	220,000	220,000	220,000	220,000	220,000	220,000
		45,000					
0	50,000	50,000	50,000	50,000	50,000	50,000	75,000
5	28,565	28,565	28,565	28,565	28,565	28,565	28,565
5	548,565	593,565	298,565	298,565	298,565	298,565	323,565
0)	(295,748)	(340,740)	(45,740)	226,749	226,749	226,749	201,749
0)	(1,276,488)	(1,617,228)	(1,662,968)	(1,436,219)	(1,209,470)	(982,721)	(780,972)

ASSUMPTIONS FOR PROFORMA PROJECTIONS

Surface Strip Mine Project

Limited surface and bulldozer rip samples indicate the mineralized portion of the Bronco Dyke is composed of sheared, fractured and highly altered granite.

Est. Ore -	0.13 oz./T gold @ $350/oz.	=	$45.50/T
	2.59 oz/T silver @ $8/oz.	=	20.72/T
			$66.22/T
	30% discount - price stabilized by bulk sales		($19.866)
	10% recovery loss factor		(6.622)
	Net		$39.732/T

Projected Reserves - 30' x 30' x 3960' ÷ 12.5 cu. ft./T = 285,120 T

Mine Life - 500T/day for 300-day year = 1.9 years

Total Operations Costs - $20/T

Net Profit - $2,991,695

Underground Mine

The following assumptions for underground mining of the mineralized quartz fraction of the Bronco Dyke are projected from limited drilling data, stockpiled ore tenure and engineer's reports.

Est. Ore -	0.25 oz./T gold @ $350/oz.	=	$87.50/T	
	7.0 oz./T silver @ $8/oz.	=	56.00/T	
	2% copper @ $0.75/#	=	30.00/T	
			$173.50/T	
	30% discount - price stabilized by bulk sales		($52.05)	With Refinery ($34.70)
	10% recovery loss factor		(17.35)	(17.35)
			$104.10/T	$121.45

Projected Reserves - 4' x 600' x 3950' ÷ 12.5 cu. ft./T = 760,320 T

Mine Life - 250T/day for 300-day year = 10.1 years

Total Operations Costs - $70/T
$74/T with refinery

Net Profit - $13,379,900
$20,012,792 with refinery

CHICO MINES PROPERTY

PROFORMA PROJECTIONS - UNDERGROUND AND SURFACE PROJECTS

	Commencing 5-1-82 Surface Mining Project	6 MONTHS	1 YEAR	1.5 YEARS	2 YEARS	2.5 YEARS	3 YEARS	4 YEARS	5 THRU 10 YEARS
1	Exploration Program	575000							
2	Land	50000	60000	1200000					
3	Start up operations		150000				(150000)		
4	Facilities - leach pad		200000						
5	Operations costs			1500000	1500000	1500000	1350000		
6									
7	Total Costs	625000	410000	2700000	1500000	1500000	1200000		
8									
9									
10	Revenue	—	—	2979900	2979900	2979900	2681910		
11	PRO 6% Royalty			(178000)	(178000)	(178000)	(160915)		
12									
13	Cash Flow	(625000)	(1035000)	(933100)	368800	1670700	2991695		
14									
15	Underground Project								
16	Exploration Program	575000							
17	Land	50000	60000	1200000					
18	Start up operations		150000	150000	150000				
19	Facilities - Mill		400000	400000	200000				
20	Operations costs					2625000	2625000	5250000	31500000
21	Total Costs	625000	610000	1750000	350000	2625000	2625000	5250000	31500000
22									
23									
24	Revenue					3903750	3903750	7807500	46845000
25	PRO 6% Royalty					(234225)	(234225)	(468450)	(2810700)
26	Cash Flow	(625000)	(1235000)	(2985000)	(3335000)	(2290475)	(1243450)	845600	13379900
27									
28	Underground - Refinery incl'd.								
29	Exploration Program	5750000							
30	Land	50000	60000	1200000					
31	Start up operations		150000	150000	150000				
32	Facilities - Mill		400000	400000	200000				
33	Refinery			300000	450000				
34	Operations costs					2775000	2775000	5550000	33300000
35	Total Costs	625000	610000	2050000	800000	2775000	2775000	5550000	33300000
36									
37									
38	Revenue					4554375	4554375	9108750	54652500
39	PRO 6% Royalty					(273263)	(273263)	(546526)	(3279156)
40	Cash Flow	(625000)	(1235000)	(3285000)	(4085000)	(2578888)	(1072776)	1939448	20012792

PHYSICAL FEATURES

The Chico Claims are situated on the west side of Stockton Hill, ~~which is in the~~ Cerbat Mountain Range. The elevation ranges from ~~about~~ concentrated 3860 feet to 5760 feet above sea level. The Little Boy Patented claim ranges between 4930 feet and 5400 feet. and the True Blue Patented claim ranges between 4250 feet and 4560 feet above sea level. As can be seen by the above elevation range, the Chico claims are situated in very rugged terrain.

Vegitation consists of Saguaro Cactus, Paloverde Tree and other desert vegitation peculiar to this elvation. Dry washes drain the area from east to west off the Cerbat Mountains

claim properties can be classified as prospects only. The True Blue & Little Boy patented claims are also considered to be prospects and would only have real estate value. Some patented claims in the general area have been sold recently for $300 to $450 per acre - depending on accessibility.

ASSAYS

The only reliable samples taken for assay must be taken across the total mineable ore vein. If the mineralized zone is only 2 inches in a 5 or 6 foot vein, the assay results of the total vein would be negligible. This has been the case in many of the ore samples taken. The most recent 10 samples taken by Martin & Associates in July 1984 had the following assay results.

6 samples 4-6 ft Vein Au=.0009 - .002 oz/t, Ag = Nil to 5.4 oz/t

4 " 2 to 14 in Veins Au = .0006 - .011 oz/t Ag Nil to 8.76 oz/t

Clair

Geological Conclusions

1. The Nature of Mineralization is generally low grade with some local spots where commercial ore is present in minor amounts.

2. Many geological reports have been made which recommended more detailed work. Subsequent core drilling programs and ~~abundant~~ Primary assays were conducted but showed only localized zones of commercial ore.

3. unsuitable for open pit mining due to the steeply dipping veins which must be worked underground.

4. Gold & Silver ore is spotty & assay averages approximate . Lead, Zinc & Copper have low market price & not commercial under present underground working methods.

General Geology

The Clico property is composed primarily of pre-Cambrian schist, gneiss, amphibolite and altered granite which were later intruded by Tertiary-Cretaceous (Laramide) granite and monzonite phorpyries. The Laramide intrusives appear to be the primary source of mineralization in the Wallapai mining district.

Most of the veins occur in fault fissure with related dikes and sills. Most veins, though not continuous, are steeply dipping to Vertical and have a general northwest strike. The Bronco dike is a fault zone ranging from 20 to 70 feet wide which strikes N 10° E and dips 60° SW. The Bronco Dike is primarily composed of Laramide Ithaca Peak Granite containing fissured dike composed of rhyolite, diabase and related rocks. The Ithaca Peak granite is highly altered for the most part.

Six or more veins of varying lengths were observed on the Clinic property. The veins range from about 2 inches to a maximum of about 10 feet, but average about 3 feet. Mineralization in the veins is erratic and the best ore shoots occur close to intersections and vein junctures. These shoots have proven to be very localized and small in size.

