CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
1520 West Adams St.
Phoenix, AZ 85007
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

The following file is part of the

Arizona Department of Mines and Mineral Resources Mining Collection

ACCESS STATEMENT

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

CONSTRAINTS STATEMENT

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

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

QUALITY STATEMENT

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

PRINTED: 01-06-2011

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: GUNSIGHT MINE

ALTERNATE NAMES:
SILVER GIRT
BURRO BURRO

PIMA COUNTY MILS NUMBER: 150

LOCATION: TOWNSHIP 14 S RANGE 4 W SECTION 16 QUARTER C
LATITUDE: N 32DEG 12MIN 27SEC LONGITUDE: W 112DEG 41MIN 05SEC
TOPO MAP NAME: MT AJO - 15 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
LEAD
SILVER
ZINC
COPPER
GOLD LODE
BARIUM WITHERITE

BIBLIOGRAPHY:
S.B. KEITH, AZBM BULL. 189, P. 122, 1974
ADMMR GUNSIGHT MINE FILE
ELEVATORSKI,E.A.,1978, AZ INDUSTRIAL MINERALS
ADMMR MINERAL REPORT NO. 2, P. 49.

10-23-69

Memo from

JERRY W. IRVIN
Field Engineer
Department of Mineral Resources
STATE OFFICE BUILDING, TUCSON, ARIZONA

TO: L.P. about C F & I Steel Corp.

J. Brooks reports that they have dropped their project (Sunnyside Mine) near Ajo. That the owners were ruled out by the government examiner

Do you want to answer enclosed letter.

(will be on field trips in December). would be glad to help him.

G.I

Sam

July 6

J.G. Butler owner of the "Gunsight" mine 17 miles So. East of Ajo in Pima County. Principal Product- Lead,

Wants to lease the mine, sell or what have you. Says "Send some one to me - please.

MEB

GUNSIGHT

Ag, Au, Pb

Pima 10 - 3 T 14 S, R 4 W

J. G. Butler, Box 216, Ajo '43

TAKEN FROM The Mineral Economics Corporation Annual Report November 10, 1982

GUNSIGHT MINE, Pima County, Arizona (66%)

The Gunsight Mine consists of 14 patented mining claims, located in the Gunsight Mining District, Pima County, Arizona. The property is owned by the Gunsight Mining Corporation, of which MEC owns 66 % of the issued and outstanding stock.

Arizona Bureau of Mines Bulletin 189, about the Gunsight Mine, states: "Shaft and tunnel workings. Prospected as early as 1870's and reportedly produced some 15,000 tons of $40/T Pb-Ag ore in 1881-1884. Sporadic production of some 120 tons of ore averaging 22% Pb, 5 oz. Ag/T and (one) oz/Au/T since 1918. . ."

H.E. Nelson, P.E., estimates that the minimum 1880's production at 1979 prices for the Gunsight Mine would be well over $600,000, and that the potential tonnage of the Gunsight vein system is 2,468,869 tons, which would represent $139,614,540, if one uses $56.55/ton (the recoverable value of the remnants of the ore produced during the 1880's). This figure should be low, however, because it is based upon samples taken of the ore that the miners left behind (being, in their judgment, too low grade to mine) during the 1880's production.

GUNSIGHT MINE PIMA

Arizona Mining Journal, June 1918, p. 36
" " " , Dec. 1918, p. 20
" " " , April 1919, p. 25

See: Mineral Economics Corporation (file) November 25, 1981 Annual Report to Stockholders.

1. Gunsight Mine
2. Papago Indian [illegible] vation, Pima County, Arizona
3. Mr. J. G. Butler, Owner
4. Messrs. Hermon and Stone
5. Sometime in April, 1947
6. The veins are composed of quartz, barite, and calcite with occasional pockets, seams or narrow veins of galena.
7. There appears to be little chance of discovery of ore shoots of attractive size.
8. ———

* * * * *

NUMBER	FILE	CONT	CONT1	PRINAME
150	**F**	**0**	**N**	**GUNSIGHT MINE**

ALTNAME1	ALTNAME2
ALTNAME3	ALTNAME4
ALTNAME5	ALTNAME6

CURSTAT	MNAME	NLATDEG	NLATMIN
PAST PRODUCER	**MT AJO - 15 MIN**	**32**	**12**

NLATSEC	WLONGDEG	WLONGMIN	WLONGSEC	TOWN	RANGE	SECTION	QUARTER	COM1
27	**112**	**41**	**05**	**14 S**	**4 W**	**16**	**C**	**PB**

MODI1	COM2	MODI2	COM3	MODI3	COM4	MODI4
	AG		**ZN**		**CU**	

COM5	MODI5	COM6	MODI6	COM7	MODI7
AU	**LODE**	**BA**	**WITHERITE**		

BIB1
S.B. KEITH, AZBM BULL. 189, P. 122, 1974
BIB2
ADMMR GUNSIGHT MINE FILE
BIB3
ELEVATORSKI,E.A.,1978, AZ INDUSTRIAL MINERALS
BIB4
ADMMR MINERAL REPORT NO. 2, P. 49.

GUNSIGHT MINE PIMA COUNTY

MG WR 4/29/88: Discussed attempt by Mr. H. Tognoni (card) to sell organ pipe cactus from his Gunsite patented claim group (file) Pima County with representatives of the State Agriculture Department. The Agriculture Department is reluctant to issue permits for removal of this rare cactus unless removal is required for specific mining (or other legitimate) purposes.

GUNSIGHT MINE PIMA COUNTY

Active Mine List April 1968 - Expl.
Active Mine List Oct. 1968 - Expl.

Mr. Jim Brooks of CF&I Steel Corp. told me they are continually drilling the Gunsight properties. GBG WR 2-7-69

Active Mine List April 1969 - Expl. - James R. Brooks, Geol.

Visited the Gunsight mine - CF&I has left. FPK WR 6-4-69

There is no activity at the Gunsight mine. GW WR 4-18-73

GUNSIGHT MINE [redacted] PIMA COUNTY

It was reported that big things had been expected from the Gunsight Mine in the reservation, after the spread in the Arizona Republic last Nov. 23, but that nothing has come of it, as there apparently has been a falling out over procedures between Mr. Lawrence J. Sheehan, the owner and Mr. Hale Tognoni, his agent.

Called Mr. Hale Tognoni and Mr. Larry Sheehan, to get the latest information on that property. It was leased by C.F&I Co/ early this year. they are remapping and sampling the mine and plan on drilling it soon. Department of the Interior is trying to have their unpatented claims invalidated.

CLH WR 4/13/68

GUNSIGHT MINE

Do Not Reproduce

PIMA CO.
GUNSIGHT HILLS

Hale Tognoni reported that Superior Oil Co. geologists had examined the Gunsight Mine and had asked for a lease-option proposition. It was suggested that it would be advisable to keep the down payment, or earnest money, low and ask for so much money if they should take up the option.

WR - LAS - 9-18-64

Conference with Lawrence Sheehan, 12/6/64

Mr. Sheehan reported that Kennecott (Bear Creek) and Phelps Dodge plan to examine the Gunsight Claims. Two areas appear to be of most interest (a) Immediately N of the old Gunsight mining area. (b) A new area, 1 mile long by - ½ to 3/4 mile wide, that lies about 1 mile of the mine workings. Both areas show strong limonite and a good fracture pattern. Geochemical test in the southern area predominently show Fluorite, copper and zinc with local spots of tungsten. At the Gunsight Mine the vein gangue was mostly barite for at least 200' down. It is probable that the barite may give way to fluorite in depth. The richer barite lead-silver ores were associated with lead-silver ores that appear to be later than the copper-zinc-fluorite type to the south. The Gunsight Shaft collar is considerably higher in elevation than the south area. The area north of the shaft showed lead and some zinc, by geochemical tests, but little copper. This area, while 50-100 ft. lower than the shaft collar, is also considerably higher than the south area. Limonite in the north area is locally prevalent and this indicates some copper (possibly from chalcopyrite) with fairly strong pyrite. Oxide copper minerals are very sparse and the gangue except locally is essentially non-reactive. The limonite is more concentrated along certain of the stronger fractures.

MEMO LAS 12/7/64

Conference with Hale Tognoni 4/9/65.

Hale Tognoni said that Phelps Dodge is reexamining the Gunsight Mine area.

MEMO LAS 4/9/65

Mr. C. B. Sheehan, 2008 W. Missouri Avenue, Phoenix, Arizona called and said that at present Kerr-McGee was looking at the Gunsight Mine, SW of Ajo.

LAS WR 10/22/65

L. J. Sheehan, Gunsight Mining Co. reported that Kennecott (Bear Creek Mining Co.) had run about 30 geophysical survey sections (I.P. and M S types) across the Gunsight Mine area, but had not yet rendered a report of any sort. He also stated that J. R. Brooks, C. F. & I. Field Engineer had examined the property and wants to do some prospect drilling.

LAS WR 1/18/67

J. C. Sheehan phoned to report that he had visited the Gunsight mine area and someone had run three grophysical lines across part of the claims. Prior to this Bear Creek Mining Co. (Kennecott) had 37-38 lines across the claims but had not sent a report. He also reported that American Zinc Co. had drilled a test hole 3/4 mile southwest of the Gunsight and had another in progress 1 miles further Southwest.

LAS WR 1/20/67

GUNSIGHT MINE [redacted] GUNSIGHT HILLS DISTRICT
PIMA COUNTY

Interview with Hale Tognoni, Agent for Gunsight Mining Co. 1/9/64.

Tognoni reported that $15,000 will be spent for electric surveys, now starting, to see if anomalies are present. He favors the area south of the old Gunsight Mine. In this area granitic rocks, partly granite and partly monzonite are cut by basic dikes (probably basaltic or a basic andesite). Fluorite was found to be fairly prevalent, whereas the Gunsight vein gangue is barite. Due to the lower elevation of most of the fluorite showings, he figured that the barite may give way to fluorite, in depth, in the Gunsight vein, a condition that often occurs elsewhere. Three electric survey lines are contemplated and these are calculated to pretty well blanket the 42 claim area. Particular emphasis will be given to an iron stained area that occupies the southeast protion. Donald Nelson, ex-Anaconda Geologist reported on the claims and recommends this area for prospecting. Other Geologists, who have seen the claims, also consider this area as possible for deeper copper.

MEMO LEWIS A. SMITH 1/9/64

GUNSIGHT MINE Do Not Reproduce PIMA COUNTY
GUNSIGHT DIST.

Interview with Hale Tognoni, 4-3-63.

Hale Tognoni reports that the Gunsight, Burro-Burro, and the Sheehan Bros.claims have been consolidated into a group of 37 claims, under a new company - The Gunsight Mining Co. Geological mapping is now being done by Gene Nelson, a consultant, out of Las Vegas, Nevada. Seventy general samples have been taken across the claims in cuts and these show several veins which appear to contain the best values. So far appreciable quantities of Copper, Lead, Zinc and Molybdenite have been found. Generally the samples show from 0.1 to 0.95 percent copper, .001 to .006 percent molybdenum, up to 4.19 percent lead and 0.09 up to 1.78 percent zinc. It is probably that some geophysical work will now be undertaken. The problem, it appears, is to determine the worth of the material between the veins.

MEMO LAS 4-3-63

MEMO

GUNSIGHT MINE

PIMA COUNTY
GUNSIGHT HILLS (Meyers) Dist.

Mr. Bacon stated that he had gone over the accessible portion of the Gunsight workings and could see very few places where lead ore was present. He found a few groups of narrow lead stringers containing galena, anglesite and some wulfenite. The strings in a couple of cases widened to small kidneys. The gangue in these places was a mixture of quartz, barite, and probably a little fluorite. The wall rock is granite with a tendency to locally change to what appeared to be monzonite.

Two veins, the Silver Girt and the Gunsight are transverse to each other and apparently intersect west and south of the tunnel which is 200 feet southwest of the main shaft. The Silver Girt vein strikes N10 degrees E. and dips eastward at about 60 degrees. It is traceable for about 600 feet. No production apparent was obtained from it. The Gunsight vein strikes variably, ranging from N70-75 degrees E on the westend, and N45-50 degrees E further to the E. It is traceable for about 300 feet. This vein is vertical in the Glory Hole area, but flattens to 72 degrees N on the west end.

Vance Bacon stated that a strongly iron impregnated area along the north half Silver Girt vein exposure may indicate possible copper mineralization. The area, as exposed was relatively small, but it plunges under alluvium on the west and could, therefore, be more extensive.

The appearance of fluorite in depth is characteristic of several barite deposits and this could indicate the possible presence of copper rather than lead-silver in depth, due to a shift in the temperature of deposition.

Three-fourths of a mile south of the Gunsight workings is a large area of strong iron oxide impregnated granitic rock which Bacon states is good copper capping and should be drilled. A similar area 1 mile southeast of the Gunsight workings, apparently is a continuation of the first area. An alluvium mantle covers the intervening area. Both iron-capped areas are sheared and the trend of the shears in both areas is similar. If the two areas are connected under the alluvium, the composite area would be extensive. The gossan area extends into the Galena Claims owned by the Sheehan family.

Bacon said his company could do nothing until litigation is resolved. The property lines are doubtful also even though the 13 claims are patented. The Sheehans are sueing for part interest in Gunsight, and have 3 sets of bordering unpatented claims comprising the Galena, Surprise and Cashier groups, each group consisting of 6 claims.

LEWIS A. SMITH - MEMO- Interview with Vance Bacon, engineer for Dynamics Research, Phoenix - 6-5-62

GUNSIGHT MINE

PIMA COUNTY
GUNSIGHT DIST.

Lawrence W. Sheehan, Advance Roofing & Supply Co., 4114 N. 20th St., Phoenix, called and stated that his brother, C. B. Sheehan and he controlled 80 per cent of the Gunsight Mine, Pima Co., Concrete & Concrete Extension and 1 Exchange claim in the Ajo Dist., Pima Co. The Gunsight is in litigation at present, being contested by Mrs. Margaret Griffin of Stockton, Calif.

LEWIS A. SMITH, Weekly Report - 3-30-62

Vance Bacon looked over the Gunsight Mine and stated that this property contains 12 patented claims. The stope sides and bottom in places still contain good showings of barite containing galena and barite. Some oxidized portions contain limonite, with wulfenite and probably cerargyrite and anglesite. The property is in litigation at present between Mrs. Griffin and the Sheehan brothers. Vance felt that the mine was worth some further prospecting once the litigation is resolved.

Lewis A. Smith
Interview with Vance Bacon, engineer for Dynamics Research Corp, 6-5-62

Vance Bacon, Engineer for the Dynamics Research, Inc., stated that he had visited the Gunsight Mine and that the property now consisted of 12 patented claims, now under litigation. He said that the open workings down to the adit level had showings of barite with galena partly oxidized to wulfenite, anglesite, and mimetite. He felt that a heavily iron stained area north of the present workings and adjacent to a crossfault might be prospectable. A second area 3/4 mile south of the workings has 200 feet in width of good iron gossan. This same gossan shows up about 1 mile southeast of the mine. Vance thinks these two are part of a substantial mineralized zone. However, his group would not do anything until the litigation is resolved. The lead-silver barite mineralization in the Gunsight is apt to be shallow since most such veins in Arizona have proven so. However, this tendency does not prevent deeper copper mineralization. The principal country rock, in which the gossans occur, is monzonite or quartz monzonite.

LEWIS A. SMITH - Interviews with Vance Bacon, 6-5-62 and 6-7-62.

GUNSIGHT MINE
Gunsight District
Pima County, Arizona.

File: 32-112-1-3

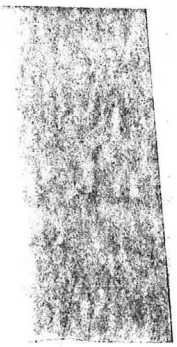
The Gunsight Mine is located 17 miles from Ajo at a point about 1.5 miles south of the Tucson-Ajo paved highway.

Geology:

The property shows several veins at the surface, two nearly paralell ones that strike northeast and dip steeply NW, and a third vein that strikes N-NE and dips easterly at about 55 degrees. The latter vein is only about 1.5 to 3 feet wide where observed. The relation of the three veins is illustrated in the sketch cross-section. The middle vein or hanging wall member of the west dipping pair is the one that has been stoped. At the surface the open stope shows widths from 3 feet to a maximum of about 15 feet. The average is about 7 or 8 feet. The length is about 125 feet at the surface but the stope shortens downward from both ends. Observed from the tunnel level, the vein appears to have been doubled in width in places by a thin gougy fault. In a small level off the winze about 40 feet below the tunnel an east dipping structure and vein joins, and apparently terminates on the west dipping vein. On the second level off the winze (about 80 feet below the tunnel level) the two west dipping veins join. These are about 20 feet apart on the tunnel level near the collar of the winze. An ore shoot was formed at their junction. A vein apparently new, appears just in the hanging wall on or above this level but it and the main vein are apparently one on the main level about 160 feet below the tunnel level. The vein zone there is about 16 feet wide, 80 feet NE of the winze but shows very little valuable mineralization. A small stope was started near this point on the best section but was stoppef after one or two cuts. This level connects with the main vertical shaft three compartment shaft at the head of the mill. This shaft has been burned out but the rock walls are good.

At the surface the ore shoot is apparently localized on a swing in strike to the left, going southwesterly. On the lower level entered, about 160 feet below the tunnel level the vein strike is more nearly E-NE except for a 60 foot length from the winze southwest.

The veins are of the type commonly found in lavas, but at the Gunsight are in granite well below the [illegible]. The veins are banded



1. Gunsight Mine
2. Papago Indian Reservation, Pima County, Arizona
3. Mr. J. G. Butler, Owner
4. Messrs. Hernon and Stone
5. Sometime in April, 1947
6. The veins are composed of quartz, barite, and calcite with occasional pockets, seams or narrow veins of galena.
7. There appears to be little chance of discovery of ore shoots of attractive size.
8. ———

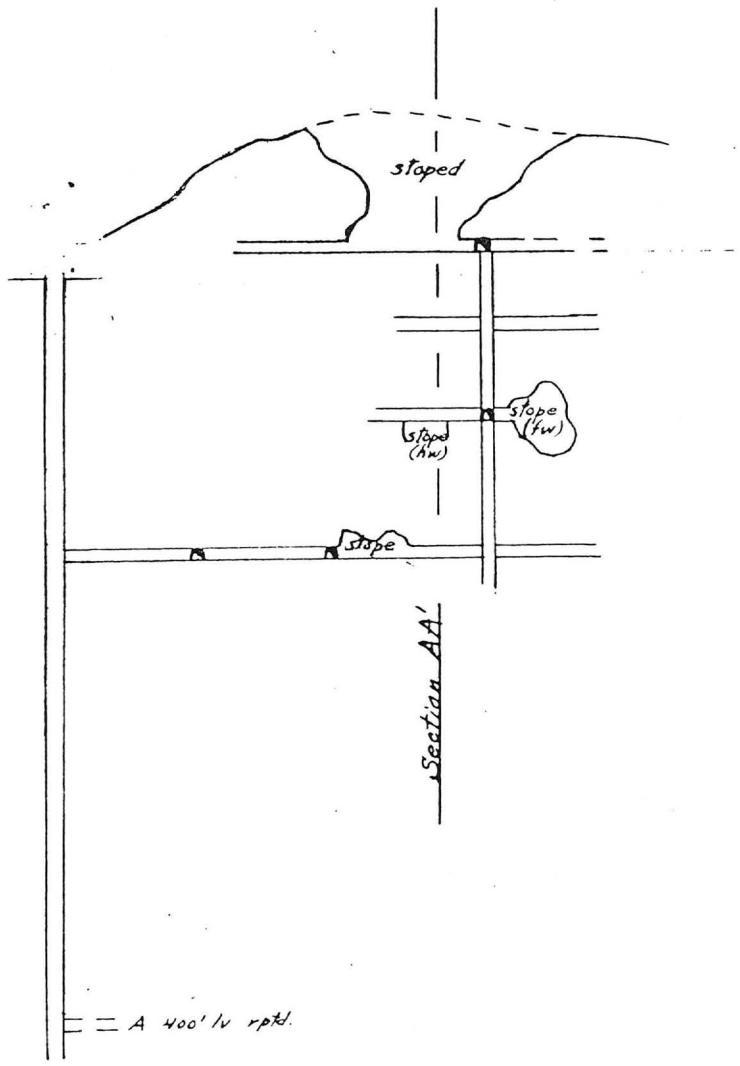
Development below the 160 level was not seen but the main vertical shaft is supposed to be over 400 feet deep and a 400 level was driven. The development observed adequately tested the vein and crosscut the walls.

