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ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: DIAMOND JOE

ALTERNATE NAMES:

CUPRITE  
SHAFT, ADIT 2  
PURPLE PASSION

YAVAPAI COUNTY MILS NUMBER: 387

LOCATION: TOWNSHIP 8 N RANGE 3 W SECTION 30 QUARTER SE  
LATITUDE: N 34DEG 00MIN 05SEC LONGITUDE: W 112DEG 36MIN 13SEC  
TOPO MAP NAME: MORGAN BUTTE - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:

SILVER  
LEAD  
GOLD  
MOLYBDENUM

BIBLIOGRAPHY:

USGS MORGAN BUTTE QUAD  
ADMMR DIAMOND JOE MINE FILE  
ADMMR DIAMOND JOE COLVO FILE  
MINERALOGICAL RECORD, V. 31, JULY, 2000 P.323

DIAMOND JOE MINE

YAVAPAI COUNTY

see: Eagle-Picher (geology file) George M. Fowler report.  
Diamond Joe file (Colvocoresses files)

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

~~December 10, 1957~~

February 11, 1958

To the Owner or Operator of the Arizona Mining Property named below:

DIAMOND JOE  
(Property)

LEAD

(ore)

We have an old listing of the above property which we would like to have brought up to date.

Please fill out the enclosed Mine Owner's Report form with as complete detail as possible and attach copies of reports, maps, assay returns, shipment returns or other data which you have not sent us before and which might interest a prospective buyer in looking at the property.

FRANK P. KNIGHT,  
Director.

Enc: Mine Owner's Report

6 February 1942

Mr. D. E. Stacy,  
Hagerman, Idaho.

My dear Mr. Stacy:

Referring to your request that I send you a copy of the Report on the Diamond Joe Mine in the White Picacho Mining District, Yavapai County, I find that it is impossible for me to copy this report at this time.

I have talked with Mr. Neil C. Clark, and he has consented for me to send this report to you with the understanding that it is to be returned within three days after receipt.

I am enclosing herewith the report attached to our files, and I shall appreciate its return as indicated above.

With best wishes I am

Yours very truly,

Jess R. Fickus  
Secretary to Mr. Coupal

jrf.  
encl.

Registered Mail  
Return Receipt Requested

cc-Neil C. Clark

DIAMOND JOE MINE

LEAD -- SILVER

Wickenburg,  
Yavapai Co.

The Diamond Joe Mining property, consisting of a group of ten unpatented mining claims in the White Picacho Mining District, Yavapai County, Arizona, approximately nine miles east of the Town of Wickenburg, and situated in Sections 28 and 29, Township 8 North, Range 3 West, Gila & Salt River Base and Meridian.

The title to the mining claims is held by a corporation organized under the laws of Arizona. All of the stock of the corporation is held by Mrs. Geo. R. Koyk and the estate of her deceased husband, Geo. R. Koyk, of which estate Mrs. Koyk is administratrix.

In a straight line the Diamond Joe property is approximately twelve miles south of the Octave Mine, now being operated by the American Smelting & Refining Company, and the writer's acquaintance with it extends over the period of his residence at Octave, which commenced in 1928, and extends to the present time.

The purpose of this survey is to outline the present physical conditions and economic possibilities of the property. It is based on the writer's personal examination of the upper workings of the property, supplemented by comprehensive reports of reliable mining engineers, whose reports are herein later referred to, and excerpts from said reports are hereto appended.

DEVELOPMENT:

The mine openings, consisting of shafts, drifts, and raises, total 2,550 feet, and are as follows:

No. 3 Shaft (Vertical) . . . . . 200 feet;  
 No. 2 Shaft (Vertical) . . . . . 180 feet;  
 No. 1 Shaft (Incline) . . . . . 75 feet;  
 Cross-cuts from the vertical shafts  
 to the vein . . . . . 240 feet;

The drifts and raises on the vein to the north of the No. 3 shaft, and of primary interest in connection with the plan herein outlined, are as follows:

- 225 level: a drift 430 feet in length;
- 180 level: 200 feet of drifts. The water level at the present time stands above the 180 level but below the 83 level;
- 83 level: 160 feet of drifts, now open and accessible. Both north and south ends are now closed by small caves, due apparently to some ore having been mined from above the drift level.
- 45 level: 70 feet of drifts, raises on the vein total about 175 feet.

To the south of the No. 3 shaft, the drift on the 225 level extends 460 feet, with a cross-cut of 55 feet.

The No. 3 shaft was put down in 1927-28 as the principal entry and work-way for this property. It was located apparently with little consideration of the character of the ground to be penetrated. It is in a fault where the formation is broken and the ground is very heavy, and as a consequence the shaft is now in a badly-caved condition. The cost of repair would be so high that it has been dropped from consideration, and this part of the work is held of no value.

The remaining 1900 feet of development work is well-located to facilitate mining, and is of importance and value. At least 1000 feet of this work would be of immediate or early value in extraction of the developed ore. It could not be duplicated at a cost of \$7500.00, and in operating the mine would be an asset of that value. The rest

would be of proportionate value in further exploration and development, particularly of the south ore body and some 300 feet of vein intervening.

ORE:

The No. 2 shaft cuts and crosses the vein at the 83 level, and the water now stands at about 85 feet on the slope of the vein below this point. There is no connection between the 83 and the 180 levels other than the shaft and the cross-cut, so nothing of the vein between these two levels and down to the water level, can be seen.

The 83 level is accessible through the No. 2 shaft or the No. 1 shaft. The slope distance on the vein from the surface or out-crop to the 83 level, is 130 feet. This level is now open and accessible for 160 feet. The 45 level penetrates the vein for 75 feet. The average width of the vein is 8 feet plus. This block of the vein, 130 x 200 x 8, which contain 16,000 tons. About 700 tons have been stoped (removed), leaving at least 15,000 tons above the 83 level. This is ore well exposed on two sides, and immediately available for production.

The 180 level is a slope distance on the vein of 133 feet below the 83 level, with a lateral development of 200 feet, in which section of the vein there would be more than 16,000 tons of ore.

The 225 level is a slope distance on the vein of 50 feet below the 180 level. Lateral development is considered at 200 feet -- the same as the 180 level -- and an average width of 6 feet. This block of the vein would contain about

5,000 tons of ore.

The 83 level is saved at both ends, apparently due to some stoping, as previously mentioned. The size of the vein and dissemination of ore minerals is indicative of commercial ore through a considerably greater lateral extent than now exposed on this level. I consider it entirely safe to say that the ore will extend downward below the 83 level at least 20 feet, and figure 18,000 tons of ore are available for immediate production, and an additional 18,000 tons as available at a very small preparatory cost. That would be above the 225 level and within a length of 200 feet along the strike of the vein. Two Hundred feet is a short strike length for an ore shoot in a vein of the known length and width of this one, and inasmuch as development has shown no limits either north or south, it is entirely reasonable to believe that considerably more ore exists than has herein been estimated.

The vein is broken and slightly displaced by faulting at about 350 feet to the south and 200 feet to the north of the No.1, or incline, shaft. Other than as exposed by this shaft, little or no surface exploration has been done to determine anything of the ore possibilities along this 550 feet of vein out-crop.

Maps show the drift on the 225 level to be in the vein for over 350 feet south of the incline shaft, and continuing unbroken, but with nothing to indicate the character or mineral content. That leaves 350 feet -- 200 feet explored -- of unbroken vein adjoining this block as estimated, offering exceptional possibilities for ore. The vein is again broken, with short displacement, 800 feet south of the incline shaft. This fault marks the northerly limit of an-

It has a strong and well-mineralized outcrop extending 400 feet farther to the south. The out-crop has been opened by three surface cuts, and the south drift on the 225 level must now be nearing the vein on its downward extension.

(See Plan Map appended) The surface exposures on the South Ore Shoot indicate potential possibilities of a large ore body. Of the section of vein between the two faults (about 450 feet), practically nothing is known. In all, there are 1,000 feet of the vein that can be considered as entirely unexplored that will more than probably produce some ore from above the 225 level, and that affords the possibility of a large volume of profitable ore.

VALUES:

The vein as exposed on the 83 level and above, has been well-sampled. Mr. A. E. Sedgwick, in a report based upon a complete examination of the property in 1923, cites sampling by L. H. Kellogg giving an average of 8.12 oz. Ag. and 9.44% Pb; by L. N. Buttler giving an average of 16.50 oz. Ag. and 8.40% Pb., and his own sampling an average of 12.82 oz. Ag. and 7.96% Pb. D. R. Finlayson, who probably has the best knowledge of the entire development of the mine, in his report estimates an average value for the ore of 14.00 oz. Ag. and 6.0% Pb.

The sampling made by A. L. Beals in 1926 was carefully and consistently done, and checked in the greater part as shown by duplicate samples and assays. A print of his sample map is appended. I have personally checked this

sampling, and find it to be reliable. It seems more than probable that the assaying of Mr. Beals' samples was by the fire method for lead. My samples have been determined by the wet method, as used at the smelter, and show a higher lead content, which is doubtless the more reliable and more nearly correct. The fire assay for lead is commonly considered to average about 10% low. In this instance I am using Mr. Beals' values as safe and conservative. Mr. Beals recognized two distinct periods of mineralization in this vein, and sectionalized most of his samples as foot-wall and hanging-wall vein. That is the right way to sample this vein, but might be confusing. The widths as given by Mr. Beals are the widths from which the samples were cut but do not indicate clearly that one wall or the other was not exposed. His weighted average and widths on the whole cannot be used in estimating average tonnage and value. His samples represent sections of the vein. This could not be improved without first exposing the vein for its full width at the points sampled. I have therefore carefully checked these samples underground and made a compilation as shown below. Fourteen of these samples represent the full width of the vein, and nine additional included in the first list, while not representing the full width, afford a good comparison in consideration of a calculated average.

<u>No.</u>	<u>Width</u>	<u>Ag. Oz.</u>	<u>Pb. %</u>	<u>Ag.</u>	<u>Pb.</u>
1 & 2	10.0	11.34	23.90	113.40	239.00
8 & 9	9.0	19.92	10.50	170.28	94.50
10 & 11	6.6	11.78	7.65	77.75	50.49
12 & 13	6.8	7.77	8.55	52.84	58.14
14 & 15	7.3	13.00	10.40	94.90	75.92
18 & 19	14.30	5.82	4.40	83.23	66.92

26 & 27	10	25.00	1.20	2	.00	12.96
28 *	6.75 *	10.20 *	.40	68.85		2.71
29 *	6.5 *	5.69 *	1.00	36.98		6.50
34 *	6.1 *	6.84 *	2.80	41.72		17.08
35 & 36	9.9	7.94	14.50	78.61		143.55
39 & 40 *	10.5 *	1.20 *	.20	12.60		2.10
45	4.0	12.64	9.00			
41 & 42 *	5.75 *	3.75 *	4.70			
46 & 47	6.1	19.50	12.90	118.95		78.69
48 & 49	7.0	23.84	11.22	166.88		78.54
50	4.8	25.48	15.00			
51	4.7	11.50	15.90			
56	4.25	14.24	12.60			
61	5.00	16.54	11.60			
62 *	5.00 *	5.87 *	4.00			
63 *	4.25 *	8.90 *	1.00			
64	4.00	4.52	3.65			
67 & 68	5.9	14.32	9.95			
69 & 70	5.6	9.50	9.87			
25 Samples:		296.10	206.89			
Average:		11.84	8.27			
14 Samples	117.65 (Col's 5 and 6)			1386.99		932.10
Average:	8.4			11.79		7.92
Excluding the samples that are starred; (7)						
Average:	8.8	14.92	10.81	13.57		10.20

Nineteen samples of the foot-wall vein only.

No.	Width	Ag. Oz.	Pb. %
3	6.75	7.70	10.70
4	6.50	5.35	11.30
5	6.65	7.80	11.10
6	6.	6.95	8.90
7	4.65	5.35	8.00
16	4.65	6.00	6.00
20 *	2.5	1.45	1.70
21	4.8	2.50	5.80
22 *	4.8	2.10	1.10
23	5.75	5.50	4.40
24	5.5	7.80	2.40
30 *	5.	3.25	1.50
31 *	5.	6.15	2.00
33	5.	6.78	2.45
52	4.9	1.45	5.00
53	3.1	2.05	7.00
54	3.7	4.60	7.00
55	3.6	.70	3.30
71	2.4	3.80	3.35
19 Samples:		87.28	103.00
Average:		4.59	5.42
Excluding the samples that are starred; (4)			
15 Samples:		74.33	96.70
Average:		4.95	6.45

Eight samples of the hanging-wall vein on

<u>No.</u>	<u>Width</u>	<u>Ag. Oz.</u>	<u>Pb. %</u>
37 *	5.25	1.05	.40
38 *	3.5	.80	2.40
43	3.5	19.50	7.10
44	3.7	13.20	8.30
57	4.75	16.99	2.50
60	4.5	13.20	13.20
65	4.5	5.70	4.80
66 *	4.8	2.35	.40
8 Samples:		<u>71.79</u>	<u>39.10</u>
Average:		8.97	4.89
Excluding the samples that are starred; (3)		67.59	35.90
Average:		13.32	7.18

	<u>Ag. Oz.</u>	<u>Pb. %</u>
Arithmetical average of all samples taken by Mr. Beals	8.47	6.17
Arithmetical average of 30 samples that are not the full width of the vein	11.77	8.73
Weighted average of 14 samples that are the full width of the vein	11.79	7.92

In the foregoing tabulations, some samples of the vein that would be of little or no profit in mining, especially where they are together, have been eliminated in calculation of ore values. Such places in the vein can be left as pillars and serve a more profitable purpose in supporting the mine openings. The amount of the vein that would be left in this way is indicated as five to ten per cent. In the practical consideration of mining, dilution or the entry of waste rock other than vein also enters. With a hanging-wall as broken as is found along this vein, that would amount to about as much as would be left in pillars, so that calculated area and volume of the vein should be close to actual production.

Laboratory test work recently conducted has demonstrated quite conclusively that an extraction of 75% of the silver and 85% of the lead can be made by proven and fairly simple metallurgical methods, also that this extraction may prove to be about the most economical. Extraction as high as 85% of the silver and 93% of the lead has been made on samples of the foot-wall section of the vein, lead predominating, and at a coarse grind -- 20 mesh. The ore from the hanging-wall section of the vein, silver predominating, will require considerably finer grinding. Extraction, within reasonable limits, is in direct proportion to the fineness of the product. Economical balance between crushing, grinding and extraction will be a detail of importance in the design of a treatment plant.

COSTS:

For the cost of mining, milling, marketing, etc., the following round figures are used, which, with proper equipment, competent supervision and low overhead, can be reduced ten to fifteen per cent.

Mining	\$3.00
Milling	2.00
Concentrate Marketing	2.75
Taxes, Insurance, Etc.	<u>.75</u>
Total -- per Ton Ore	\$8.50

The average of as reliable sampling of exposed ore as is possible, gives a minimum mineral content of 8.5 oz. Ag. and 6% Pb. The weighted average that I have calculated from Beals' sampling, less 10% for dilution, is approximately 11 oz. Ag. and 7% Pb., and should be very close to actual production down to permanent water level on this ore vein (assumedly about the 225 level). Figuring silver at 64¢

Pb. ore, profit would be slightly under \$3.00 per ton; on 11.0 oz. Ag., 7.0% Pb. ore, profit would be about \$5.50 per ton. These figures are fairly balanced, reasonable limits to be anticipated, with, in my opinion, the more fair analysis approaching the higher figure. I can foresee nothing within reason to go appreciably under or over these limits, other than change in the price of the two metals. To the best of my information, the outlook for lead is an increase in price, based principally on the fact that our largest fields and producing mines are being rather rapidly depleted with no known fields, districts, or mines of any large potential possibility, either in this country or abroad. Based on possible production and the fact that the market was 6¢ to 6<sup>1</sup>/<sub>2</sub>¢ but three months since, it would seem that the price for lead might reasonably be expected to higher in the near future. On this ore that would mean an increase of from one to two dollars a ton. The price of silver in this country is in the hands of our government, and it seems the price for the next year will be that lately established, i. e.: 64.64¢ per ounce. With forethought in the design of a mill, a decrease in the price of silver could be met with but little decrease in profit. That is possible principally because of the character of this ore. Recovery of the silver values requires a considerably finer grind than does the lead values. Less grinding, increased tonnage at the same cost or a reduced unit cost can well be accommodated through the price range for silver.

Without going into detailed cost estimates, adequate

mine and mill equipment to put the property on a thirty-ton daily production, will cost erected and ready for operation about \$25,000.00. That would be a capacity of about 10,000 tons a year. With a practically assured tonnage of 36,000, the mine would have a life of at least three and one-half years. This would be increased materially by additional development, and could be doubled or tripled at a comparatively small expenditure for mine development. The cost of water would be pumping from the mine, which is covered in operating and equipment costs.