No commercial ore reserves have been blocked-out on the property.

Previous, extensive exploration work has been carried out by E. I. Du Pont, Bethlehem Regional operations, Inc., Pennzoil-Duval corp., Miranda Exploration Inc., Rio Tinto Canadian Exploration, RMC corporation and Chevron E. Corp., et. al. Extensive mapping, drilling, geophysical surveys, assays, assessment work etc. failed to find or block-out commercial ore so the properties were not renewed. option to purchase the

Adjacent properties.

The Pennzoil-Duval open pit copper-molybdenum operation was closed down about two years ago because of low grade ore & the low price

for these minerals.

The Clico property would be an underground operation, therefore, the ore would have to be much higher grade than an open pit operation.

The Jamesian mine has the most extensive workings and these workings are primarily along the Bronco Dike. The mine consists of a 400 foot shaft with rather extensive tunneling. The lower part of the mine is flooded and extensive rehibilitation work would be necessary to de-water, re-timber + clean the workings. This expenditure is not feasible since ore is in small shoots and no new ore has been blocked-out by drilling and other exploration methods.

Based upon the extensive exploration work by the various mining companies which failed to block-out minable ore bodies, the

Many grab samples have been taken by various people who reported high gold & Silver values, however, the vein width and other data could not be confirmed by research or in the field. The fact that extensive samples were taken and assayed by several reliable mining companies, who failed to exercise their option to buy the property indicate the assay results were non-commercial.

Conclusions:

1. The patented & unpatented Lode claims are classified as prospects only. Extensive exploration work has failed to block out commercial ore.
2. The two patented claims have only real estate value
3. Assays of reliable samples have proven non-commercial except in small, erratic ore shoots at Vein intersections and vein fractures. The small size of these ore shoots are not conducive to large scale mining practice.
4. The lode claims are in remote, mountainous terrain with poor accessibility for the most part
5. Electric power is available about 3 mile away. Limited access roads are present for 4-wheel vehicle only.

Previous Exploration Work on Claim

E.I. Du Pont & Co — $250,000+

Pacific Regional Operations Inc — 195,000

Duval Pennzoil — ?

Chas E. Goetz, et. al — 50,000+ — ~~Mapping~~, Surveying, Assays, Assessment Work & Various Geological Evaluations.

Noranda Expl. Inc

Rio Tinto Canadian Exploration

RMC Corp

1977 VLF Electromagnetic Survey — Small anomalous zone in Northern Part of claim. Anomalies not Drilled. VLF Survey Indicates presence of Iron which Indicates possible Sulphide zone?

Brester

Jemison Mine,

Cerbat Mountains

Hualpai Mining District

Mohave County

Arizona.

REPORT OF L. WEBSTER WICKES.

Kingman, Arizona,

Dec. 26th, 1916.

GNAEDINGER. Report

JEMISON MINE.

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 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 theaccompanying 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 vein'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 footwall 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 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 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.

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 volcanics 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 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, togetner 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.

of the sum of

DOLLARS

to paid,

have Granted, Sold and Conveyed, and by these presents do Grant, Sell and Convey, unto the said

of the County of State of all that certain

Subject to current taxes and assessments, reservations and all easements, rights of way, covenants, conditions, restrictions, liens and encumbrances of record.

TO HAVE AND TO HOLD the above described premises, together with all and singular the rights and appurtenances thereto in anywise belonging unto the said

heirs and assigns forever and do hereby bind
heirs, executors and administrators, to Warrant and Forever Defend, all and singular the said premises unto the said

heirs and assigns, against every person whomsoever lawfully claiming, or to claim the same, or any part thereof.

WITNESS hand at
this day of 19
Witness at request of Grantor:

.....

.....

.....

.....

(602) 968-1275

(602) 277-2483

CHARLES R. WARD CORPORATION

Mining Development & Mineral Recovery

4706 EAST ALTA VISTA

PHOENIX, ARIZONA 85040

117

Copy Of a report by Mr. E. Ross Housholder

P. E., Registered Land Surveyor

"Extracts on Cashier Mine"

Wallapai Mining District

Mohave County

Arizona

1955

TERMINOLOGY: Standard terms used in this report follow definitions of those relating to the metal mining industry obtained from "A Glossary of the Mining and Mineral Industry by Albert H. Fay, published 1920, by the U. S. Bureau of Mines.

"Ore" Page 475 Bull. 95, Bur. of Mines, Dept. Int.
A natural mineral compound, of the elements of which one at least is a metal. The term is applied more loosely to all metalliferous rock, though it contain the metal in a free state, and occasionally to the compounds of non-metallic substances, as sulphur ore. (Raymond).
Also, material mined and worked for nonmetals, as pyrite is an ore of sulphur (Webster).
A mineral of sufficient value as to quality and quantity which may be mined with profit. Ihlseng).
A mineral, or mineral aggregate, containing precious or useful metals or metalloids, and which occurs in such quantity, grade, and chemical combination as to make extraction commercially profitable. (Robert Peele, Min. & Met. Soc. of America, Bull. 64, p. 257)
A metalliferous mineral, or an aggregate of metalliferous minerals, more or less mixed with gangue, which from the standpoint of the miner, can be won at a profit, or from the standpoint of a metallurgist can be treated at a profit. The test of yielding a metal or metals at a profit seems to me, in the last analysis, to be the only feasible one to employ. (J. F. Kemp, Trans., Canadian Min. Inst., 1909, p. 367).

"Ore blocked out" - P. 476
Ore exposed on three sides within a reasonable distance of each other. (H. C. Hoover, p. 17)

"Ore developing" - P. 476
Ore exposed on two sides. See Probable ore. (H. C. Hoover, p. 17) First class, blocks with one side hidden; second class, blocks with two sides hidden; third class, blocks with three sides hidden. (Philip Afgall, Min. and Met. Soc. of Am., Bull.64, p. 250)

"Probable ore" P. 540
Any blocked ore not certain enough to be "in sight" and all ore that is exposed for sampling, but of which the limits and continuity have not been proved by blocking. Also, it includes any undiscovered ore of which there is a strong probablility of existence. Ore that is exposed on either two or three sides. Whether two or three sides be taken as a basis will depend on the character of the deposit. (Min. and Met. Soc. of Am., Bull. 64, pp. 258 and 262).

"Ore developed" P. 476
Ore exposed on four sides in blocks variously prescribed.

E. Ross Householder

"Deposit" p. 211
The term mineral deposit or ore deposit, is arbitrarily used to designate a natural occurrence of a useful mineral ore in sufficient extent and degree of concentration to invite exploitation. (Raymond)

"Exploitation" p. 255
The extraction and utilization of ore. Often confused with "exploration." (Richard)

"Exploration" p. 255
The work involved in locking for ore. Often confused with "exploitation". (Richard)

"Exploring mine" p. 255
(Scot.) A working place driven ahead of the others to explore the field. (Barrowman) Prospect.

"Prospect" p. 540
To examine land for the possible occurrence of coal or valuable minerals by drilling holes, ditching, or other work. (Steel)

"Prospect hole" p. 540
Any shaft, pit, drift, or drill hole made for the purpose of prospecting the mineral-bearing ground.

"Prospecting" p. 540
Searching for new deposits; also, preliminary exploration to test the value of lodes or placers already known to exist.