There appears to be little chance of discovery of oreshoots of attractive size.

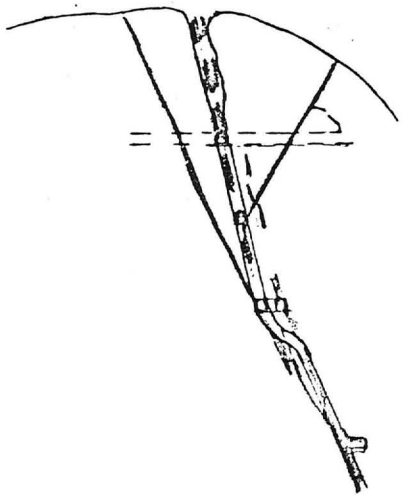
April 1947.

Hernon and Stone

Longitudinal Section
Looking SE



Section A-A'
Looking SW



SKETCH SECTIONS
GUNSIGHT MINE
PIMA CO. ARIZONA
1" = 100' 4/3/47

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine GUNSIGHT MINE

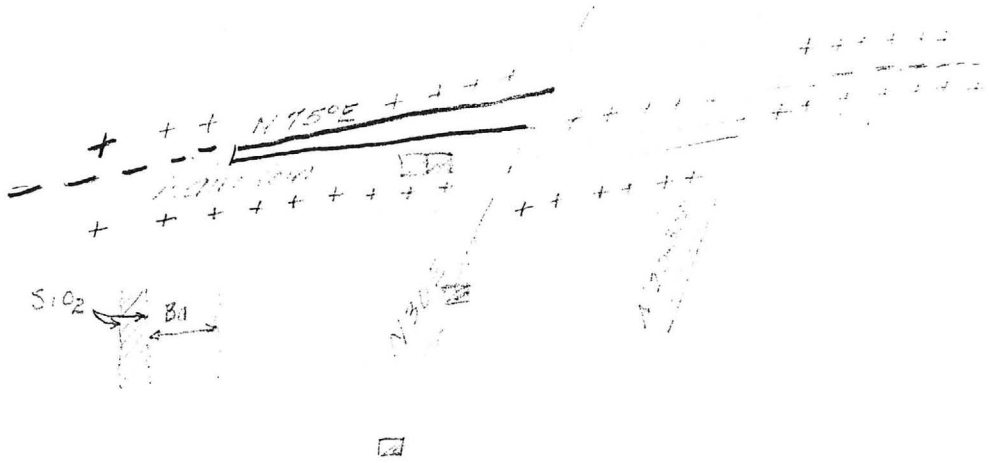
District GUNSIGHT, PIMA COUNTY

Subject: Visit

Date May 7, 1957

Engineer Frank Knight, Director
B. J. Squire
Lewis A. Smith

The Gunsight Mine lies in a granite porphyry mass SE of Ajo, Arizona, in the Gunsight Hills (R4W, T14S, Section 2). It lies in strong fracture which has been offset by two cross, or transverse faults. All are pre-mineral fractures which have been filled by barite and quartz and some lamellar quartz, fluorite, and calcite. The ore minerals appear to be embolite, cerargyrite and relicit argentite. The vein has a nearly vertical dip. The south part is massive quartz which has a crenulated in texture with notable "cockade" vugs. The accompanying drawing shows the general geological relations.



The granite porphyry (6_p) shows a strong orthoclase development or impregnation which is similar to the hypogene mineralization at Ajo. Possible siliceous flux ore is worth some further investigation. "Glory hole" stoping was seen.

A small amount of tailings are located in a small canyon. Last work done in 1920's.

Patented Claims.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine	GUNSIGHT MINE	Date	May 7, 1957
District	GUNSIGHT, PIMA COUNTY	Engineer	Frank Knight, Director B. J. Squire Lewis A. Smith
Subject:	Visit		

The Gunsight Mine lies in a granite porphyry mass SE of Ajo, Arizona, in the Gunsight Hills (R4W, T14S, Section 2). It lies in strong fracture which has been offset by two cross, or transverse faults. All are pre-mineral fractures which have been filled by barite and quartz and some lamellar quartz, fluorite, and calcite. The ore minerals appear to be embolite, cerargyrite and relicit argentite. The vein has a nearly vertical dip. The south part is massive quartz which has a crenulated in texture with notable "cockade" vugs. The accompanying drawing shows the general geological relations.

The granite porphyry (6_p) shows a strong orthoclase development or impregnation which is similar to the hypogene mineralization at Ajo. Possible siliceous flux ore is worth some further investigation. "Glory hole" stoping was seen.

A small amount of tailings are located in a small canyon. Last work done in 1920's.

Patented Claims.

GUNSIGHT MINE File: 32-112-1-3
Gunsight District
Pima County, Arizona.

The Gunsight Mine is located 17 miles from Ajo at a point about 1.5 miles south of the Tucson-Ajo paved highway.

Geology:

The property shows several veins at the surface, two nearly paralell ones that strike northeast and dip steeply NW, and a third vein that strikes N-NE and dips easterly at about 55 degrees. The latter vein is only about 1.5 to 3 feet wide where observed. The relation of the three veins is illustrated in the sketch cross-section. The middle vein or hanging wall member of the west dipping pair is the one that has been stoped. At the surface the open stope shows widths from 3 feet to a maximum of about 15 feet. The average is about 7 or 8 feet. The length is about 125 feet at the surface but the stope shortens downward from both ends. Observed from the tunnel level, the vein appears to have been doubled in width in places by a thin gougy fault. In a small level off the winze about 40 feet below the tunnel an east dipping structure and vein joins, and apparently terminates on the west dipping vein. On the second level off the winze (about 90 feet below the tunnel level) the two west dipping veins join. These are about 20 feet apart on the tunnel level near the collar of the winze. An ore shoot was formed at their junction. A vein apparently new, appears just in the hanging wall on or above this level but it and the main vein are apparently one on the main level about 160 feet below the tunnel level. The vein zone there is about 16 feet wide, 80 feet NE of the winze but shows very little valuable mineralization. A small stope was started near this point on the best section but was stoppef after one or two cuts. This level connects with the main vertical shaft three compartment shaft at the head of the mill. This shaft has been burned out but the rock walls are good.

At the surface the ore shoot is apparently localized on a swing in strike to the left, going southwesterly. On the lower level entered, about 160 feet below the tunnel level the vein strike is more nearly E-NE except for a 60 foot length from the winze southwest.

The veins are of the type commonly found in lavas, but at the Gunsight are in granite well below the the eroded Tertiary volcanic formations. The veins are banded and crustified and are composed of quartz, barite, and calcite with occasional pockets, seams or narrow veins of galena.

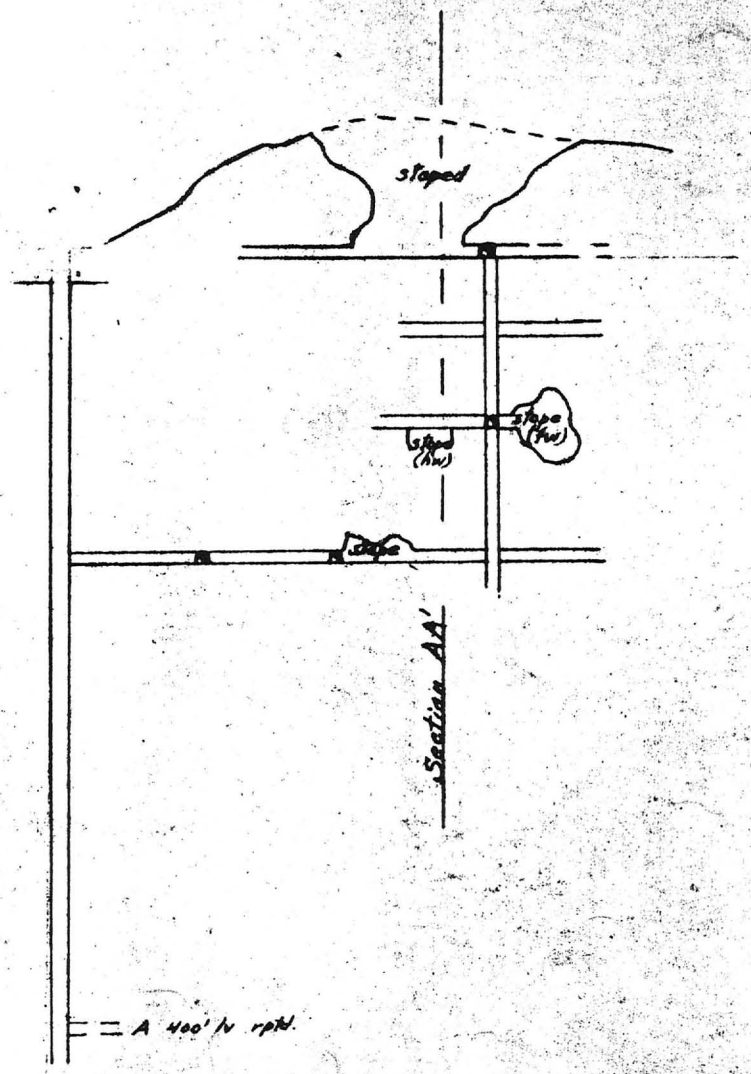
Development below the 160 level was not seen but the main vertical shaft is supposed to be over 400 feet deep and a 400 level was driven. The development observed adequately tested the vein and crosscut the walls.

There appears to be little chance of discovery of oreshoots of attractive size.

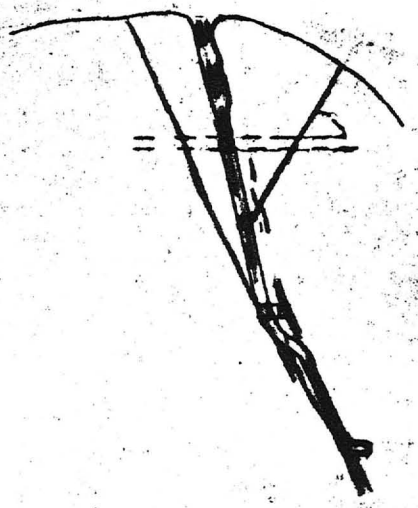
April 1947.

Hernon and Stone

Longitudinal Section
Looking SE



Section A-A'
Looking SW



SKETCH SECTIONS
GUNSIGHT MINE
PIMA CO. ARIZONA
1" = 100' 4/3/47

(1)

MINERAL ECONOMICS CORPORATION

CONSULTING MINING ENGINEERS AND GEOLOGISTS

HALE C. TOGNONI, P.E. 2084
MINING AND GEOLOGICAL ENGINEER
GEORGE-ANN TOGNONI, CARTOGRAPHER

1525 WEST NORTHERN AVENUE
PHOENIX, ARIZONA - 85021
WI 4-2124

GEOLOGICAL REPORT
GUNSIGHT MINING CORPORATION PROPERTIES

PROPERTY DESCRIPTIONS

In sections 16, 17, 20 and 21, Township 14 South, Range 4 West, G & SRB & M, Meyers Mining District, Pima County, Arizona, the Gunsight Mining Corporation owns the fourteen patented mining claims called the Gunsight, Silver Girt, Eastern, Morning Star, Extension of Morning Star, Crescent, C & C, Sunrise, Galena, F. M. Gillett, Kerlin, Keystone, Silver Clance and Southern Belle and the twenty-one unpatented mining claims which are recorded in Pima County Recorders Office as set forth below:

Name of Claim	Name of Claim	Name of Claim
Cashier	Galena No. 1	Surprise No. 1
Assistant Cashier	Galena No. 2	~~Surprise No. 2~~
Assistant Cashier Extension	Galena No. 3	Surprise No. 3
East Cashier Extension	Galena No. 4	Surprise No. 4
North Cashier	Galena No. 5	Surprise No. 5
South Cashier	Galena No. 6	~~Surprise No. 6~~
~~South Cashier Extension~~	Surprise	Surprise No. 7

In section 10, Township 15 South, Range 4 West, at Wahl's Well, approximately 6 miles south of the above property, the corporation owns the patented 5-acre Gunsight millsite and the unpatented Richlieu Placer claim.

In addition to the above, the Corporation acquired rights, from all of its organizers, by quit claim to 57 unpatented mining claims which are located adjacent to and around the south end of the above listed unpatented claims. Legal action quieting title to these 57 claims in the Gunsight Mining Corporation was completed on May 1, 1964. The names of these claims are as follows:

Name of Claim	Name of Claim	Name of Claim
Ajax	Black Bess Extension	New Gunsight

American Boss
American Boss #1
American Boss #2
American Boss #3
Sundown
Sundown #1
Sundown #2
Sundown #3
Sundown #4
Sundown #5
Sundown #6
Sundown #7
Sundown #9
Sundown #10
Sundown #11
Sundown #12
Sundown #13
Liberty Bond No. 1
Liberty Bond No. 2
Black Boss Extension #1
Black Boss Extension #2
Black Boss Extension (Fraction)
Wonder
Wonder #1
Wonder #2
Wonder #3
Wonder #4
Wonder #5
Wonder #6
Wonder #7
Athol
Athol #1
Athol #2
Athol #3
War Eagle
Key to the Gunsight
New Gunsight #2
New Gunsight #3
Yellow Aster
Yellow Aster #1
Yellow Aster #2
Yellow Aster #3
Yellow Aster #4
Yellow Aster #5
Yellow Aster #6
Yellow Aster #7
Yellow Aster #8
Oriental
Philadelphia
Regal
Regal Fraction
Revenue
Revenue #1
Modoc

GENERAL GEOLOGY

The Gunsight mining property (approximately 1½ miles wide and 2 miles in length) is located in the Gunsight Hills 14.7 miles south via Arizona Highways 85 and 86 of Ajo, Arizona; thence approximately one mile by dirt road through the Indian settlement of Schuchuli (Many Chickens) to the northern most mine workings. This area is in the Papago Indian Reservation, in southern Pima County, in southwestern Arizona, about 20 miles north of the Mexican boundary.

Ajo is the largest town in the area, and is connected by the Tucson, Cornelia, and Gila Bend Railroad, owned by the Phelps Dodge Corporation, with the main line of the Southern Pacific Railroad at Gila Bend.

Physical Features:

The Gunsight Hills are on the northeast flank of the Ajo Range of Mountains in the Sonoran Desert section of the Basin and Range province at from 1500 to 2600 feet in elevation.

The area is characterized by small though somewhat steep, granitic hills protruding through the Alluvial fill, about 1000 feet above the surrounding valleys.

Climate and Vegetation:

Climate records at Ajo indicate the temperature ranges from 23° F. to 115° F., with the daily maximum above 100° F. being very common. Annual precipitation at Ajo is about 10 inches.

Palo Verde, saguaro, palo fierro, mesquite, ocotillo, hedgehog cactus, barrel cactus, prickly pear, cholla, creosote bush, greasewood, and various grasses cover the surface.

HISTORY AND PRODUCTION

Patents were issued on the patented mining claims of Gunsight Mining Corporation at the following times: 1882, Gunsight, Silver Girt and the Eastern; 1883, Morning Star, Extension of the Morning Star and the Crescent; 1886, C & C, Keystone, Silver Glance and Southern Belle; 1885, Kerlin; 1925, F. M. Gillett; 1926, Galena and Sunrise.

The Gunsight Mine's recorded production is $100,000.00 in silver from 1878 to 1896. (University of Arizona Bulletin No. 140).

Harry E. Nelson (May, 1963) estimates that the Gunsight claim probably produced $250,000.00 in silver and lead.

In 1882, 1883 and 1884 the Report of the Director of the Mint upon Statistics of the Production of Precious Metals in the "United States" stated the following:

> "1882, the Gunsight Mine is mentioned as being the best developed, the best equipped, and the leading mine in the district; with a 200-foot incline, a drift 200 feet on the vein at the 100 foot level, and a crosscut at the 200 foot level, and with plans to sink a vertical shaft immediately. About 4,000 tons of ore were mined during the prospecting work, that averaged between $30 to $40 per ton in value. The mine has two types of ore, free milling and smelting, with the free milling predominating. The milling ore consists of black sulperrets (Raymond - an old synonym for sulfide) and chlorides, and the smelting ore of lead and iron carrying silver."
>
> "1883, the Baker shaft is mentioned as being 340 feet deep, and that crosscuts had been driven connecting to the old workings on the Gunsight Vein, 300 feet below the surface. It was thought that the mill could be furnished

with 50 tons of ore per day from the deepest workings."

"1884, (apparently by R. C. Pearson), the Silver Girt shaft (probably the Baker shaft mentioned in the Report for 1883) is mentioned as being down 380 feet, with the first level at 200 feet (Raser's sketch dated Nov., 1942, shows the main shaft cutting the Silver Girt vein at the 200 level, and the drift north as being driven on the Silver Girt vein) consisting of a north drift of 147 feet, all in ore; and a south drift 240 feet in length that was being stoped for 180 feet - the ore averaging $23 per ton. The old Gunsight shaft (probably the winze from the Lower Adit Level) is mentioned as being 240 feet (deep?), with 31 feet of ore exposed, averaging $60 per ton without sorting, and still in ore; the first level is at 100 feet, with 130 feet of stoping ground, the vein being seven feet wide and averaging $75; the second level having 180 feet of stoping ground that averaged $60."

From the appearance of the workings on the Galena, C & C and Keystone patented claims and the unpatented Surprise claims some silver and lead was produced but there is no record of such production.

Claims in Question in Here

I. M. Sheehan relocated the unpatented, Surprises, Galenas and Cashiers from 1922 through 1926 and is the widow of Mr. C. B. Sheehan who was a mining engineer working at the Gunsight mine.

From the evidence on the ground, it would appear that these unpatented claims were first located at the same time as the patented claims to the north and the south, or sometime before 1900. The surface is dotted by old workings, many of the deeper workings could become accessible by a small amount of cleaning and repairing of the timber.

Due to the isolated location and depressed metal prices in the late 1880's this property has virtually lain idle since then.

Subsequent stock company promotions, claim locations and diversified property acquisitions cluttered the title into an almost impossible tangle.

C. B. Sheehan began his work on the property in 1918. He built a mill, rehabilitated the Gunsight and Surprise mine workings and had acquired many of the existing property rights when his venture was terminated by his untimely death in 1926.

The New Cornelia Mine, an open pit of Phelps Dodge Corporation, located at Ajo, Arizona produced approximately 650,000 lbs. of copper previous to 1917. The production from 1917 to 1931, both inclusive, was about 763,000,000 lbs. Since 1931 the production has not been published. Although copper is overwhelmingly the most valuable product, gold and silver recovered with it in the sulphide ores have netted about 5/6 cents per pound of copper. The developed reserves of the deposit are adequate for a life of thirty or forty years at a rate of production in excess of 50,000,000 pounds a year. (University of Arizona Bulletin No. 141.)

GENERAL GEOLOGY

From Harry E. Nelson (See Notes 1963)

The rocks of this area are identified on 1960 geology map prepared by the Arizona Bureau of Mines as being Laramide granite. The hills to the west, north and east are identified as Tertiary andesite.

Geologists think, that during the Permo-Triassic, a geosyncline was developed in southwestern Arizona, the Altar District, Sonora, Mexico, and southern California. The long axis of this trough, northwest to east-west, created a seaway through to the Pacific in the vicinity of Los Angeles.

During Triassic time the sediments in the trough were folded into a mountain chain, the thrust being to the northeast against the positive pre-Tertiary Plateau.

Then erosion stripped this Triassic mountain range to base-level during the Tertiary revolution. The line of weakness of the old geosyncline still existed when the Tertiary mountain-building forces produced the present fault-block mountain ranges that trend to the northwest in southwestern Arizona.

The surface features of the area are the result of desert erosion. The older rocks are carved into mountains with sharp ridges and needle peaks. Mesas were formed by the more recent basaltic and andesitic flows. The Sierra type mountains are surrounded by alluvial fans and rock-floored sloping plains.

Sedimentary Rocks:

A conglomerate (Tertiary Daniels?) with a smooth polished surface, outcrops in the wash 300 feet south of the old Gunsight

cementary. This conglomerate carries boulders up to two feet in diameter, but most of the partially rounded pebbles are less than ½ inch in diameter. The cementing agent appears to be mostly silica with very little effervescence to dilute hydrochloric acid.