Mr. Finlayson reports, in 1929, sufficient water from the mine for the operation of a mill of one hundred tons daily capacity for a few months. Further development would be required for steady operation. Mr. Gohring reports the mine as making an average of fifteen gallons of water per minute. Less than one-half of that amount would be sufficient for a treatment plant of thirty tons daily capacity. With the water now in the mine, a volume ample to treat the total tonnage of ore estimated is assured. Sufficient water for domestic purposes is available from a shaft on one of the smaller veins on the property.

The equipment cost, if amortized during the life of the assured ore reserves (18,000 tons), would cover a period of twenty to twenty-four months, and with interest at eight per cent. would amount to approximately \$1.50 per ton of ore. At a profit of \$3.00 per ton, it would take about 8,700 tons of ore and ten months of operation to pay the equipment cost from production. At a profit of \$5.50 per ton, it would take about 4,700 tons of ore and less than six months of operating

time to pay the equipment cost from production. I consider  
repayment of the capital required to put the Diamond Joe  
Mine into production, together with a very good profit, is  
assured.

Respectfully,

M. E. PRATT  
M. E. Pratt,  
Mining Engineer.

Octave, Arizona,

February, 1938.

EXCERPTS FROM A REPORT ON THE DIAMOND JOE GROUP OF CLAIMS  
BY A. E. SEDGWICK, MINING AND CIVIL ENGINEER,  
LOS ANGELES, CALIFORNIA.

This report bears two dates, March, 1921, and March, 1923. Mr. Sedgwick was in no way interested in the Diamond Joe property, and this examination and report was made because of some transaction pending at the time.

HISTORY:

"About twenty years ago the claims were located by A. B. Lovell. He sank a vertical and an incline shaft on the vein sixty-five feet deep, and shipped some ore. The records of these shipments are not available. The property then passed to Etter Brothers, who leased it to a Mr. Bannister. Bannister worked the ore in crude hand jigs and shipped some concentrates from his jigs to the smelter. These smelter reports are not available.

Bannister failed to take up his bond and the property reverted to Etter Brothers. They sorted and shipped some of the ore to a concentrating plant at Wickenburg, w which, according to the records as reported by McLeod, who recently examined the property, assayed as follows:

<u>Tons</u>	<u>Gold Ozs.</u>	<u>Silver Ozs.</u>	<u>Lead %</u>
23.1	0.03	11.60	6.50
3.4	0.03	9.20	12.00
14.3	0.02	7.70	12.80
2.6	0.02	5.20	4.30
<u>25.6</u>	<u>0.02</u>	<u>9.00</u>	<u>13.50</u>
69.	Av. 0.0238	Av 9.467	Av. 10.589

It appears that during the war work was stopped at the mine and no assessment work was done or papers filed

asking exemption from assessment. In 1920, the claims were re-located by John B.atto, who assigned a one-fourth interest each to George R. Koyk, A. L. Garford, and L. N. Butler, No abstract, etc.

#### ECONOMIC FEATURES:

The claims are about 3500 feet sea level. At this elevation the desert climate is very mild with but three warm months during the year. During these months the weather is not hot enough to interfere with work, and the nights are usually cool. There is no snow in the winter. The average rainfall during the year is about three inches. (Range -- 3 to 8 inches)\*

There is no surface water on the property or in the immediate vicinity. Water has been obtained for domestic purposes in shallow wells in nearby gulches. The main shaft has fifty feet of water in it and now stands at a point approximately seventy-five feet below the collar of the shaft. Water for milling and for domestic purposes must be developed, and conserved by a de-watering apparatus in the mill to prevent mill waste. The cost of developing water and the success of such development work are problematic. The inhabitants do not consider the water situation serious. They state that water can be found close to the surface in the gulches. The presence of water in the mine seems to confirm this statement. It may be a serious problem and should be carefully investigated.

#### GEOLOGIC RELATIONS:

The claims are located on the southerly slope of a batholith which, in the vicinity of the mine, has been eroded so that no sedimentary rocks are present. The up-

LIFE OF THE BATHOLITH HAS PRODUCED MASSIVE CHANNELS OF  
channels for ore deposition.

The texture of the rock is granitoid. It contains quartz, soda-lime feldspar, orthoclase, hornblend, and some biotite. The quartz predominates over the feldspars. The soda-lime feldspar slightly predominates over the orthoclase. This determines the country rock as quartz diorite, shading into grano-diorite, etc.

The main fissure bears north 27 degrees west, and dips to the southwest at an angle of 38 degrees from the horizontal. (This last word is a mistake; should be vertical.)\* It is a true fissure vein, widened by replacement of the wall rock, and can be traced for a distance of nearly 3000 feet on the surface.

ORE DEPOSITION:

The values seem to be quite uniformly disseminated through the vein. Occasionally there is a streak along the hanging wall which runs a little higher (in silver)\* than the rest of the vein, etc.

Zinc and barium are usually associated with lead ores in vein of this kind. Here we find barium but almost no zinc.

It is difficult to estimate the extent of the oxidized zone.

At the 75 foot level there is no indication of a change in the character of the ore. In arid districts, such as this locality, the oxidized zone is liable to be very deep, because the permanent water level is deep. To accentuate this, the Diamond Joe Group lies at an elevation considerably above that of the surrounding country and the

nearest water courses. Therefore, it is probable that the permanent water level is considerably below the surface of the claim and an extensive oxidized zone may be expected. In any case, the character of the ore at the permanent water level cannot be predicted until it is exposed. The character of the ore above the water level is known and since a deep oxidized zone is indicated, a considerable tonnage may be expected.

MINING METHODS:

The dip and width of the vein are favorable for shrinkage stoping. The ore is not hard but stands well and stulls only would be needed to support the stopes.

There is no equipment at the mine that could be used to advantage.

ORE VALUES:

In an examination by Mr. L. M. Kellogg, preliminary to this one, samples taken gave an average value of \$15.67 per ton. (Silver \$1.00 -- Lead 4%)\* The mine had been sampled previously by Mr. J. M. McLeod, a mining engineer, and by Mr. L. N. Butler, who owns an undivided one-quarter interest in the mine. The results of these assays are tabulated below, disregarding the gold content which averaged 0.02 ozs. per ton.

<u>Silver, oza.</u>	<u>Lead %</u>
4.00	10.10
20.30	9.10
6.50	8.60
3.80	3.70
6.00	15.70
.02	6.50
19.92	7.90
49.08	16.08
28.00	10.30
7.92	7.80

By  
L. M. Kellogg

L. N. Butler

Silver, Ozs	Lead %
2.50	12.00
14.18	3.20
17.36	5.60
12.70	4.90
28.00	12.00
16.20	7.60
17.40	7.50
4.40	6.50
26.50	2.40
18.80	14.00
17.00	9.10
17.00	3.50
4.80	10.80
Average	
14.89	8.47

J. N. McLeod

A. E. Sedgwick

From the surface indications and indications in the mine, it is fair to assume the deposit will be 400 feet long, 150 feet deep and 7 feet wide. In such a deposit there will be 35,000 tons of ore.

On a basis of 40 tons per day (50 ton plant)	\$ 2.80
Total cost of ton of ore into mill (mining)	
Milling cost per ton	1.43
Concentrate, R.R.Freight, Smelter charges, penalties, deductions, tax	
3% Per ton concentrates	\$ 22.33
Hauling and handling	3.50
Total cost per ton of concentrate	<u>25.83</u>
ratio of concentration 6.75 to 1 (Cost per ton of ore)	3.83
Taxes, interest, etc.	.45
Total cost per ton of ore treated	<u>8.51</u>

CONCLUSION:

The prospects of developing a large deposit are very favorable. The surface indications, the character of the vein, and its geological relations indicated a deep oxidized zone several hundred feet in length. Very little change in the character of the ore need be feared until the limits of the oxidized zone are approached.

The ore presents no complicated metallurgical problem.

A profit of \$3.00 per ton may be expected after all charges have been made, including amortization of the capital

invested. (\$57,000.00).

After the capital has been repaid, a profit of \$5.00 per ton will be realized."

EXCERPTS FROM A REPORT ON THE DIAMOND JOE PROPERTY  
BY D. R. FINLAYSON, MINING ENGINEER. DATED JULY, 1929.

During this time Mr. Finlayson was manager of the Vulture Mine, near Wickenburg, Arizona.

"As shown in the accompanying map, the main vein continues through the center of three claims (4500 feet)\*. This vein is well-defined and except for two small cross faults, is continuous. The throw of these faults is small and of no particular detriment to the development of the property. There is a well-defined vein on the Diamond Joe No. 7, (claim)\* and another on the Diamond Joe No. 9 (Claim)\*, also a small vein carrying gold, silver and copper on the Diamond Joe No. 3. (Claim)\* This last intersects the main vein of the property. The Diamond Joe vein is developed to the 290 foot vertical level. (290' below the collar of the No. 3 shaft or 225' below the outcrop of the vein at the No. 1 shaft)\* Levels 1, 2, and 3 are connected with raises and ore blocked out in the North Shoot. The vein, where developed, has an average width of eight feet, and the walls are well-defined and regular, with a dip of 45 degrees to the west.

South of this developed shoot is the cropping of a large shoot of ore which is undeveloped, except for a short cross-cut tunnel and an open cut. This shoot has not been penetrated by any of the mine levels, though the 290

root level, when extended a few feet farther, should reach it. The tonnage in this South Shoot should be very much greater than that in the North Shoot, and there is no reason why the values should not be as good. This shoot is in harder formation and should continue to hold its size, about 12 feet, for sufficient depth to make a very large ore body. This also applies to the developed North Shoot, though this shoot is not so regular.

The developed tonnage in the North Shoot is approximately 135,000 tons, with an average value in silver and lead of \$11.00 at present market price for these metals. (About 53¢ for silver and 3½¢ for lead)\*

At present the water stands at a point just above the third level. For a few months there would be sufficient water for mill purposes, (for a mill capacity of 100 tons daily)\* but a more permanent water supply would need to be developed soon."

A supplementary report dated February, 1934, says:

"All ore so far developed is in the North Shoot. This ore contains about 14 ozs. silver and 6% lead per ton. At the present price for those metals, 64½¢ per oz. for silver and 4¢ per pound for lead, there is a gross value of \$13.83 per ton. At 85% mill extraction, less freight, smelter charges and deductions on concentrates, would give a net production of \$8.90 per ton. Subtract mining and milling costs of approximately \$4.50 per ton and we have a net of \$4.40 per ton on 135,000 tons blocked out in the North Shoot."

This report is not dated, but was probably written the latter part of 1934. Maps appended bear the date August, 1934. For the past two years Mr. Gohring has been examining engineer in Arizona for Federal Mine Loan applications.

"The Diamond Joe Mine is in the White Picacho Mining District, in the extreme southern part of Yavapai County, Arizona. It is nine miles northeast of Wickenburg, which is in Maricopa County, on the Santa Fe Railroad. The group consists of eight (now ten)\* full claims, not patented. They belong to the Diamond Joe Mining Co., Inc., an Arizona corporation, but the entire stock of this is owned by Mr. George R. Koyk, of Wickenburg. (deceased)\*

#### GEOLOGY:

The claims lie in a granite igneous rock, which we may call grano-diorite. This is intruded extensively by dikes of various kinds, ranging from basic andesites to very acid rocks. There is considerable faulting and the vein or ore body is in the main fault, a north-south fissure dipping about fifty degrees west. None of the intrusive dikes cut across this and although we have at least two known faults crossing the vein, they dislocate it hardly any and are therefore of no economic importance.

#### THE VEIN:

The ore outcrop is plainly seen and can be traced continuously, allowing for short stretches where it disappears under wash, for about 1200 feet, and from sporadic indications of the same fissure, for a probable total length

up to 3,000 feet.

The mineralization is principally a calcite gangue carrying lead and silver minerals, with considerable iron stain in places, and evidence of an intrusion of porphyry along the fissure.

#### THE MINE:

Early work followed the vein down on an incline, Shaft No. 1, which eventually connected at the 83 ft. level with a later vertical shaft, No. 2. Later a new working shaft was sunk 500 feet and connected with Nos. 1 and 2 by drifts and raises. The deepest working level is 225 feet, all elevations starting at the collar of Shaft No. 1. This 225 feet vertical represents 325 feet on the incline of the vein. (Calculated average dip  $43^{\circ} - 48'$ )\* At present the mine is full of water to the 157 ft. level.

Shaft No. 3 is caved in near the surface. The other shafts are open and in good condition, and all drifts and raises are open and in good condition down to water level. The mine itself, when it was being operated, made an average of fifteen gallons (of water)\* per minute.

#### TONNAGE OF ORE:

In estimating tonnage there is not enough systematic development to measure blocked-out ore accurately. The outcrop to the north is continuous on the surface for 800 feet, and the vein is developed continuously on the 225 ft. level for over 600 feet, with the limits not yet reached.

The only continuous cross-section of the ore from top to bottom that can be studied is that shown on Map P-2-b.

This shows a minimum thickness of ore above the water level of nine feet. The ore on the borrom level, 68 feet under water, is shown by this record as five feet thick. I therefore find eight feet as a conservative estimate of the ore width. Therefore, I feel that, as everywhere we have found the ore continuous on the bottom level, I should take the length of the surface outcrop as the length of developed ore or 800 feet in the north end, where all the main workings are driven. The incline depth to the bottom level is 325 feet, and I allow nothing below that. The width is eight feet, and the vein ore weighs in place 13.5 cu. ft. to the ton. I thus arrive at 154,000 tons of developed ore.

To the south is a similar outcrop of the same vein, easily traces for 400 feet, and this has just been struck on the bottom or 225 foot level. It was found but no development done. Open cuts on the surface show it stronger and wider even than the outcrop farther north, with the same lead silver mineralization.

I see nothing to indicate that this portion of the vein will not be at least as good as the developed portion and, using the same figures, I arrive at a tonnage of 77,000 tons, called probable ore.

As the outcrop is identical throughout its length, I mean in character and type, and as everywhere so far developed the ore proves to go down, I think the above indicated tonnage is proven far beyond any doubt.

Furthermore, I find the same vein outcropping intermittently for over twice the length used in estimating; sand washes and dikes conceal most of its extensions.

We know that there is sure to be some losses of waste in this vein and also some ore destroyed where the faults cross, but we also know of two other veins which show lead and silver that should eventually produce ore, and we also have reason to expect development on the main vein beyond the 1200 feet in length used.

I, therefore, am not making any allowance and believe that for the present purpose I can safely assume the tonnage shown as 231,000 tons.

VALUE OF ORE:

As far down as can now be reached both the lead and silver minerals are mostly in oxidized forms. There is some galena (55% determined by test work)\*, but most of the lead is Anglesite-sulphate and cerussite-carbonate.

On the 225 foot level the silver is said to begin to appear as a sulphide, but one finds very little silver sulphide above. (All of the galena contains silver as sulphide)\*

The vein has a banded structure and generally shows crystalline calcite towards the foot wall, etc., -- but in general one finds the lead and silver minerals anywhere across the vein.

There is not enough data available to make any accurate estimate of metal value for the total estimated tonnage, etc.

However, we have a good sampling record above the 83 foot level, about 125 feet on the incline. This sampling was done by A. L. Beals, a competent engineer. I have made

a careful study of his sampling and assays underground. I estimate from his results and my own checking and estimating that the red oxidized material near the hanging wall runs 23.6 ozs. silver and 7.25% lead over a width of three to four feet. The white calcite toward the foot wall runs 7 ozs. silver and 11.6% lead over a width of five to six feet. The weighted average ore above the 83 foot level is 12.5 ozs. silver and 10.15% lead.

OPERATING COSTS:

	<u>Cost per Ton Concentrates</u>		<u>Cost per Ton Ore</u>
	Wet	Dry	Wet
Mining			2.12
Milling			.96
Supervision			.47
Haul to R.R.	1.00	1.18	.20
R. R. Freight	7.60	8.94	1.49
Silver deduction		2.87	.48
Smelter treatment and deductions		6.20	1.03
Lead deductions		13.56	<u>2.26</u>
Total			9.01

\* Parentheses Ours

ALTIMA ASSAYS, NOTES ON THE DIAMOND JOE MINE  
MOHAVE COUNTY, ARIZONA

The following report was made by one of the superintendents of the mine. It shows the location of the vein, the nature of the work, assays, and the results of the work. It is marked out there the vein is located below this level and is extremely rich. It shows a width of 12 inches of ore running as high as 1000 feet above the level. There would be no possible profit. I took the samples in the vein in the deepest part of the mine. The assay shows 5.25 oz. gold, 5.25 oz. silver, and 7.00 oz. lead. This mine has covered the location of the vein. The value of the silver-bearing quartz is low.

LOCATION:

The Diamond Joe mine is located in a high mountain range 28 miles southeast of Yucca. The first 16 miles of the road from Yucca is a very good desert road. The road then climbs over a very high pass and goes down the east side of the range to the mine. Altogether there is 12 miles of grade and some of it is very steep. If any amount of ore was to be taken out and shipped and supplies brought in, the transportation would be a tremendous undertaking.

The Copperville, Leviathan, and Cedar mines are close to the Diamond Joe.