"Development" p. 214
Work done in a mine to open up ore bodies, as sinking shafts and driving levels, etc. (Skinner).

and

"Resources"
(Re. S. G. Lasky, (with U.S. Geol.Surv.) p. 15, Vol. 23, No. 8, Aug. 1955, Western Mining)
"Resources include" all material in the ground, discovered or undiscovered, usable at present, or not, rich or lean, considered within the context of all factors -- that may influence its conversion into a reserve."

"Reserves" (Re. A. P. Butler, Jr. (with U.S.Geol.Surv), p. 15, Vol. 23, No. 8, Aug. 1955 Western Mining.
Apply to known deposits that have aspects of usability within a specified set of economic and technological conditions.

E Ross Householder

"Positive ore" P. 530 Bull. 95

Ore exposed on four sides in blocks of a size variously prescribed. See "Ore developed," also "Proved ore." (B. C. Hoover, p.17)

Ore which is exposed and properly sampled on four sides, in blocks of reasonable size, having in view the nature of the deposit as regards uniformity of value per ton and of the third dimension, or thickness. (Min. and Met. Soc. of Am., Bull. 64, p. 262)

"Proved ore". p. 541

Ore where there is practically no risk of failure of continuity (H. C. Hoover, p. 19). See also Positive ore.

"Possible ore" p. 531

Ore which may exist below the lowest workings, or beyond the range of actual vision. (Min. and Met. Soc. of Am., Bull. 64, p. 262).

"Ore expectant" p. 476

The whole or any part of the ore below the lowest level or beyond the range of vision. See Possible ore, also Prospective ore. (H. C. Hoover, p. 17). The prospective value of a mine beyond or below the last visible ore, based on the fullest possible data from the mine being examined, and from the characteristics of the mining district. (Phillip Argall, Min. and Met. Soc. of Am., Bull. 64, p. 260)

"Prospective ore" p. 540

Ore that cannot be included as proved or probably, nor definitely known or stated in terms of tonnage. See Possible ore, also Ore expectant. (H. C. Hoover, p. 19)

"Low grade" p. 409

A term applied to ores relatively poor in the metal for which they are mined; lean ore.

"Ore faces" p. 476

Those ore bodies that are exposed on one side, or show only one face, and of which the values can be determined only in a prospective manner, as deduced from the general condition of the mine or prospect. (Min. and Met. Soc. of Am., Bull. 64, p. 255)

"Ore partly blocked" p. 477

Those ore bodies that are only partly developed, and the values of which can be only approximately determined. (see Probable ore)

"Ore in sight" p. 477, Bull. 95

A term frequently used to indicate two separate factors in an estimate, namely

(a) Ore blocked out, that is, ore exposed on at least three sides within reasonable distance of each other;

(b) Ore which may be reasonably assumed to exist, though not actually blocked out;

these two factors should in all casesbe kept distinct, because

(a) is governed by fixed rules, while

(b) is dependent upon individual judgment and local experience. The expression "ore in sight" as commonly used in the past appears to possess so indefinite a meaning as to discredit its use completely. The terms Positive ore, Probable ore, and Possible ore are suggested. (Min. and Met. Soc. of Am., Bull. 64, pp. 258 and 261)

E. Ross Houshalder

TRANSPORTATION & SUPPLIES

A good mine road of easy down grade leads from the present workings of the Cashier mine, connecting with the Arizona State oil cake paved U.S. 93 highway which is about 2-3/4 miles westerly from the property, thence 13 miles over paved highway to Kingman, the chief distributing center for northwestern Arizona, where ample supplies of all kinds needed in mining are kept in stock.

CLIMATE

The district has a healthful climate with mild winters which permits good working conditions the year around. The vegetation is typical of semi-arid mountain regions. The rainfall is about 10 to 12 inches per year.

WATER SUPPLY

Domestic water can now be secured from several good springs on the property. Water from the present underground workings is in excess of any development requirements, and as development proceeds it is believed sufficient water will be obtained for other purpose

TOPOGRAPHY

The district ranges in elevation from 3,000 feet in the foothills on the west to 5,000 feet on the east, at the crest of the Cerbat Mountain Range. Lane Springs, along which the Cashier mine is located, is a short, deeply cut side valley situated northeast of Todd Basin and the Golconda Mine, from which it is separated by a prominent ridge extending northwestward from the axis of the range. Lane Springs canyon empties into Long Wash the principal drainage of the immediate section, which leads northward and westward into Sacramento Valley. The mountain sides on either slope of Lane Springs canyon has a steep pitch. These slopes are deterial covered but permit the ready construction of trails and roads to all parts of the group.

ORE DEPOSITS OF THE DISTRICT

The ore deposits of this district contain principally lead, zinc, silver and gold, and sometimes copper. They occur in fissure veins which have a generally northwesterly trend and a steep northeasterly dip. Those situated north of Cerbat Wash including Lane Springs canyon section contain principally lead, zinc, silver and gold. The gangue is mainly quartz and the values usually favor the handing wall. The principal minerals are pyrite, chalcopyrite, galena, sphalerite, stibnite, and native gold. Near the surface native silver, argentite, and ruby silver appear, together with free gold, but the water level is often less than 80 feet, and subsequently primary ores come in at relatively slight depth.

E. ROSS HOUSHOLDER, E. M.
CHEMIST & ASSAYER
REGISTERED PROFESSIONAL ENGINEER
MEMBER
SOCIETY OF AMERICAN MILITARY ENGINEERS
AMERICAN ASSOCIATION OF ENGINEERS
AMERICAN SOCIETY OF ENGINEERS

KINGMAN, ARIZONA.

July 18, 1927

WE HEREBY CERTIFY THAT THE SAMPLES ASSAYED FOR

Cashier Mine,
Kingman, Arizona.

GAVE THE FOLLOWING RESULTS:

OWNER'S MARK	GOLD OZ. PER TON	GOLD VAL. PER TON	SILVER OZ. PER TON	SILVER VAL. PER TON	GOLD AND SILVER VAL. PER TON DOLLARS	GOLD AND SILVER VAL. PER TON CENTS	COPPER PER CENT	LEAD PER CENT	Zinc per cent
					2m 1955 (ERR)				
Ore from Dodge vein near face	0.03	$0.42	5.44	$4.91@90¢/oz	$5.59		0.6%	5.2%	13.44%
Select ore Ableman tunnel dump	0.76	$16.71	35.72	$33.15@90¢/oz	$58.74		2.5%	44.0%	3.32%
Select ore Cashier shaft	0.36	$8.44	23.00	$20.70/90¢/oz	$32.30		0.88%	41.4%	7.61%
Ore from Main tunnel 100 feet from portal	0.02	$0.42	3.32	$2.99@90¢/oz	$3.69		0.7%	1.3%	3.25%

GOLD AT $20.67 PER OUNCE.

SILVER AT PER OUNCE.