The matrix of the conglomerate is light gray in color, while the component rocks are darker gray andesites, brown and reddish chert, gray granitic rock, and boulders of a basic rock with white phenocrysts ½ inch long.

Metamorphic Rocks:

No metamorphic rocks (gneisses or crystalline schists) were recognized as such in the field.

Metamorphism thought to be a contact aureole of the late intrusive rocks is partially developed in the southeastern and southern area mapped.

Igneous Rocks:

The igneous rocks of the area were identified by Dr. Byron J. Sharp from thin sections made by Robert E. Jones of specimens gathered by Harry E. Nelson.

Quartz monzonite and granite are the major igneous rocks of the area and are cut by rhyolitic and basic dikes.

The Gunsight Hills of this area are made up of leucogranite and leucoquartz monzonite herein called granite and quartz monzonite intruded by granite aplite, all of which are cut by rhyolitic and andesite dikes.

The Quartz Monzonite-1511:

This rock occupies the southeastern and the southern section and forms brownish-gray rolling hills, and is the least resistant to erosion of the rocks outcropping in the area.

The quartz monzonite has several facies variations and contains quartz, white feldspar, biotite and chlorite. This rock is medium grained and gray to greenish gray in color. Numerous small discontinuous east trending dark basic dikes and tan aplitic dikes cut the gray quartz monzonite with increasing frequency from east to west.

Dull white to gray pegmatitic quartz zones are found in the quartz monzonite with increasing frequency from east to west.

The Granite (Leucogranite-545 and Leucoquartz Monzonite-551):

Outcrops in the northern and northeastern section of the area are mapped.

The north limit of the granite is an abrupt change formed earlier than present drainage from a gentle north-dipping weathered outcrop, to perhaps 30 feet of partially cemented alluvial fill.

The granite forms the wall rock of the Gunsight Mine, and the mountain ridges to the south and southeast of the mine. On the crest of the ridge south of the mine, granite aplite is found intruding the granite.

The granite is coarse grained; the chief constituents are quartz and pink and white feldspar. The rock has a reddish color, but this is thought to be from iron oxide. Specular hematite is an accessory mineral.

Granite Aplite (Leucogranite aplite-544, Leucogranite-547, Leucogranite-553):

This type of rock outcrops in the central part of the area mapped. Mineral Monument No. 1, on the highest peak, is on an outcrop of the granite aplite. It weathers to sharp ridges and needle peaks, and it forms rock-floored sloping plains bordering the ridges and peaks. It has a pronounced joint system.

The granite aplite intrudes the granite, and while no cropping was seen of it intruding the quartz monzonite - it is thought to do so.

The rock is fresh-looking and appears to be unaltered. It is tan in color, and is very fine grained with an aplitic texture. The chief constituents are quartz, pink feldspar, and a little biotite. Very thin seams of specularite are found in the joints of this type of rock.

An outcrop of this type of rock on the ridge west of the Surprise Incline has many thin (less than 1/16 inch) stringers of quartz, that strike east, cutting the rock.

Rhyolite Dikes (Quartz Latite Porphyry-581, Leucogranite Porphyry-565, Leucorhyolite Porphyry-550, Rhyolite Porphyry-552):

Rhyolite dikes cut the quartz monzonite, the granite, and the granite aplite.

The rock is light gray or tan in color, and weathers gray with small black spots. The rhyolite has very small phenocrysts of quartz and what is thought to be sanidine, as well as larger phenocrysts of partially altered pink feldspar and an unknown dark mineral, all set in a gray or tan aphanitic groundmass.

From the chemical analyses that have been done to date it seems that in all probability that there are two different ages of rhyolite dikes.

A rhyolite dike which varies from about 20 to 30 feet in width, cuts the quartz monzonite in the southern area was traced on the surface for about 2,000 feet. It trends in a westerly direction, and is cut and offset by many faults, in one area it was cut by a black basic dike, with no apparent offset; apparently this is a push-a-part and does indicate the age relation, with the dark basic dike being younger than the rhyolite dike.

Another rhyolite dike cuts the granite in the eastern area mapped was found in a wash. Its lateral extent is not known; where seen it is five feet wide.

A small outcrop of iron stained rhyolite was seen in the northeast corner of the Eastern Claim, apparently cutting the granite.

Another rhyolite dike that outcrops in the southwest corner of the Galena No. 4 Claim was traced for about 300 feet in a westerly direction. It is faulted off on the western end. The dike is about ten feet wide.

Additional specimens of rock resembling rhyolites submitted for petrographic examination are the following: No. 561 (Granophyre) C & C Claim, No. 562 (Leucorhyolite) C & C Claim, No. 565 (Leucogranite) Galena No. 5 Claim, No. 571 (Altered dike 65% altered feldspar probably porphyry) Surprise No. 7 Claim, and No. 581 (Quartz latite porphyry) Surprise No. 4 Claim.

Basic Dikes:

The black (Basic Dikes) cut the quartz monzonite, the granite,

the granite aplite; and one was found cutting a rhyolite dike.

The black basic dikes are most numerous in the southwestern part of the district; only two were mapped cutting the granite, and four were mapped cutting the granite aplite.

An analysis of specimens taken for petrographic examination resulted in the following:

No. 546 - Galena No. 5 Claim, - Andesite Dike
No. 548 - East side of District, 220 feet north of North Endline of Surprise No. 5 Claim, - Andesite Dike
No. 554 - Crescent Claim, - Andesite Dike
No. 555 - Surprise Claim, - Andesite Dike
No. 557 - Surprise Claim, - Quartz Latite
No. 558 - Surprise Claim, - Andesite

SUMMARY OF HARRY E. NELSON'S REPORT (May 25, 1963)

1. Strong persistent veins outcrop on the Gunsight Mining Property; one has been mapped on the surface for over 4,000 feet.

2. The veins follow fault zones and appear as lineation in aerial photographs.

3. The vein systems can be separated into three groups:

a. Veins that strike to the northwest and dip to the southwest.
b. Veins that strike to the north and northeast, and dip to the east and southeast.
c. Veins that strike to the east and northeast, and dip to the north and northwest.

4. The veins that strike to the east and northeast, and dip to the north and northwest have produced the major amount of ore from the district; the values have been in silver and lead, with total production thought to be in excess of $250,000.00 and produced prior to 1900.

5. Large mineralized areas are found at the intersections of veins and other structures.

6. Minerals identifiable in this area are: quartz, calcite, siderite (?), specularite, fluorite, barite, scheelite, galena,

chalcopyrite, chrysocolla, malachite, azurite and cinnabar.

7. Igneous rocks were mapped in this district that contain significant amounts of fluorine, tungsten and zirconium.

8. Gold, silver and lead mineralization appear to be independent of the tungsten mineralization.

9. Fluorite is probably the most common vein mineral after quartz and the dark brown carbonate (siderite?) and is probably present in economic quantities.

10. Studies of the crystal habit of fluorite suggest that the light-colored octahedral crystals are typical of relatively high temperature of formation.

11. The penetration of fluorine into the wall rocks adjacent to the veins is of unique significance. Since the wall rocks are an igneous granitic type Nelson advances the theory that the back pressure has been substantial and that this is probably a deep zone of mineral formation.

12. Tungsten is one of the most persistent elements and although scheelite was the only tungsten mineral identified other tungsten minerals are probably present. One structure shows a calculated average of 64.0 inches of width assaying .675% WO_3. Tungsten is probably present in economic amounts on the property.

13. The copper mineral chalcopyrite has been found on the surface in the southeastern section of the Gunsight Property. It could be that the silver-lead mineralization of the northern part of the district is a manifestation of zoning from the copper area of the southeast to the silver-lead of the north. As stated before this is elephant country in regard to mineral wealth. One elephant has been found, the big copper deposit of the New Cornelia Mine, at Ajo. If there be any credence to the zoning hypothesis, then the southeastern section of this district should be prospected for copper.

CONCLUSIONS BY HALE C. TOGNONI

This mining property has the criteria that makes it one that merits mineral exploration. The criteria is:

1. Surface mineralization, i.e. barium, copper, fluorite,

gold, lead, mercury, molybdenum, silver, tungsten and zinc appearing in significant quantities.

2. Favorable host rocks. (Similar to the rock types of Ajo.)

3. Structural conditions that can create "space" for economic mineral deposition.

4. Past economic production of silver and lead from a small segment of one of the main vein systems.

IMMEDIATE POTENTIALS

The Gunsight Property possesses the following four potentials which merit immediate attention:

1. Probability of additional silver-lead ore bodies along the 4,000 foot extension of the Gunsight vein.

2. Possibility of an economic tungsten deposit.

3. Possibility of the separation of fluorite and barite to make one economic composite.

4. Possibility of a disseminated copper deposit.

IMMEDIATE PROCEDURAL RECOMMENDATIONS

In order to move toward the development of the above four potentials, it is recommended that the following procedure be followed:

1. Additional surface excavations be made to develop better exposures of the veins and surface mineralization.

2. The above new surface excavations be sampled for additional assay information.

3. Further geophysical surveys be made in the areas recommended by Harry E. Nelson.

4. Companies with sufficient capital to finance exploration on a large scale be contacted.

Respectfully submitted,
MINERAL ECONOMICS CORPORATION

Hale C. Tognoni, P.E. #2048
September 6, 1963

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

FILED
JUL 10 1963

Mine GUNSIGHT CLAIMS Date 6/4/63

District GUNSIGHT HILLS, PIMA CO. Engineer Lewis A. Smith

Subject: Visits and conferences with Lawrence Sheehan and Hale Tognoni. 6/4/63 and 6/21/63, respectively.

PROPERTY: 42 claims, (21 patented and 21 not patented).
38 in vicinity of the Gunsight Mine (Parts of Secs 16,17,20, 21 T14S, R4W).
4 near Wall's Well (being negotiated) (Sec10, T15S, R4W).

OWNERS: Gunsight Mining Corp., Hale Tognoni, 411 N. Central Ave., agent. This Corporation was formed by the consolidation of several holdings in the two areas. The principal members are the Sheehans (50%) Mrs. Margaret Griffin (10%) El Paso Natural Gas Co. (5%) B. Q. Hall, Dallas, Texas,(10%) Dr. L. B. Dobben, Scottsdale (5%), plus two others (Nalestone and Hatten of Phoenix) 5 % each, the remaining claims are being negotiated (10%).

MINERALS: (1) Lead-silver (Barite Type)
(2) Fluorite
(3) Potential Copper (as indicated by leached outcrops)

WORK: (1) 7 miles of roads were built. numerous old cuts and pits cleaned out Location work on some new claims. ~~and location work on a few~~.
(2) Old working at the 640-foot Gunsight Shaft plus 4 levels at 100-foot intervals. One large stope from the surface down to 100-foot level.
(3) Old 200 shaft on the Burro Burro Claim.

GEOLOGY: Gene Nelson, retired Anaconda Geologist, now working out of Las Vegas, Nevada, recently mapped and sampled the claims, but is waiting for final analytical results before submitting his report. However, he stated (according to Sheehan) that the most prospectable area, from a gossan standpoint, lies in the SE portion of the area. This agrees with the opinion expressed by Vance Bacon, who had previously studied the area, and with the observations made by Lewis Smith. In this particular portion the limonite is more prevalent than elsewhere and this limonite indicates appreciable copper and strong iron. Neverthe less since no deep prospecting has been done here, in the past, some drilling will be required in order to prove it out, one way or another.

The area is mainly composed of quartz monzonite porphyry that according to Mr. West, Chief Engineer, for Phelps Dodge at Ajo, is quite similar to the New Cornelia monzonite, in which the Ajo Pit is located. This conclusion is checked by several observers.

The dump, at an old shaft on the south slope of the Gunsight Mine Hill, shows some material that contains chalcopyrite, some chalcocite, and considerable pyrite. According to Sheehan, this shaft is reported to have reached about 200-feet deep.

Some veins are reported, including the Gunsight vein, that yielded the bulk of the production within the area. A new mineral zone disclosed in a bulldozer cut lies along a transverse fault vein (probably Silver Girt) that cuts the Gunsight vein structure and apparently terminates the main Gunsight ore shoot on the west. This zone crosses a saddle southwest of the main Gunsight workings.

This transverse fracture vein was prospected, northeast of the Gunsight vein, by several short shafts, over a length of several hundred feet, but no stoping was evident in these workings. They apparently, judging from the size of the dumps, produced very little ore. The fault zone, in this area, shows quartz, barite, and a strong limonitic zone which could have copper possibilities in depth. To the south of the Gunsight vein a bulldozer cut along a new road, opened a mineralized zone which, according to Sheehan, is 30 feet wide, and is said to have portions that assay up to 18 percent lead and 10-20 ounces of silver. The principal mineral, here is argentiferous galena that is affiliated with fluorite (probably some barite) along with wallrock fragments. It also carries some gold and zinc. The best ore in the Gunsight vein was contained in a massive, crystalline barite gangue. According to Vance Bacon, the barite appears to give way to fluorite in depth, and, with this change, the lead-silver values are reported to have decreased. The shift from barite to fluorite is not uncommon, elsewhere, in the baritic lead-silver veins or in straight barite veins. Since lead, silver, and barite most commonly are deposited under relatively low temperature conditions, the shift toward higher temperature minerals such as fluorite, copper, etc., would not be unexpected. It is not now known if, with the reported increase in depth of the fluorite, copper will also become more prevalent in this area. In the area as a whole, especially in other veins, south of the Gunsight vein, fluorite appears to be more prevalent than barite, and most of these outcrops are at a lower elevation than most of the Gunsight vein stopes.

Note: Hale Tognoni said he would try to obtain a copy of Nelson's Report for the Department.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine GUNSIGHT MINE Date 3/10/64

District GUNSIGHT HILLS (MEYERS) DIST. PIMA CO. Engineer Lewis A. Smith

Subject: MINE VISIT with Hale Tognoni and John Reynolds, Chief Geologist for El Paso Natural Gas Co.

The Gunsight Mining Co. has completed a system of good bulldozer roads that well blanket the property. At various places bulldozer cuts have been made in order to expose bedrock, vein outcrops, or fault zones. This work, along with some older pits and workings are well distributed. The old Gunsight Mine workings are partly open down to the 200-foot level, although they were reported to extend downward to the 400-foot level. The main Gunsight vein has been traced for about 2000 feet and trends NE-SW. The vein mineralization varies considerably in width. Near the south end of the vein, as exposed, it encounters a "rhyolitic" dike of considerable width that, along its north border, is strongly impregnated by limonite of sulphide derivation (mostly pyrite). The dike has either terminated the vein fracture or has off-set it. This dike is probably pre-mineral. In association with the vein, near this intersection, a basic rock is locally present, and this is also mineralized. Near to this multiple intersection a second vein structure also appears to intersect the main vein. This structure is variable in trend, but is generally not far from N.S. Between this vein intersection and the Gunsight Mine, a third vein intersects the main vein. This trends NE at a more oblique angle to the main vein than that of the second vein. Thus a structural locus is apparent at the SW end of the vein and this locus should be explored at more depth. Lead-silver mineralization is evident, but not prominent, although the limonite concentration is quite strong. Evidence of intermittent lead-silver mineralization was found along all of the veins, but more so on the "main" vein, which locally is reported to have been rich in silver content.

The wall rock of this portion of the property is granite cut by aplitic dikes and by two main shear systems, an older(?) NE-SW group and a N 10-15 deg to W group. The two shear systems form a prominent intersection locus at the main ore shoot of the mine. Here an EW fault also intersects these. Thus at this intersection locus the main lead-silver-barite mineralization occurred. Neverthe less, strong mineralization accompanied by strong rock alteration continues northeastward, from the main ore shoot, for several hundred feet, to where the rock plunges under a detritus cap. This zone is up to 300 feet wide and is bordered on the northwest by another vein fracture that is roughly parallel to the main vein. The interval between the two fractures is less intensely mineralized than near or in the fractures. This mineralization tapers off rapidly on both sides of the zone. The zone has not been appreciably prospected and it certainly should be. It even could continue northeastward under the detritus for an undetermined distance. Further information might also be obtained by cleaning out the mine from the 200 to the 400 foot level, particularly to see if there is a change in mineralization in depth, such as a shift from a barite gangue to fluorite, or an indicated shift from relatively low temperature to relatively higher temperature mineralization. Zinc, Tungsten and Fluorite are more evident to the south, at lower elevations. Iron mineralization feathers out from the mineral zone along shears in decreasing abundance.

At the southwestern end of the vein system silicification appears to be more relatively frequent and the gangue is darker in color, probably due to the presence of basic dike material in, or beside the vein. Here fluorite is more prevalent and the barite becomes less abundant and more sporadic in occurrence. The elevation here is also considerably lower than at the mine shaft collar.

On the south side of the main ridge the granite is invaded by a number of dikes that show considerable variation in character. Apparently there are two main basic dike types, andesitic and basaltic, but there may readily be transitions between the two. Somewhat south of the main ridge, and along the south border of the property, a relatively narrow dike of probable monzonite composition, forms a higher relief, relatively resistant ridge. This is relatively medium textured rock that is not too intimately fractured on the average, but locally is severely shattered and has been cut by rhyolitic dikes. It contains oxide copper (mainly chrysocolla) and small blebs or specks of limonite that were derived mainly from pyrite although some copper is indicated. The outcrop of this rock is strongly kaolinized and a good part of the limonite has been whipped out. A bulldozer cut indicates a somewhat stronger concentration of limonite at 4-5 feet below the surface. The contacts between this dike and the invaded rocks might warrant further prospecting especially where the dike is crossed by faults or shears.

Between this monzonite dike and the main ridge is a depressed area that could have resulted from more intense rock alteration or from a strong transverse fault zone, either of which could have caused a weakened zone. Within this depression some basic dikes an aplitic dike and a rhyolite dike have intruded the granitic rocks. The main sets of faults, that trend NE and NW, respectively, cross the area. Mineralization on both the faults and along the dikes, has been more concentrated than elsewhere in the depression. At one place, where the two sets of faults and basic dikes appear to be heading for intersection, the limonite concentration increases in intensity. This locus should also be prospected, in depth. In this part of the property Fluorite and Tungsten indications are strong and increased zinc showings are noteworthy. Although some lead indications are also found. Silver and lead appeared to have decreased, possibly due to indicated higher depositional temperatures. South of the monzonitic ridge limonite (pyrite) gossan was seen as is the case in the eastern portion of the claims. This may be part of a pyritic "halo" similar to that that sometimes forms around the borders of some disseminated copper deposits. For some reason pyrite appears to migrate farther out than some other sulphides. The limonite within this area is somewhat migratory with respect to the original sulphide grains, and it shows relatively small copper indications, "Salt and pepper" limonite specks extend well out from the source. The vugs or other openings are relatively empty, as far as limonite is concerned and intense kaolinization is present. This all indicates a very high iron to copper ratio in the original sulphides. No "relief" limonite was seen indicating that little chalcocite could have been present. However, a little "relief" limonite was seen in the depressed area, to the west and north of this "halo" area. Copper oxides were also evident, although not too frequently, in the depressed area.

On the whole three more prospectable areas were seen:

(1) Northeast of the Gunsight workings.
(2) At the structural locus at the southwest "end" of the Gunsight vein.
(3) The Fault-dike locus in the southern depressed area.

The general impression was gained that structural loci were more prrospectable and that the possibility of large disseminated areas was not so evident. Basic dikes seem to have been somewhat involved in the opening up of portions of the rocks along their borders to the invasion of mineral-bearing solutions and apparently also mineralize. Faults and shears, although of more than one age, seem also to be important, provided they are premineral in age.

STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA 85007

April 11, 1968

To: Frank P. Knight, Director

From: C. L. Hoyt, Field Engineer

Subject: Gunsight Mine. Gunsight District - Pima County

To get the latest information on the status of this mine, I called Mr. Hale Tognonni. He told me that the property is under lease to CF&I Co. but could give me no further details. I then called Mr. Larry Sheehan at his Advance Roofing and Supply Co. (Present address 1923 W. Grant Street, Phoenix, Phone 258-2668). He said CF&I Co. took a 3-year lease and option to purchase in January of this year. Geophysical results so far are about as had been expected from Mr. Nelson's 1963 report. Drilling has not yet been started, but is expected to start soon.

He said that recently the Department of the Interior has tried to have his unpatented claims declared invalid for lack of mineralization, but the new geophysical work has stopped this action temporarily.