HISTORY:

The present owner, Manuel Martinez of Kingman, has had this property for 30 years. He first worked it himself. In 1892 he shipped 40 tons, which gave assay returns of \$10,000 on a high silver market. After working out a small tonnage of high grade near surface, he has had it under option to several different parties, who did considerable development work but found no ore that would pay. In 1922 Martinez shipped six tons that ran 159 oz. silver, 12.8% lead, and \$1.05 gold. The net smelter return was \$810.86. This shipment under present market conditions would show no profit, due to the narrowness of the vein and the adverse working conditions.

VEIN:

The vein is a typical quartz fissure vein in granite. It varies in width from nothing up to 20" of quartz. The fissure or zone of crushing is from four to 12 feet wide. It is barren except for the stringer of vein quartz that run through it. The vein strikes N 70° W, and the dip is almost vertical. The width of quartz is very irregular, but is seldom over 20".

SAMPLES, ASSAYS, AND TONNAGES:

The following map was made by one of the companies to which Martinez had the property optioned. It shows the development work, assays, and tonnages. The mine is worked out above the main tunnel level, and the tonnages estimated below this level are extremely unlikely. Assuming a width of 12 inches of ore running as high as these assays show, there would be no possible profit. I took two samples in the bottom winze, which is the deepest working in the mine. These gave .02 oz. gold, 5.26 oz. silver, and .04 oz. gold, and 7.02 oz. silver. This winze has entered the sulphide zone. The values are a silver-bearing galena, too low grade to be considered ore.

The following is a list of samples taken:

- No. 1. Cut across 20 inches of quartz in deepest winze.  
0.04 oz. gold, 7.02 oz. silver.
- No. 2. Finer in bottom of winze below No. 1. 0.02 oz. gold,  
5.26 oz. silver.
- No. 3. On 150-foot level below main tunnel 16 inches across  
vein in roof. 0.02 oz. gold, 8.04 oz. silver.
- No. 4. Mill ore from chute on 100-foot level below main tunnel.  
0.02 oz. gold, 4.56 oz. silver.
- No. 5. Mill ore from dump of first tunnel above main tunnel.  
0.06 oz. gold, 23.50 oz. silver.
- No. 6. Three pieces of typical galena ore from bottom winze.  
7.20 oz. silver.

CONCLUSION:

The Diamond Joe has produced a small tonnage of very high grade ore, which came from up near the grass roots. Practically all of the pay ore has been worked out. The lowest workings have entered the sulphide zone, and the ore here is too low grade to show a profit under the most favorable market for silver.

Submitted by ,

12 September 1941

Mrs. Nell Koyk,  
c/o Mr. Neil C. Clark,  
Heard Building,  
Phoenix, Arizona.

My dear Mrs. Koyk:

I am enclosing herewith a copy of mine owners report covering the **DIAMOND JOE MINE** in Yavapai County filed with the Department of Mineral Resources.

A copy of this report will be submitted to anyone making inquiry for a property such as yours.

Yours very truly,

Charles F. Willis  
Chairman, Board of Governors

CFW-jrf

May 1916

The Diamond Joe, an old silver property has started up again and they are finding tungsten as a constituent of the ore.

May 27, 1957

DIAMOND JOE

YAVAPAI COUNTY

This property idle.

MARK GEMMILL

Reference: Eagle-Picher (geology file) Geo. M. Fowler report

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Mr. James L. Gallagher

726 Butte St.

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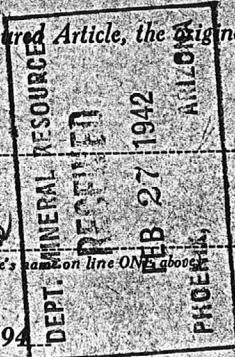
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MINE JOURNAL 7/5/42

ROOT, A. P. (LESSEE)

OWNER- DIAMOND JOE MINING CO.

MINE - DIAMOND JOE MINE - 9 miles east of Wickenburg.

Now under lease to C.D.Howe, Yarnell - Aug. 3-19

HOWE, C. D. (LESSEE)  
Yarnell, Arizona

8-1

MINE - DIAMOND JOE MINE

Bought out lease from A. P. Root and took over on 3rd of Aug.

GALLAGHER, James L.  
726 Butte St.  
Prescott, Ariz.

See DIAMOND JOE - re gas application

1-3-45

NAME OF MINE: DIAMOND JOE  
OWNER:

COUNTY: Yavapai  
DISTRICT:  
METALS: Pb

OPERATOR AND ADDRESS		MINE STATUS	
Date:	James L. Gallagher,	Date:	
1/45	726 Butte St., Prescott	1/45	Developing
		4/45	Small shipment
		6/45	Idle

DIAMOND JOE MINING CO. (OWNER)

~~MT~~

MINE - DIAMOND JOE MINE - 9 miles east of Wickenburg.

LESSEE - ROOT, A. P.

Now under lease to C. D.Howe, Yarnell - Aug. 3-1942

# Purple Passion Mine      Draft Yavapai County, Arizona

by Ed Davis & Bill Gardner

The Purple Passion Mine is located approximately 8 miles northeast of Wickenburg, Arizona (about 60 miles west and a little north of Phoenix). The mine produces several very odd crystal habits of wulfenite and also hosts some unusual mineral associations, like wulfenite on smokey quartz, amethyst, or fluorite.

## Introduction

Through the years, the surrounding property occasionally has yielded small quantities of material, and current activity is producing a fair amount of good quality wulfenite specimens. The mine consists of a single unpatented claim on government land, (controlled by the Bureau of Land Management (BLM)), in the White Picacho mining district, in Yavapai County, Arizona. The mountains around Wickenburg have been extensively mined for gold, silver, lead, and molybdenum, and it is common to see tailing piles and audits in the general area on the way to the mine. In addition to the many small prospects sites, the King Solomon and Monte Cristo Mines are located to the north, to the south east is the Great Southern Mine, and the Monarch Mine is to the south.

## Location and climate

The Purple Passion Mine is in the Heiroglyphic Mountains located on the USGS Arizona Morgan Butte 7.5 minute topographical map at T8N R3W SEC 30 SE 1/4; the latitude is N34° 0 Min 2 Sec, and the longitude is W112° 35 Min 53 Sec. The mine is in the Sonoran Desert, about 3500' above sea level. At this elevation, the desert climate is somewhat milder than in the lower desert, but during the three summer months, daytime temperatures routinely climb above 110°F making it almost unbearable for the casual mineral collector. The average rainfall is about 3-8 inches yearly.<sup>1</sup> So far, on the way to the mine, we have seen desert life which includes rabbits, range cattle, three deer, a coyote, many birds, a gopher snake, several rattlesnakes, a javelina, scorpions, tarantulas, honey bees, lizards, and a gila monster. One diamondback rattlesnakes resides 40' straight down one of the old shafts.

## History

Late in the fall of 1995, we got together with four other mineral collectors to actively work a site that one of the others knew about. On the surface, we saw a vein of material which consisted of small wulfenite crystals in calcite with an occasional thin vein of fluorite or galena. Along the base of the hill, about a hundred feet south of a small pile of purple tailings, there was an inclined shaft, a vertical shaft, a windmill powered water pump, two water tanks, a old forge, and some concrete bases for an old headstock and winch system. The vertical shaft is about 15- 20' in diameter and goes straight down approximately 45 - 50 feet and seems to stop. There does not appear to be any significant mineralization in the vertical shaft. The inclined shaft follows the vein down at about a fifty-five degree angle towards the vertical shaft. It is about 6 feet square and is collapsed after the first 15'. The vein exposed in this inclined shaft is mostly calcite containing small layers of green fluorite with traces of galena and wulfenite. Four or five hundred feet across the wash and up a hill was another vertical shaft (collapsed about 20' down) and some major concrete foundations. Only a small amount of tailings were present at any of these locations and we believed the whole site must have been either a millsite for trucked in material, or minor prospect holes with no major workings, but this was not the case. Conversations with some mineral collectors brought the rumors that a extensive series of tunnels used to exist at the site but that the tunnels were now caved in.

We eventually located Bill Hunt, a micro-mount collector with some first hand knowledge of the site. Bill came up to the mine in the middle of May, and shared with us what he remembered about the site. The mineralized vein lays on a fault surface of a hill which extends above the wash. Around 1975, Bill Hunt (and some of his friends), worked the surface of this deposit and looked down into some of the old tunnels. They excavated the vein from ground level up, and removed a section of the exposed purple fluorite vein with the wulfenite. The tailing pile of purple fluorite at the north end of our shaft was made by Bill Hunt's group. *The Mineralogical Record, July - August, 1980.*<sup>2</sup> indicates six localities where acicular wulfenite (needles) can be found and it includes the statement that Bill Hunt (and others), found acicular wulfenite at the Great Southern Mine in Yavapai County. That reference is to our claim since Bill thought our mine site was part of the Great Southern Mine and he had labeled specimens accordingly. [Later, Bill's group found references which indicated the site had something to do with a group of claims under the names of Kelly and or Hogan. ] The small amounts of material that can be found in collections up until this time, may be labeled under several alternative names such as Kelly, Hogan, or the Great Southern. Because of these labeling discrepencies, material that has the appearance of what is currently being mined, is almost certain to have come from the Purple Passion Mine.

A stroke of luck (and several days researching the file data at The Arizona Department of Mines and Mineral Resources (ADMMR)) solved the mystery of the history.<sup>3</sup> The Purple Passion Mine is located at the site of what was known as the Diamond Joe

Mine. Due to an incorrect "guess" during a mapping survey, the records had placed the Diamond Joe Mine at one of its prospect claims some distance to the east, and it was recorded as being in the south west quarter of section 29 instead of its true location in the south east quarter of section 30. The reason there were no large tailing piles was that the vein was wide enough to make the tunnels with very little waste rock. All the ore was milled on site and processed prior to shipping.

The Diamond Joe vein was discovered in 1890 and was only worked sporadically until 1926-27 when a millsite was equipped and a medium sized operation was started. At that time, 60 tons of ore / week was being processed, averaging 12-15 % lead and 13.5 ozs / ton of silver ( no records have been found for the molybdenum and small amounts of gold). At only 15 gpm, the mine did not produce enough water for processing the ore full time when the production was increased to 100 tons /day. In an effort to keep the mill running, in 1927-28, a 500' shaft was sunk to serve a dual purpose. The first 225' was used as the main entrance to the lowest working level of the mine and the bottom 275' was used as a water reservoir. Late in 1928, the mine was closed due to insufficient water.<sup>4</sup> According to the ADMMR records, the mine was briefly reopened in 1945, but never regained its commercial status and only shipped a small amount of ore before closing again. A total of 2,250' of tunnel was driven, with levels at 45', 83', 180', and 225' and about 135,000 tons of ore was removed. It appears that the mine is flooded up to about the 45' level at this time.

## Geology

The claim is located on the southerly slope of a batholith which has been eroded so that no sedimentary rocks are present. The uplift of the batholith has produced numerous fissures as channels for ore deposition. The main fissure strikes north 27° west dipping @55° to the southwest. It is a true fissure vein, widened by displacement of the wall rock, and can be traced on the surface for a distance of about 3000 feet. The texture of the country rock is granatoid. It contains quartz, soda-lime feldspar, orthoclase, hornblende, and biolite. The quartz predominates over the orthoclase. This determines the country rock to be quartz diorite, shading to grano-diorite. The mineralized vein has a banded structure, but in general one finds lead and silver minerals disseminated across the vein. Calcite generally predominates along the footwall, intermingling with veins of purple and green fluorite. The vein is cross faulted several times but little displacement of the vein is experienced. However, a second period of mineralization is recognizable. As the headwall is approached, an iron stained, leached calcareous material becomes prevalent. The highly intruded condition of the hanging wall has resulted in extensive kaolinization. In places, this has widened the mineralized vein to the total thickness of ten feet.<sup>5</sup>

In arid districts such as this locality, the oxidized zone is liable to be extensive, because the permanent water level is very deep. To add to this, the Purple Passion Mine lies at an elevation considerably above the surrounding country and the nearest major water courses. The old mining reports show that at the 225 foot level the lead and silver minerals were still in their oxidized forms. However, since 1947, the surface water has flooded the old tunnels to about the 60 foot depth. It is anticipated that the 50 years of flooding may have produced local conditions that have changed the vein minerals where the water has penetrated.

In lead and silver veins of this kind, zinc and barium are usually well associated with the ore. In this respect, the mineralogy of the Purple Passion Mine appears to be a little different. In this deposit, only small amounts of barium and zinc are encountered; the zinc being found as beautiful micro-crystalline sprays of willemite and smithsonite, and the barium as barite.<sup>5</sup> Small clear quartz crystals are common. Pockets of amethyst, as well as lustrous smoky quartz are found occasionally. Several of the specimens of wulfenite have been found to be slightly radioactive (up to 50,000 disintegrations per minute) and the radioactive material was identified by gamma spectroscopy as uranium 238 and its daughter products. The uranium minerals have not yet been positively identified. We suspect one of the uranium minerals is andersonite because we have found some microscopic brilliant lime green crystals (they have been sent off to be tested). Occasionally blue hemimorphite and smithsonite balls can be seen peppering a specimen. Although silver, and gold can sometimes be seen on specimens, the real treasures of the Purple Passion Mine are the wulfenite crystals.

In this mine, the wulfenite crystals exhibit an array of color, and the wulfenite has three basic habits- tabular, acicular (needles), and acicular-tabular. The most interesting and complex habit of wulfenite found at the mine are the acicular-tabular crystals and we have coined the term "fuzzie tabs" to describe them. They have the appearance of two scrub brushes placed back to back. The fuzzy tabs appear to have a normal tabular crystal in the center which sprouted an over growth of needles growing perpendicular to the plane of the seed wulfenite tab, usually an equal distance out of both sides. In pockets with fuzzy tabs, the remaining solution often grew small needles through out the rest of the pocket. The usual tabular forms are common as opaque butterscotch colored blades up to 2" on an edge. Any place groundwater has touched the smooth tabs, the surface has turned an opaque yellow, however, the inside of the crystals remain translucent. Occasionally, in pockets that were protected from the ground water, lustrous, transparent blades, up to 1/2" on an edge are also found. Commonly, wulfenite specimens can be found as hundreds of intertwined blades, usually quite battered and weighing from a few grams up to 3kg. Some of the color changes appear to be caused by the oxidation of the crystals from the action of surface waters. Nearly 50% of the wulfenite crystals found at the mine are needles (acicular) which are pyramidal and bipyramidal shapes that are stretched considerably along the c-axis. These crystals tend to be rather a drab tan to a honey yellow color. The acicular needles sometimes bundle together to form a tabular shaped crystal which does not appear to have a seed tab in the center, and they look distinctly different than the fuzzy tabs.

A highly cleavable lemon yellow crystalline calcite serves as a major matrix material in the mine, as does a powdery, grainy purple banded fluorite. On the micro level, the fluorite is found nicely crystallized as cubes, octahedrons, and dodecahedrons. In some areas of the mine the fluorite is quite crystalline on the macro level. In these cases the fluorite tends to be a vivid green apple color. An oxidized form of galena; cerussite is also present in crystalline form. The anglesite present however, is almost exclusively massive.

With all the minerals being abundant in quantity, well crystallized, and many of them displaying multiple crystal habits, there are a fantastic number of mineral combinations that may be found on a single specimen. When the vivid color combinations are factored in, an extensive range of unique materials is available.

## Conclusion

While the majority of specimens that are being produced are micro or thumbnail sized up to small cabinet pieces, the mine is showing more intense crystallization as depth is gained. The crystals are becoming larger and gemmier. The Purple Passion workings, although currently tunneling only 20 feet deep, will hopefully at some point join the Diamond Joe tunnel system opening up a large area of untapped specimen producing vein.

Currently collecting on the claim is permitted on a fee dig basis. For more information you have contact Bill Gardner at (602) 547-2234 or Ed Davis at (602).

## Mineral Occurrences:

**Anglesite-PbSO<sub>4</sub>** A breakdown product due to the oxidation of galena, is typically found as a massive silvery-black metallic ore. Sometimes it has a core of galena, and other times serves as a core for further oxidation products such as cerussite or wulfenite.

**Aragonite-CaCO<sub>3</sub>** This form of calcium carbonate usually is found as a fine crystalline druse coating pockets of smoky quartz crystals.

**Barite-BaSO<sub>4</sub>** The striking contrast of snow white barite blades on purple fluorite and sometimes with wulfenite as well; are an exceptional find. Small seams of barite come and go through the purple fluorite vein and sometimes find their way into the calcite layer. These blades are typically 3/8" but can get as large as 3/4".

**Biotite-K (Mg, Fe)<sub>3</sub>(Al,Fe)Si<sub>3</sub>O<sub>10</sub>(OH,F)<sub>2</sub>** This is found in the country rock, but not associated with the vein.

**Calcite-CaCO<sub>3</sub>** Calcite dominates the vein with thicknesses up to 7' near the footwall. Typically, the large crystals are all intergrown and fairly clear yellow or white. These large crystals surround pockets containing quartz (clear, milky, smokey, and amethyst), wulfenite, and all the other minerals found in the vein.