CHARGES $ Paid

E. Ross Householder ASSAYER

NOTHING TO SELL BUT SERVICE

52

GOLD $35 PER OUNCE
SILVER 50 CENTS PER OUNCE

Wm L. Kesm ASSAYER

WE HAVE ASSAYED YOUR four SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

DESCRIPTION	NO.	OZS. GOLD PER TON	OZS. SILVER PER TON	PER CENT LEAD	PER CENT COPPER	PER CENT ZINC	INSOL. PER CENT	PER CENT IRON	PER CENT	VALUE OF GOLD PER TON
Picked Shaft Panama	125-1	0.13	33.60		0.90	11.70				$ 4.65
10 Ft. from Portal 10 Ft. Wide	125-3	0.14	1.85	1.70	0.50					$ 4.90
20 Ft. from Portal 20 Ft. Wide	125-4	0.06	32.40	2.80	0.50	None				$ 2.10
Upper Shaft 8 Ft. from Portal	125	0.08	8.95		0.50	None				$ 2.80

REMARKS:

CHARGES $ 12.50

CRISMON & NICHOLS

[signature]

E. R. EASTO   P. H. CRISMON   ORRIN FISHER   HAROLD E. SULVER

CRISMON & NICHOLS

ASSAYERS AND CHEMISTS

PHONE 3-7417   229-231 SOUTH WEST TEMPLE STREET   P. O. BOX 170[illegible]

REPORT OF ASSAY

SALT LAKE CITY, UTAH July 5, 1955

Esperanza Mining Co.

WE HAVE ASSAYED YOUR three SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

DESCRIPTION	NO.	OZS. GOLD PER TON	OZS. SILVER PER TON	PER CENT LEAD	PER CENT COPPER	PER CENT ZINC	INSOL. PER CENT	PER CENT IRON	PER CENT	VALUE OF GOLD PER TON
Hanging Wall 30 in	126-5	0.03	17.20	6.70	3.70					$ 1.05
Dump-Cashier Cross cut	126-6	0.06	3.40	4.60	0.45	6.15				$ 2.10
Cashier 30 ft. from Portal Cross Cut Gob	126-7	0.02	0.60	0.60	0.40	None				35¢

SAMPLES [illegible] DAYS [illegible]

SAMPLES [illegible] RECEIVE [illegible]

REMARKS:

CHARGES $ 10.00

CRISMON & NICHOLS

[signature]

July 26, 1955

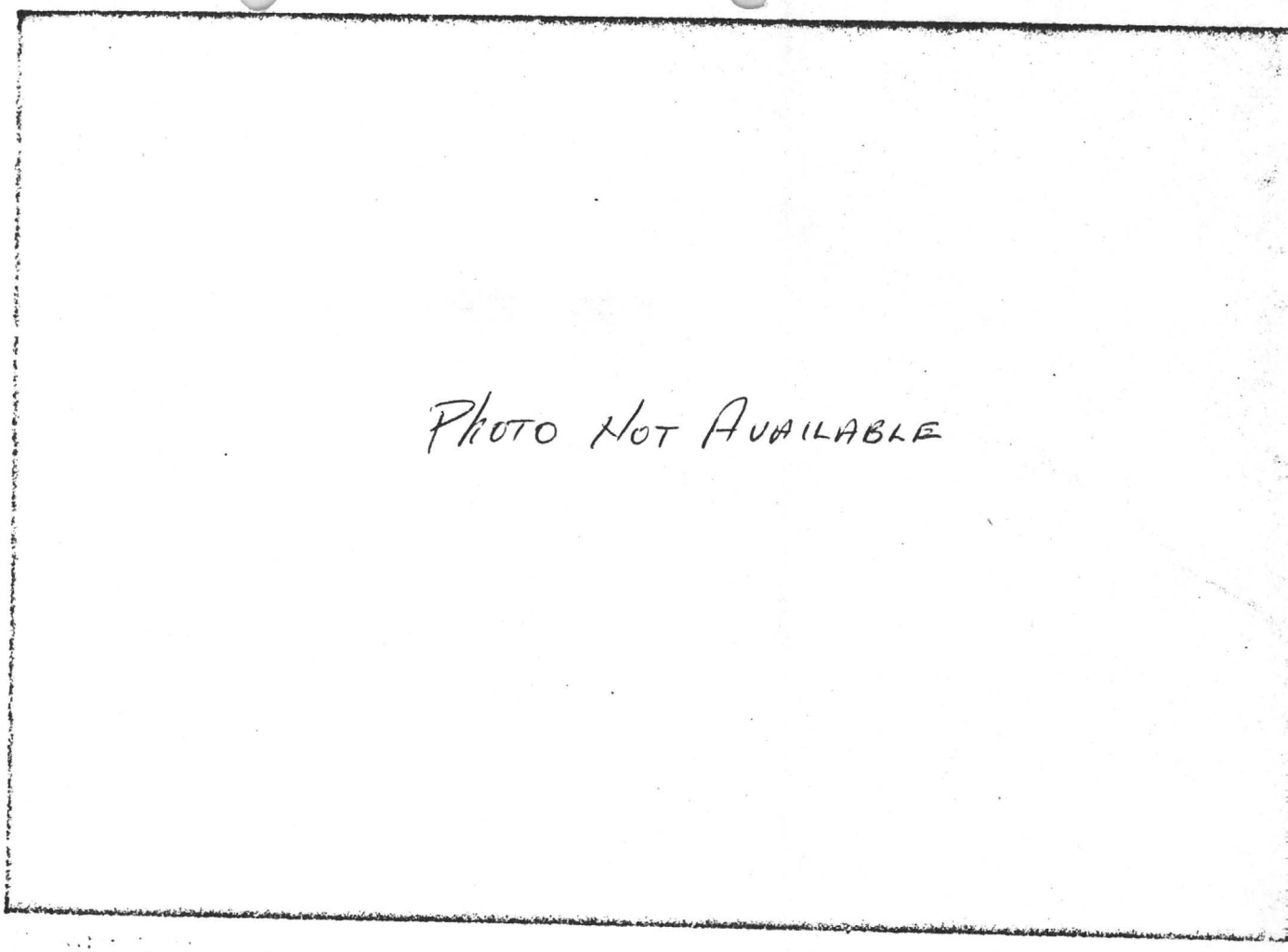
MOHAVE MINER PRINT

OFFICE NUMBER	OWNER'S MARK	GOLD, PER TON OUNCES	GOLD, PER TON VALUE	SILVER, PER TON OUNCES	SILVER, PER TON VALUE	TOTAL VALUE GOLD & SILVER	COPPER PER CENT	LEAD PER CENT	ZINC PER CENT
227	Panama #3 ft wall 10ft portal 10" wide floor	.03		1.6			.4	1.51	.8
228	Portal 30ft wide-hanging wall	Trace		18.0			3.9	6.50	
229	Cashier #6 dump at cross cut	.02		.7			.2	7.25	
230	Cashier #7 30ft portal cross cut	Trace		Trace			Trace	.6	
231	Upper Shaft	.02		8.0					
232	Panama #1 picked sample	Trace		34.8			.6	12.76	
	Aug. 16, 1955								
385	Cashier cross-cut 50 ft in #1	Trace		.50					
386	Cashier cross-cut 50 ft in #2	.16		7.50			.1	4.8	4.

GOLD $35 PER OUNCE

SILVER 90 CENTS PER OUNCE

Wm. L. Kern ASSAYER



OUTCROP OF THE ALPHA VEIN.

Looking southeast from the center of the New Years claim of the Cashier group, along the outcrop of the Alpha vein, showing the dumps of the Alpha mine in the central background from which many thousands of dollars worth of ore have been mined and shipped from this same vein according to production records published concerning this mine I believe and expect this vein will be cut by the proposed Cashier development tunnel.