IN REPLY REFER TO

United States Department of the Interior

OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS
4015 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22203

Partial only

UNITED STATES
v.
GUNSIGHT MINING COMPANY

IBLA 70-380 Decided March 1, 1972

Appeal from a decision by Robert W. Mesch, Departmental hearing examiner (Arizona Contest 6-3597 (Papago I. R.)), holding lode mining claims null and void.

Affirmed.

Mining Claims: LOCATABLE PUBLIC LAND - Withdrawn Lands - Effect of withdrawals; PRACTICE AND PROCEDURE - Hearings- evidence

Where the land occupied by mining claims is subsequently withdrawn from all forms of exploration, location and entry under the mining laws, evidence obtained thereafter by drilling, sampling and other exploratory activities cannot be considered for any purpose other than the extent to which such geological investigations may tend to support an assertion that valuable deposits of minerals had been physically disclosed within the boundaries of each of the claims prior to that date, i.e., the qualifying discovery must have been made prior to the date of the withdrawal.

Mining Claims: DISCOVERY - Nature of Requirement - marketability requirement

Where the mineral of primary interest (fluorite) cannot be mined profitably alone or in association with other locatable minerals, although the presence of such minerals is indicated, a qualifying discovery of a valuable mineral deposit has not been effected.

Mining Claims: DISCOVERY - Nature of Requirement - geological inference - prudent man test

The finding of a mineralized area on which the hope for the development of a valuable mine relies to a disproportionate degree on the chance of encountering ore bodies as yet unknown cannot be regarded as an endeavor in which a prudent man would be justified in investing with a reasonable expectation of

GFS(CON) 30 (1972)
GFS(MIN) 12 (1972)

STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA 85007

January 20, 1969

To: FRANK P. KNIGHT, Director

From: Grady B. Gulledge, Field Engineer

Re: BLM Hearing on GUNSIGHT MINE, January 7, 8, and 9, 1969.
Room 3457, Federal Building, 230 N. First Avenue, Phoenix.

Hearings Examiner, Robert Mesch; Prosecuting Attorney, Fritz Groman; BLM Mining Engineers, Bob McColly, Hal Suzie and Henry Ash.

Gunsight Mining Company represented by Hale Tognoni, Attorney, who is also a stockholder; Dr. and Mrs. L. B. Dobben, investors and principal stockholders; Larry J. Sheehan, original locator and part owner; James R. Brooks, principal witness, chief geologist for C. F. & I./Steel Corp.; and Harry Eugene Nelson, registered geological engineer from Las Vegas, Nevada, who was also a witness.

Tues., Jan. 7th - 10:30 A.M. Attorney Gorman called Henry Ash to stand - questioned him reference to the workings, cuts and diggings, surface and underground or evidence of any type of diggings on the unpatented claims of the Gunsight Group and pointed them out on the wall map. Mr. Tognoni questioned Mr. Ash about one hour.

After lunch Attorney Gorman called Bob McColly on the stand, questioned him same line of questions asked of Henry Ash; then Mr. Tognoni took over started repudiating both questions and answers. Dr. Dobben was called on stand to be identified as a stockholder only.

At 5:10 P.M. the case was continued until the following morning.

Wed., Jan. 8th - hearings resumed at 9:15 A.M.
Attorney Gorman called Henry Ash on stand and Hal Suzie to stand by. Gorman resumed his line of questioning of Hal Suzie as to evidence if any signs of workings, on the cuts, roads, trails, or any evidence of any workings of any type on the claim or claims that they had marked and identified on wall maps. Also if Suzie or Ash, saw and sampled any of the ores that was marked on the map and was the unpatented claims. They stated that they saw no such evidence on any cuts, sampling, or work of any kind and no such work was done in that period of time. Mr. Tognoni was repudiating the questions and answers of Gorman, Ash and Suzie.

After lunch James Brooks of C.F.& I. was put on stand by Mr. Tognoni who started questioning him on the rare-earth minerals found and assayed by C.F.&I., other engineers and chemists. Mr. Tognoni questioned Mr. Brooks on uses and demands of fluorite and fluorspar by C.F.& I. and if they would use it. Mr. Brooks said it was a good quality and they could and would use it.

At 5:30 P.M. hearing continued until the following morning.

Thursday, January 9th - hearings resumed at 9:15 A.M.
BLM called James Brooks to the stand to review his statement in part. Mr. Gorman continued to question Mr. Brooks on the rare earths, and in particular the quantity and quality of fluorite and fluorspar and its uses. Mr. Tognoni questioned Mr. Brooks on the quality and his opinion as to the quantity in carload tonnage. Mr. Brooks said that C.F.& I. would use this material in large tonnages; depending on the completion of their drilling program on these properties.

After lunch Mr. Tognoni called Henry Eugene Nelson, engineer, to the stand. He said he made the report for Mr. Tognoni. BLM identified his large report as the report they had been using. BLM questioned all of his assays and findings and had him on the stand 3 hours.

Mr. Tognoni called Larry Sheehan to the stand for about 2 hours - same type of questions. However, all BLM questions was namely and solely pertaining to the unpatented land.

Case finished at 6:30 P. M.

COPY

Mr. E. H. Powers
Phoenix, Arizona

Los Angeles, California,
November 16, 1927.

Dear Sir:

At your suggestion I visited the Gunsight Mining property and examined the same and submit the following report:

GUNSIGHT MINING PROPERTY

TITLE: The title to this property comes through United States Patents issued thereon and the originals of which are recorded in the County Recorders Office of Pima County, Arizona, at Tucson, the County Seat thereof.

EXTENT OF PROPERTY: The Gunsight Mine comprises three patented claims knows as the Gunsight, the Silver Girt and the Easter, and the total acreage included therein on account of overlapping boundaries is about fifty acres. In addition thereto there is also a five-acre mill site situated about five miles southeasterly from this property.

LOCATION: The Gunsight mining property is located in Pima County, Arizona, and lies about ten miles north of the International boudary between Arizona and the Republic of Mexico and near to the old Papago Indian Reservation. It is located sixteen miles south of Ajo and sixty-five miles south from Gila Bend in Maricopa County.

ROADS AND HIGHWAYS. This property lies three-quarters mile southerly from the State Highway between Ajo and Tucson. This highway is in splendid condition and well maintained and suitable for any and all demands that may be made upon it in the way of transportation. The highway connects with the Tucson, Cornelia and Gila Bend Railroad at Ajo and extends further on north to Gila Bend where it crosses the Southern Pacific Railroad and connects with the main East and West State Highway, crossing the State of Arizona.

HISTORY: The Gunsight mining property has a history that extends back into the early seventies. It is connected up with the territorial days of Arizona. The early data concerning this property I obtained from Mrs. Levy, who as a girl of 13 years of age came west with a wagon train on the old Tucson Trail that

passed this property in the year 1873. At that date the property was worked in a small way. The ore was sorted, sacked and hauled by wagon train to Yuma on the Colorado River a distance of about two hundred miles. It was then loaded on the steamer operated by Capt. Polhemus and carried down the river to the Gulf of California. The ore was then transferred and loaded aboard sailing vessels and taken to a smelter at Swansea Wales where it was treated.

It takes but little imagination to believe that the ore so mined and transported must have been of high value to have yielded any profits.

When the railroad was completed to Tucson, the ore from the Gunsight mine was hauled to that point over the old Southern Trail, a distance of one hundred sixty miles and shipped to the nearest smelter.

The Gunsight mine again appears in history in the report of the United States Mint for the year 1882. From that report we glean the fact that considerable work has been done upon the property. A shaft called the Bakers Shaft had been sunk to a depth of 260 feet and connected therewith there were numerous drifts and levels.

The parties making this report to the United States Mint stated that the ore taken out in development had a value of $40.00 per ton and that a sample of ore taken from the dump at the collar of this shaft showed values of $74.95.

This property was mentioned in the Mint Report for 1883 and that report shows that the Baker Shaft had reached a depth of 340 feet and that it had cut another vein of ore of higher grade than any of the ore that had been previously found in the workings and the report also stated that all of the workings were extended in good ore.

For most of the intermedia to history from 1883 up to the present time, I am compelled to depend upon the evidence shown by the physical condition of the property and I observe the following:

The Bakers Shaft has been sunk to a depth of 400 feet and is a two-compartment shaft and in fine condition. Some time subsequent to 1883 a mill was erected on said property and water for the purpose of operating that mill was brought from the mining claim hereinbefore referred to five miles southeast of the property near the Aqua Dulce Mountains.

Subsequent to the demonitization of silver this property was raided by the Apache Indians and the mining machinery was entirely destroyed and the old boilers shot full of holes and the pipe line connected with the water supply was also shot full of holes and otherwise destroyed.

The Gunsight Mine has not been operated since it was closed down after the demonitization of silver and all of the improvements thereon prior to that time have been practically wrecked, and destroyed and the mill removed possibly for the iron that was in it during the early part of the World War, and the shaft was very much damaged by boulders rolling into it from the mountain slope above it.

In the early part of the World War some parties secured a lease on it and it is reported that they shipped one carload of ore from the property and that the net returns therefrom was $12,000.00.

The result of the taking out of this carload of ore is that all of the working faces and stopes have been stripped of the highest grade bunches of ore in sight. This does not, however, materially affect the value of the property. High-grade bodies of ore are found all through the ore formation in all mines especially in a mine having the characteristics and ore conditions found in the Gunsight.

I also examined the amount of tailings washed down from the working of the mill on said property and allowing for the wash of the wet seasons in this part of Arizona carrying away a very considerable part of such tailings, I find that what is left shows that a comparatively small amount of ore was treated in the mill. I should judge somewhere between ten and fifteen thousand tons at the utmost. From examination of the tailings remaining, it is apparent that the percentage of savings was not extremely high and that the process used is what was known as the pan amalgmation process of thirty to forty years ago and that process was very inefficient and new processes have been developed which are a great improvement and can make very close savings of ore on such property as this.

The present owners of this property bought the title from the heirs of the original patentee a short time more than two years prior to the date hereof, and they have done during the time they have been in possession of it a very great amount of work in placing the property in a condition to become a producer.

The Baker Shaft has been relined and put in first-class condition. Four hundred and more feet of drifting have been done on the four hundred foot level which as hereinafter noted puts in evidence a large amount of ore. A hoisting frame has been erected and a Samson hoist driven by gasoline power and with a capacity of hoisting two tons, has been installed. An air compressor has been installed on the premises and part of the mine as hereinafter designated has been piped with the use of air, and the owners have ready to be installed, a first class Diesel driven air compressor, 309 cu. ft. capacity. It will supply air for a much larger number of air drills and put the property in such a condition that at least one hundred tons of ore can be taken out daily and by using additional shifts, the amount of ore can be doubled.

The work done by the present owners has been such that the property is now ready for the installation of the necessary machinery to operate a mill having a capacity of fifty to one hundred tons per day, as will be hereafter noticed.

TOPOGRAPHY. The northern limit of the Gunsight Mine lies in a small valley which has a general east and west course. The small range of mountains in which the Gunsight workings are found rises a little further to the south, and the workings hereinafter described are found on the northerly slope of this small range of mountains, the highest of which does not rise more than one thousand feet above the floor of the valley.

GEOLOGY. The geological formation in which the workings of the Gunsight mine is found is that of an altered granite, gneiss, some porphyry, lime and barium spar with occasional evidence of the existence of small bodies of flour spar.

A careful examination of the structure within the limits of the Gunsight property shows that there have been great local disturbances and that these disturbances have been favorable to the concentration of mining values into veins and that such concentration has produced large quantities of commercial ore. It also appears from a careful examination that within the limits of the Gunsight Mine there is a network of veins and the intersection of these veins are points of great concentration and that high grade ore values can be expected at all of such points of concentration, as will be hereinafter shown.

PHYSICAL CONDITION OF PROPERTY. The surface of the Gunsight Mine shows the following condition to exist:

A road suitable for all purposes and all kinds of weather extends south from the state highway along and near to the westerly line of this property. At a point opposite the tunnel which leads in the Glory Hold hereinafter mentioned, this road turns to the east and continues entirely across the property.

At 300 ft. east from where it turns at the Glory Hole is the Baker Shaft. It lies on the south side of the road and is equipped with a proper head frame for hoisting and directly opposite from this head frame on the north side of the road is the hoist house. In this hoist house there is installed a Samson Hoisting Engine of an adequate capacity to hoist two tons from the bottom of the shaft on each load, and there is also in the same building the completed foundation for the installing of the air compressor which the company has ready for such installations.

A short distance further east there is a well equipped blacksmith shop sufficiently supplied to take care of all the needs of the property when it gets into active operation. Lying directly north of the Baker Shaft and further down the slope of the mountain are the dumps of material taken from the property, and also the foundation of a mill, and at a point 300 ft. northeasterly from the Baker Shaft is found the entrance to the incline shaft which goes down to the 200 ft. level hereinafter mentioned and on each side of the road leading from the highway south to the entrance of the tunnel to the Glory Hole are situated permanent buildings suitable for the accomodation of superintendents, employers, employees of all kinds and miners, ready for occupation.

Going on east of the road above mentioned from the Baker Shaft a distance of about 600 feet, it cuts across the eastern vein and shows good ore on the surface and on the surface immediately south of the Baker Shaft and at an elevation of about 80 ft. above it, are two spar dykes with a distance of about 25 ft. between them, all of which, upon examination is found to be ore matter as hereinafter stated.

UNDERGROUND WORKING. As above mentioned at the point where the road above described turns east across the property and on the same level as the collar of the Baker Shaft, is the entrance to the tunnel running southeasterly into the mountain. This tunnel is 180 ft. in length and is in good condition and equipped with air pipes leading into the workings above described.

At 130 ft. from the entrance it crosses the Glory Hole at about 30 ft. from its entrance. This tunnel also cuts across the

Silver Girt vein. This vein has a dip of 40° to the southeast and at the place where it is cut in this tunnel shows a width of eight feet.

After passing across the Glory Hole at a distance of about 30 ft. from that point, it cuts a 36 in. ledge showing silver and copper ore. This ledge has not heretofore appeared on the surface. On the further side of this 36 inch ledge is a contact between the ledge matter and the porphyretic granite with a spar and lime selvage lying in the contact.

Returning to the Glory Hole there is a tunnel running southwesterly along the Gunsight vein for a distance of 105 feet. All of this tunnel is in good mill ore. The Glory Hole proper extends northeasterly from the point of entrance from the tunnel above mentioned and runs along the Gunsight vein. The floor of the Glory Hole on the level with the collar of the shaft is 12 ft. wide and 45 ft. long. It carries this size a height of 30 ft. above the floor. At that level it is 180 ft. long and continues 40 ft. up to the surface and has a varying width of from seven to twelve feet. These dimensions show that 70,000 cubic feet of material were taken out of this excavation and allowing 13 cubic feet to the ton, we would find that 5,400 tons had been taken out of this Glory Hole.

The dump at and below the entrance to the tunnel which contains all of the material taken from this Glory Hole and the tunnels above mentioned, shows not more than 1500 tons of material at that place. This amount of material on an estimate is about equal to what was taken out of the tunnels and therefore there was taken out from the Glory Hole 5,400 tons of ore and as all of the work above described is the first work done on the mine, we are forced to the conclusion that this ore was hauled to Yuma and shipped to England as above described and knowing the expense of such transportation, we are justified in believing that it was all high grade.

On the floor of the Glory Hole there is a winze that runs down to the 200 ft. level. This winz is well equipped with ladders and at the time of my visit, was open for examination only to the 100 ft. level. The remaining 100 ft. of the winz had been used as a chute to drop ore to the 200 ft. level and load it into cars and hoist it to the surface through the Baker Shaft, and this part of the winz is now full of ore.

At 55 ft. from the collar of this winz there is a drift

extending southwesterly 35 ft. and northeasterly 40 ft. All of these workings are in good ore and show a vein more than 12 ft. wide carrying ribbon galena and no walls exposed.

The second landing in the winz 42 ft. further down shows a drift running southwesterly 45 ft. also a cross-cut of about 42 ft. in length and no walls showing on either side. This ore is all good milling ore and carrying some high-grade that can be shipped.

From this point we returned to the surface and went to the 200 ft. incline shaft lying northeasterly from the Baker Shaft. This shaft is directly under the vein and net in the ore itself. At this point it has a dip of about 35° for the first 100 ft. and the second 100 ft. the dip is about 30°.

At the 200 ft. level this incline shaft cuts into the vein and shows a width of approximately 4 feet. Passing southwesterly along this drift at 285 ft. we come to the Baker Shaft which cuts through the vein and continues on down 200 ft. to the lower workings. The ore in this drift from the foot of the incline shaft to the Baker Shaft shows that it is the Silver Girt vein.

We then proceeded further southwesterly, a distance of 235 ft. all in ore and this ore from the Baker Shaft southwesterly is ore that comes from the Gunsight vein, and this shows that two veins intersect each other at the point where the Baker Shaft passes through them.

All of this drift from the bottom of the incline shaft first above mentioned past the Baker Shaft on to the foot of the 200 ft. winz, coming down from the Glory Hole, is in ore. Between the 200 ft. level and the 400 ft. level the Baker Shaft lies under the ore and at a 400 ft. level there is a cross cut northeasterly to the vein proper about 35 ft. long, and from this cross cut drifts have been run southwesterly and northeasterly 200 ft. in each direction making 400 ft. in all, and this 400 ft. drift is all in ore. The ore in this drift shows that it is approaching but has not yet reached the water level of the country, but it does show more sulphides, lead, silver and copper and it is reasonable to consider that within the next one hundred or one hundred fifty feet the real sulphide ore zones will be encountered and this would make of the mine one of the best producing mines in the country because of the immense net work of veins found within the property and hereinafter more fully described.

WATER. In the early work of this property water was developed about five miles to the southwest near the Aqua Dulsa Mountains and brought by pipe to the property as hereinbefore noted.

I made an examination of the property with respect to water development and went up to the Aqua Dulse Valley where water was before produced and I find that all of the outlet of that valley together with the outlet from something like 200 square miles of territory flows through the little valley lying immediately north of this property, and on making a close examination of this valley near the property, I find that there is a reef of porphyretic granite that crosses this valley and that the water flowing from the valley must pass over this reef.

I also find that a well has been dug near the State Highway north of this property and that a great abundance of water for all purposes is found in this well.

With these facts before me, it is plain that by sinking a well to a depth of not exceeding 150 feet in the upper part of this valley and at a distance of about 3000 feet from the hoist house an abundance of water can be had. The vegetation all through the valley shows that there is water underneath and the geological formation is such that there is no place to escape except through this narrow valley and the reef crossing the valley as above referred to will force this water nearer to the surface and the amount thereof should be abundant from such a large drainage area.

LABOR. The Gunsight Mine is situated as above referred to in the Southern part of Arizona, and Mexican, native Spanish American and Indian labor is available, and for a mine of this type, I believe that either one of these classes of labor for mining operations would be advisable. They are willing to work for lower wages. They live with their own families and if a Commissary Department is maintained at the mine, will spend almost all of their money at the Commissary, and altogether, they are a reliable and agreeable class of people. However, the Indian labor, if composed of Yaquis does not mix well with the Mexican labor and one class or the other should be chosen entirely.

ORE IN SIGHT AND THE VALUE THEREOF. In making an estimate of the number of tons of ore in sight, no attention is paid to the eastern vein or to the vein on the west side of the property or an intermediate vein between the western and the Silver Girt on the east side, and reference is made to but three veins. In

sinking the Baker shaft at 340 ft. it cut through a vein of ore with a width of five ft. and at 400 feet a cross cut 35 ft. long running to the northeast intersected this vein. The 400 ft. drift on this level is on this vein and shows an average width of 5 ft. This vein lies under the vein cut on the 200 ft. level and shows the best average value of any of the workings on the property. It crops at the surface about 400 ft. southwesterly from the incline shaft that leads down to the 200 ft. level.

This gives a body of ore 400 ft. long, 400 ft. in height, and an average width of 5 ft. making a total of 800,000 cu. ft. On the 200 ft. level there is a drift a little over 500 ft. in length with a height taking the collar of the shaft as the level of 200 ft. and an average width of 5 ft. plus as there are many places in this vein which run from 10 to 40 ft. in width and no walls on either side.

This would give a body of ore 500 ft. long, 200 ft. high and 5 ft. in thickness or 1,000,000 cu. ft. This is actual ore in sight. Allowing for probable ore, 25 ft. below the 200 ft. level we have an additional 125,000 cu. ft. of ore. This is equivalent to 150,000 tons of ore in sight.