**Cerussite-PbCO<sub>3</sub>** Cerussite is found as clear, honey, or sherry colored adamantine crystals usually 1/4" or less, (although we have seen a 1" crystal that was collected here some years ago).

**Chlorargyrite-AgCl** This mineral appears to account for the majority of the silver in the deposit. It seems to appear as a greenish or brownish to copper colored crust.

**Fluorite CaF<sub>2</sub>** Fluorite occurs both as a purple or green granular matrix, and as well defined crystals in pockets. The purple matrix is often banded with botryoidal shaped deep purple and lilac colored layers. Intergrown cubes up to 1/4" have been found and the colors range from purple to green with occasional areas of yellow or raspberry. On the microscopic level at 15x, the crystals are well defined cubes, octahedrons, and dodecahedrons.

**Galena-PbS** Galena is found across the vein as thin stringers or small pockets, and as a layer between the upper and lower portions of the vein. It is usually very fine grained and the assays indicate it contains about 10% silver. To date, we have only seen one specimen with a small well defined cube.

**Gold-Au** The assays indicate .2 Oz of gold /ton, but exactly where it is and what it is associated with is unclear. Extremely small particles of free gold have been seen in some of the material.

**Kaolinite- $\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4$**  This member of the clay group defines the upper boundary of the vein. It was formed by alteration of the country rock during the second period of mineralization which deposited the upper portion of the vein.

**Orthoclase- $\text{KAlSi}_3\text{O}_8$**  This feldspar is part of the country rock and some of it was altered to make the kaolinite.

**Phosgenite- $\text{Pb}(\text{CO}_3)_2$**  A small number of microscopic amber or yellow striated crystals have been observed.

**Quartz- $\text{SiO}_2$**  Quartz is found in the vein as small seams and also in well formed pockets. Varieties include clear, smokey, milky, and amethyst. So far, the sizes range up to about 1/2" and wulfenite has been found on all of the varieties.

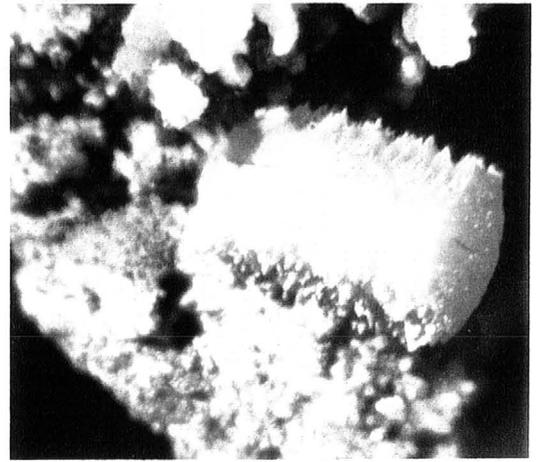
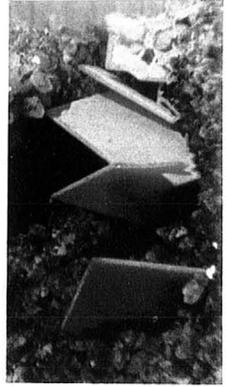
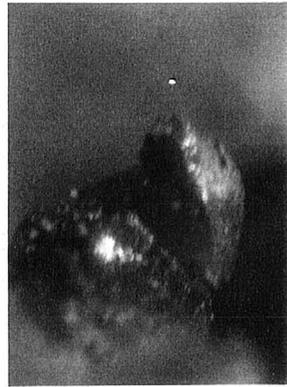
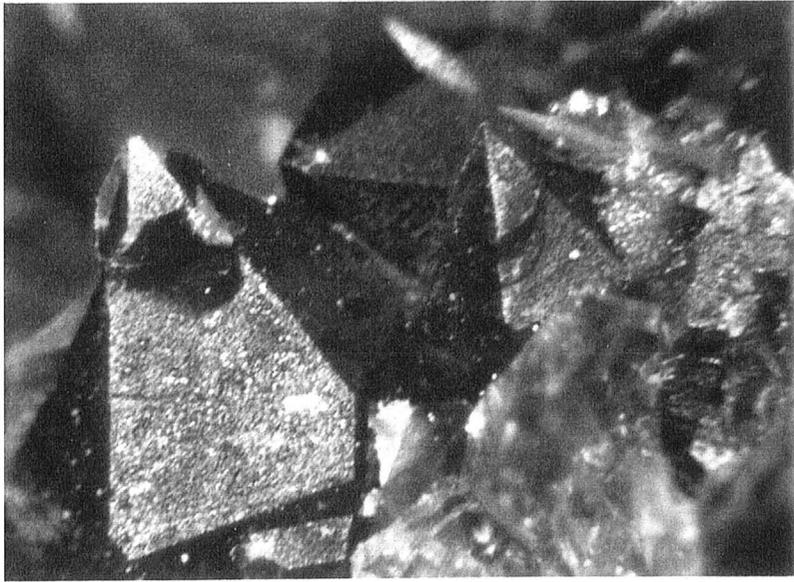
**Silver-Ag** In addition to the chlorargyrite, the silver is found as small wires, ribbons and globules.

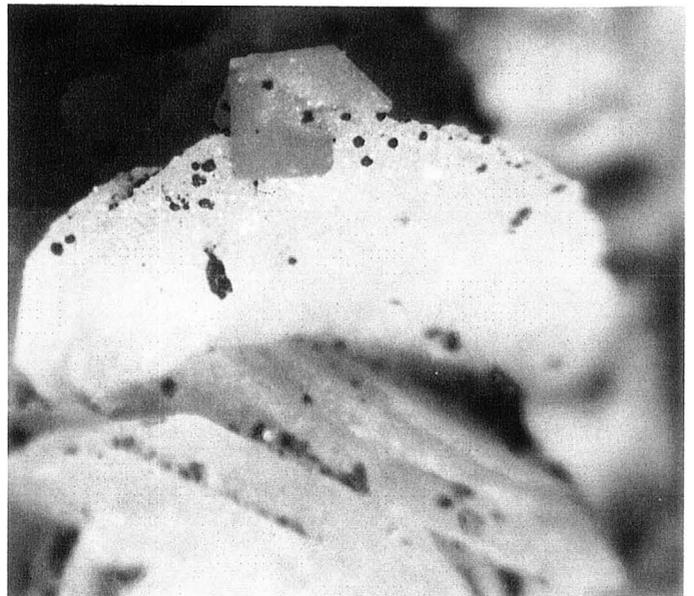
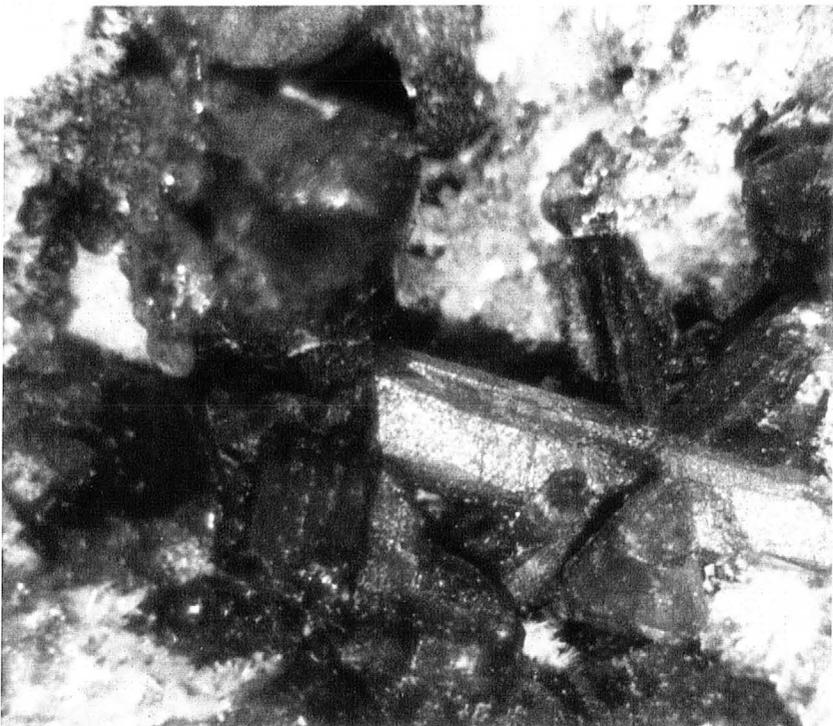
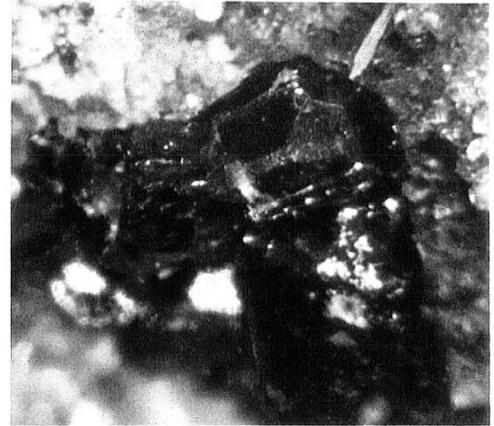
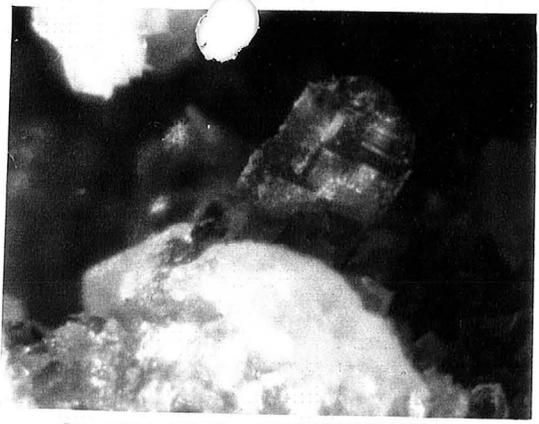
**Smithsonite  $\text{ZnCO}_3$**  Currently it is found as white to greenish microscopic botryoidal shapes.

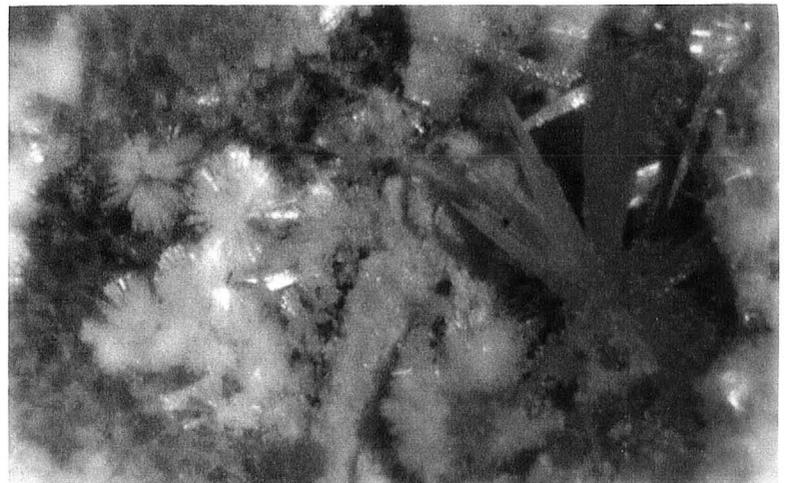
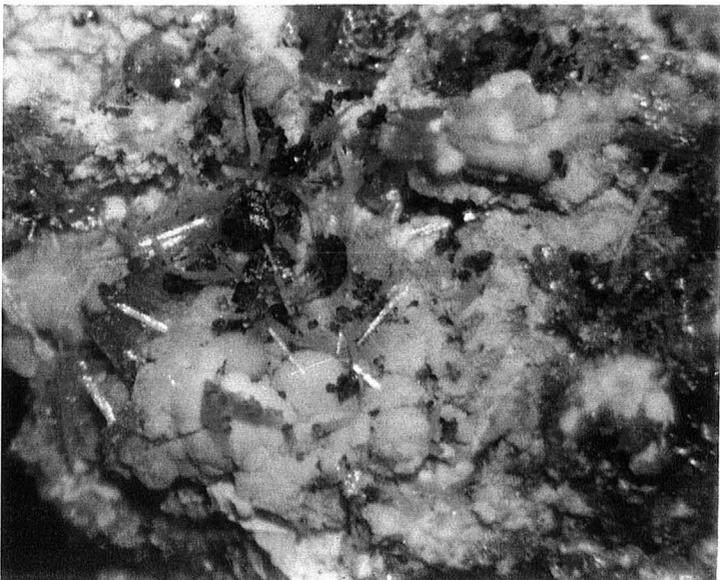
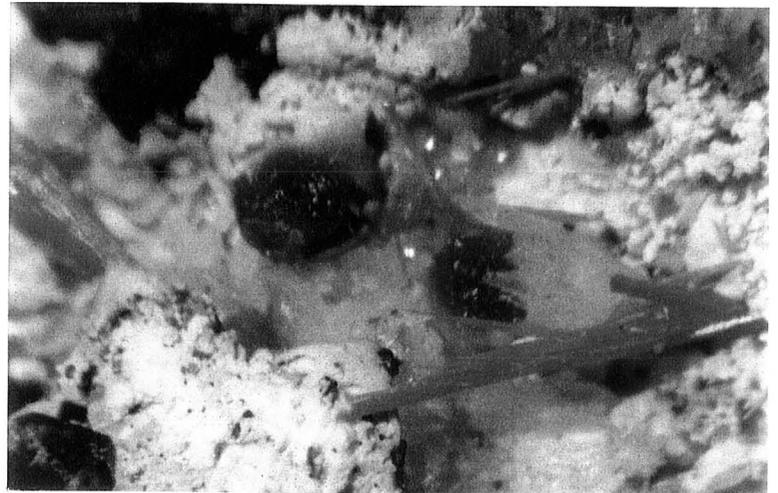
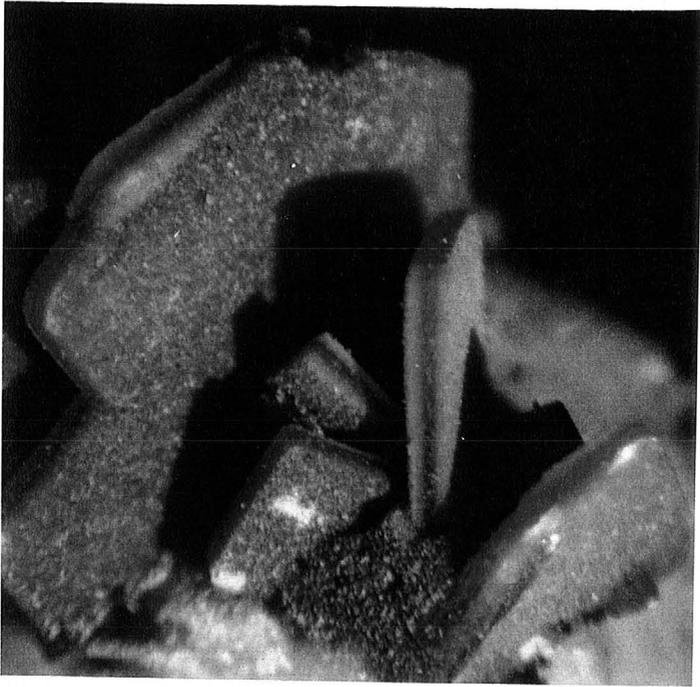
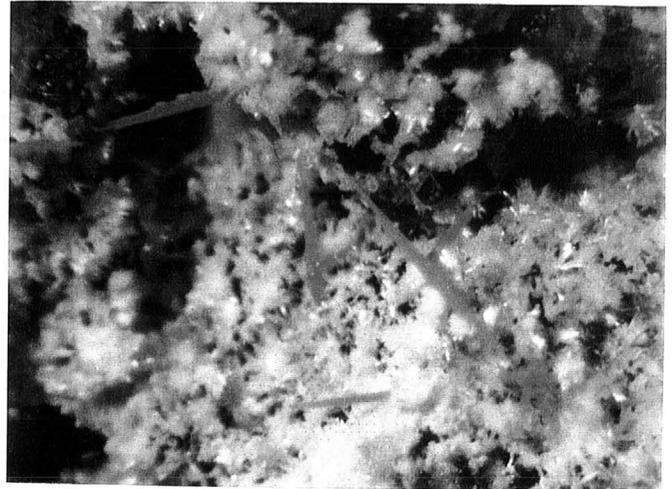
**Willemite- $\text{Zn}_2\text{SiO}_4$**  The willemite occurs as microscopic sprays of clear, white, or pinkish crystals, often on smoky quartz.

**Wulfenite- $\text{PbMoO}_4$**  The wulfenite is distributed throughout the vein and it also grows in fissures in the bordering country rock. The colors range from dull opaque butterscotch through yellows and orange to lustrous, transparent orange-yellow. The habits are tabular, pyramidal, bipyramidal, acicular and acicular-tabular ("fuzzy tabs"). Unattached clusters of blades weighing up to 3kg have been found in cracks weathered out of the calcite. Some of the wulfenite clusters are mildly radioactive (one measures 5,000 counts per minute). Loose, opaque blades up to 2" on a side, and 1/8" thick have been found. Thin attached blades up to 1" on a side, have been collected on quartz as well as on the granular purple fluorite. The largest wulfenite needle was about 5/8" long and 1/16" thick. The largest transparent, lustrous crystal so far is about 3/8".