ALPHA VEIN

Box #1 The Alpha vein is about 400 feet northerly from the Cashier vein and practically parallels it although trends more to the north, almost directly across the strike of the pre-Cambrian gneiss complex. Croppings are both prominent on the Cashier property and the patented Alpha estate to the east, as can readily be noticed in the above photograph. This vein being for the most part a prominent reef of black iron and manganese stained quartz. The vein varies in width from 4 to 30 feet, and consists principally of a gangue in which the ore occurs. The ore contains silver sulphide, pyrite and chalcopyrite. Another almost parallel vein to this Alpha vein outcrops a couple hundred feet northerly which has the same general character as this one. Both have a steep dip to the northeast. The latter vein apparently enters the old Summit property.

WEDGE VEIN

Note #1 The Wedge or Main working tunnel has been driven about 900 feet, of which 375 feet has been on the Wedge vein itself, exposing ore of a possible milling grade. The wedge vein has a west northwest strike with a dip ranging between 75 and 86 degrees to the northeast. This vein is several hundred feet southwesterly from the Ableman tunnel on the Cashier vein. According to the observed strike and dip of the wedge vein it is expected that it will coincide with the Cashier vein upon the Cashier property near its easterly endline, not far from the boundary of the Night Hawk mine.

Note #2 A short distance from the Cashier shaft to the southwest there is a marked quartz stringered blowout on the wedge vein tha would lead me to believe that there could be an ore body beneath the surface at this point. The present face of the main working tunnel is now in what is believed by me to be of a grade that will probably make milling ore and it just entering beneath this widened portion of the vein which would bear out the supposition mentioned above. An assay taken from this ore gives 5.44 ounces silver, 5.2% lead and 13.44% zinc together with a low percentage of copper. The ore is encountered over the whole face of the drift in three parallel streaks varying in width between 6 inches to 2 feet, with streaks of gangue material between 3 to 6 inches wide. Much water has been encountered at this place which is typical of ore bodies in the sulphide zone, in this district.

Between the Cashier vein and this Wedge vein there is another vein that outcrops prominently but on which there has been little prospecting.

DEVELOPMENT & ORE EXPOSURES

Note #3 As just stated the Wedge vein has been opened 375 feet by the present working tunnel. A 500 foot crosscut has been started toward the Cashier and Alpha veins as is recorded in the accompanying map. One hundred feet from the portal there has been some zinc ore exposed. This ore occurs in a lense about 60 feet long, and varying from 8 inches to 2½ feet in width carrying from 2 to 6 per cent zinc and a few ounces in silver according to mine records In places lead occurs in appreciable quantities. The ore shoot at the face of the tunnel has already been exposed for 40 feet carrying values in lead, zinc, silver and copper. There is a marked increase in the silica or quartz content where the ore occurs in this vein.

Note #4 The Ableman tunnel on the Cashier vein has been driven about 60 feet in a southeasterly direction along the vein at a shallow depth. Bert Ableman, the locator of this group, after whom this tunnel is named, made a shipment during December 1924, that had according to Mr. Ableman's records shown to me in 1927 and my belief "a gross value of $216 per ton from an underhand stope in the heading of this tunnel. The following month he made another small shipment that had a gross value of $64 per ton. Thes shipments were sent to the sampling works at Kingman. French and

Winters, two contractors and leasors, shipped 8 tons from this tunnel in the spring of 1925 that brought them $51 per ton. The values were in lead, silver, gold, and zinc." A selected sample from ores left on the dump gave assay returns of 35.72 ounces in silver, $16.71 in gold, 2.5% copper, 44.0% lead and 3.32% zinc, which checks the reported value of the shipments made from this tunnel.

One noticeable feature of the ore deposits in this tunne was that a horizontal bedding or "floor" of mica schist was found above each of the lead ore shoots.

Then there is the Cashier shaft on this same vein severa hundred feet to the southeast that is 85 feet deep. Jack Connelly who owned this claim between 45 and 55 years ago told me personal in 1924 that he sunk this shaft, from which he shipped a carload of ore that brought him $48 per ton even with an exceedingly low price for lead. The claim was then known as the Hasyampa. The companion claim which is now partially covered by the New Years claim, being the westerly extension of the Alpha vein was then known as the Sun Yan." There is today a 16 inch exposure of lead sulphide ore at the bottom of this shaft contained in a 3-1/2 foot face of lower grade ore of milling grade. A selected sample from the old dump gave in 1927 returns of $6.44 in gold, 23.00 ounces silver, 0.8% copper, 41.4% lead and 7.61% zinc.

For the most part the other openings on the property consist of location and assessment holes on the various veins whi have uncovered considerable ore of varying grade. In general the Cashier group lies in the heart of a mineralized area from which much ore has been extracted, but the development of the group itself has been neglected in the past, for the superficial work that has been done thus far has only scratched the veins. The showings thus far made have been good and the property, I believe has much promise in a mining way.

SHIPPING ORES TO CUSTOM PLANTS SUGGESTED

Until the time arrives when the development of the Cashi mining property uncovers an extent of ore of sufficient size to justify the expenditure necessary for constructing and equipping a milling plant of its own on the estate itself, it is preferable to mine, sort or select, and ship to custom milling plants or custom smelters, even though the ore responds to milling treatmen at a reasonable cost per ton. With present competition for ores b smelting plants and the more efficient operation of large custom milling plants as compared to small size plants, it will figure to your advantage to ship to those plants rather than consider the erection of a small plant on the Cashier mine group at this time.

ADVANTAGES OF SHIPPING TO CUSTOM PLANT

Advantages to be gained by shipping rather than constructing a small smelting or mill treatment plant on the Cashier mine group, may be summarized as follows:

(1) a large developed body of ore is not initially required.

(2) Initial plant cost, including development of considerable amounts of water, is not necessary.
(3) The risk involved in the proposition as a whole when no mill treatment plant or smelter is erected at the mine itself, is not as great, due to the smaller investment necessary.

ORE VALUE DETERMINED BY SHIPPING RETURNS

Note [1] C. D. (Blackie) McGovern, was mine superintendent in charge of underground operations at the Cashier mine during the 1938 activity and on the fifth of September 1955, personally told me that "the ore, taken from a 35 to 40 foot wing in the Cashier tunnel at about 740 feet from the portal, where they cut the Cashier Vein and the ore shoot uncovered above near the surface (see sketch map) in the Ableman Tunnel, contained an average of $68 in gold (Au) and silver (Ag) and 5 to 6 per cent lead (Pb) and from 2 to 4 per cent copper (Cu). On the Cashier tunnel level at this point they drifted in ore to the northwest on the Cashier vein about 35 to 40 feet. They also, at that time drifted southeast about 25 to 30 feet. The shipping grade ore average (according to McGovern) about 18 inches in width, although in places the width dropped to 4 and/or 5 inches in width. The mill grade ore varied from 26 inches to 38 inches in addition to the width of the shipping ore."

Note [2] Mr. McGovern also stated that "at 1,100 feet in from the tunnel portal the Alpha Vein was cut and a short drift run to the northwest about 18 feet, and about 12 feet to the southeast. Ore was extracted from these drifts and some underhand stopping to make up a shipment to the Keystone mill, then operating at Mineral Park, about 8 miles by road to the north of the Cashier Mi This ore contained $64 in gold and silver, a little lead, some zinc and a small amount of copper. The vein was similar in width to that of the Cashier Mine, both as to the higher grade streak an the milling grade ore, which they were not interested in mining at that time." Mr. M. B. Maxwell who had worked in the Cashier mine agreed with the statement made by Mr. McGovern.