As to the values, I would say that I have averaged all available assays coming to my knowledge from said property and it gives an average value of $31.20 per ton. On the other hand I have averaged all of the assays taken by me and that gives an average value of $29.80 per ton. It is fair to conclude that the average value of ore, per ton, on this property is $30.00, and at that figure, there is more $4,000,000 in sight in the said property.

RECOMMENDATIONS. After examining the Gunsight property and studying the conditions that I found there, I would recommend to the present owners that as soon as possible they begin mining operations on the eastern vein and also that they go into the Glory Hole and drive a tunnel to the southeast for the purpose of cutting a new vein that runs up the mountain and above the Glory Hole. The conditions surrounding the croppings of this vein and its proximity to the Glory Hole leads me to believe that shipping ore will be encountered and by running the tunnel you would hit it seventy or seventy-five feet below the surface.

The ore taken out of the eastern vein and the ore taken out of the Glory Hole should be sorted and the high grade ore shipped to the smelter. I also believe that it would be wise and I recommend it, to run another cross-cut tunnel from the Glory Hole

into its opposite wall, for the reason that there is evidence there of bodies of galena ore. The true wall of the Glory Hole formation has not been struck on either side and this body of ore should be carefully explored.

The Baker shaft should be operated and drifts started on the 340 ft. level where there is good ore, also on the 200 ft. level where the loading chutes are ready for operation and the ore taken therefrom should be carefully sorted and the high grade shipped.

An examination of the dumps now existing on the property as well as the ore on the floor of the Glory Hole and in the first and second landing of the winz running down to the 200 ft. level from the Glory Hole, all show this fact to exist; that by careful sorting of this ore, a large tonnage of high grade shipping ore can be gathered together and the shipping of this ore would soon produce an income sufficient to enable you to put in a reduction plant.

I would further say that I have had an opportunity to examine the flow sheet prepared by the Southwestern Engineering Corporation with offices at 1221 Hollingsworth Building in the City of Los Angeles, wherein they make a report upon the treatment of samples of ore taken from this property, and they have made a saving of 88.8% of the silver and 91% of the lead, and that the middlings from their treatment contained 8.2% of the silver and 5.7% of the lead.

They have also prepared a flow sheet showing the suggested machinery necessary to treat the ore out of the Gunsight property and I have examined that carefully, and have examined their assay sheets in connection with their tests and I would recommend to you that as soon as you are finacially able to do so, that you erect a plant as suggested by the Southwestern Engineering Corporation, with a capacity of from 50 to 100 tons per day as your mine has ample ore in sight to provide for such an operation.

The crushing of your ores and finer grinding are mechanical matters and any good mining machinery firm can furnish you equipment for that purpose, but the portion of your plant which is to recover your values is a metallurgical process and calls for the careful advice of a metallurgical engineer and chemist.

In conclusion I would say that I believe you have a valuable property and that it is worthy of a strong effort to put it on

production and that in doing this, you must use the best judgment obtainable.

Respectfully submitted,

CHARLES S. McKELVEY

612 Chester Williams Bldg.
Los Angeles, California
Dated: November 16th, 1927

The assays from that property show as follows:

1. Sample taken across 4 ft. vein at the bottom of the 200 ft. incline shaft shows a value of $38.20.

2. Sample taken from first level in the winz running from the Glory Hole shows a value of $51.04.

3. Sample taken from the bottom of the winz on the 200 ft. level shows a value of $64.32.

4. A sample taken from the Glory Hole in the floor across shows $51.22.

5. Another sample cut across the floor of the Glory Hole shows $31.06.

6. A sample taken from the eastern vein hereinabove referred to shows values of $70.42.

7. Samples from the 400 ft. level across the vein shows values of $32.08.

8. Samples across the 200 ft. level to the southeast of the shaft 8 feet wide, shows values of $18.87.

9. Samples from 200 ft. level 100 ft. northeast from Baker Shaft shows a value of $10.79.

These latter samples are most excellent mill ore. In fact all of the ore on the 200 ft. level can be milled at a profit.

10. Another sample was taken from the croppings between the two spar dykes, lying to the east of the Glory Hole and about 200 feet south of the hoist. This was broken off the croppings across a distance of 20 feet and shows values of $21.14.

Part of these values being 15% lead carried in the ore.

THE EAGLE-PICHER MINING & SMELTING COMPANY
MIAMI, OKLAHOMA

INTRA-COMPANY CORRESPONDENCE

TO Grover Duff - Tucson Office DATE April 6, 1951

FROM John W. Chandler - Miami Office

SUBJECT: Exploration Work

Dear Grover:

We are presently compiling a record of all the mines and prospects which we have examined for the Company during the past 10 years.

Starting with 1940, and listing the work done by years, such as 1940, 1941, 1942, etc., we would like to have the following information tabulated:

1. Name of property
2. Location - (State and County)
3. Who it was submitted by
4. Who made the examination
5. Time spent on the examination
6. Metals involved
7. General conclusions drawn from examination
8. Remarks - Under this heading could be shown whether we have done drilling or any other work in addition to the examination. Give brief outline. If the property subsequently became a mine unit and was operated so state.

We do not have a complete file in this office on all properties examined by the Company and we will combine your report with the one being made up from our files to make the final report complete. I would appreciate it if you could put someone on this work until it is completed, sending me three copies of your tabulation.

Best regards,

Jack.

John W. Chandler.

JWC/jm

4-25-51 - Mr. Chandler will send us a list of the properties on which they have reports in their files, and we will then send him the information on the others.

GJD

May 25, 1943

MEMORANDUM

The Gunsight Mine
Ajo, Arizona

TO: George A. Ballam

FROM: J. S. Coupal

Mr. John C. Graham, 309 North Fifteenth Avenue, Phoenix, has a lease on the Gunsight from J. G. Butler, Box 216, Ajo.

He shipped on May 7, 1943 fifty-two tons of ore running .005 gold, 3.5 silver, and 8.3% lead. He plans to ask for reconsideration of a loan application for $20,000 which was turned down December, 1942.

I suggest that you advise Mr. Graham when you will be in the Ajo district and when you can examine the Gunsight Mine and assist him in any information necessary.

/ Gunsight Mining Corp.

Ph. 9464122

C-44460

NOTES ON

THE SHEEHAN MINES AREA

MEYERS MINING DISTRICT

PIMA COUNTY, ARIZONA

HARRY E. NELSON

REGISTERED GEOLOGICAL ENGINEER

NEVADA LICENSE NO. 691

MAY 25, 1965

NOTES ON THE SHEEHAN MINE AREA, MEYERS MINING DISTRICT, PIMA COUNTY, ARIZONA

Table of Contents

Harry E. Nelson
2018 East Norman Avenue
Las Vegas, Nevada

May 25, 1963

NOTES ON THE SHEEHAN MINES AREA, MEYERS MINING DISTRICT, PIMA COUNTY, ARIZONA

INTRODUCTION:

The Sheehan Mine Area is located 14.7 miles south via Arizona Highways 85 and 86 of Ajo, Arizona; thence approximately one mile by dirt road through the Papago Indian settlement of Schuchuli (Many Chickens) to the northern most mine workings. This area is in the Papago Indian Reservation, in southern Pima County, in southwestern Arizona, about 20 miles north of the Mexican boundary.

Ajo is the largest town in the area, and is connected by the Tucson, Cornelia, and Gila Bend Railroad, owned by the Phelps Dodge Corporation, with the main line of the Southern Pacific Railroad at Gila Bend.

The New Cornelia Mine, an open pit producing since about 1917, is located at Ajo, Arizona. As of 1956, the New Cornelia Mine ranked seventh in total copper production when compared with the "Great Porphyry Copper Mines" of the world; its production is under that of Utah, Chuquicamata, Braden, Morenci, Chino, and Andes. Thus this is elephant country in regard to mineral wealth.

The Sheehan Mine Area is about a mile and a half in length and about a mile wide and trends in a northerly direction.

Physical Features:

This area lies in the Sonoran Desert section of the Basin and Range province. It is a part of the Gunsight Hills on the northeast flank of the Ajo Range of Mountains. It lies in Sections 16, 17, 20, and 21, T. 14 S., R. 4 W., Gila and Salt River Base and Meridian.

It is an area whose center is made up of sharp ridges and peaks that

rise about 1,000 feet above the surrounding alluvial valleys. Altitude ranges from about 1,500 to 2,600 feet.

There are no permanent streams in the area.

Climate and Vegetation:

Climatic records at Ajo indicate the temperature ranges from 23° F. to 115° F., with the daily maxima above 100° F. being very common. Annual precipitation at Ajo is about 10 inches.

Even though the climate is that of the Sonoran Desert, vegetation is abundant and the area appears unusually green. Found in the area are the following: palo verde, saguaro, palo fierro, mesquite, ocotillo, hedgehog cactus, barrel cactus, prickly pear, cholla, creosote bush, greasewood, and various grasses.

No farming is done in this area. The Papago Indians run a few cattle in the vicinity of Schuchuli.

Water is obtained from shallow wells.

Rock exposures are excellent.

Purpose and Scope:

Field geologic mappling and sampling started March 12, 1963 and terminated April 11, 1963 for a total of 20 field days. Surface geology was platted on a scale of one inch to 300 feet.

The topographic base map showing the mining claims was prepared by Mr. Hale C. Tognoni, Mining Consultant for the Sheehan Mining Corporation, from an enlargement of an aerial photograph. The surface geology and the location of the samples were drawn directly on the base map.

Aerial photographs of this area were taken by Maddock Associates Aerial Survey, Inc., 4900 East Indian School Road, Phoenix, Arizona. The 9" x 9" steroscopic pairs of the aerial photographs were studied. One enlargement,

at a scale of one inch to 400 feet, of the center of the area was studied. It is thought the aerial photographs were taken at the wrong time of day, for shadows hide much of the features on the north side of the sierra type hills in the center of the area.

During this program 118 samples were taken for assay and for petrographic study. The samples for assay were taken by the writer to Hawley and Hawley, 1800 West Grant Road, Tucson, Arizona. The samples of rock specimens were sent by the writer to Dr. Byron J. Sharp, 4131 Olympic Way, Salt Lake City 17, for petrographic study. Mr. Robert E. Jones, 1615 Sampson Street, Butte, Montana made 43 thin sections of the rock specimens for the petrographic analysis. The field geologic maps were turned over to Mr. Tognoni for final drafting.

Mr. Lawrence J. Sheehan, President of the Sheehan Mining Corporation, worked with the writer during the greater portion of the field work.

Mr. Don Dixon, Resident Geologist for the Phelps Dodge Corporation at Ajo, conducted the writer, Mr. Tognoni, Dr. Dobbin, Mr. Hatton, Mr. Bleish, and Mr. Malmstone through the New Cornelia open pit on March 18, 1963. On March 22, 1963, Mr. Dixon discussed the Sheehan Mine Area with the writer, looked at the collected rocks and ore specimens, studied the steroscopic pairs of aerial photographs of the area; and made helpful suggestions, in regard to the textural differences of the rocks as seen in the steroscopic pairs.

The purpose of this investigation was to determine by geologic mapping and by sampling the areas of major economic interest and to make recommendations for exploration to Mr. Tognoni.

Bibliography:

1. Report of the Director of the Mint Upon the Statistics of the Production of Precious Metals in the United States for the Year 1882, page 299; Year 1883,

page 60; Year 1884, page 49.

2. 1899, Blake, W. P., Territorial Geologist: Historical Sketch of Mining in Arizona, Report of the Governor of Arizona, p. 145-153.

3. 1912, Hill, J. M., Mining Districts of the Western United States: U. S. Geol. Survey Bull. 507, p. 65.

4. 1917, Mineral Resources: U. S. Geol. Survey, p. 937.

5. 1917, Mineral Industry, Annual Reviews of Statistics, Technology, and Trade, McGraw-Hill Book Co., New York City, p. 700.

6. 1918, Bramwell, A. W., In Ajo and Scheelite Districts: Ariz. Min. Jour., vol.2, no. 7, p. 20.

7. 1919, Bramwell, A. W., News of Ajo and Gunsight Districts: Ariz. Min. Jour., vol. 2, no. 11, p. 24-25.

8. 1922, Bryan, Kirk, Erosion and Sedimentation in the Papago Country, with a Sketch of the Geology: U. S. Geol. Bull. 730, p. 19-90.

9. June 8, 1926, Unpublished Letter, to Mr. Victor F. Brown, Ann Arbor, Michigan from W. P. Putman, The Detroit Testing Laboratory, Detroit, Michigan, four pages, one page of assays.

10. 1937, Gilluly, James, Geology and Ore Deposits of the Ajo Quadrangle, Arizona: Arizona Bureau of Mines, Geological Series No. 9, Bulletin No. 141, 83 p., maps.

11. 1941, Wilson, E. D., Tungsten Deposits of Arizona: Ariz. Bur. of Mines, Geol. Ser. No. 13, Bull. 146, p. 141.

12. 1946, Kerr, Paul F., Tungsten Mineralization in the United States: Geological Society of America, p. 106.

15. October 1962, Unpublished Report, Bacon, Vance N., Preliminary Examination of Gunsight Mine Area, 9 p., 4 maps.

14. 1962, Unpublished Report, Tognoni, Hale C., Geological Report on the Sheehan Mine of the Meyers Mining District, 5 p., assays.

Geologic Map:

1. Geologic Map of Pima and Santa Cruz Counties, Arizona: Prepared by the Arizona Bureau of Mines, University of Arizona, Tucson, Arizona; by Eldred D. Wilson, Richard T. Moore, and Robert T. O'Haire, scale 1/375,000, 1960.

History:

The conspicuous croppings of the veins, some showing galena; the nearness to the watering and trading post at Wall's Well, five miles to the south; the nearness to the copper croppings of the Ajo region, 15 miles to the northwest, all lead one to believe that the Indians, Spanish, and Mexicans, as well as early day Americans undoubtedly mined in this area.

This area is about 30 miles from the Bahia de S. Jorge on the northeast coast of the Gulf of California.

In 1687, the Jesuit missionaries, Fathers Kino and Salvatiera, established the first mission within the region now known as Arizona. Thirty years later there were nine missions. The converts were mostly from the Pimas, who took the name of "Papago" (baptised). The missions were subject to constant raids from the Apaches, who no doubt interfered with the mining, and in the year 1757 there was an uprising of the Pimas, with the destruction of several of the missions and murders of the priests. This disaster was followed in 1765 by a royal decree of expulsion of the Jesuit Fathers and the substitution of eight Franciscan friars in 1768.

New Mexico was ceded to the United States in 1848. At that time, southern Arizona, south of the Gila River, was Mexican territority. The Gadsden Purchase of 1853 brought the Sheehan Mine Area as well as the Ajo Area into the United States.

The old Arizona Copper Mining and Trading Company (Ajo) was one of the first, if not the first, mining incorporations upon Arizona property. The Ajo

mine was located in November 1854, by a party of Americans from California. Major Robert Allen, U. S. A., Deputy Quartermaster-general of the Department of the Pacific, was president, and J. Downer Wilson, of San Francisco, was secretary and treasurer of the corporation. As soon as work commenced on the Ajo mines, they were claimed by several wealthy residents of Sonora as being within Mexican territory. In the month of March, 1855, a Mexican company of cavalry was sent from the district of Altar and from Ures, the capital of Sonora at that time, to dispossess the Americans, to capture them, and to take them to Ures as prisoners. The miners refused to go and defended their position. With only nine men against 110 dragoons and vaqueros, the mine was successfully held and the Mexicans dispersed. For six months after this nothing was done beyond prospecting, but in the fall of the year 1855 the boundary line had been run, and it was found that the Ajo mining camp was at least 40 miles inside the boundary on the United States side. Shortly thereafter ten tons of highgrade copper ore (red oxide) was shipped to Swansea, Wales for smelting. However it wasn't until 1911 that the Calumet and Arizona Company with Ira Joralemon as the geologist and John C. Greenway as the manager that successful drilling was started that finally proved an enormous tonnage of 2% oxidised copper ore; and it wasn't until 1917 that a big plant at Ajo, with a capacity of 5,000 tons per day was completed.

The Gunsight Mine, a part of the holdings of the Sheehan Mining Corporation in the Meyers Mining District, is mentioned in the "Report of the Director of the Mint upon the Statistics of the Production of Precious Metals in the United States" for the years 1882, 1883, and 1884. It is interesting to note that these are the only published reports, known by the writer, to exist on any of the mines in this district.

In the Report for 1882 - the Gunsight Mine is mentioned as being the best developed, the best equipped, and the leading mine in the district; with a 200-

foot incline, a drift 200 feet on the vein at the 100 foot level, and a crosscut at the 200 foot level, and with plans to sink a vertical shaft immediately. About 4,000 tons of ore were mined during the prospecting work, that averaged between $ 30 to $ 40 per ton in value. The mine has two types of ore, free milling and smelting, with the free milling predominating. The milling ore consists of black sulpherrets (Raymond - an old synonym for sulfide) and chlorides, and the smelting ore of lead and iron carrying silver.

In the Report for 1883 - the Baker shaft (probably the main vertical shaft) is mentioned as being 340 feet deep, and that crosscuts had been driven connecting to the old workings on the Gunsight Vein, 300 feet below the surface. It was thought that the mill could be furnished with 50 tons of ore per day from the deepest workings.

In the Report for 1884 - report apparently by R. C. Pearson - the Silver Girt shaft (probably the main vertical shaft - the Baker shaft mentioned in the Report for 1883) is mentioned as being down 380 feet, with the first level at 200 feet (Rasor's sketch dated Nov. 1942, shows the Main Shaft cutting the Silver Girt Vein at the 200 level, and the drift north as being driven on the Silver Girt Vein) consisting of a north drift of 147 feet, all in ore; and a south drift 240 feet in length that was being stoped for 180 feet - the ore averaging $ 23 per ton. The old Gunsight shaft (probably the winze from the Lower Adit Level) is mentioned as being 240 feet (deep ?), with 31 feet of ore exposed, averaging $ 60 per ton without sorting, and still in ore; the first level is at 100 feet, with 130 feet of stoping ground, the vein being seven feet wide and averaging $ 75; the second level having 180 feet of stoping ground that averaged $ 60.

The Sheehan Mining Property of 19 unpatented mining claims were located and recorded in 1922 and 1925 by I. M. Sheehan, wife of Cornelius Benjamin Sheehan. Cornelius "Con" Sheehan, born in Dublin, Ireland in 1881, moved with

the family to Butte, Montana in 1884. He started working in the mines in Butte when he was eleven and worked his way up to be a shiftboss. He attended the Montana School of Mines while still working underground. He was married in Butte, in 1917 he and Mrs. Sheehan moved to the Ajo area, where Lawrence J. Sheehan was born at Wall's Well. Cornelius Sheehan worked for John C. Greenway in the open pit at Ajo, and later at Jerome, Bisbee, and other mining camps in Arizona as an engineer. In 1921 he acquired the Gunsight Mine and formed an Arizona corporation with Walter Wheeler, a lawyer from Detroit, Michigan, and Marvin Hall, a business man, to develop the area. He rebuilt the Gunsight Mill, installed a water line from Wall's Well, five miles to the south, re-timbered the Gunsight Winze and the Surprise Incline, and started mining in both the Gunsight Mine and the Surprise Mine. Cornelius Sheehan died in 1922, at the age of 41, leaving Mrs. Sheehan with a house in Phoenix and six small children. Following his death the corporation folded, and later John J. Butler, the watchman at the property, sued for wages and was awarded three patented claims. Mr. Butler sold the mill and pipeline, and left in his will the three patented claims to his daughter Margaret Griffin.

In 1942, lessees by the names of Graham and Thomas applied for an RFC loan to reopen the Gunsight Mine. The examining engineer was C. A. Rasor. The loan apparently was refused. The report of C. A. Rasor has not been seen by the writer, but copies of C. A. Rasor's underground maps and assays, dated November 1942, are included in the report by Vance N. Bacon.

According to Lawrence J. Sheehan, "Brick" Squires, a mining engineer working for the Arizona State Mineral Department, examined the underground workings of the Gunsight Mine in 1955, and later wrote a report on the property. This report has not been seen by the writer.

GENERAL GEOLOGY:

The rocks of this area are indicated on the Geologic Map of Pima and Santa Cruz Counties, prepared by the Arizona Bureau of Mines, University of Arizona, Tucson, Arizona, 1960, as being Laramide granite. The hills to the west, north, and east are indicated as Tertiary andesite.