About 16' down, some of the smooth tabs were more protected and have a more translucent orange color, beveled edges, and a luster. The current shaft starts at a place where the vein was mostly a fine grained purple fluorite matrix about two feet thick, with small areas of calcite, quartz and galena. About 12 feet under ground, the nature of the vein changed mostly to a coarse grained calcite. Above the vein is a thin layer of soft rock and a thick layer of caliche. The water followed cracks in the vein and has eroded open pockets where it leached







ROOT, A. P. (LESSEE)

OWNER- DIAMOND JOE MINING CO.

MINE - DIAMOND JOE MINE - 9 miles east of Wickenburg.

Now under lease to C.D.Howe, Yarnell - Aug. 3-1942

SURVEY OF OPERATING MINES

JUNE 8th, 1942.

By A. C. Nebeker

~~Indicated~~

DIAMOND JOE MINE

Diamond Joe Mine  
Diamond Joe Mining Co. Owner

A. P. Root Lessee  
A. P. Root, Pres.  
Durango, Colo.

Joe. A. Minoletti Mgr. and Supt.  
Wickenburg Arizona.

This property is located 9 miles East of Wickenburg, Arizona. To get to the mine take the road to the East out of Wickenburg follow it for 5 miles on a good auto road, then turn to the right and follow not such a good road for 4 miles.

1941 had no production, due to the fact that the present Lessee did not take this mine until the first of this year.

1942 Production has been approximately 350 tons of lead-silver ore before this last month. The production is now 60 tons per week of lead-silver ore.

The average value of the ore assays 12% to 15% lead, 12 Ozs to 15 Ozs silver.

The vein is 6 feet wide and can be traced for 3000 feet, and has a dip of 60 degrees to the West. The walls are decomposed granite with some schists in spots. The ground in the mine is considered heavy and requires close timbering.

The present operation consists of stopping from the 80 ft drift levels and continuing dewatering the shaft. After this work is done the shaft will be sunk another 100 ft and drifts will be driven both north and south along the vein, to block out ore.

The ore is shipped to El Paso, Texas. The last car sent out netted them \$29.00 per ton after paying a \$9.00 per ton freight.

The power used now is Gasoline driven hoist and compressor.

The property consists of 12 claims all but 2 patented, in a rolling and rugged country.

The mine furnished all the water now needed and probable will for some time.

This property at one time had a 50 ton mill, of the crusher and shaker table type, and is reported to have shipped some \$20,000 worth ore.

4  
men are now employed, but expect to double force in 30 days.

These people say they are not anxious to sell, but incase they run short they would consider a deal.

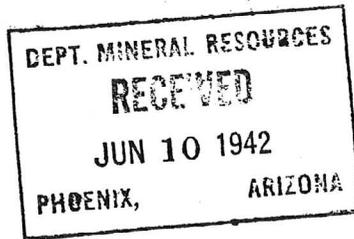
SURVEY OF OPERATING MINES

By A. C. Nebeker

Diamond Joe Mine  
Diamond Joe Mining Co. Owner

A. P. Root Lessee  
A. P. Root, Pres.  
Durango, Colo.

Joe. A. Minoletti Mgr, and Supt.  
Wickenburg Arizona.



JUNE 8th, 1942.

~~Subsidiary~~  
DIAMOND JOE MINE

*Map*

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*Al Nebeker*

GA

DEPT. MINERAL RESOURCES  
**RECEIVED**  
AUG 14 1942  
PHOENIX, ARIZONA

SURVEY OF OPERATING MINES

AUG 11TH 1942

By A. C. Nebeker

Diamond Joe Mine  
Wickenburg, Ariz.

Diamond Joe Mining Co. Owner.  
Wickenburg, Ariz.

C. D. Howe Lessee,  
Yarnell, Ariz.

On June 8th 1942 a report was made on this property when it was being worked by Mr A. P. Root of Durango, Colo.

Mr C. D. Howe bought out the Root lease and equipment and took over on the 3rd of August. He is now shaping it up so he can continue with mining.

There is a 6 foot vein showing veinlets of galena with some carbonates of lead in a gangue of coarse calcite crystals. It is claimed that this vein will ship ore ~~mineralizing~~ averaging 12% lead and 12 Ozs silver. There has been a stope of ore taken out from the surface to the present water which is now 80 feet from the surface. This stope is 5 to 6 feet between walls and a length on the strike of about 60 feet, and has a dip of 60 degrees to the west.

Mr Howe started the pump to-day to dewater the shaft, so he can see the 18 inches of reported highgrade ore which is in the face of lower level. They have now a car of ore ready for the market.

Mr Howe says, if the mine warrants it, when he gets the water out, he may apply for a development loan, so he can put more speed in the work.

He is working 3 men and himself now, expects to add on more in the near future.

The equipment consists of the same machinery as reported in June.

*A. C. Nebeker*

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
MINE OWNER'S REPORT

MD-21

Date: 8/16/41

1. Mine: Diamond Joe
2. Location: 9 miles NE of Wickenburg  
Sec. 28, 29 T 8 N, R 3 W
3. Mining District & County: White Picacho  
Mining District, Yavapai County
4. Former name
5. Owner: Mrs. Nell Koyk
6. Address (Owner) C/o Neil C. Clark  
Heard Building, Phoenix, Arizona
7. Operator
8. Address (Operator)
9. President, Owning Co.
- 9A. President, Operating Co.
10. Gen. Mgr.
14. Principal Minerals: Silver-lead
11. Mine Supt.
15. Production Rate
12. Mill Supt.
16. Mill: Type & Cap.
13. Men Employed
17. Power: Amt. & Type
18. Operations: Present None
19. Operations: Planned To install mill of from 25 to 30 ton capacity when  
finances available - to handle shallow ores and later  
reopen and develop mine for increased tonnage capacity.
20. Number Claims, Title, etc. 10 unpatented claims held by Arizona Corporation  
of which Mrs. Koyk holds all stock in her name and for  
the estate of Geo. R. Koyk of which Mrs. Koyk is  
administratrix.
21. Description: Topography & Geography: In foothills at elevation of 3500 ft.  
Desert climate with sparse desert vegetation.
22. Mine Workings: Amt. & Condition Total mine openings of 2550 feet.  
No. 1 shaft, 75 ft. incline  
No. 2 shaft, 180 ft. vertical  
No. 3 shaft, 500 ft. vertical  
From No. 3 shaft, 180-ft. level, 200 ft. of drifting; on 225-ft. level 430 ft.  
of drifting; 83-ft. level, 160 ft. of drifting and on 45-ft. level, 70 ft. of  
drifting with raises totaling 175 ft. Water stands just about 180-ft. level.

(Over)

MINE OWNER'S REPORT

Geology & Mineralization

A grano-diorite formation. Extensively intruded by dikes ranging from basic andesites to very acid rock. Oxidized lead and silver minerals in upper zone changing to sulphides in depth.

Reserve: Positive & Probable, Ore Dumps, Tailings

From surface indications and indications in mine it is fair to assume that the deposit will be 400 ft. long, 150 ft. deep and 7 feet wide of oxidized ores or about 35,000 tons.

Dimensions and Value of Ore body

Larger tonnage from lower workings. Ore above the 85-ft. level shows a weighted average - from a series of careful samplings - of 12.5 oz. silver and 10.15% lead.

Line, Mill Equipment & Flow-Sheet

Metallurgical tests show a recovery of 75 to 85% of the silver and 85 to 93% of the lead - depending on fineness of grind - by flotation.

Load Conditions, Route

Good auto road direct to mine from Wickenburg

Water Supply

A limited supply of water now available - sufficient for a 25 to 30-ton mill. Additional water can be developed for a larger installation.

Brief History

Located about 20 years ago and developed mainly from 1926 to 1928.

Special Problems, Reports Filed

Reports on file from M. E. Pratt, Octave, Arizona; A. E. Sedgwick, Los Angeles, California; and Dan Finlayson, Wickenburg, Arizona.

Remarks

Has sufficient ore in sight to warrant installation of a 25 to 30-ton mill at this time.

Property for sale: Price, terms and address to negotiate.

See Neil C. Clark for terms for sale or lease.

32. Signature

Neil C. Clark, Agent

Use additional sheets, if necessary

# SHATTUCK DENN MINING CORPORATION

and

## SUBSIDIARIES

.....Engineering.....Office

Date..... March 15, 1957.....

TO: Mr. D. M. Kentro  
Assistant Vice-President

SUBJECT: Emmons & Krug Property near  
Wickenburg, Arizona.

On March 10th I visited the lead-silver property owned by Lawrence Emmons and Robert Krug, situated approximately 10 miles northeast of Wickenburg, Arizona. I was accompanied on this examination by Mr. Robert Krug.

This property has been taken up with eight unpatented claims. Outcrops of the vein can be traced for about 1500 feet on the surface on the Calcite #1 and #2 claims. On the Calcite #1 claim several hundred feet of mining has been done, apparently many years ago, but no records of content, etc. seem to be available. The mine at one time was known as the "Diamond Joe". The vein runs north and south and dips approximately 55 degrees to the west. Samples taken on the outcrop near the mine and 1500 feet south, show the following results:

#1--Au--Tr., Ag--3.3oz., Pb--1.1%, Mo--1.06%  
#2--Au--Tr., Ag--5.0oz., Pb--Tr.

A sample taken near the mine dump of a  $\frac{1}{4}$ " size crushed ore pile, gave the following assays: Au--.03oz., Ag--10.6oz., Pb--1.8%.

East of the Calcite claims outcrop another similar outcropping was examined on the Kilroy #1 claim which lies parallel to the Calcite #1 claim. Some mining was done on this claim as was evidenced by the stripping of a couple of feet of the outcrop and the stockpiling of some of the ore. This property was known as the "Great Southern", and as in the case of the "Diamond Joe" no records are available. Grab samples taken over approximately 100 feet of the outcrop gave the following assays:

Au--.01oz., Ag--0.8oz., Pb--0.20 %.

The outcrops on the two claims are not related on the surface and no faulting appears to be in evidence. Mineralization is contained in a limestone formation bounded by pegmatites in a barren schist. The limestone outcrop that was sampled was approximately 18" to 24" wide with some mineralization showing on the pegmatite walls. Minerals recognized in the vein

were cerussite, galena, wulfenite, fluorite, cerargyrite, barite, and calcite.

This property was probably mined at one time for its high-grade silver content but shows no promise of being a profitable venture except on a small scale chloride deal.

Louis F. Bombardieri  
Chief Engineer

COMMODITY INFORMATION

\*COMMODITIES PRESENT C10 < A.G. P.B. W.A.U. >  
 ORE MINERALS C30 < CERUSSITE, WULFENITE, CERARGYRITE, ANGLECITE, ARGENTIFEROUS GALENA >  
 COMMODITY SUBTYPES C41 < >  
 GEN. ANALYTICAL DATA C43 < >  
 COV. INFO. COMMENTS C50 < >

\* SIGNIFICANCE

	PRODUCER		NON-PRODUCER	
MAJOR PRODUCTS	MAJOR	< A.G. P.B. >	MAIN COMMODITIES PRESENT	C11 < >
MINOR PRODUCTS	MINOR	< W.A.U. >	MINOR COMMODITIES PRESENT	C12 < >
POTENTIAL PRODUCTS	POTEN	< >		
OCCURRENCES	OCCUR	< >	OCCURRENCES	OCCUR < >

\*PRODUCTION

	PRODUCER		NON-PRODUCER		
PRODUCTION	YES (circle)	PRODUCTION SIZE	SMALL MED LGE (circle one)	PRODUCTION	UND NO (circle one)

\*STATUS

EXPLORATION OR DEVELOPMENT

	PRODUCER		NON-PRODUCER	
STATUS AND ACTIVITY	A20	< S >	STATUS AND ACTIVITY	A20 < >

DISCOVERER L20 < A. B. LOVELL >  
 YEAR OF DISCOVERY L10 < > NATURE OF DISCOVERY L30 < > YEAR OF FIRST PRODUCTION L40 < 1901 > YEAR OF LAST PRODUCTION L45 < 1946 >  
 PRESENT/LAST OWNER A12 < L. EMMONS AND R. KRUG (1957) >  
 PRESENT/LAST OPERATOR A13 < >  
 EXPL./DEV. COMMENTS L110 < CONSISTS OF 10 CLAIMS; MOST RECENT OWNER HOLD SOME BUT NOT ALL OF THE ORIGINAL CLAIMS, INCLUDING CALCITE NO. 1 AND NO. 2; MINE LOCATED ON CHARLES NO. 1, NO. 2, NO. 4 AND NO. 5 >

DESCRIPTION OF DEPOSIT

DEPOSIT TYPE(S) C40 < VEIN >  
 DEPOSIT FORM/SHAPE M10 < TABULAR >  
 DEPTH TO TOP M20 < > UNITS M21 < > MAXIMUM LENGTH M40 < 1500 > UNITS M41 < FT >  
 DEPTH TO BOTTOM M30 < 225 > UNITS M31 < FT > MAXIMUM WIDTH M50 < 225 > UNITS M51 < FT >  
 DEPOSIT SIZE M15 < SMALL > M15 < MEDIUM > M15 < LARGE > (circle one) MAXIMUM THICKNESS M60 < 8 > UNITS M61 < FT >  
 STRIKE M70 < N27W > DIP M80 < 55SW >  
 DIRECTION OF PLUNGE M100 < > PLUNGE M90 < >  
 DEP. DESC. COMMENTS M110 < >

DESCRIPTION OF WORKINGS

Workings are: SURFACE M120 UNDERGROUND M130 BOTH M140 (circle one) OVERALL LENGTH M190 < 1100 > UNITS M191 < FT >  
 DEPTH BELOW SURFACE M160 < 225 > UNITS M161 < FT > OVERALL WIDTH M200 < 200 > UNITS M201 < FT >  
 LENGTH OF WORKINGS M170 < 2,550 > UNITS M171 < FT > OVERALL AREA M210 < 220000 > UNITS M211 < SQ. FT. >  
 DESC. OF WORK. COV. M220 < THREE SHAFTS (NO. 2 AND NO. 3 ARE VERTICAL, NO. 1 IS INCLINED); ALL ARE CONNECTED UNDERGROUND >

GEOLOGY

\* AGE OF HOST ROCK(S) K1 < P.R.O.T., T.E.R.T., UNDATED BUT PROBABLY 1750 MILLION YEARS AND OLDER; UNDATED, PROBABLY PALEOZOIC-MESOZOIC >  
 \* HOST ROCK TYPE(S) K1A < GRANODIORITE, GRANITE, GRANITIC GNEISS, SCHIST, RHYOLITE, ANDESITE >  
 \* AGE OF IGNEOUS ROCK(S) K2 < P.R.O.T., T.E.R.T., UNDATED, AS LINE K1 >  
 \* IGNEOUS ROCK TYPE(S) K2A < GRANODIORITE, GRANITE, RHYOLITE, ANDESITE (?) >  
 \* AGE OF MINERALIZATION K3 < P.A.F.E.O.-M.I.O., UNDATED, PROBABLY MID-TERTIARY >  
 \* PERT. MINERALS (NOT ORE) K4 < QUARTZ >  
 \* ORE CONTROL/LOCUS K5 < FRACTURE, SHEARING IGNEOUS ACTIVITY - DIKES >  
 \* MAJ. REG. TRENDS/STRUCT N5 < FOLIATION IN PRECAMBRIAN SCHIST AND GNEISS TRENDS N75E TO N65E >  
 \* TECTONIC SETTING N15 < >  
 \* SIGNIFICANT LOCAL STRUCT N70 < VEINS (AND GENETICALLY RELATED (?) DIKES) TREND N10W TO N40W AND CROSSCUT PRECAMBRIAN FABRIC >  
 \* SIGNIFICANT ALTERATION N75 < NONE >  
 \* PROCESS OF CONC./ENRICH. N80 < OXIDATION AT NEAR SURFACE >  
 \* FORMATION AGE N30 < P.R.O.T., UNDATED, PROBABLY 1750 MILLION YEARS OR OLDER >  
 \* FORMATION NAME N30A < UNNAMED GNEISS, SCHIST >  
 \* SECOND FM AGE N35 < >  
 \* SECOND FM NAME N35A < >  
 \* IGNEOUS UNIT AGE N50 < P.R.O.T., UNDATED, AS LINE N30 >  
 \* IGNEOUS UNIT NAME N50A < UNNAMED GRANODIORITE, GRANITE >  
 \* SECOND IG. UNIT AGE N55 < P.A.F.E.O.-M.I.O., UNDATED, PROBABLY MID-TERTIARY >  
 \* SECOND IG. UNIT NAME N55A < UNNAMED RHYOLITE, ANDESITE (?) DIKES >  
 \* GEOLOGY COMMENTS N85 < DEPOSIT IS HIGH-ANGLE QUARTZ VEIN WHICH IS ASSOCIATED WITH RHYOLITE OR ANDESITE DIKES OF PROBABLE MID-TERTIARY AGE THAT CUT PRECAMBRIAN IGNEOUS AND METAMORPHIC ROCKS. >