The footage from the Cashier Tunnel portal of about 740 feet to the Cashier Vein corresponds closely with the 80 degree dip noted on the surface, although the recorded dip of the vein was 72 degrees at the point of contact. Also the 80 degree dip of the Alpha Vein would indicate that it would be encountered at near 1,100 feet from the tunnel portal (see sketches).

After careful calculations, and in keeping with the definitions of standard terms, relating to the metal mining industry, I have tabulated the resulting information, in the following, table. Note carefully the terminology and tonnage.

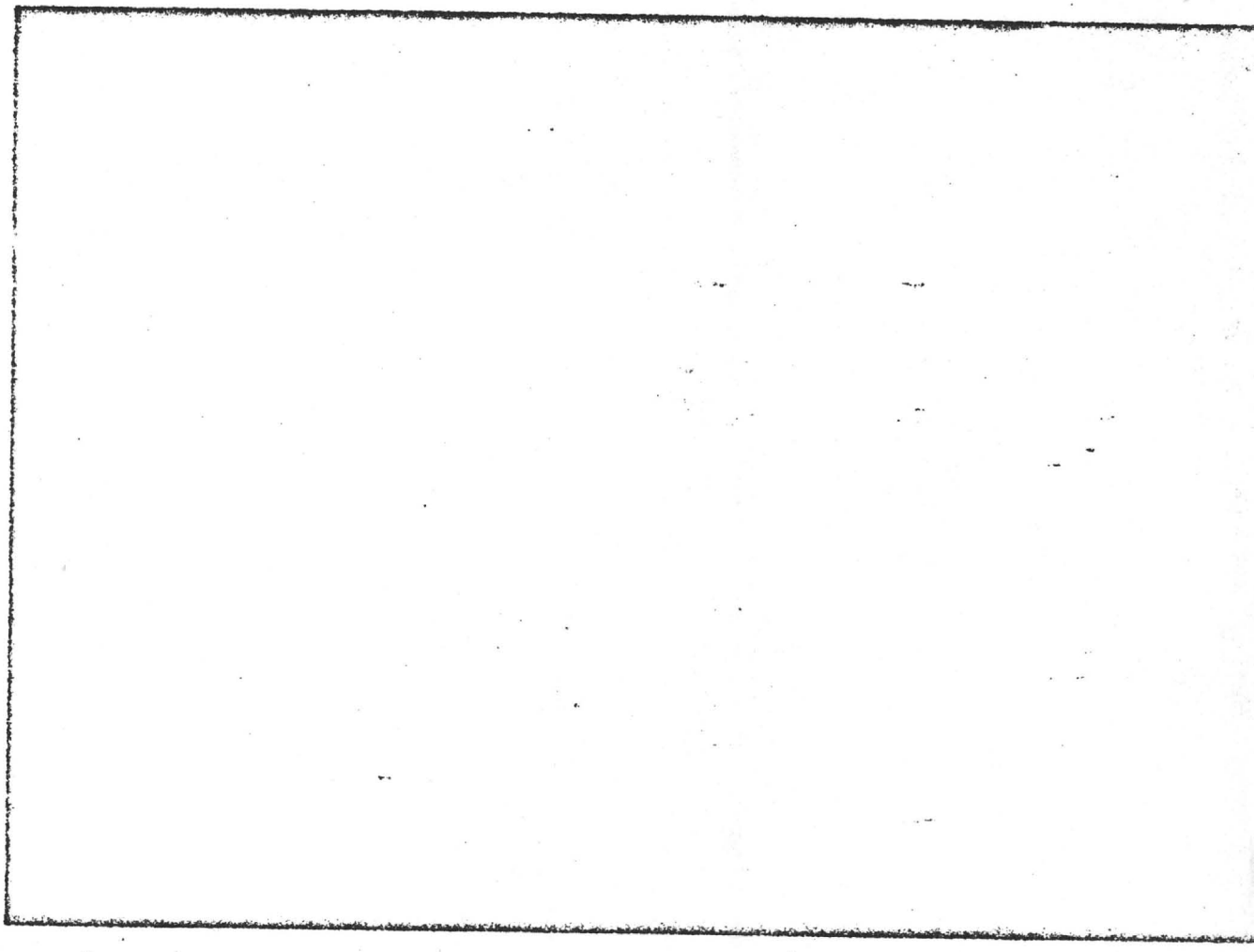
Tonnage estimates by E. Ross Hornbolder, E. M., Sept. 1958

Type of ore*	Name of vein or deposit area		Total
	Cashier vein	Alpha vein	
Probable Ore (A)	1,940	700	2,640
Additional Disclosed Material (A&B)	3,800	1,280	5,080
Total Proved Ore (A,B,C)	5,740	1,980	7,720
*See accompanying sketch vertical projection maps	**	**	**
Additional Possible ore	6,900	2,500	9,200
Total of ore in place	12,640	4,980	16,920

Based on the knowledge of the lead, zinc, copper sulphide deposits carrying gold and silver values in this area and mining district and the existing characteristics in evidence at this lead-zinc-copper with gold and silver mine property, I estimate and expect your future development of these deposits, will reasonably uncover an additional tonnage, hereby tabulated.

Additional ore expected	27,000	8,000	35,000
Total for all expectant ore	39,640	12,980	51,960

71-021-



AT THE PORTAL OF THE CASHIER TUNNEL

This shows a portion of the Big dump at the Main Workin Tunnel, and the track leading from the portal.

LOCATION & TRANSPORTATION

The Cashier group is located in the southwest portion o Township 23 North, Range 17 West, in the Wallapai Mining Distri in the Cerbat Mountain Range, Mohave County, Arizona, at an elevation ranging between 4000 and 4500 feet above sea level. The group is 2-3/4 miles in an easterly direction by haulage ro from the junction with Arizona State Highway U.S. 93 oil cake paved highway leading southeasterly into Kingman, the Mohave County seat, on the main line of the Atchison, Topeka & Santa F railroad; also the junction with Arizona State oil cake paved highway U.S. 66.

SUMMARY

After a careful preliminary examination of the six lode mining claims, comprising the estate of the Cashier group, located in the Hallapai Mining District, Mohave County, Arizona, it would seem to me that the indications on the property; such as the prominent vein exposures, whose characteristics are similar to the production veins of the district, the same general strike and dip of the veins to those in the geological formations recognized as favorable in which to expect commercial ore deposits in the district, and to the discovery of ore, of commercial grade, carrying a mineral content; indicated by the assay and shipping records mentioned above, warrants further exploration and development to open up the ore bodies believed by me to exist on the group, especially those on the Wedge, Cashier and Alpha veins, that have already exposed ore at or near the surface.

Because the ores of this mine already show a value as indicated above supplemented by a development program to explore and determine their extent have the possibility to prove profitable to the owners.

In going over this property and examining the large vein having widths up to 40 feet, and obtaining samples carrying from a few dollars up to better than $100 in values, supplemented by the favorable geological conditions, I was impressed with the possibilities of this property. It is my opinion that when these ore bodies have been opened up to several hundred feet in depth, supplemented with suitable lateral work, that it will prove to be one of the important mines of the district, as is attested by the persistent length and width of the outcrops and the type of deposition.