It is thought that a deep Permo-Triassic geosyncline was developed in southwestern Arizona; in the Altar District, Sonora, Mexico; and in southern California. It is also thought that the long axis of this trough was northwest to east-west, and that the seaway was through to the Pacific in the vicinity of Los Angeles. It is also assumed that during Triassic time the sediments in the trough were folded into a mountain chain, the thrust being to the northeast against the positive pre-Tertiary Plateau element. Erosion then proceeded and continued to the initiation of the Tertiary revolution when the old Triassic mountain range had been base-leveled and the sediments stripped from it. The line of weakness of the old geosyncline still existed, and the Tertiary mountain-building forces tended to make the present fault-block mountain ranges that trend to the northwest in southwestern Arizona.

The surface features of the area are the result of desert erosion. The older rocks are carved into mountains with sharp ridges and needle peaks. The more recent basaltic and andesitic flows form mesas. Rock-floored sloping plains are found bordering the mountains of the sierra type, a good example of this is the Sheehan Mine Area.

Sedimentary Rocks:

A conglomerate is poorly exposed in the wash 400 feet south of the old Gunsight Cemetery; and continues east some 600 feet, to within about 200 feet of the dirt highway that connects Arizona Highway 86 to Wall's Well and Gu Vo.

As exposed in the wash, a smooth polished surface forms the outcrop.

The conglomerate carries boulders up to two feet in diameter, but most of the pebbles are less than 1/4 inch in diameter and are partially rounded. The cementing agent appears to be mostly silica, for very little effervescence was seen when dilute hydrochloric acid was applied.

The matrix of the conglomerate is light gray in color, while the component rocks are darker gray andesites, brown and reddish chert, gray granitic rock, and boulders of a basic rock with white phenocrysts 1/4 inch long.

This conglomerate is tentatively correlated with the Tertiary Daniels Conglomerate as described by Gilluly in the Geology and Ore Deposits of the Ajo Quadrangle, Arizona, page 46.

Metamorphic Rocks:

No metamorphic rocks (gneisses or crystalline schists) were recognized as such in the field.

Metamorphism thought to be a contact aureole of the late intrusive rocks is partially developed in the southeastern and southern area mapped.

Igneous Rocks:

As of this time the petrographic analysis of the 43 specimens, whose thin-sections were made by Mr. Robert E. Jones, and whose petrographic analysis were made by Dr. Byron J. Sharp, have not been received by the writer.

The following rock unit descriptions have been made by the writer in the field based on megascopic examination of the rocks.

The Gunsight Hills of this area are made up of granite and quartz monzonite intruded by granite aplite, all of which are cut by rhyolitic and basic dikes.

(Quartz Monzonite)

This mass of rock occupies the southeastern and the southern section mapped.

It forms brownish-gray rolling hills, and is the least resistant to erosion of the rocks outcropping in the area.

This unit consists of rocks of several varieties. In the main it is gray in color; some areas have a distinct greenish cast, probably caused by epidote. Numerous small discontinuous dark basic dikes cut the gray quartz monzonite with increasing frequency from east to west; they are most numerous from the Burro Burro Claim westward, and they trend in an easterly direction. Numerous small discontinuous tan aplitic dikes cut the gray quartz monzonite in the vicinity of the Southern Belle Claim; they trend in an easterly direction.

Dull white to gray pegmatitic quartz zones are found in the quartz monzonite, with increasing frequency from east to west.

The rock is medium grained. The minerals seen in the hand specimen (No. F-1511, submitted for petrographic analysis) were quartz, white feldspar, biotite, and chlorite (?). Some calcite is thought to be present, for there was some effervescence when dilute HCl was applied.

Qualitative spectrographic analysis of a portion of sample No. F-1511, the elements found and the percentage range are as follows:

Major - Si

1.0 to 10.0% - Al, Na, K, and Fe.

0.10 to 1.0% - Ca, and Mg.

0.01 to 0.10% - Mn, Ti, Ba, Sr, V, and Zr.

less than 0.01% - B, Pb, Zn, Cu, Cr, Ni, and Co.

(Granite)

This type of rock outcrops in the northern and northeastern section of the area mapped.

The north limit of this type of rock is an abrupt change from a gentle north-dipping weathered outcrop, to perhaps 30 feet of partially cemented alluvial fill.

This abrupt change is not a part of the present drainage system, but appears to have been formed earlier.

The granite forms the wall rock of the Gunsight Mine, and the mountain ridges to the south and southeast of the mine. On the crest of the ridge south of the mine, granite aplite is found intruding the granite.

The granite is coarse grained; the chief constituents are quartz and pink and white feldspar. The rock has a reddish color, but this is thought to be from iron oxide. Specular hematite is an accessory mineral. Specimens No. 545 and No. 551 were submitted for petrographic examination.

Chemical analyses of this rock showed the following:

Sample No. 538 - East Side - Trace Au, Trace Ag, 0.20% Pb, None Cu, 0.08% Ba, 0.40% Zn, 0.001% Mo, 1.43% CaF_2, and 0.006% W.

Sample No. 545 - East Side - None Au, Trace Ag, 50 PPM Pb, 20 PPM Cu, None PPM Zn, 10 PPM Mo, 250 PPM W, and None PPM Sn.

Sample No. 551 - North Side, altered zone - Trace Au, Trace Ag, 250 PPM Pb, 40 PPM Cu, 100 PPM Zn, 10 PPM Mo, 100 PPM W, and None PPM Sn.

An important item in these analyses is the 1.43% CaF_2 found in what was thought to be an unaltered specimen of the granite. The fluorite content plus the large grain size leads one to the supposition that the granite crystallized at depth and that the fluorine couldn't escape. The source of the fluorine for the fluorite in the veins in this district is in all probability the same magma that produced this granite.

The tungsten content is important too, for it will be shown that other later rocks in this district also carry tungsten and are probably related to the same magma that produced this granite.

The age of this granite is not known, but it is thought to be probably of Laramide Time, and younger than the quartz monzonite previously described.

(Granite Aplite)

This type of rock outcrops in the central part of the area mapped. Mineral Monument No. 1, on the highest peak, is on an outcrop of the granite aplite. It weathers to sharp ridges and needle peaks, and it forms rock-floored sloping plains bordering the ridges and peaks. It has a pronounced joint system.

The granite aplite intrudes the granite, and while no cropping was seen of it intruding the quartz monzonite - it is thought to do so.

The rock is fresh-looking and appears to be unaltered. It is tan in color, and is very fine grained with an aplitic texture. The chief constituents are quartz, pink feldspar, and a little biotite. Very thin seams of specularite are found in the joints of this type of rock.

An outcrop of this type of rock on the ridge west of the Surprise Incline has many thin (less than 1/16 inch) stringers of quartz , that strike East, cutting the rock.

Specimens No. 544, No. 547, and No. 553 were submitted for petrographic examination.

Chemical analyses of the granite aplite showed the following:

Sample No. 544 - East Side - None Au, Trace Ag, 50 PPM Pb, 10 PPM Cu, None PPM Zn, 20 PPM Mo, 500 PPM W, and None PPM Sn.

Sample No. 547 - East Side, largest grain size of this type of rock found - None Au, 0.10-oz. Ag, 50 PPM Pb, 15 PPM Cu, None PPM Zn, 10 PPM Mo, 500 PPM W, and None PPM Sn.

Sample No. 553 - West Side - Trace Au, 0.10-oz. Ag, None PPM Pb, 20 PPM Cu, None PPM Zn, 10 PPM Mo, 500 PPM W, and None PPM Sn.

It is interesting to note that this type of rock carries up to 0.10-oz. Ag, 500 PPM W, and that it is lacking in Zn.

The small grain size indicates rapid cooling, thus it is thought that this

igneous rock intruded the area under very little cover; and that it is a later and more acidic phase of the same magma that produced the previously described granite.

(Rhyolite Dikes)

Rhyolite dikes cut the quartz monzonite, the granite, and the granite aplite.

The rhyolite dike that cuts the quartz monzonite in the southern area was traced on the surface for about 2,000 feet. It trends in a westerly direction, and is cut and offset by many faults. In one area it was cut by a black basic dike, with no apparent offset; apparently this is a push-a-part and does indicate the age relation, with the dark basic dike being younger than the rhyolite dike.

The rhyolite dike varies from about 20 to 30 feet in width. The rock is light tan in color. Phenocrysts of quartz, what is thought to be sanidine, and an unknown dark mineral are set in a tan aphantic groundmass. Specimen No. 581 was submitted for petrographic examination.

The rhyolite dike that cuts the granite in the eastern area mapped was found in a wash. Its lateral extent is not known; where seen it is five feet wide.

The rock is tan in color. The rhyolite has phenocrysts of quartz and what is thought to be sanidine, all set in a tan aphantic groundmass. Specimen No. 549 was submitted for petrographic examination. Chemical analysis of the rhyolite is as follows:

Sample No. 549 - East Side - None Au, Trace Ag, 150 PPM Pb, 20 PPm Cu, 25 PPM Zn, 20 PPM Mo, 100 PPM W, and None PPM Sn.

A small outcrop of iron stained rhyolite was seen in the NE corner of the

The black basic dikes are most numerous in the southwestern part of the district; only two were mapped cutting the granite, and four were mapped cutting the granite aplite.

The following specimens were taken for petrographic examination:

No. 546 - Galena No. 5 Claim

No. 548 - East side of District, 220 feet north of North Endline of Surprise No. 5 Claim

No. 554 - Crescent Claim

No. 555 - Surprise Claim

No. 557 - Surprise Claim

No. 558 - Surprise Claim

No. 568 - Surprise No. 7 Claim

No. 571 - Surprise No. 7 Claim

No. 582 - Surprise No. 5 Claim

No. F-1503 - Silver Glance Claim

Chemical analyses of the basic dikes are as follows:

Sample No. 546 - None Au, Trace Ag, 50 PPM Pb, 20 PPM Cu, 50 PPM Zn, 10 PPM Mo, 375 PPM W, None PPM Sn.

Sample No. 548 - None Au, Trace Ag, 150 PPM Pb, 20 PPM Cu, 150 PPM Zn, 10 PPM Mo, None PPM W, None PPM Sn.

Sample No. 554 - None Au, Trace Ag, 50 PPM Pb, 30 PPM Cu, 10 PPM Zn, 10 PPM Mo, 50 PPM W, and None PPM Sn.

Sample No. 555 - Trace Au, Trace Ag, 50 PPM Pb, 10 PPM Cu, 10 PPM Zn, 10 PPM Mo, 50 PPM W, and None PPM Sn.

These assays indicate that there are in all probability two different ages of black basic dikes; note that Sample No. 548 is the only one not carrying any tungsten. It is suggested that all the specimens be assayed by the PPM method.

Eastern Claim, apparently cutting the granite. Specimen No. 550 was sent for petrographic examination. Chemical analysis of the rhyolite is as follows:
Sample No. 550 - NE Corner of Eastern Claim - Trace Au, Trace Ag, 50 PPM Pb, 20 PPM Cu, 25 PPM Zn, 10 PPM Mo, 100 PPM W, and None PPM Sn.

The rhyolite dike that outcrops in the SW Corner of the Galena No. 4 Claim was traced for about 300 feet in a westerly direction. It is faulted off on the western end. The dike is about ten feet wide.

The rock is light gray in color, and weathers gray with small black spots. The rhyolite has very small phenocrysts of quartz and what is thought to be sanidine, as well as larger phenocrysts of partially altered pink feldspar; all set in a gray aphantic groundmass. Specimen No. 552 was submitted for petrographic examination. Chemical analysis of the rhyolite is as follows:
Sample No. 552 - SW Corner of Galena No. 4 Claim - Trace Au, Trace Ag, 100 PPM Pb, 20 PPM Cu, None PPM Zn, 10 PPM W, and None PPM Sn.

From the chemical analyses that have been done to date it seems that in all probability that there are two different ages of rhyolite dikes; note Sample No. 552 is the only one not carrying any Zinc. It is suggested that all specimens be assayed by the PPM method.

Additional specimens of rock thought to be rhyolites submitted for petrographic examination are the following: No. 561 C & C Claim, No. 562 C & C Claim, No. 565 Galena No. 5 Claim, No. 571 Surprise No. 7 Claim, and No. 581 Surprise No. 4 Claim.

(Basic Dikes)

The black basic dikes cut the quartz monzonite, the granite, the granite aplite; and, one was found cutting a rhyolite dike.

disseminated sulfides are present.

2. Photograph 7872 - pronounced lineation striking about N. 30° E. at 4,000 feet N. 27° E. of U. S. Mineral Monument No. 1. This zone can probably be correlated with the well developed vein system mapped to the south, and is postulated as being the extention of the Silver Girt Vein system.

3. Photograph 7872 - pronounced lineation striking about N. 15° E. at 5,000 feet N. 3° E. from U. S. Mineral Monument No. 1.

4. Photograph 7870 - lineation striking about N. 70° and 80° E. at 1,400 feet S. 55° E. from U. S. Mineral Monument No. 1. This area was inspected on the ground; the area is covered with talus, nothing was recognized.

5. Photograph 7870 - lineation striking about N. 10° W. part of a system thought to continue 3,000 feet to the south; at 1,800 feet S. 72° E. from U. S. Mineral Monument No. 1. Nothing was recognized on the ground.

6. Photograph 7870 - lineation striking about N. 30° W., part of a system thought to continue 3,000 feet to the southeast; at 3,800 feet East of U. S. Mineral Monument No. 1. This structure is postulated to be of major importance, and a part of the structure correlated with the Little Ajo Mountain Fault.

7. Photograph 7866 - pronounced lineation striking N. 30° E. at 4,700 feet S. 5° W. from U. S. Mineral Monument No. 1. It is to be noted that this structure is almost parallel to the Keystone Vein some 900 feet to the west; and is almost parallel to the vein some 600 feet to the east.

8. Photograph 7866 - pronounced lineation striking N. 5° E. at 4,600 feet S. 17° E. from U. S. Mineral Monument No. 1. This is possibly the southern extention of the Surprise Vein System. It is thought that part of this structure has been recognized in the field - the fault that cuts and offsets the basic

Structure:

As mentioned before it is thought that this area probably has lines of weakness that trend to the northwest along the axis of an old geosyncline. Some of these old lines of weakness are thought to have been recognized, through the study of aerial photographs.

(Aerial Photographs)

Study of the structure of this area was greatly aided by the 9" x 9" steroscopic pairs, at a scale of approximately one inch to 745 feet; and, the enlargement of the central area to a scale of one inch to 300 feet. Shadows on the northern slopes are a problem.

The aerial photographs show a pronounced lineation or linear structure present in the area. Some of these zones are as follows:

1. Photographs 7872 and 7861 - indicate a probable fault zone that strikes N. 50° to 60° W. This zone passes through the southern part of the Indian Village of Schuchuli, north of the area mapped. It is interesting to note that the Little Ajo Mountain Fault as mapped and described by Gilluly in the Geology and Ore Deposits of the Ajo Quadrangle, Arizona is pointed in this direction, and with very little deviation in its strike it could be present. It is to be noted too, that the rocks north of the Little Ajo Mountain Fault in the Ajo Quadrangle are described mainly as Tertiary volcanics with a little Tertiary Daniels conglomerate and Tertiary fanglomerate.

This condition appears to the writer to be somewhat similar just north of the area mapped; for here again is an area of Tertiary volcanics, and here again is a small patch of conglomerate tentatively correlated with the Daniels Conglomerate, north of the postulated fault.

Geophysical prospecting across this area would certainly prove or disprove the geological concept of large faults in this area, and could indicate also if

13. Photograph 7864 - lineation striking N. 75° E. at 3,500 feet S. 27° W. of U. S. Mineral Monument No. 1; and lineation striking N. 85° E. at 2,600 feet S. 15° W. of U. S. Mineral Monument No. 1.

14. Photograph 7864 - lineation striking N. 40° W. at 4,500 feet S. 80° W. of U. S. Mineral Monument No. 1; and lineation striking N. 30° W. at 4,050 feet S. 60° W. of U. S. Mineral Monument No. 1; and lineation striking N. 25° W. at 4,200 feet S. 42° W. of U. S. Mineral Monument No. 1. These are thought to be the same structure.

It is thought that the fourteen lineation trends just described should be investigated.

(Folds)

No folds were recognized in the field.

(Faults)

As mentioned before, it is thought there are old lines of weakness of an old geosyncline present in this area. Some of these lines of weakness or faults are mineralized and represent the veins in the area.

As will be discussed in the section on veins, these are divided into three groups; (1) veins that strike to the northwest and dip to the southwest, (2) veins that strike to the north, northeast, and east, and dip to the east and southeast, and (3) veins that strike to the east and northeast and dip to the north and northwest.

As has been discussed in the section on aerial photographs, probable major fault zones that strike from N. 50° to 60° W. are thought, by the writer, to be present near the Indian Village of Schuchuli. It is postulated that a split of this zone, trending N. 30° W., probably forms the eastern boundary of the district,

dike; and cuts off the rhyolite dike. About 400 feet south of the rhyolite dike cut-off, along the trend of this structure is found an area that has small seams of quartz, some of which contain chalcopyrite. This is the only area in the district seen with this sulfide mineral at the surface; no exploration has been done in this area.

The southern part of this structure apparently is influenced by lineation that strikes N. 70° E. This zone of intersection might be the key to the emplacement of the chalcopyrite, and should be investigated.

9. Photograph 7870 - lineation striking N. 55° E. at 5,300 feet S. 50° E. from U. S. Mineral Monument No. 1. It is to be noted that this zone of lineation will make an intersection with the lineation described in Item 6; the intersection will be near the center of Section 22, and should be investigated.

10. Photographs 7865 and 7866 - in the vicinity of the Burro Burro Claim and westward, general massive lineation striking N. 70° to 80° E. This is thought to be from the numerous basic dikes found in this area. This trend does not pass eastward beyond the Keystone Vein.

11. Photographs 7863 and 7864 - lineation striking about N. 10° W. at 5,600 feet N. 60° W. of U. S. Mineral Monument No. 1; lineation striking N. 5° E. at 2,900 feet S. 80° W. of U. S. Mineral Monument No. 1. These are thought to be the same structure. It is to be noted that the lineation on the 9" x 9" photographs strikes very nearly North, yet in trying to plat it on the 1" to 300' topographic sheet the strike is changed - could be distortion in the enlargement from which the 1" to 300' print was made.

12. Photograph 7864 - lineation striking N. 45° E. at 1,500 feet S. 70° W. of U. S. Mineral Monument No. 1; and lineation striking N. 15° W. at 1,400 feet S. 60° W. of U. S. Mineral Monument No. 1.

Geologic History of Area:

It is thought that a deep Permo-Triassic geosyncline was developed in southwestern Arizona. It is assumed that during Triassic time the sediments in the trough were folded into a mountain chain, later erosion leveled the mountain chain. The lines of weakness of the old geosyncline and Tertiary mountain building forces tended to make the present fault-block mountain ranges; and formed lines of weakness for the intrusion of igneous rock and of volcanic activity.

It is thought the granite in the northern and eastern part of the district intruded the quartz monzonite of the southern and southeastern section of the district at some depth; for the granite contains fluorite as an accessory mineral as well as specularite, probably indicating an elevated temperature and pressure. The granite also contains 100 PPM tungsten. The age of the granite is unknown, but it is thought to be probably Laramide.

It is thought the granite aplite intruded both the granite and the quartz monsonite; and that it probably represents a more acidic phase of the same magma that produced the granite, for while both contain tungsten, the granite aplite contains the greater amount (500 PPM). The age of the granite aplite is unknown, but it is thought to be probably Early Tertiary.

At a still later time rhyolite dikes and finally basic dikes invaded the area, some of these are thought to be associated with the same magma, for again some of them contain tungsten (50 to 375 PPM) while others (basic dikes) have none.

Important renewed fracturing separated different stages of vein formation; three separate vein systems were developed. The veins all contain some fluorine, barium, tungsten, zinc, and copper. The metallization is believed to be associated to the end phase of the intrusions from the same magma that produced the granite and the granite aplite.

to the writer, are those mentioned in the "Report of the Director of the Mint Upon the Statistics of the Production of Precious Metals in the United States" for the years 1882 and 1884.

In the report for the year 1882, it is mentioned that the Gunsight Mine produced 4,000 tons of ore during the prospecting work, that averaged between $ 30 to $ 40 per ton. Thus it is thought that the production was from $ 120,000 to $ 160,000, for or prior to 1882.