GENERAL COMMENTS

GENERAL COMMENTS GEN < >

GENERAL REFERENCES

File

- REFERENCE 1 F1 < USRM - ABGMT FILE >
- REFERENCE 2 F2 < ABGMT CLIPPINGS FILES >
- REFERENCE 3 F3 < AZ DEPT. MINER. RESOURCES FILE DATA >
- REFERENCE 4 F4 < >

U.S. CRIB-SITE FORM

RECORD IDENTIFICATION

RECORD NUMBER B10 < > RECORD TYPE B20 < X, I, M > DEPOSIT NUMBER B40 < >  
 REPORT DATE G1 < 8, 1, 1, 2 > INFORMATION SOURCE B30 < 1, 2 > FILE LINK IDENT. B50 < USRM-004 025 >  
YR. MO.  
 REPORTER(SUPERVISOR) G2 < ROTH, FRANCES A > < DEWITT, ED >  
(last, first, middle initial) (last, first, middle initial)  
 REPORTER AFFILIATION G5 < ABGMT > SITE NAME A10 < DIAMOND JOE MINE >  
 SYNONYMS A11 < >

LOCATION

RAINING DISTRICT/AREA A30 < BLACK ROCK DISTRICT >  
 COUNTY A60 < YAVAPAI > STATE A50 < AZ > COUNTRY A40 < U.S. >  
 PHYSIOGRAPHIC PROV A63 < 1, 2, 4 >  
 DRAINAGE AREA A62 < 1, 5, 0, 7, 0, 1, 0, 3, 4 >  
 QUADRANGLE NAME A90 < MORGAN BUTTE > LAND STATUS A64 < 0, 0, 4, 1, 4, 1 >  
(1, 9, 6, 9) QUADRANGLE SCALE A100 < 2, 4, 0, 0, 0 >  
 SECOND QUAD NAME A92 < RED PICACHO > SECOND QUAD SCALE A91 < 2, 4, 0, 0, 0 >  
(1, 9, 6, 4)  
 ELEVATION A107 < 3, 2, 4, 0, 4, FT. >

UTM ACCURACY GEODETC  
 NORTHING A120 < 3, 7, 6, 3, 2, 5, 0 > ACCURATE  (circle) ESTIMATED EST < > LATITUDE A70 < > N  
 EASTING A130 < 3, 5, 1, 8, 9, 0 > LONGITUDE A80 < > W  
 ZONE NUMBER A110 < 1, 1, 2 >

CADASTRAL  
 TOWNSHIP(S) A77 < 0, 0, 8, N, 1, 4 > RANGE(S) A78 < 0, 0, 3, W, 1, 4 >  
 SECTION(S) A79 < 30 >  
 SECTION FRACTION(S) A76 < SE OF SE >  
 MERIDIAN(S) A81 < GILA AND SALT RIVER >

POSITION FROM NEAREST PROMINENT LOCALITY A82 < ABOUT 3.1 MILES SOUTH WEST OF DENVER HILL >  
 LOCATION COMMENTS A83 < LOCATION FOR UTM MEASURED TO CENTER OF SHAFT AND ADIT ON EAST SIDE OF INTERMITTANT STREAM; ANOTHER SHAFT, INDICATED BY MINE WORKINGS SYMBOL, IS SLIGHTLY SOUTH, TO WEST OF STREAM >

\* ESSENTIAL INFORMATION  
 + ESSENTIAL SOMETIMES OR HIGHLY RECOMMENDED

The Diamond Joe Mine is in the White Picacho Mining District, in the extreme southern part of Yavapai County, Arizona. It is nine miles northeast of Wickenburg which is in Maricopa County on the Santa Fe Railroad.

The group consists of eight full claims, not patented. They belong to the Diamond Joe Mining Co. Inc., an Arizona corporation but the entire stock of this is owned by Mr. George R. Koyk, of Wickenburg. The claims are shown on a map marked A-5 accompanying this report. They are on record in the county seat and the company has available a full certified abstract of title.

The claims were located about 1890 and minor work done intermittently until 1926-27 when Mt. Koyk and associates equipped the mine with machinery and developed extensively, built a fine mill and barely started operations when they were forced to shut down, not having enough water to operate steadily. The mine and mill have not been operated since.

#### GEOLOGY

The claims lie on a granitic igneous rock, which we may call grano-diorite. This is intruded extensively by dikes of various kinds, ranging from basic andesites to very acid rocks. There is considerable faulting and the vein or orebody is in the main fault, a north-south fissure dipping about 50 degrees W. None of the intrusive dikes cut across this and although we have at least two known faults crossing the vein they dislocate it hardly any and are therefore not of economic importance. All of the above disturbance is in the hanging wall, the footwall area being a relatively undisturbed area of diorite (?), solid and little altered. The highly intruded condition of the hanging wall has resulted in extensive kaolinization, with schistosity, and the general result is a badly broken, distorted, kaolinized area over the ore.

#### THE VEIN

The ore outcrop is plainly seen and can be traced continuously, allowing for short stretches where it disappears under washes, for about 1200 feet, and, from sporadic indications of the same fissure, for a probable total length up to 3000 feet. The mineralization is principally a calcite gangue carrying lead and silver minerals, with considerable iron stain in places, and evidence of an intrusion of porphyry along the fissure.

#### THE MINE

Early work followed the vein down on an incline (shaft NO. 1) which eventually connected at the 83 ft. level with a later vertical shaft (No. 2). Later a new working shaft was sunk 500 ft. and

connected with Nos. 1 and 2 by drifts and raises. The deepest working level is 225 ft., all elevations starting at the collar of shaft No. 1. This 225 ft. vertical represents 325 ft. on the incline of the vein.

The relations of all the above are shown on attached general map marked B-C-3 and on cross section map F-2-6, the latter being from my own observations and surveys, and the former adapted from former surveys and amplified by me.

At present the mine is full of water to the 157 ft. level. Shaft No. 3 is caved in near the surface. The other shafts are open and in good condition, and all drifts and raises are open as indicated on the maps and may be inspected down to water level.

#### EQUIPMENT AND PLANT.

Attached prints No. B-G-6-7-a, and B-G-6-7-b show the arrangement of the plant buildings and attached also is a photograph showing the same. The buildings are all of timber frame covered with galvanized iron. They all have concrete floors and retaining walls, with rock or concrete foundations, and are all in perfect condition. There is an office and garage 16 ft. square, 2 stories, and a staff mess house 16 by 30 ft. not shown on prints.

The main equipment on the ground is:-

##### POWER HOUSE

Benz 240 H. P. full diesel engine with 175 K. V. A., 440 volt generator and 9 K-W, 175 volt exciter, with switchboard, tools and fittings complete, and one power drill press with motor.

##### Shop

Complete blacksmith forge with blower and tools; pipe cutting equipment to take up to 8 inch pipe; one No. 5 Ingersoll Leyner drill sharpener; one small drill press.

##### Hoist house

One direct drive Diesel compressor--C. P. - 309 cu. ft. air per minute; one gas driven 40 H. P. Western Hoist; small motor driven priming compressor with air tank and gauge; two steel air receivers 3½ by 9ft., and 3 by 5½ by.

One wood gallows frame 27 ft. high.

##### Assay Office

Complete equipment except muffle furnace includes, Braun crusher and pulverizer, motor driven; pulp balance, button ballance, and scales; full line of chemicals and glassware.

### Tanks

1000 gal. fuel oil tank.  
4300 gal. cooling tank with slat cooler on top.  
10000 gal. water storage tank--steel.  
50000 gal. water storage tank--wood stave.

### Mill

9" by 16" Universal jaw crusher.  
Automatic feeder to rod mill.  
4' by 8' Marcy rod mill.  
22' Doer classifier--drag type.  
3-K-K flotation machines.  
1 Whilfley table.  
1 Doak vacuum pump.  
1 6' by 4' Oliver filter  
1 28' wood stave tank with Doer thickener for tails.  
Sand and circulating pumps; motors; belting, shafting  
and piping.

### Miscellaneous

Surveyors transit, rod, tapes; adding machine;  
typewriter; 5 mine cars.

The buildings cost \$13,000.00 and the equipment \$65,000.00.  
The machinery has been well taken care of and is in perfect condition.

The mill is rated at 100 tons daily capacity. By installing and intermediate Symonds cone or other crusher it could be readily enlarged to 130 or 140 tons. Attached is a print marked B-H-2-a showing flow sheet.

### TONNAGE OF ORE

In estimating tonnage there is not enough systematic development to measure blocked out ore accurately. The outcrop to the north is continuous on the surface for 800 ft. and the vein is developed continuously on the 225 ft. level for over 600 ft. with the limits no yet reached. The only continuous cross section of the ore from top to bottom that can be studied is that shown on Mat Exhibit F-2-b. This shows a minimum thickness of ore above the water level of over 9 ft. The ore on the bottom level, 68 ft. under water is shown by their records, as 5 ft. thick. I, therefore, find 8 ft. as a conservative estimate of the ore width.

Therefore, I feel that, as everywhere we have found the ore continuing on the bottom level, I should take the length of the surface outcrop as the length of developed ore or 800 ft. in the north end (where all the mine workings are driven). The incline depth to the bottom level is 325 ft., and I allow nothing below that. The width is 8 ft. and the ore weighs in place 13.5 cu. ft. to the ton. I thus arrive at 154,000 tons of developed ore.

To the south is a similar outcrop of the same vein, easily traced for 400 ft. and this had just been struck on the 225 or bottom level when the mine was closed in 1928. It was found but no development done. Open cuts on the surface show it stronger and wider even than the outcrop further north, with the same lead silver mineralization.

I see nothing to indicate that this portion of the vein will not be at least as good as the developed portion and, using the same figures I arrive at a tonnage of 77,000 tons, called probable ore.

As the outcrop is identical throughout it's length, I mean in character and type, and as everywhere so far developed the ore proves to go down, I think the above indicated tonnage is proven far beyond any doubt. Furthermore I find the same vein outcropping intermittently for over twice the length used in estimating (sand washes and dikes conceal most of it's extensions).

We know that there are sure to be some horses of waste in this vein and also some ore destroyed where the faults cross, but we also know of two other veins which show lead and silver that should eventually produce ore, and we also have reason to expect development on the main vein beyond the 1200 ft. in length used.

I, therefore, am not making any allowances and believe that for present purposes I can safely assume the tonnage shown as 231,000 tons.

#### VALUE OF ORE

As far down as can now be reached both the lead and silver minerals are mostly in oxidized forms. There is some galena but most of the lead is in cerrusite (carbonate) and aragonite (sulphate). On the 225 ft. level the silver is said to begin to appear as a sulphide, but above one finds very little silver sulphide.

The vein has a banded structure and generally shows crystalline calcite towards the foot wall, with from 2 to 4 feet of iron stained, leached, calcareous material towards the hanging wall. Commonly the parting banding between these formations carries heavy lead over a width of from an inch or two to over a foot in width, and also the values are commonly better near the hanging wall, but in general one finds the lead or silver minerals anywhere across the vein. The bottom part of the present workings shows only patches of the crystalline calcite and the entire vein width for fifty feet above the present water level is a red, oxidized, porous matrix carrying considerable chert. See cross section F-2-b for 50 ft. above water level.

There is not enough data available to make any accurate estimate of metal value for the total estimated tonnage, owing to the flooded condition of the two bottom levels and the absence of

any but hearsay records. There can be no question that they found the vein on the bottom level and that it had good silver values and some lead. Also there is plenty of evidence that the lead values are much lower on the 180 and 225 (290) foot levels than above. I took three samples, 1-2 & 3 G, as shown on attached section F-2-b, that indicate this. They were taken here primarily to find how the values varied with vein width, as this location is the only available place in the mine with a good exposure all the way from foot to hanging wall. The values could not be taken as average however, for the other side of this 20 ft. wide stope contains much more visible mineral than the side sampled.

The samples ran:-

<u>No.</u>	<u>Width of Sample</u>	<u>Oz. Silver</u>	<u>% Lead</u>
1-G	6 ft. 7 in.	13.58	1.4
2-G	9 ft. 6 in.	9.04	0.4
3-G	12 ft. 0 in.	6.96	1.5
Average	9 ft. 4 in.	9.25	1.1

However, we have a good sampling record above the 83 foot level - about 125 ft. on the incline. This sampling was done by A. L. Beale, a competent engineer. I took samples 4-G, 5-G-F, and 5-G-H, shown on attached Section F-2-b, to check some of his samples and got a fair check. I have made a careful study of his sampling and assays underground. I estimate from his results and my own checking and estimating that the red oxidized material near the hanging wall runs 23.6 Oz. silver and 7.25% lead over a width of 3 to 4 feet. The white calcite towards the footwall runs 7 Oz. silver and 11.6% lead over a width of 5 to 6 ft. The weighted average ore therefore above the 83 foot level (125) is 12.5 Oz. silver and 10.15 % lead. For purposes of estimating I will call this 12 Oz. silver and 9% lead.

There should be enough of this ore to run a 100 ton mill  $2\frac{1}{2}$  years with profits as indicated later.

#### SUGGESTED OPERATING PLAN

It would seem to me that the sensible plan of operation for this mine would be to start to mine the ore from the 83 ft. level up, through No. 2 shaft. When the mill was in steady operation, No. 3 shaft would be repaired and hoisting would be transferred eventually to that shaft, but at leisure. One strong reason for doing this is the necessity of conserving the water now in the mine, which should carry the mill for several months. It will be necessary to get other water as explained later but before going into that and equipment expenses, I present here estimated costs and profits on the above basis.

## OPERATING COSTS:

I estimate the probable costs to operate as below:-

	<u>Cost per ton concentrates</u>		<u>Cost per ton wet ore.</u>
	Wet	dry	
Mining			\$2.12
Milling			.96
Supervision			.47
Haul to R. R.	1.00	1.18	.20
R. R. Frt.	7.60	8.94	1.49
Smelter Treatment & deductions		6.20	1.03
Silver deduction		2.78	.48
Lead deduction		<u>13.56</u>	<u>2.26</u>
Total.....			9.01

The cost is based on 100 tons per day. Tests made in 1927 indicate that 6 tons of ore will make 1 dry ton of concentrates and that concentrates as shipped run 15% moisture.

Mining and milling costs were arrived at by setting up in detail the labor cost to operate, and calling that 60% of the total for mining, and 40% of the total for milling, these percentages being based on the experience figures of similar operations. Allowance was made for two crews on development.

The silver and lead deductions shown represent the difference between the gross value of these metals delivered to the smelter, and the amount they actually pay. These items theoretically cover metallurgical losses, and refining and marketing costs.

## PROFITS

Deducting the cost per ton, \$9.01 from the gross value per ton, \$12.32 (after 15% mill loss) leaves an operating profit of \$3.31 per ton. From this taxes will eventually be deducted and these will probably amount to from 20% to 25%. Present metal prices are used--that is 64.5¢, silver; and 3.75¢, lead.

## GENERAL

There are no apparent complications about this operation and I am quite sure that the above estimates can easily be attained, and profits exceeded, in practice. The mining of the ore will have to be carefully planned and intelligently supervised owing to the bad hanging wall, but I see no reason why a system cannot be developed that will take care of this cheaply.

Mill tests have been made on the ore and beyond a doubt recoveries of 85 to 90% of the values can be recovered.

The principal obstacle now is the water supply. The mine

itself when it was being operated made an average of 15 gals. per minute which is about half the requirements. It will be necessary to install a 4 inch pipe line about 3 miles long to insure water. A well at that distance is available and probably adequate, according to Mr. Koyk.

Before operations can start certain preparations must be made. The mill requires minor remodelling and equipment. The main or No. 3 shaft is caved near the surface and probably will have to be reblocked and repaired to the 290 (225) ft. level. Shaft No. 2 is open but is only one compartment, cribbed, down to the 83 ft. level. From there to the bottom, at the 180 ft. level it is regularly timbered, one and one half compartments.

I estimate initial expense to start operations on the above schedule to be:

Repairing No. 2 shaft and enlarging to surface (one and one half compartments).....	\$2500.00
Equipment at No. 2 shaft: 35 H. P. gas Hoist; 2 cooling tanks; air and water pipes; head frame and bin; cage; aerial tram to mill; installing;.....	6500.00
Drifting, and preparing stopes.....	5000.00
Mill remodelling:- 1 Whilfley table; 1 concentrate thickener; 6 flotation machines; 1 concentrate dryer; installing;.....	7135.00
New change room, with office room;.....	1500.00
One light truck.....	1000.00
Supplies at mine:- 2 cars timber; fuel oil; 4 stoper drills; 4 jackhammer drills; bars and mountings; steel; air & water hose; rails; 6 mine cars; powder; fuse; caps; carbide; oil; small tools;	7500.00
Supplies at Mill:- 1 car flotation, reagents and chemicals.....	3300.00
Accident Insurance payment.....	2500.00
Water development, pump, and 3 miles 4inch line.	<u>15000.00</u>
TOTAL...	\$52,825.00

Nothing has been allowed above for repairing the main shaft, No. 3. It is impossible to estimate this and if it is desired to put in a figure in the initial estimate it cannot be based on information. As we know that it is caved in several places, and that probably the 290 ft. level (225) is also caved, I do not think it safe to allow less than \$10,000.00 additional for this work.