These veins are strong and well defined, and in my opinion there is no question as regards their permanency and continuity to a great depth. It can be expected that the base metals content will materially increase as the openings penetrate below the leached surface area. This has already been proven in the shallow openings already made. Then too, samples taken from the various openings on these veins, all carry encouraging values. This opinion is based also on my observation and knowledge of similar prospects that have become important producers in this area.

APPENDIX

A condensed description of ROCKS is here included, gleaned from pages 94 and 95 in Arizona Bureau of Miles Bulletin Vo;. VI, No. 6 (1935, by Dr. G. Montague Butler. In so far as any of these terms are used in this report, the definitions of such terms are intended to conform to the following data.

E. Ross Housholder

E. ROSS HOUSHOLDER, E.M.
Registered Professional Engineer #25

ROCKS

Five classesof rocks are generally recognized, namely: igneous, clastic, chemical precipitates, organic, and metamorphic. Each class may be briefly defined and described as follows:

IGNEOUS ROCKS

Igneous rocks are formed by the solidification of once molten earth material--magma. Three subdivisions of igneous rocks may be recognized, namely: plutonic, minor intrusive, and extrusive. Most igneous rocks are very hard when fresh.

PLUTONIC ROCKS: Such igneous rocks have usually cooled slowly far below the surface where the pressure is very high. They ordinarily occur in masses of great size, although relatively narrow dikes of some plutonic species, such as pegmatite, are common in some localities. Plutonic rocks are compact, composed of interlocked grains large enough to be seen with the unaided eyes, which consist of two or more ingrediants each of which may be readily recognized by a mineralogist, and, with very rare exceptions, the more plentiful ingredients do occur in well-formed crystals.

MINOR INTRUSIVE ROCKS: Such igneous rocks are formed from magma that has risen toward the surface of the earth through cracks (forming dikes) or has spread between layers of earth material (forming sills, etc.) Part, at least, of the ingredients are forced to crystallize with relative rapidity when the magma comes in contact with cool earth material (resulting in fineness of grain) and, although the pressure on the solidifying magma averages less than on plutonic magmas, it is still relatively great, so the resulting rock is compact. All of the ingredients of some of the minor intrusive rocks are so small that none of them may be identified or even seen with the unaided eyes, but, typically, these rocks show well-formed crystals of one or two minerals embedded in a finer groundmass.

EXTRUSIVE ROCKS: Such igneous rocks have solidified on or relatively close to the surface of the earth and occur typically in surface flows, volcanic necks, and dikes. Otherwise, but the latter are frequently porous, are more commonly composed of lava glass (obsidian), and they are sometimes banded (show flow texture).

E. Ross Housholder

CLASTIC ROCKS

Clastic rocks are composed of fragments of other rocks, produced by weathering or mechanical disintegration. The fragments may be several inches or feet in diameter (conglomerates and breccias), much smaller, but visible to the unaided eyes (arkose, grit, and sandstone), or microscopic (shale, clay, and some limestone). The fragments may be transported by wind and water and are usually stratified (laid down in distinct layers), especially if finally deposited in water, when they are called sediments or sedimentary rocks. The fragments are often eventually cemented together more or less firmly, but all degrees of hardness are found in clastic rocks. Such rocks contain shells or other remains of organisms (fossils).

CHEMICAL PRECIPITATE ROCKS

Chemical precipitate rocks are composed of material deposited by precipitation from water solutions, usually as the result of evaporation. The precipitate rocks are commonly interbedded with sediments that were washed into the evaporating body of water. Rock salt and gypsum are illustrations of this type of rock.

ORGANIC ROCKS

Organic rocks are composed of

(1) Material secreted or deposited by animals or plants, or

(2) Made up of animal or plant remains.

Illustrations are some limestone and coal.

METAMORPHIC ROCKS

Metamorphic rocks are made up of other rocks that have been changed in appearance or composition, or both, by pressure, heat, or solutions that have percolated through them. Two types are recognized, namely: regional or dynamometamorphic rocks and contact or thermometamorphic rocks.

REGIONAL OR DYNAMOMETAMORPHIC ROCKS: Such rocks are composed of earth material that has been deeply buried and, therefore, subjected to enormous pressure and some heat. Such rocks are often banded, hard, and composed of interlocked grains visible to the unaided eyes. They cometimes contain well-formed crystals. Illustrations are mica schist, gneiss, slate, quartzite, and some marble.

CONTACT OR THERMOMETAMORPHIC ROCKS: Such rocks are composed of material that has been changed and often baked by the heat of intrusions of molten magma and by the chemically active solutions expelled by such magma as they cool. Illustrations are garnet and epidote rocks.

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DESCRIPTION OF ROCK SPECIES MENTIONED IN THIS REPORT

ALASKITE: A granular plutonic igneous rock composed almost entirely of the relatively light colored minerals, quartz and feldspar. Like granite (which see), but lacking dark colored constituents.

ANDESITE: An extrusive igneous rock that usually contains glassy, light colored, plagioclase feldspar crystals in a darker colored, fine-grained groundmass. Does not contain visible quartz, but may contain black hornblende or black augite pyroxene crystals. The groundmass may be porous and the rock then has a very rough texture.

BASALT (MALPAIS): An extrusive igneous rock that often contains small, black crystals of pyroxene or dark green or brown crystals of olivine in a somewhat lighter colored groundmass in which may be imbedded, however, numerous small, very slender, glassy plagioclase feldspar crystals. Usually very dark colored and relatively heavy and frequently decidedly porous.

BRECCIA: A clastic rock that is composed of angular broken fragments of other rock, more or less fiemly cemented together. The fragments are often large, and must exceed 1/8 inch in diameter.

CONGLOMERATE: A clastic rock that is composed of large, rounded fragments of other rock more or less firmly cemented together; otherwise like a breccia (which see).

DIABASE: A minor intrusive igneous rock that shows numerous slender, dull or stony lustered, usually white plagioclase feldspar crystals, pointing in all directions, imbedded in a dark colored (often black on fresh surfaces) groundmass that is composed of pyroxene.

DIORITE: A plutonic igneous rock like granite (which see) in texture, but it contains no visible quartz and is usually predominantly composed of white plagioclase feldspar and black hornblende.

GABBRO: A plutonic igneous rock like granite (which see) in texture, but it contains no quartz and is usually predominantly composed of dark colored pyroxene and lesser amounts of white or light green plagioclase feldspar.

GNEISS: A regional metamorphic rock usually associated with other schists and much like granite (which see) in composition. In fact small specimens cannot always be distinguished from granite, but the rock is plainly banded when seen in the field, and white mica (muscovite) is a very common constituent.

GRANITE: A plutonic igneous rock that consists essentially of pinkish to white orthoclase feldspar and quartz, but mica, especially black mica (biotite), is a common constituent and other and other minerals may be present in subordinate amounts.

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LIMESTONE: A rock composed essentially of carbonate of lime which dissolves with the emission of bubbles when a drop of dilute or concentrated muriatic acid is placed upon it. Depending upon its origin it may be either a clastic or an organic rock or a chemical precipitate. Most limestones are finely granular and light colored. They are often flint-like in appearance when freshly broken. They may contain fossils which are usually composed of quartz.