In the report for the year of 1884, it is mentioned that the Gunsight Mine had ore with values of $ 23 per ton, $ 60 per ton, and $ 75 per ton, however the tonnage mined was not given.

It is thought that with the scant information known that the total production from the Gunsight Mine was probably in excess of $ 250,000 and that, it probably represents the production of the district; and, that the values were in silver and lead.

Distribution - Vein Systems:

On the basis of field work done to date, it is thought, that the vein systems of this district can be separated by their physical characteristics into three groups: (1) veins that strike to the northwest and dip to the southwest, (2) veins that strike to the north and northeast and dip to the east and southeast, and (3) veins that strike to the east and northeast and dip to the north and northwest.

(Veins That Strike to the Northwest and Dip to the Southwest):

1.) Strike N. 15° W., dip 78° SW., Cashier Claim. This is a prospect pit exposure. The vein shows black carbonate with some green fluorite. Two samples were taken:

Sample No. 596 - 24.0-inches, HW, Trace Au, 0.70-oz. Ag, 0.14% Pb, 0.03% Cu,

ORE DEPOSITS:

Prior Mining and Exploration in District:

A good deal of mining exploration has been done in this area, most of which is thought bo have been done prior to 1900. Prospect pits and shafts have been sunk on the various veins. The only systematic development has been the Gunsight Mine; this work being done on faulted segments of both the Gunsight and the Silver Girt veins.

At the Gunsight Mine, there is a vertical shaft considered to be the deepest in the district; it is thought to be about 600 feet deep, with levels at 200 feet and at 400 feet. The total amount of drifting and crosscutting is unknown.

The Surprise Incline, on the Surprise Claim, is thought to be about 150 feet deep. This incline was sunk on the Surprise Vein. The amount of drifting and crosscutting is unknown.

The C & C Incline, located in the southwest corner of the C & C Claim, is thought to be a deep one, for the dump located at the collar of the incline is quite large. This incline was sunk on the C & C Vein.

On the Burro Burro Claim a vertical shaft was sunk. This shaft is thought to be probably the second deepest in the district, for a big dump is located at the collar. This shaft was not sunk on a vein, but was sunk in country rock, part of which was basic dike rock. The sinking of a big deep shaft in this location is hard to explain for the small discontinuous veins found on the Burro Burro Claim; unless of course one considers that 500 feet to the east is one of the major veins of the district, and that it dips to the west and should intersect the Burro Burro Shaft at about 1900 feet vertical depth.

The mineral production from the district is unknown, but in all probability the Gunsight Mine accounted for practically all of it. The only statistics known

this is the third highest tungsten sample taken in the district.

Sample No. 588 - 26.0-inches, FW, Nil Au, Trace Ag, Trace Pb, 0.32% Cu, 0.27% Zn, 0.006% Mo, 0.21% Ba, 1.42% CaF_2, and 0.65% WO_3. Note, this is the second highest sample in tungsten taken in the district.

It is obvious from the samples taken in the Kerlin Incline that no assay limit for tungsten was reached in the sampling program. This is an altered and broken area, and extends about 400 feet to the west. More work is thought needed in this area.

4.) Strike North-South, dip 55° E., Galena No. 2 Claim. A shaft was sunk on this structure; much iron oxide is present. A grab sample was taken off the dump.

Sample No. 509 - grab sample, 0.010-oz. Au, Trace Ag, Trace Pb, 0.20% Cu, 0.09% Zn, and 0.060% Mo.

5.) Strike N. 5° E., dip 25° SE., Gunsight Claim. Three such veins were mapped with this strike, the only dip taken was on the most easterly. The two westerly veins apparently cut and offset the vein striking N. 40° E. No samples were taken.

6.) Strike N. 10° E., dips 55° to 70° SE., Silver Girt Vein. Galena was seen on the Lower Adit Level in this vein. The galena occurred in irregular, discontinuous streaks. According to the sketch maps of "Rasor, 1942" included in the report of Vance N. Bacon, the Silver Girt Vein was the main vein drifted north of the Main Shaft on the 200 level of the Gunsight Mine.

Two samples were cut in the face of the west drift on this vein on the Lower Adit Level, see samples No. 524 and 525.

The Silver Girt vein was sampled in a surface cut about 850 feet northeast of the adit exposure; here the vein appears to be mostly quartz, see samples No. 528 and 529.

0.31% Zn, 0.001% Mo, 0.07% Ba, 1.45% CaF_2, and 0.15% WO_3.

Sample No. 597 - 46.0-inches, plus, vein, 0.005-oz. Au, 1.25-oz. Ag, 0.28% Pb, 0.27% Cu, 0.31% Zn, 0.002% Mo, 0.30% Ba, 10.45% CaF_2, and 0.11% WO_3.

2.) Strike N. 50° W., dip 62° SW., Galena No. 4 Claim. This is a prospect pit exposure. No samples were taken.

(Veins That Strike to the North and Northeast and Dip to the East and Southeast)

1.) Strike North-South, dips 70° to 80° E., C & C Claim. Shafts were sunk on these two veins. Two samples were taken on the east vein at a depth of 35 feet down the shaft.

Sample No. 584 - 11.0-inches, soft broken vein, 0.020-oz. Au, 0.28-oz. Ag, 0.10% Pb, 0.89% Cu, 0.31% Zn, 0.004% Mo, 0.08% Ba, 15.16% CaF_2, and 0.19% WO_3.

Sample No. 585 - 33.0-inches, FW, 0.025-oz. Au, 0.28-oz. Ag, Trace Pb, 0.41% Cu, 0.27% Zn, 0.003% Mo, 0.15% Ba, 1.28% CaF_2, and 0.13% WO_3.

2.) Strike North-South, dip 80° E., South Cashier Extention Claim. The shaft was sunk on vein fault braccia. One sample was taken 10-feet below the surface.

Sample No. 576 - 60.0-inches, 0.010-oz. Au, Trace Ag, 0.31% Pb, 0.07% Cu, 0.27% Zn, 0.003% Mo, 0.21% Ba, 7.46% CaF_2, and 0.15% WO_3.

3.) Strike North-South, dip 68° E., Kerlin Claim. A 24-foot incline has been sunk on this vein. Three samples were cut at 18-feet down the incline.

Sample No. 586 - 12.0-inches, HW, fault zone broken, Trace Au, Trace Ag, Trace Pb, 0.04% Cu, 0.27% Zn, 0.18% Ba, 3.35% CaF_2, and 1.13% WO_3. Note, this is the highest sample in tungsten taken in the district.

Sample No. 587 - 26.0-inches, middle, Nil Au, Trace Ag, Trace Pb, 0.14% Cu, 0.31% Zn, 0.007% Mo, 0.28% Ba, 0.61% CaF_2, and 0.49% WO_3. Note,

and 0.009% W.

Sample No. 539 - 24.0-inches, FW, gray zone some quartz, Trace Au, 2.80-oz. Ag, 0.72% Pb, 0.05% Cu, 0.94% Ba, 0.69% Zn, 0.028% Mo, 6.56% CaF_2, and 0.014% W.

Sample No. 540 - 2.0-inches, purple quartz, 0.005-oz. Au, 0.20-oz. Ag, 0.26% Pb, 0.09% Cu, 0.16% Ba, 0.30% Zn, 0.002% Mo, 6.92% CaF_2, and 0.008% W.

Sample No. 541 - 60.0-inches, iron oxide impregnated rock with quartz stringers, 0.005-oz. Au, 0.10-oz. Ag, 0.15% Pb, 0.09% Cu, 0.20% Ba, 0.30% Zn, 0.002% Mo, 4.21% CaF_2, and 0.006% W.

Sample No. 542 - 32.0-inches, recemented quartz zone with some iron oxide, Trace Au, 0.50-oz. Ag, 1.69% Pb, 0.08% Cu, 0.12% Ba, 0.30% Zn, 0.027% Mo, 1.85% CaF_2, and 0.006% W.

Sample No. 543 - 24.0-inches, recemented fault breccia, Trace Au, 3.60-oz. Ag, Trace Pb, 0.04% Cu, 0.14% Ba, 0.40% Zn, 0.015% Mo, 2.14% CaF_2, and 0.008% W.

8.) Strike N. 15° E. to North-South, dips 70° to 80° SE., Surprise No. 3 Claim, and south of Surprise No. 3 Claim. Shafts and surface cuts prospect this vein. This vein system is thought to be present in one of the larger fault zones in the district for two reasons; (1) a basic dike follows this same fault zone, and (2) an east striking rhyolite dike is cut and offset more than 200 feet by this fault zone. A small amount of red cinnabar is thought to be present in the southern area where three samples were taken.

Sample No. F-1505 - 60.0-inches, FW, highly altered granitic rock, Trace Au, Trace Ag, 0.18% Pb, 0.06% Cu, 0.31% Zn, 0.003% Mo, 0.18% Ba, 3.10% CaF_2, 0.15% WO_3, and 0.035% Hg.

Sample No. F-1506 - 36.0-inches, Vein, 0.005-oz. Au, 1.45-oz. Ag, 0.96% Pb, 0.31% Cu, 0.72% Zn, 0.188% Mo, 5.81% Ba, 36.06% CaF_2,

Sample No. 524 - 6.0-inches, HW of fault, Trace Au, 6.80-oz. Ag, 0.70% Pb, 0.05% Cu, 0.26% Ba, 0.35% Zn, 0.002% Mo, 8.63% CaF_2, and 0.011% W.

Sample No. 525 - 60.0-inches, vein of quartz, barite, galena(-), None Au, 1.40-oz. Ag, 0.78% Pb, 0.04% Cu, 6.66% Ba, 0.99% Zn, 0.004% Mo, 6.63% CaF_2, and 0.010% W.

Sample No. 528 - 60.0-inches, FW, altered granitic rock with quartz stringers, None Au, 0.10-oz. Ag, 0.34% Pb, 0.02% Cu, 0.80% Ba, 0.35% Zn, 0.001% Mo, 2.50% CaF_2, and 0.015% W.

Sample No. 529 - 60.0-inches, vein with quartz and barite, None Au, 0.80-oz. Ag, 0.87% Pb, 0.02% Cu, 4.34% Ba, 0.30% Zn, 0.008% Mo, 6.13% CaF_2, and 0.013% W.

7.) Strike N. 10° E., dips 60° to 70° SE., Surprise and Surprise No. 5 Claims. On the Surprise Claim is a well timbered two compartment incline at 75° SE. In the vicinity of the incline an iron stained gossan more than 100 feet wide and about 200 feet long outcrops. In the iron stained gossan the minerals specularite, barite, and fluorite can be seen. In a surface cut at S. 20° W. at 35 feet from the collar of the incline two samples were cut, see samples No. 536 and 537.

This vein continues to the northeast, and on the Surprise No. 5 Claim surface cuts and shafts expose the vein. In a surface cut of the Surprise No. 5 Claim, some 1,300 feet northeast of the Surprise Incline, five samples were cut, see samples No. 539, 540, 541, 542, and 543.

Sample No. 536 - 60.0-inches, FW, much iron oxide, some quartz, 0.010-oz. Au, 0.59-oz. Ag, Trace Pb, 0.04% Cu, 0.08% Ba, 0.30% Zn, 0.009% Mo, CaF_2 not run, 0.008% W.

Sample No. 537 - 24.0-inches, quartz with some iron oxide, Trace Au, 1.60-oz. Ag, 2.73% Pb, 0.02% Cu, 0.06% Ba, 0.30% Zn, 0.008% Mo, CaF_2 not run,

highest sample in Zinc taken in the district.

Sample No. 513 - 30.0-inches, iron stained wall rock, 0.010-oz. Au, 0.29-oz. Ag, 0.25% Pb, 0.11% Cu, 0.30% Zn, and 0.002% Mo.

Sample No. 514 - 60.0-inches, iron stained wall rock with quartz stringers, 0.100-oz. Au, 0.40-oz. Ag, 0.45% Pb, 0.04% Cu, 0.30% Zn, and less than 0.001% Mo. Note, this is the highest sample in gold taken in the district.

Sample No. 515 - 60.0-inches, iron stained wall rock with quartz stringers, 0.060-oz. Au, 0.34-oz. Ag, 0.41% Pb, 0.22% Cu, 0.25% Zn, and 0.007% Mo. Note, this is the second highest sample in gold taken in the district.

Sample No. 516 - grab sample, specimen of green copper minerals, 0.040-oz. Au, 0.56-oz. Ag, 0.37% Pb, 21.95% Cu, 0.30% Zn, and 0.004% Mo. A portion of this grab sample was sent for spectrographic analysis, also indicated were Mn, Ba, Ni, Be, Sr, V, Cr, Co, Zr, and B.

11.) Strike N. 50° E., dips 65° to 70° SE., Eastern Claim. An adit was driven on this vein. No samples were taken.

12.) Strike N. 35° E., dips 50° to 60° SE., Sunrise Claim. This vein was sampled in a surface cut about 150 feet south of its most northerly outcrop. These three samples are the most northerly taken in the district on a vein.

Sample No. 550 - 60.0-inches, FW, highly altered granitic rock, None Au, 0.70-oz. Ag, 0.44% Pb, 0.01% Cu, 3.80% Ba, 0.40% Zn, 0.002% Mo, 5.99% CaF_2, and 0.015% W.

Sample No. 551 - 44.0-inches, FW vein, barite and black carbonate, Trace Au, 1.20-oz. Ag, 1.94% Pb, 0.01% Cu, 21.78% Ba, 0.49% Zn, 0.003% Mo, 11.41% CaF_2, and 0.009% W.

0.11% WO_3, and 0.010% Hg. Note, this is the highest sample in fluorite taken in the district; also highest in Mo.

Sample No. F-1507 - 24.0-inches, HW, highly altered granitic rock, Trace Au, 0.20-oz. Ag, 0.30% Pb, 0.02% Cu, 0.40% Zn, 0.083% Mo, 0.31% Ba, 1.18% CaF_2, 0.09% WO_3, and 0.010% Hg. Note, this is the second highest sample in Mo taken in the the district.

9.) Strike N. 30° E., dips 45° to 50° SE., Galena Claim. This vein is exposed by surface cuts and a shaft. Vein material containing big pieces of galena were found in the shaft dump. A grab sample of the galena was sent for assay to determine the silver content.

Sample No. 502 - grab sample of galena, Trace Au, 9.5-oz. Ag, 66.10% Pb, 0.90% Cu, Trace Zn, and Nil Mo.

10.) Strike N. 30° E., dips 80° to 85° SE., Crescent Claim. Surface cuts expose the vein. The vein outcrop is heavily iron stained. Sample No. 510 was taken 250 feet northeast up the hill from the open cut at the end of the road. Samples No. 511, 512, 513, 514, and 515 were taken in the open cut across the vein at the end of the road. Sample No. 516 was a broken piece of oxidized vein material dug out of the road, about 50 feet northwest of the open cut at the end of the road, where it had been carried by the bulldozer; green copper minerals are in this specimen - a piece of which was given to Mr. Hale C. Tognoni.

Sample No. 510 - 72.0-inches, east part of 33 foot wide altered zone, iron stained, Trace Au, Trace Ag, 0.20% Pb, 0.02% Cu, 0.15% Zn, None Mo.

Sample No. 511 - 60.0-inches, HW, fault breccia, 0.030-oz. Au, 0.67-oz. Ag, 0.93% Pb, 0.12% Cu, 1.38% Zn, and 0.002% Mo.

Sample No. 512 - 44.0-inches, broken vein material, 0.030-oz. Au, 0.57-oz. Ag, 1.54% Pb, 0.54% Cu, 1.78% Zn, and 0.007% Mo. Note, this is the

Sample No. 517 - 60.0-inches, vein of quartz, barite, fluorite, and galena, Trace Au, 5.60-oz. Ag, 1.71% Pb, 0.38% Cu, 18.30% Ba, 0.49% Zn, 0.008% Mo, and 16.78% CaF_2. Tungsten was not run.

b.) Strike N. 50° E., dip 70° NW., Extention of Morning Star Claim. No samples were taken.

c.) Strike N. 80° E., dips 62° to 85° NW., Morning Star Claim. No samples were taken.

d.) Strike East, dip 70° N., Morning Star Claim. No samples were taken.

e.) Strike N. 70° E., dip 70° NW., Morning Star Claim. This location is about 2,500 feet east of Sample No. 517, and is about 1,000 feet west of the open stope of the Gunsight Mine. One sample was taken.

Sample No. 535 - 36.0-inches, vein, very hard iron stained quartz, Trace Au, 2.80-oz. Ag, 0.82% Pb, 0.03% Cu, 0.94% Ba, less than 0.001% Mo, 13.73% CaF_2, and 0.013% W.

f.) Strike N. 70° E., dip 77° NW., Gunsight Claim. No samples were taken.

g.) Strike N. 75° E., dip 75° NW., Gunsight Claim. This location is about 200 feet west of the open stope of the Gunsight Mine, and is the faulted segment west of the Gunsight Mine workings. One sample was taken.

Sample No. 501 - 60.0-inches, chip sample, rock very hard, quartz, barite, galena, and fluorite; Trace Au, 3.90-oz. Ag, 1.20% Pb, 0.01% Cu, Trace Zn, Nil Mo.

h.) Strike N. 80° E., dip 80° NW., Gunsight Claim. The vein in this vicinity has probably accounted for most of the production from this district. This is the open stope of the Gunsight Mine. The Gunsight Vein was sampled on the Lower

Sample No. 532 - 10.0-inches, HW vein, quarts and barite, Trace Au, 1.40-oz. Ag, 0.86% Pb, 0.04% Cu, 13.56% Ba, 1.68% Zn, 0.003% Mo, 5.06% CaF_2, and 0.010% W.

13.) Strike N. 40° E., dips 75° SE., Gunsight Claim. This vein is thought to be the main Gunsight Vein. Note that east of the north trending fault zone the Gunsight Vein has apparently changed from a north or northwest dipping vein to one that dips to the southeast. No samples were taken in this area.

14.) Strike N. 60° E., dip 48° SE., claim east of Surprise No. 7 Claim. A prospect pit has been sunk on this vein. One sample was taken, it is the most easterly sample taken in the district.

Sample No. 573 - 60.0-inches, broken iron stained zone with some green fluorite, Trace Au, 0.05-oz. Ag, 0.25% Pb, 0.04% Cu, 0.27% Zn, 0.002% Mo, 0.38% Ba, 5.13% CaF_2, and 0.45% WO_3. Note, this is the fourth highest tungsten sample taken in the district.

In summary of this group of 14 veins it can be seen that 12 of them are found in sub-group of from North-South to N. 35° E. in strike; and here are found the highest samples taken in the district in gold, molybdenum, tungsten, zinc, barium, and fluorite.

(Veins That Strike to the East and Northeast and Dip to the North and Northwest)

1.) All of the following vein segments are thought to be part of the same vein system; the sequence is from West to East:

a.) Strike N. 50° E., dip 70° NW., west of Extention of Morning Star Claim. One sample was taken; it is the most westerly of any taken in the district.

sample No. F-1516. A gossan zone over 100 feet in width is found near the north endline of the Keystone Claim; see samples F-1517, F-1518, and F-1508.

Sample No. F-1516 - 10.0-foot chip sample of east side of 30-foot vein, near south endline of Keystone Claim, quartz, black carbonate, fluorite, some CuO_x; 0.003-oz. Au, 0.35-oz. Ag, 0.41% Pb, 0.40% Cu, 0.36% Zn, 0.016% Mo, 1.78% Ba, 29.64% CaF_2, 0.05% WO_3, and 0.39% Mn. Note, this is the second highest fluorite sample taken in the district.

Sample No. F-1517 - 60.0-inches chip sample, east side of 100-foot gossan, 0.002-oz. Au, 0.10-oz. Ag, Trace Pb, 0.21% Cu, 0.36% Zn, 0.072% Mo, 0.25% Ba, 0.71% CaF_2, 0.03% WO_3, and 0.06% Mn. Note, this is the third highest Molybdenum sample taken in the district.

Sample No. F-1518 - 60.0-inches chip sample, 35 feet west of Sample No. F-1517, altered granitic rock, Trace Au, Trace Ag, 0.08% Pb, 0.07% Cu, 0.40% Zn, 0.004% Mo, 0.34% Ba, 0.17% CaF_2, 0.05% WO_3, and 0.06% Mn.