I do not think there is the least doubt but that the ore is there and that the above program and operations can be carried out within the estimates given. Preparing the mine for stoping 100 tons of ore per day will be the job requiring most time and I think at least three months will be required before the mill can start.

The mill eventually will be fed through the main or No. 3 shaft, and the ores now under water treated. There can be little question that these ores will be profitable and greatly extend the life of the mine, but they will, under the above program, come into the picture normally and naturally without being essential to steady operation for a year or two.

It seems likely that an enlargement of the power plant will some day be advisable, so that the mine as well as the mill can be operated electrically, but these changes will come along after operations are proceeding profitably.

In figuring values in this report nothing has been allowed for gold. The ore averages something better than 0.01 oz. per ton which is below the limit customarily paid for at custom smelters, and nothing was, in the past, received for it. However, the amount of gold would be of importance over a term of months and doubtless the smelter contract, when based on steady regular shipments, would be drawn to provide for gold payments.

In Mr. Sedgwick's report, attached, the mine is described as of a period when development had reached only to the 83 ft. level. His figures, therefore, cover the same ore extent that I have used. He finds the average value of the ore to be 14.89 oz. silver and 8.4% lead.

It will be noted that the claim lines as shown of the claim map, attached, Exhibit No. A-5, are not consistent with those shown on the general map, Exhibit No. B-C-3. I find that Mr. Koyk's locations and monuments actually cover the entire vein outcrop continuously, but the aids and end lines have not been accurately surveyed. The ground is fully covered and protected, but when a survey for patent is made it will be found necessary to establish the exact end and side lines accurately by amending the present locations. Exhibit No. A-5 is therefore an idealized picture of that the eight claims actually and in fact cover.

With this mine equipped and developed as it is, there is no possibility of its failure to make substantial profits under even the conditions now existing. Present opinion seems to be general that silver will soon be forced to the legal limit of \$1.29 per ounce. I estimate that this would increase the profit from \$3.31 to \$9.20 per ton. Wage increases and cost of supplies would presumably be higher under this condition, but in any event, and with full realization of the uncertainty of economic forecasts at this time, it seems to me extremely probable that profits from the Diamond Joe Mine will, in the near future, considerably exceed the \$3.31 per ton basis I have used.

Signed W. B. GOHRING?

Mining Engineer, Phoenix, Arizona.

August 1934

A P P E N D I X

EXCERPTS FROM A REPORT ON THE DIMAOND JOE GROUP OF CLAIMS BY A. E. SEDGWICK, MINING AND CIVIL ENGINEER, LOS ANGELES, CALIFORNIA.

This report bears two dates, March 1921, and March 1923. Mr. Sedgwick was in no way interested in the Diamond Joe property, and this examination and report was made because of some transaction pending at the time.

HISTORY:

"About twenty years ago the claims were located by A. B. Lovell. He sank a vertical and an incline shaft on the vein sixty-five feet deep, and shipped some ore. The records of these shipments are not available. The property then passed to Etter Brothers, who leased it to a Mr. Bannister. Bannister worked the ore in crude hand jigs and shipped some concentrates from his jigs to the smelter. These smelter reports are not available.

"Bannister failed to take up his bond and the property reverted to Etter Brothers. They sorted and shipped some of the ore to a concentrating plant at Wickenburg, which, according to the records as reported by McLeod, who recently examined the property, assayed as follows:

<u>Tons</u>	<u>Gold Ozs.</u>	<u>Silver Ozs.</u>	<u>Lead %</u>
23.1	0.03	11.60	6.50
3.4	0.03	9.20	12.00
14.3	0.02	7.70	12.80
2.6	0.02	5.20	4.30
<u>25.6</u>	<u>0.02</u>	<u>9.00</u>	<u>13.50</u>
69.0 Av.	0.0238 Av.	9.467 Av.	10.589 Av.

"It appears that during the war work was stopped at the mine and no assessment work was done or papers filed asking exemption from assessment. Therefore, January 1, 1920, the claims were re-located by John Boetto, who assigned a one-fourth interest each to George R. Koyk, A. L. Garford, and L. N. Butler. No abstract, etc.

ECONOMIC FEATURES:

"The claims are about 3500 feet above sea level. At this elevation the desert climate is very mild with but three warm months during the year. During these months the weather is not hot enough to interfere with work,

and the nights are usually cool. There is no snow in the winter. The average rainfall during the year is about three inches. (Range -- 3 to 8 inches)\*

"There is no surface water on the property or in the immediate vicinity. Water has been obtained for domestic purposes in shallow wells in nearby gulches. The main shaft has fifty feet of water in it and now stands at a point approximately seventy-five feet below the collar of the shaft. Water for milling and for domestic purposes must be developed, and conserved by a de-watering apparatus in the mill to prevent mill waste. The cost of developing water and the success of such development work are problematic. The inhabitants do not consider the water situation serious. They state that water can be found close to the surface in the gulches. The presence of water in the mine seems to confirm this statement. It may be a serious problem and should be carefully investigated.

#### GEOLOGIC RELATIONS:

"The claims are located on the southerly slope of a batholith which, in the vicinity of the mine, has been eroded so that no sedimentary rocks are present. The uplift of the batholith has produced numerous fissures as channels for ore deposition.

"The texture of the rock is granatoid. It contains quartz, soda-lime feldspar, orthoclase, hornblend, and some biotite. The quartz predominates over the feldspars. The soda-lime feldspar slightly predominates over the orthoclase. This determines the country rock as quartz diorite, shading into grano-diorite, etc.

"The main fissure bears north 27 degrees west, and dips to the southwest at an angle of 38 degrees from the horizontal. (This last word is a mistake; should be vertical.)\* It is a true fissure vein, widened by replacement of the wall rock, and can be traced for a distance of nearly 3000 feet on the surface.

#### ORE DEPOSITION:

"The values seem to be quire uniformly disseminated through the vein. Occasionally there is a streak along the hanging wall which runs a little higher (in silver)\* than the rest of the vein, etc.

"Zinc and barium are usually associated with lead ores in vein of

\* Parenthesis ours.

this kind. Here we find barium but almost no zinc.

"It is difficult to estimate the extent of the oxidized zone.

"At the 75 foot level there is no indication of a change in the character of the ore. In arid districts, such as this locality, the oxidized zone is liable to be very deep, because the permanent water level is deep. To accentuate this, the Diamond Joe Group lies at an elevation considerably above that of the surrounding country and the nearest water courses. Therefore, it is probable that the permanent water level is considerably below the surface of the claim and an extensive oxidized zone may be expected. In any case, the character of the ore at the permanent water level cannot be predicted until it is exposed. The character of the ore above the water level is known and since a deep oxidized zone is indicated, a considerable tonnage may be expected.

MINING METHODS:

"The dip and width of the vein are favorable for shrinkage stoping. The ore is not hard but stands well and stulls only would be needed to support the stopes.

"There is no equipment at the mine that could be used to advantage.

ORE VALUES:

"In an examination by Mr. L. M. Kellogg, preliminary to this one, samples taken gave an average value of \$15.67 per ton. (Silver \$1.00 -- Lead 4%)\* The mine had been sampled previously by Mr. J. M. McLeod, a Mining engineer, and by Mr. L. N. Butler, who owns an undivided one-quarter interest in the mine. The results of these assays are tabulated below, disregarding the gold content which averaged 0.02 ozs. per ton.

<u>Silver Ozs.</u>	<u>Lead %</u>	<u>By</u>
4.00	10.10	L. M. Kellogg
20.30	9.10	
6.50	8.60	
3.80	3.70	
6.00	15.70	
.02	6.50	L. N. Butler
19.92	7.90	
49.08	16.08	
28.00	10.30	
7.92	7.80	
2.50	12.00	
14.18	3.20	
17.36	5.60	

\* Parenthesis ours.

	<u>Silver Ozs.</u>	<u>Lead %</u>	<u>By</u>
	12.70	4.90	
	28.00	12.00	J. N. McLeod
	16.20	7.60	
	17.40	7.50	
	4.40	6.50	
	26.50	2.40	A. E. Sedgwick
	18.80	14.00	
	17.00	9.10	
	17.00	3.50	
	<u>4.80</u>	<u>10.80</u>	
Average	14.89	8.47	

"From the surface indications and indications in the mine, it is fair to assume the deposit will be 400 feet long, 150 feet deep and 7 feet wide.

In such a deposit there will be 35,000 tons of ore.

"On a basis of 40 tons per day (50 ton plant)	\$ 2.80
Total cost of ton of ore into mill (mining)	
Milling cost per ton	1.43
Concentrate. R. R. freight, smelter charges, penalties, deductions, tax 3%. Per ton concentrates	\$ 22.33
Haulage and handling	<u>3.50</u>
Total cost per ton of concentrate	\$ 25.83
Ratio of concentration, 6.75 to 1 - (Cost per ton of ore)	3.83
Taxes, interest, etc.	<u>.45</u>
Total cost per ton of ore treated	\$ 8.51

#### CONCLUSION:

"The prospects of developing a large deposit are very favorable. The surface indications, the character of the vein, and its geological relations indicated a deep oxidized zone several hundred feet in length. Very little change in the character of the ore need be feared until the limits of the oxidized zone are approached.

"The ore presents no complicated metallurgical problem.

"A profit of \$3.00 per ton may be expected after all charges have been made, including amortization of the capital invested. (\$57,000.00).

"After the capital has been repaid, a profit of \$5.00 per ton will be realized."

#### EXCERPTS FROM A REPORT ON THE DIAMOND JOE PROPERTY BY D. R.

FINLAYSON, MINING ENGINEER. DATED JULY, 1929. During this time Mr. Finlayson was manager of the Vulture Mine, near Wickenburg, Arizona.

"As shown in the accompanying map, the main vein continues through

the center of three claims (4500 feet)\* This vein is well-defined and except for two small cross faults, is continuous. The throw of these faults is small and of no particular detriment to the development of the property. There is a well-defined vein on the Diamond Joe No. 7, (claim)\* and another on the Diamond Joe No. 8 (claim)\*, also a small vein carrying gold, silver and copper on the Diamond Joe No. 3. (claim)\*. This last intersects the main vein of the property. The Diamond Joe vein is developed to the 290 foot vertical level. (290' below the collar of the No. 3 shaft or 225' below the outcrop of the vein at the No. 1 shaft)\*. Levels 1, 2, and 3 are connected with raises and ore blocked out in the North Shoot. The vein, where developed, has an average width of eight feet, and the walls are well-defined and regular, with a dip of 45 degrees to the west.

"South of this developed shoot is the cropping of a large shoot of ore which is undeveloped, except for a short cross-cut tunnel and an open cut. This shoot has not been penetrated by any of the mine levels, though the 290 foot level, when extended a few feet farther, should reach it. The tonnage in this South Shoot should be very much greater than that in the North Shoot, and there is no reason why the values should not be as good. This shoot is in harder formation and should continue to hold its size, about 12 feet, for sufficient depth to make a very large ore body. This also applies to the developed North Shoot, though this shoot is not so regular.

"The developed tonnage in the North Shoot is approximately 135,000 tons, with an average value in silver and lead of \$11.00 at present market price for these metals. (About 53¢ for silver and 3½¢ for lead)\*.

"At present the water stands at a point just above the third level. For a few months there would be sufficient water for mill purposes, (for a mill capacity of 100 tons daily)\* but a more permanent water supply would need to be developed soon."

---

A supplementary report dated February, 1934, says:

"All ore so far developed is in the North Shoot. This ore contains about 14 ozs. silver and 6% lead per ton. At the present price for these metals, 64½¢ per oz. for silver and 4¢ per pound for lead, there is a gross

\* Parenthesis ours.

value of \$13.83 per ton. At 85% mill extraction, less freight, smelter charges and deductions on concentrates, would give a net production of \$8.90 per ton. Subtract mining and milling costs of approximately \$4.50 per ton and we have a net of \$4.40 per ton on 135,000 tons blocked out in the North Shoot."

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EXCERPTS FROM A REPORT ON THE DIAMOND JOE PROPERTY BY W. B. GOHRING, MINING ENGINEER, PHOENIX, ARIZONA. This report is not dated, but was probably written the latter part of 1934. Maps appended bear the date August, 1934. For the past two years Mr. Gohring has been examining engineer in Arizona for Federal Mine Loan applications.

"The Diamond Joe Mine is in the White Picacho Mining District, in the extreme southern part of Yavapai County, Arizona. It is nine miles northeast of Wickenburg, which is in Maricopa County, on the Santa Fe Railroad. The group consists of eight (now ten)\* full claims, not patented. They belong to the Diamond Joe Mining Co., Inc., an Arizona corporation, but the entire stock of this is owned by Mr. George R. Koyk, of Wickenburg. (Deceased)\*.

GEOLOGY:

"The claims lie in a granite igneous rock, which we may call granodiorite. This is intruded extensively by dikes of various kinds, ranging from basic andesites to very acid rocks. There is considerable faulting and the vein or ore body is in the main fault, a north-south fissure dipping about fifty degrees west. None of the intrusive dikes cut across this and although we have at least two known faults crossing the vein, they dislocate it hardly any and are therefore of no economic importance.

THE VEIN:

"The ore outcrop is plainly seen and can be traced continuously, allowing for short stretches where it disappears under wash, for about 1200 feet, and from sporadic indications of the same fissure, for a probable total length up to 3,000 feet.

"The mineralization is principally a calcite gangue carrying lead and silver minerals, with considerable iron stain in places, and evidence of an intrusion of porphyry along the fissure.

\* parenthesis ours.

### THE MINE:

"Early work followed the vein down on an ineline, Shaft No. 1, which eventually connected at the 83 ft. level with a later vertical shaft, No. 2. Later a new working shaft was sunk 500 feet and connected with No.'s 1 and 2 by drifts and raises. The deepest working level is 225 feet, all elevations starting at the collar of Shaft No. 1. This 225 feet vertical represents 325 feet on the incline of the vein (calculated average dip  $43^{\circ} - 48'$ )\*. At present the mine is full of water to the 157 ft. level.

"Shaft No. 3 is caved in near the surface. The other shafts are open and in good condition, and all drifts and raises are open and in good condition down to water level. The mine itself, when it was being operated, made an average of fifteen gallons (of water)\* per minute.

### TONNAGE OF ORE:

"In estimating tonnage there is not enough systematic development to measure blocked-out ore accurately. The outcrop to the north is continuous on the surface for 800 feet, and the vein is developed continuously on the 225 ft. level for over 600 feet, with the limits not yet reached.

"The only continuous cross-section of the ore from top to bottom that can be studied is that shown on Map F-2-b. This shows a minimum thickness of ore above the water level of nine feet. The ore on the bottom level, 68 feet under water, is shown by this record as five feet thick. I therefore find eight feet as a conservative estimate of the ore width. Therefore, I feel that, as everywhere we have found the ore continuous on the bottom level, I should take the length of the surface outcrop as the length of developed ore or 800 feet in the north end, where all the main workings are driven. The incline depth to the bottom level is 325 feet, and I allow nothing below that. The width is eight feet, and the vein ore weight in place 13.5 cu. ft. to the ton. I thus arrive at 154,000 tons of developed ore.

"To the south is a similar outcrop of the same vein, easily traced for 400 feet, and this has just been struck on the bottom or 225 foot level. It was found but no development done. Open cuts on the surface show it stronger and wider even than the outcrop farther north, with the same lead-silver mineralization.

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\* Parenthesis ours.

"I see nothing to indicate that this portion of the vein will not be at least as good as the developed portion and, using the same figures, I arrive at a tonnage of 77,000 tons, called probable ore.

"As the outcrop is identical throughout its length, I mean in character and type, and as everywhere so far developed the ore proves to go down, I think the above indicated tonnage is proven far beyond any doubt.

"Furthermore, I find the same vein outcropping intermittently for over twice the length used in estimating; sand washes and dikes conceal most of its extensions.

"We know that there is sure to be some losses of waste in this vein and also some ore destroyed where the faults cross, but we also know of two other veins which show lead and silver that should eventually produce ore, and we also have reason to expect development on the main vein beyond the 1200 feet in length used.

"I, therefore, am not making any allowance and believe that for the present purpose I can safely assume the tonnage shown as 231,000 tons.

VALUE OF ORE:

"As far down as can now be reached both the lead and silver minerals are mostly in oxidized forms. There is some galena (55% determined by test work)\*, but most of the lead is Anglesite-sulphate and cerussite-carbonate.

"On the 225 foot level the silver is said to begin to appear as a sulphide, but one finds very little silver sulphide above. (All of the galena contains silver as sulphide).\*

"The vein has a banded structure and generally shows crystalline calcite towards the foot wall, etc., -- but in general one finds the lead and silver minerals anywhere across the vein.