MARBLE: A regional or contact metamorphic rock that is formed from limestone and has the same composition as limestone, but it is rather coarsely granular so that the individual grains, which are usually glassy, and have the perfect cleavage of calcite (which see), are visible to the unaided eyes.

MONZONITE: A plutonic igneaur rock like diorite (which see), but it contains both orthoclase (often pinkish in color) and plagioclase (often white or greenish in color) feldspar.

PEGMATITE: A plutonic igneous rock that occurs in dikes and is much like granite (which see) in texture and composition, but the individual grains or crystals are very large (often several inches long, or larger), and white mica (muscovite) is a much commoner constituent than black mica (biotite). May contain beryl, topaz, tourmaline, and even rarer minerals.

PERIDOTITE: A basic plutonic rock that is usually dark colored and relatively heavy. It contains no feldspar or quartz. Dark brown or green pyroxene (hypersthene, enstatite, or diallage) and olivine are the most plentiful ingredients, but it may also contain magnetite, chronite, and pyrrhotite.

PHONOLITE: An extrusive igneous rock, sometimes has a somewhat greasy luster, occurs in various tints of dull green, gray, and brown, and shows few easily identifiable minerals other than small, scanty crystals of glassy feldspar and, sometimes, numerous very thin, slender black crystals of aegerite pyroxene. One peculiarity of these rocks is that thin slabs, when suspended or held in proper way and struck with a hammer or pick, ring like a bell, hence the name, from two Greek words meaning "sound" or "tone" and "stone." Usually formed when the phonolite breaks as a molten lava up through crater fillings, and quickly solidifies in the form of dikes. Phonolite can rarely be recognized with certainty by other means than a microscopic examination of a thin section. Its presence does not necessarily indicate the near presence of any particular metal or mineral.

PORPHYRY: A minor intrusive igneous rock that, typically, shows well-formed crystals of light colored, stony lustered orthoclase feldspar, and, more rarely, quartz in a dense, fine-grained groundmass.

QUARTZITE: A regional metamorphic rock formed from sandstone. The openings between the grains in the sandstone have been filled with quartz and the resulting rock is very dense.

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SANDSTONE: A clastic rock that is composed of grains of other substances, usually largely or almost entirely quartz, which are more or less firmly cemented by silica, calcium carbonate, iron oxide, or some other substance. The individual grains are visible to unaided eyes and are of the size of coarse granulated sugar, or smaller.

SCHIST: A regional metamorphic rock that has, typically, a banded (schistose) texture and often breaks readily along the bands. There are many varieties, such as mica schist, tremolite schist, etc., each being usually named by prefixing the name of the most prominent mineral or minerals.

SERPENTINE: A rock formed by the alteration of very basic igneous rocks like peridotite (which see). It is usually soft enough to be easily scratched with a knife, has a somewhat waxy or greasy luster, feels smooth, breaks with a smoothly curving fracture, is most often some shade of green (commonly dark) in color, and light may frequently be seen through thin edges.

SHALE: A clastic rock made of layers (often as thin as cardboard, or thinner) or particles, too small to be visible to unaided eyes, of various hydrous aluminum silicates (of which kaolinite is one), quartz and other impurities. It is usually soft, smells like clay, especially when moistened, and breaks along the layers. The color is usually brown or gray.

SLATE: A regional metamorphic rock like shale in composition but much harder. It breaks into strong, thin sheets perpendicular to the pressure that produced it and the color is most frequently black

SYENITE: A plutonic igneous rock like granite (which see), but it contains no visible quartz and black hornblende is more often present than is black mica.

RHYOLITE: An extrusive igneous rock that is usually light colored and relatively light in weight. It often contains glassy, colorless or white orthoclase feldspar crystals and, less frequently, quartz crystals imbedded in a fine grained groundmass that often feels rough. It sometimes shows flow texture (is banded) and may be glassy (obsidian). When it is very finely porpus and contains no grains of minerals visible to unaided eyes, it is called pumice.

TRACHYTE: Exactly like rhyolite (which see), but no quartz, or practically none, is visible even in thin sections under the compoun microscope. It cannot usually be distinguished from rhyolite in the field.

TUFF: Composed mostly of the fine material (particles of volcanic glass) called volcanic ash that is thrown into the air during volcanic eruptions. It is usually white or light tinted, porous, light in weight, and soft. It feels rough and commonly contains angular fragments of extrusive rocks.

VOLCANIC BRECCIA: A breccia (which see) that contains numerous angular fragments of extrusive rocks.

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References to publications

The following list of publications and sources of information, used as part of the references in compilling this report, is here included for the information of those who may be interested.

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GEOLOGY OF THE LAKE SPRINGS SECTION

The country rock is the pre-Cambrian granite, gneiss, and schist complex. It is intruded by dikes of minette, granite, granite porphyry, rhyolite and other rocks, some of which are associated with workable veins and are too greatly sericitized for determination. The complex is also flanked on the west by masses of Tertiary volcanic rocks, principally rhyolite.

The veins for the most part are regular and persistent wit well defined walls. They occur chiefly in the pre-Cambrian granitic fissures. Oxidation has altered the upper part to a depth ranging from 50 to 300 feet, and this oxidized zone changes to the primary ore within a vertical range of 10 to 40 feet. At the present time operators utilize the sulphide ores. The old time miners were unable to market the sulphide ores at a profit such as has been mined during the past several decades in the district. Only the oxidized and secondary enriched ores were they able to treat and ship. Therefore today there are mines being developed which may be capable of important production. The veins have suffered great erosion, and their mode of occurrence leads to the belief that they were deposited at comparatively great depths by hot circulating waters.

GEOLOGY AND VEINS OF THE CASHIER GROUP

The geology of the Cashier group corresponds to that of the district. The country rock is pre-Cambrian gneiss, extensively intruded by granite porphyry. In the shallow underground workings the granite porphyry seems to be associated with the veins and is finer grained than the outcrops. There are evidences of five major veins on this property, together with smaller ones that will bear investigation as the development of the mine proceeds.

CASHIER VEIN

The Cashier vein is in the central part of the group. It might be well to here record that Bert Ableman, a former owner of this mine group in 1927 told me personally that "a good tonnage of heavy lead ore has been extracted from its workings, especially from the 85 foot shaft, known as the Cashier shaft," which is within 500 feet of the westerly endline of the Night Hawk mine, and from the Ableman tunnel. This vein has a northwestward strike and the similar dip as the Night Hawk vein, of which it is undoubtedly the western extension. It is a large vein dipping to the northeast between 70 and 80 degrees. It contains sulphide ores of lead, silver, zinc and gold, and in places carrying some copper. Some of the present workings are many feet below the grass roots. The ore shoots that have been exposed, I believe however, have promise to become producers, following an intelligent development program. Based on his office records in 1927, Bert Ableman told me personall that "the ores thus far shipped from the Cashier vein ranged betwee $48 and $200 per ton."

DUVAL CORPORATION – EXPLORATION DEPT.

CHICO MINES

GEOLOGIC SKETCH MAP

DRAWN BY	DRAWN BY	DATE
J.W.	J.W.	8/26/68

1000' 0' 1000' 2000'

STATE: ARIZONA
COUNTY: MOHAVE
TOWNSHIP, RANGE: T 23 N, R 17 W
MAP NO.: B-2427
PLATE 5