Sample No. F-1504 - grab sample of dump, massive green boulders from what looks like an old prospect pit on south edge of wash, on west edge of gossan; 0.005-oz. Au, 0.05-oz. Ag, 0.41% Pb, 0.44% Cu, 0.90% Zn, 0.012% Mo, 0.85% Ba, 22.47% CaF_2, 0.15% WO_3, and 0.03% Hg. Note, this is the fourth highest sample in fluorite taken in the district, and this is the second location where mercury has been found.

3.) Strike N. 75° to 85° E., dips 60° to 75° NW., Burro Burro Claim. Two veins are in this group. They appear to be small, discontinuous, and in the footwall of small basic dikes. In a prospect pit at 70 feet N. 30° W. of the

Adit Level in two places; (1) the back at 7-feet west of the winze, see samples No. 520 and 521, and (2) the face of the east drift approximately 150-feet northeast of the winze, see samples No. 522 and 523.

Sample No. 520 - 26.0-inches, FW part of vein, Trace Au, 23.30-oz. Ag, 5.22% Pb, 0.06% Cu, 10.70% Ba, 1.53% Zn, 0.012% Mo, 11.77% CaF_2, and 0.010% W. Note, this is the highest assay sample taken in the district in both silver and lead.

Sample No. 521 - 36.0-inches, HW part of vein, Trace Au, 13.20-oz. Ag, 1.53% Pb, 0.04% Cu, 12.42% Ba, 1.53% Zn, 0.010% Mo, 5.63% CaF_2, and 0.013% W. Note, this is the second highest assay sample taken in the district in silver.

Sample No. 522 - 45.0-inches, FW part of vein, 0.005-oz. Au, 1.20-oz. Ag, 2.17% Pb, 0.06% Cu, 0.82% Ba, 1.58% Zn, less than 0.001% Mo, 11.20% CaF_2, and 0.009% W.

Sample No. 523 - 42.0-inches, HW part of vein, None Au, Trace Ag, 2.49% Pb, 0.04% Cu, 0.58% Ba, 0.30% Zn, less than 0.001% Mo, 15.55% CaF_2, and 0.010% W.

It is to be noted that the vein system that has been traced from west to east is the only one in the northern part of the district that dips to the north and northwest; and that, east of the north trending faults shown on the map some major shift must have taken place, for the vein systems dip to the southeast.

2.) Strike N. 30° E., dips 75° to 80° NW., south of Keystone Claim, Keystone Claim, and most southwestern part of Southern Belle Claim. This vein is thought to be the largest in the southern part of the district; it has been traced for over 1,800 feet in strike length, and at one place is 30.0-feet in width, see

big vertical Burro Burro Shaft two samples were cut, see samples No. F-1509 and F-1510. In a prospect pit S. 75° E. at 200 feet from the big vertical Burro Burro Shaft three samples were cut, see samples No. F-1512, F-1513, and F-1514.

Sample No. F-1509 - 24.0-inches, altered granitic rock, CuO_x on seams, Nil Au, Trace Ag, 0.16% Pb, 0.25% Cu, 0.31% Zn, Nil Mo, 0.14% Ba, 2.35% CaF_2, and 0.05% WO_3.

Sample No. F-1510 - 24.0-inches, HW, black basic dike, CuO_x on seams, Nil Au, 0.05-oz. Ag, Nil Pb, 0.92% Cu, 0.36% Zn, 0.001% Mo, 1.25% CaF_2, and 0.03% WO_3.

Sample No. F-1512 - 31.0-inches, FW, altered granitic rock, some CuO_x, Trace Au, 0.05-oz. Ag, Trace Pb, 0.29% Cu, 0.31% Zn, Nil Mo, 0.22% Ba, 0.39% CaF_2, and 0.07% WO_3.

Sample No. F-1513 - 16.0-inches, iron stained granitic rock with quartz stringers, Trace Au, 0.20-oz. Ag, Trace Pb, 0.18% Cu, 0.27% Zn, Nil Mo, 0.18% Ba, 0.36% CaF_2, and 0.07% WO_3.

Sample No. F-1514 - 12.0-inches, HW, black basic dike, some CuO_x, Trace Au, 0.10-oz. Ag, Trace Pb, 0.61% Cu, 0.27% Zn, 0.004% Mo, 0.18% Ba, 0.71% CaF_2, and 0.04% WO_3.

It is interesting to note that copper is associated with the basic dikes in this area.

4.) Strike N. 25° E., dip 77° NW., Galena No. 2 Claim. This is a prospect pit. This is an altered, bleached white, area, with maroon colored iron oxide staining. Two samples were cut.

Sample No. 507 - 60.0-inches, CuO_x disseminated in a highly bleached rock, Trace Au, Trace Ag, Trace Pb, 0.95% Cu, 0.30% Zn, 0.006% Mo.

Note, this is the second highest copper assay from a cut sample taken in the district.

Sample No. 508 - 6.0-inches, quartz stringer with CuO_x, 0.020-oz. Au, Trace Ag, Trace Pb, 2.45% Cu, 0.49% Zn, 0.008% Mo. Note, this is the highest copper assay from a cut sample taken in the district.

In summary of this group of veins it can be seen that here are found the highest assays of samples taken in the district in silver, lead, and copper. Fluorite is present, while not having the highest assay value, is found in wider veins that rank second and third in fluorite assay value. In this group are found, what is considered by the writer to be, the two major vein systems in the district.

Mineralogy:

The veins are traceable on the surface as dark gray-brown croppings, with quartz, dark brown carbonate (siderite?), fluorite, and barite. The outcrops generally are dense and hard, apparently little effected by weathering.

A small amount of galena was seen in the outcrops in the northern and northwestern sections of the district.

A small amount of chalcopyrite was seen in the rocks in the southeastern part of the district.

Specularite is a common mineral in this area.

Scheelite was seen as disseminated small blue white specks under an ultra-violet light; it is thought than another tungsten mineral is present for some of the samples assayed higher in tungsten than was thought possible for the amount of scheelite present.

Some of the calcite fluoresces a deep red in color, probably indicating manganese as an activator.

Chrysocolla, malachite, and azurite in small amounts are found on some of the dumps

Cinnabar was seen as small reddish stains on altered granitic rock in the most southerly area mapped.

No zinc mineral was recognized.

No silver mineral was recognized. Silver is thought to be somewhat independent of the lead mineral galena in this district; its distribution is erratic as a check of the assays will show, good examples are Sample No. 502 and 524.

Sample No. 502 - 9.5-oz. Ag, 66.10% Pb

Sample No. 524 - 6.8-oz. Ag, 0.70% Pb.

While six assays show a trace of silver to varying amounts up to 2.49% lead could be considered normal; eight assays show a trace or nil in lead and up to 3.60-oz. silver, and these assays are considered to be abnormal. This leads one to suspect that there should be some silver minerals present, and that genetically some of the silver is independent of the lead.

Gold, silver, and lead mineralization is thought to be independent of the tungsten mineralization. Good examples of this are Samples No. 586, 587, and 588.

Sample No. 586 - Trace Au, Trace Ag, Trace Pb, and 1.13% WO_3

Sample No. 587 - Nil Au, Trace Ag, Trace Pb, and 0.49% WO_3

Sample No. 588 - Nil Au, Trace Ag, Trace Pb, and 0.65% WO_3.

For the district the following generalizations are thought to be recognized:

(1) There is a greater amount of quartz in the vein outcrops in the most northern area mapped.

(2) There is a greater amount of barite in the vein outcrops in the most northern and western areas mapped.

(3). More specularite is found in the north central and the north area.

(4). Most of the epidote is found in the southeast central area.

(5). Fluorite is probably the most common vein mineral after quartz and

the dark brown carbonate (siderite?).

In this area the fluorite crystals seen were of the octahedral form. The color was a dull white to gray with very little of the green or purple varieties. Assays indicate too, that fluorite is present in large amounts in this district. The highest value was found in a sample taken 1,000 feet southwest of the Surprise No. 3 Claim, in the southern part of the district, see sample No. F-1506.

Sample No. F-1506 - 36.0-inches, vein; 0.005-oz. Au, 1.45-oz. Ag, 0.96% Pb, 0.31% Cu, 0.72% Zn, 0.188% Mo, 5.81% Ba, 0.11% WO_3, 0.010% Hg, and 36.06% CaF_2.

The second highest value in fluorite was found in a sample taken in the southern part of the district, near the south endline of the Keystone Claim. This chip sample was the east ten feet of a 30-foot outcrop of the Keystone Vein, see sample No. F-1516.

Sample No. F-1516 - east 10-feet of a 30-foot vein; 0.003-oz. Au, 0.35-oz. Ag, 0.41% Pb, 0.40% Cu, 0.36% Zn, 0.016% Mo, 1.78% Ba, 0.05% WO_3, 0.39% Mn, and 29.64% CaF_2.

The third highest value in fluorite was found in the Upper Adit above the Gunsight Mine, on the west end of the open stope. This vein is in the footwall of the Gunsight Vein. Two samples were cut, see samples No. 526 and 527.

Sample No. 526 - 33.0-inches, vein; None Au, 0.20-oz. Ag, 0.45% Pb, 0.04% Cu, 3.10% Ba, 0.30% Zn, 0.022% Mo, 0.016% W, and 25.18% CaF_2.

Sample No. 527 - 60.0-inches, hanging wall of vein (note how the fluorite has penetrated into the wall rock); None Au, Trace Ag, 0.25% Pb, 0.05% Cu, 0.94% Ba, 0.35% Zn, 0.001% Mo, 0.016% W., and 14.26% CaF_2.

The Gunsight Vein carries fluorite, in the Gunsight Mine. The vein was sampled underground at seven feet west of the collar of the winze on the adit level, see sample No. 520.

Sample No. 520 - 26.0-inches, vein, Trace Au, 23.30-oz. Ag, 5.22% Pb, 0.06% Cu, 10.70% Ba, 1.53% Zn, 0.012% Mo, 0.010% W, and 11.77% CaF_2.

It is interesting to note that the granite carries fluorite. A specimen of unaltered granite was taken from near the northeast endline of the Surprise No. 5 Claim, in the eastern part of the district, see sample No. 538.

Sample No. 538 - granite rock specimen, Trace Au, Trace Ag, 0.20% Pb, None Cu, 0.08% Ba, 0.46% Zn, 0.001% Mo, 0.006% W, and 1.43% CaF_2.

It was suggested in a letter to Mr. Hale C. Tognoni dated May 6, 1963, that ten of the highest grade CaF_2 samples from different parts of the district be checked by spectrographic analysis. The pulps of these samples are still at Hawley and Hawley, Assayers and Chemists, Inc., and they could send a portion of each pulp for the analysis.

The elements that should be specifically requested to be checked in the spectrographic analysis are the following: (1) Cerium, (2) Yttrium, (3) Lanthanum, (4) Europium, (5) Samarium, (6) Erbium, (7) Dysprosium, (8) Neodymium, (9) Terbium, and (10) Germanium.

The following samples are the ones that should be checked: Samples No. 520, 526, 527, 535, 538, 573, 597, F-1504, F-1506, and F-1516.

(Wall Rock Alteration)

Wall rock alteration of the veins is not pronounced, in change of color, in most cases.

Bleaching of the granitic rock to a white color is found; this form of hydrothermal alteration is thought to be sericitization. A good example of this type of alteration is found in the vicinity of samples No. 507 and 508, on the Galena No. 2 Claim; these samples are the highest cut copper samples taken in the district.

Carbonatization could be one of the types of hydrothermal alteration, for much carbonate was found in the district; however, it was not apparent to the writer as a form of wall rock alteration.

Silicification of the wall rocks was not apparent to the writer.

Greisenization of the wall rocks was not apparent to the writer.

The penetration of fluorine into the wall rocks is one of unique significance for this district. All samples taken, that have been assayed for fluorine, show fluorite is present in the wall rocks adjacent to the veins. In some cases the fluorite content is considered to be extremely high, see samples No. 526 and 527.

Sample No. 526 - 33.0-inches , vein, assays 25.18% CaF_2

Sample No. 527 - 60.0-inches , HW wall rock, assays 14.26% CaF_2.

The question raised by the enrichment of the wall rock in fluorite deals with the porosity of the rock, and upon the back pressure of the escaping gases or fluids. Since the wall rocks are igneous granitic types of rocks, it is thought by the writer, that the back pressure must have been substantial and it probably indicates a deeper zone of formation than one would ordinarily expect.

(Paragenesis)

The paragenesis of the minerals in this area is not known, for as of this

time no polished sections or thin sections of the vein material have been made or studied.

Ore Controls:

The veins of the district occupy fault zones that have had renewed fracturing during different stages of vein formation. Some vein material has brecciated and recemented and then broken again. Some of the vein-fault zones are long; the Gunsight Vein has been traced on the surface westward for over 4,000 feet.

At the points of intersection with divergent structures (faults, veins, or basic dikes) the mineralizing solutions appear to have permeated into the broken country rocks. Good examples of these zones are the gossans in the vicinity of the Surprise Incline; and, the area at the north end of the Keystone Vein and its intersection with the basic dike.

Influence of rock type should be considered, for very little in the way of veins or vein material is found in the central area of granite aplite. The special relation to igneous bodies shows an abundance of mineralization near the edge of or away from the granite aplite core.

Chemical ore controls are thought to be important for this is a district very high in fluorine, as seen in the mineral fluorite. Fluorite, it is to be remembered, forms under a wide range of pressure and temperature conditions. The granite of the north and eastern part of the district has been found to contain 1.43% fluorite, and was probably produced at elevated temperatures and under pressure.

Studies of the crystal habit of fluorite suggest that the light-colored octahedral crystals are typical of relatively high temperature of formation, where the more deeply colored cubic crystals are formed under low-temperature conditions (see page 85, The System of Mineralogy, Seventh Edition, Volume 2,

Plache, Berman, and Frondel, 1951).

The granitic rock of the north and eastern part of the district has been found to contain 0.08% Ba. Barium is thought to be removed from the wall rock by fluorine bearing gases and becomes concentrated therein, giving rise to fluorite-barite veins (see page 478, Geochemistry by Kalervo Rankama and Th. G. Sahama, The University of Chicago Press, 1949). This supposition might account for the higher barite content of the veins in the northern part of the district.

Tungsten is also found in the district, with the greater amount, 500 PPM, being found in the granite aplite. The samples from the Kerlin Incline seem to indicate the scarcity at the time of the deposition of the tungsten of gold, silver, and lead; and that even the mineral fluorite was in short supply.

Copper is found in the district, with the greater amount being found in the southern and southeastern parts of the district. Chalcopyrite has been found on the surface in the southeastern section. It could be that the silver-lead metallization of the northern part of the district is a manifestation of zoning from the copper area of the southeast to the silver-lead of the north.

CONCLUSIONS:

1.) Study of the aerial photographs indicates lineation, and possible lineation intersections that should be checked in the field.

2.) Igneous rocks were mapped in this district that contain significant amounts of fluorine, tungsten, and zirconium.

3.) Strong persistent veins outcrop in this area; one has been mapped on the surface for over 4,000 feet.

4.) The veins follow fault zones.

5.) The vein systems of this district can be separated into three groups:

(1) Veins that strike to the northwest and dip to the southwest.

(2) Veins that strike to the north and northeast, and dip to the east and southeast.

(3) Veins that strike to the east and northeast, and dip to the north and northwest.

6.) The veins that strike to the east and northeast, and dip to the north and northwest have produced the major amount of ore from the district; the values have been in silver and lead, with total production thought to be in excess of $ 250,000 and produced prior to 1900.

7.) Large mineralized areas are found at the intersections of veins and other structures.

8.) Minerals seen in this area are: quarts, calcite, siderite (?), specularite, fluorite, barite, scheelite, galena, chalcopyrite, chrysocolla, malachite, azurite, and cinnabar.

9.) No silver mineral was recognized. The distribution of silver is erratic.

It is thought that genetically some of the silver is independent of the lead mineral galena.

10.) Gold, silver, and lead mineralization is thought to be independent of the tungsten mineralization.

11.) Fluorite is probably the most common vein mineral after quartz and the dark brown carbonate (siderite?).

12.) In this area the fluorite crystals seen were of the octahedral form. Studies of the crystal habit of fluorite suggest that the light-colored octahedral crystals are typical of relatively high temperature of formation.

13.) The penetration of fluorine into the wall rocks is one of unique significance for this district. All samples taken, that have been assayed for fluorine, show fluorite is present in the wall rocks adjacent to the veins. Since the wall rocks are igneous granitic types of rocks, it is thought by the writer, that the back pressure must have been substantial and that it probably represents a deeper zone of formation than one would ordinarily expect.

14.) Fluorite is thought to be present in economic amounts in this district.

15.) Tungsten is one of the most persistent elements in this district. The only tungsten mineral seen was scheelite, however it is thought another tungsten mineral is present. One structure shows a calculated average of 64.0-inches of width assaying 0.675% WO_3; however the assay limits of this structure are not known in width or in length. Tungsten is thought to be present in economic amounts in this district.

16.) One vein system that strikes to the east and northeast and dips to the north and northwest is the Gunsight-Morning Star- Extention of Morning Vein System. This vein system has been traced for over 4,000 feet on the surface.

Where it has been developed on the Gunsight Claim it has probably produced over $ 250,000, in silver and lead. It is thought that other economic ore bodies of silver and lead will be found along this structure.

17.) The copper mineral chalcopyrite has been found on the surface in the southeastern section of the district. It could be that the silver-lead metallisation of the northern part of the district is a manifestation of zoning from the copper area of the southeast to the silver-lead of the north. As stated before this is elephant country in regard to mineral wealth. One elephant has been found, the big copper deposit of the New Cornelia Mine, at Ajo. If there be any credence to the zoning hypothesis, then the southeastern section of this district should be prospected for copper.

Gunsight Vein that was stoped at the portal has not been sampled.

6. Specimens should be taken for mineralogical and petrographic examination from near the bottom of the Kerlin incline; the three samples taken at 18 feet down the incline assayed from 0.49% to 1.13% WO_3, for a calculated average of 84.0-inches of width assaying 0.675% WO_3 (these are the highest tungsten samples taken in the district), so that the paragenesis can be worked out for this section of the district.

   (a) It is to be noted that no assay limit was reached in the sampling of this structure in either the foot or hanging walls, thus they should be tested by drilling.

7. The bleached zone that strikes N. 25° E. and dips 77° NW., on the Galena No. 2 Claim, that assayed 0.95% Cu for 60.0-inches and 2.45% Cu for 6.0-inches, should be cut by bulldozing and then channel sampled with the thought of drilling.

8. The area in the southeastern part of the district where the copper mineral chalcopyrite was found as very small stringers should be trenched by bulldozing and then channel sampled with the thought of drilling. Geophysical prospecting for sulfides at depth in this area should be given careful consideration.

9. The apparent lineation intersection near the center of Section 22, T. 14 S., R. 4 W., Gila and Salt River Base and Meridian is thought to be possibly a big gossan area. This area should be studied, bulldozed, sampled, and considered for geophysical prospecting.

Harry [illegible]
Registered Mining Engineer
License No. [illegible], Nevada
Las Vegas, Nevada
May 25, [illegible]

RECOMMENDATIONS:

The following recommendations are made for this district:

1. The lineation and lineation intersections should be checked in the field; if nothing can be seen by walking over the ground, the areas should be trenched by bulldozing; if it proves to be necessary they should be channel sampled, with the eventual thought of drilling.

2. The Keystone Vein, where it is 30 feet wide, should be trenched and channel sampled across the entire width. A bulk sample of the vein should be taken for preliminary mill testing. The Keystone Vein should be drilled.

3. The gossan areas of the Surprise Incline Area and the North Keystone Area, should be trenched by bulldozing and channel sampled, with the thought of drilling.

4. The Surprise Incline should have ladders installed so that it can be mapped and sampled, with the thought of driving a crosscut from the bottom of the incline through and under the gossan exposed on the surface.

5. (a) The Gunsight Mine should be mapped and sampled, and specimens should be taken for mineralogical and petrographic examination so that the paragenesis can be worked out for this section of the district.

   (b) The Gunsight Vein System (4,000 feet long) should be explored to the west. A good way to start, on the east end, would be to drift southwest on the Silver Girt Vein, on the Lower Adit Level, to its intersection with the Gunsight Vein and then follow the Gunsight Vein to the southwest.

   (c) The western section of the Gunsight Vein System should be drilled.

   (d) The Upper Adit Level of the Gunsight Mine should be sampled to the portal. The 33-inch vein near the face assayed 25.18% CaF_2, and the next 5-feet of the hangingwall assayed 14.26% CaF_2, yet the remaining distance to the