"There is not enough data available to make any accurate estimate of metal value for the total estimated tonnage, etc.

"However, we have a good sampling record above the 83 foot level, about 125 feet on the incline. This sampling was done by A. L. Beals, a competent engineer. I have made a careful study of his sampling and assays underground. I estimate from his results and my own checking and estimating that the red oxidized material near the hanging wall runs 23.6 ozs. silver

\* Parenthesis ours.

and 7.25% lead over a width of three to four feet. The white calcite toward the foot wall runs 7 oss. silver and 11.6% lead over a width of five to six feet. The weighted average ore above the 83 foot level is 12.5 oss. silver and 10.15% lead.

OPERATING COSTS:

	<u>Cost per Ton Concentrates</u>		<u>Cost per Ton Ore</u>
	<u>Wet</u>	<u>Dry</u>	<u>Wet</u>
Mining.....			2.12
Milling.....			.98
Supervision.....			.47
Haul to Railroad.....	1.00	1.18	.20
Railroad Freight.....	7.60	8.94	1.49
Silver Deduction.....		2.87	.48
Smelter Treatment and Deductions		6.20	1.03
Lead Deductions.....		13.56	<u>2.26</u>
Total.....			9.01 "

COPY

DIAMOND JOE MINE

LEAD -- SILVER

The Diamond Joe Mining Property , consisting of a group of ten un-patented mining claims in the White Picacho Mining District, Yavapai County, Arizona, approximately nine miles east of the Town of Wickenburg, and situated in Sections 28 and 29, Township 8 North, Range 3 West, Gila & Salt River Base & Meridian.

The title to the mining claims is held by a corporation organized under the laws of Arizona. All of the stock of the corporation is held by Mrs. Geo. R. Koyk and the estate of her deceased husband, Geo. R. Koyk, of which estate Mrs. Koyk is administratrix. (See Note 1.)

In a straight line the Diamond Joe property is approximately twelve miles south of the Octave Mine, now being operated by the American Smelting & Refining Company, and the writer's acquaintance with it extends over the period of his residence at Octave, which commenced in 1928, and extends to the present time.

The purpose of this survey is to outline the present physical conditions and economic possibilities of the property. It is based on the writer's personal examination of the upper workings of the property, supplemented by comprehensive reports of reliable mining engineers, whose reports are herein later referred to, and excerpts from said reports are hereto appended.

DEVELOPMENT:

The mine openings, consisting of shafts, drifts, and raises, total 2,550 feet, and are as follows:

No. 3 Shaft (Vertical).....	500 feet;
No. 2 Shaft (Vertical).....	180 feet;
No. 1 Shaft (Incline).....	75 feet;
Cross-cuts from the vertical shafts to vein	240 feet.

The drifts and raises on the vein to the north of the No. 3 shaft, and of primary interest in connection with the plan herein outlined, are as follows:

225 Level: A drift 430 feet in length;  
180 Level: 200 feet of drifts. The water level at the present time stands above the 180 level but below the 83 level;

- 83 Level: 160 feet of drifts, now open and accessible. Both north and south ends are now closed by small caves, due apparently to some ore having been mined from above the drift level.
- 45 Level: 70 feet of drifts, raises on the vein, total about 175 feet.

To the south of the No. 3 shaft, the drift on the 225 level extends 460 feet, with a cross-cut of 55 feet.

The No. 3 shaft was put down in 1927-28 as the principal entry and work-way for this property. It was located apparently with little consideration of the character of the ground to be penetrated. It is in a fault where the formation is broken and the ground is very heavy, and as a consequence the shaft is now in a badly-caved condition. The cost of repair would be so high that it has been dropped from consideration, and this part of the work is held of no value.

The remaining 1900 feet of development work is well-located to facilitate mining, and is of importance and value. At least 1000 feet of this work would be of immediate or early value in extraction of the developed ore. It could not be duplicated at a cost of \$7500.00, and in operating the mine would be an asset of that value. The rest would be of proportionate value in further exploration and development, particularly of the south ore body and some 300 feet of vein intervening. (See Note 2.)

ORE:

The No. 2 shaft cuts and crosses the vein at the 83 level, and the water now stands at about 85 feet on the slope of the vein below this point. There is no connection between the 83 and the 180 levels other than the shaft and the cross-cut, so nothing of the vein between these two levels and down to the water level, can be seen.

The 83 level is accessible through the No. 2 shaft or the No. 1 shaft. The slope distance on the vein from the surface or out-crop to the 83 level, is 130 feet. This level is now open and accessible for 160 feet. The 45 level penetrates the vein for 75 feet. The average width of the vein is 8 feet plus. This block of the vein, 130 x 200 x 8, would contain 16,000 tons. About 700 tons have been stoped (removed), leaving at least 15,000 tons above the 83 level. This is ore well exposed on two sides, and immediately available for production. (See Note 3.)

The 180 level is a slope distance on the vein of 133 feet below the 83 level, with a lateral development of 200 feet, in which section of the vein there would be more than 16,000 tons of ore.

The 225 level is a slope distance on the vein of 50 feet below the 180 level. Lateral development is considered at 200 feet -- the same as the 180 level -- and an average width of 6 feet. This block of the vein would contain about 5,000 tons of ore.

The 83 level is caved at both ends, apparently due to some stoping, as previously mentioned. The size of the vein and dissemination of ore minerals is indicative of commercial ore through a considerably greater lateral extent than now exposed on this level. I consider it entirely safe to say that the ore will extend downward below the 83 level at least 20 feet, and figure 18,000 tons of ore are available for immediate production, and an additional 18,000 tons as available at a very small preparatory cost. That would be above the 225 level and within a length of 200 feet along the strike of the vein. Two Hundred feet is a short strike length for an ore shoot in a vein of the known length and width of this one, and inasmuch as development has shown no limits either north or south, it is entirely reasonable to believe that considerably more ore exists than has herein been estimated.

The vein is broken and slightly displaced by faulting at about 350 feet to the south and 200 feet to the north of the No. 1, or incline, shaft. Other than as exposed by this shaft, little or no surface exploration has been done to determine anything of the ore possibilities along this 550 feet of vein out-crop.

Maps show the drift on the 225 level to be in the vein for over 350 feet south of the incline shaft, and continuing unbroken, but with nothing to indicate the character or mineral content. That leaves 350 feet -- 200 feet explored -- of unbroken vein adjoining this block as estimated, offering exceptional possibilities for ore. The vein is again broken, with short displacement, 800 feet south of the incline shaft. This fault marks the northerly limit of another but undeveloped ore body known as the South Ore Shoot. It has a strong and well-mineralized out-crop extending 400

feet farther to the south. The out-crop has been opened by three surface cuts, and the south drift on the 225 level must now be nearing the vein on its downward extension. (See Plan Map appended) The surface exposures on the South Ore Shoot indicate potential possibilities of a large ore body. Of the section of vein between the two faults (about 450 feet), practically nothing is known. In all, there are 1,000 feet of the vein that can be considered as entirely unexplored that will more than probably produce some ore from above the 225 level, and that affords the possibility of a large volume of profitable ore.

VALUES:

The vein as exposed on the 83 level and above, has been well-sampled. Mr. A. E. Sedgwick, in a report based upon a complete examination of the property in 1923, cites sampling by L. H. Kellogg giving an average of 8.12 oz. Ag and 9.44 % Pb; by L. N. Buttler giving an average of 16.50 oz. Ag and 8.40% Pb, and his own sampling an average of 12.82 oz. Ag and 7.96% Pb. D. R. Finlayson, who probably has the best knowledge of the entire development of the mine, in his report estimates an average value for the ore of 14.00 oz. Ag and 6.0% Pb.

The sampling made by A. L. Beals in 1926 was carefully and consistently done, and checked in the greater part as shown by duplicate samples and assays. A print of his sample map is appended. I have personally checked this sampling, and find it to be reliable. It seems more than probable that the assaying of Mr. Beals' samples was by the fire method for lead. My samples have been determined by the wet method, as used at the smelter, and show a higher lead content, which is doubtless the more reliable and more nearly correct. The fire assay for lead is commonly considered to average about 10% low. In this instance I am using Mr. Beals' values as safe and conservative. Mr. Beals recognized two distinct periods of mineralization in this vein, and sectionalized most of his samples as foot-wall and hanging-wall vein. That is the right way to sample this vein, but might be confusing. The widths as given by Mr. Beals are the widths from which the samples were cut but do not indicate clearly that one wall or the other was not ex-

2  
 posed. His weighted average and widths on the whole cannot be used in estimating average tonnage and value. His samples represent sections of the vein. This could not be improved without first exposing the vein for its full width at the points sampled. I have therefore carefully checked these samples underground and made a compilation as shown below. Fourteen of these samples represent the full width of the vein, and nine additional included in the first list, while not representing the full width, afford a good comparison in consideration of a calculated average.

<u>No.</u>	<u>Width</u>	<u>Ag Oz.</u>	<u>Pb %</u>	<u>Ag</u>	<u>Pb</u>
1 & 2	10.0	11.34	23.90	113.40	239.00
8 & 9	9.0	19.92	10.50	170.28	94.50
10 & 11	6.6	11.78	7.65	77.75	50.49
12 & 13	6.8	7.77	8.55	52.84	58.14
14 & 15	7.3	13.00	10.40	94.90	75.92
18 & 19	14.30	5.82	4.40	83.23	66.92
26 & 27	10.8	25.00	1.20	270.00	12.96
28	* 6.75	*10.20	* .40	68.85	2.71
29	* 6.5	* 5.89	* 1.00	36.98	6.50
34	* 6.1	* 6.84	* 2.80	41.72	17.08
35 & 36	9.9	7.94	14.50	78.61	143.55
39 & 40	*10.5	* 1.20	* .20	12.60	2.10
45	4.0	12.64	9.00		
41 & 42	* 5.75	* 3.75	* 4.70		
46 & 47	6.1	19.50	12.90	118.95	78.69
48 & 49	7.0	23.84	11.22	166.88	78.54
50	4.8	25.48	15.00		
51	4.7	11.50	15.90		
56	4.25	14.24	12.60		
61	5.00	16.54	11.60		
62	* 5.00	* 5.87	* 4.00		
63	* 4.25	* 8.90	* 1.00		
64	4.00	4.52	3.65		
67 & 68	5.9	14.32	9.95		
69 & 70	5.6	9.50	9.87		
25 Samples		296.10	206.89		
Average:		11.84	8.27		
14 Samples:	117.85	(Columns 5 and 6)		1386.99	932.10
Average:	8.4			11.79	7.92
Excluding the samples that starred; (7),					
Average:	8.8	14.92	10.81	13.57	10.20

Nineteen samples of the foot-wall vein only.

<u>No.</u>	<u>Width</u>	<u>Ag Oz.</u>	<u>Pb %</u>
3	6.75	7.70	10.70
4	6.50	5.35	11.30
5	6.65	7.80	11.10
6	6.	6.95	8.90
7	4.65	5.35	8.00
16	4.65	6.00	6.00
20	*2.5	1.45	1.70
21	4.8	2.50	5.80
22	*4.8	2.10	1.10
23	5.75	5.50	4.40
24	5.5	7.80	2.40

<u>No.</u>	<u>Width</u>	<u>Ag Oz.</u>	<u>Pb %</u>
30	*5.	3.25	1.50
31	*5.	6.15	2.00
33	5.	6.78	2.45
52	4.9	1.45	5.00
53	3.1	2.05	7.00
54	3.7	4.60	7.00
55	3.6	.70	3.30
71	2.4	<u>3.80</u>	<u>3.35</u>
19 Samples:		87.28	103.00
Average:			
Excluding the samples that are starred; (4)			
15 Samples:		74.33	96.70
Average:		4.95	6.45

Eight samples of the hanging-wall vein only.

<u>No.</u>	<u>Width</u>	<u>Ag Oz.</u>	<u>Pb %</u>
37	*5.25	1.05	.40
38	*3.5	.80	2.40
43	3.5	19.50	7.10
44	3.7	13.20	8.30
57	4.75	15.99	2.50
60	4.5	13.20	13.20
65	4.5	5.70	4.80
66	*4.8	<u>2.35</u>	<u>.40</u>
8 Samples:		71.79	39.10
Average:		8.97	4.89
Excluding the samples that are starred; (3)			
Average:		67.59	35.90
		13.32	7.18

	<u>Ag Oz.</u>	<u>Pb %</u>
Arithmetical average of all samples taken by Mr. Beals.....	8.47	6.17
Arithmetical average of 30 samples that are not the full width of the vein.....	11.77	8.73
Weighted average of 14 samples that are the full width of the vein.....	11.79	7.92

In the foregoing tabulation, some samples of the vein that would be of little or no profit in mining, especially where they are together, have been eliminated in calculation of ore values. Such places in the vein can be left as pillars and serve a more profitable purpose in supporting the mine openings. The amount of the vein that would be left in this way is indicated as five to ten per cent. In the practical consideration of mining, dilution or the entry of waste rock other than vein also enters. With a hanging-wall as broken as is found along this vein, that would amount to about as much as would be left in pillars, so that calculated area and volume of the vein should be close to actual production.

METALLURGY:

Laboratory test work recently conducted has demonstrated quite conclusively that an extraction of 75% of the silver and 85% of the lead can be made by proven and fairly simple metallurgical methods, also that this extraction may prove to be about the most economical. Extraction as high as 85% of the silver and 93% of the lead has been made on samples of the foot-wall section of the vein, lead predominating, and at a coarse grind -- 20 mesh. The ore from the hanging-wall section of the vein, silver predominating, will require considerably finer grinding. Extraction, within reasonable limits, is in direct proportion to the fineness of the product. Economical balance between crushing, grinding, and extraction will be a detail of importance in the design of a treatment plant.

COSTS:

For the cost of mining, milling, marketing, etc., the following round figures are used, which, with proper equipment, competent supervision and low overhead, can be reduced ten to fifteen per cent.

Mining	\$ 3.00
Milling	2.00
Concentrate Marketing	2.75
Taxes, Insurance, Etc.	.75
Total -- Per Ton Ore	\$ 8.50

The average of as reliable sampling of exposed ore as is possible, gives a minimum mineral content of 8.5 oz. Ag and 6% Pb. The weighted average that I have calculated from Beals' sampling, less 10% for dilution, is approximately 11 oz. Ag and 7% Pb, and should be very close to actual production down to permanent water level on this ore vein (assumedly about the 225 level). Figuring silver at 64¢ per ounce and lead at 5¢ per pound, on 8.5 oz. Ag, 6.0% Pb ore, profit would be slightly under \$3.00 per ton; on 11.0 oz. Ag, 7.0% Pb ore, profit would be about \$5.50 per ton. These figures are fairly balanced, reasonable limits to be anticipated, with, in my opinion, the more fair analysis approaching the higher figure. I can foresee nothing within reason to go appreciably under or over these limits, other than change in the price of the two metals. To the best of my information, the outlook for lead is an increase in price, based principally on the fact that our largest fields and producing mines are being rather rapidly depleted

with no known fields, districts, or mines of any large potential possibility, either in this country or abroad. Based on possible production and the fact that the market was 6¢ to 6½¢ but three months since, it would seem that the price for lead might reasonably be expected to go higher in the near future. On this ore that would mean an increase of from one to two dollars a ton. The price of silver in this country is in the hands of our government, and it seems the price for the next year will be that lately established, i. e.; 64.64¢ per ounce. With forethought in the design of a mill, a decrease in the price of silver could be met with but little decrease in profit. That is possible principally because of the character of this ore. Recovery of the silver values requires a considerably finer grind than does the lead values. Less grinding, increased tonnage at the same cost or a reduced unit cost can well be accommodated through the price range for silver.

Without going into detailed cost estimates, adequate mine and mill equipment to put the property on a thirty-ton daily production, will cost erected and ready for operation about \$25,000.00. That would be a capacity of about 10,000 tons a year. With a practically assured tonnage of 36,000 the mine would have a life of at least three and one-half years. This would be increased materially by additional development, and could be doubled or tripled at a comparatively small expenditure for mine development. The cost of water would be pumping from the mine, which is covered in operated and equipment costs. (See Note 4.)

Mr. Finlayson reports, in 1929, sufficient water from the mine for the operation of a mill of one hundred tons daily capacity for a few months. Further development would be required for steady operation. Mr. Gohring reports the mine as making an average of fifteen gallons of water per minute. Less than one-half of that amount would be sufficient for a treatment plant of thirty tons daily capacity. With the water now in the mine, a volume ample to treat the total tonnage of ore estimated is assured. Sufficient water for domestic purposes is available from a shaft on one of the smaller veins on the property.

The equipment cost, if amortized during the life of the assured ore reserves (18,000 tons), would cover a period of twenty to twenty-four

months, and with interest at eight per cent would amount to approximately \$1.50 per ton of ore. At a profit of \$3.00 per ton, it would take about 8,700 tons of ore and ten months of operation to pay the equipment cost from production. At a profit of \$5.50 per ton, it would take about 4,700 tons of ore and less than six months of operating time to pay the equipment cost from production. I consider repayment of the capital required to put the Diamond Joe Mine into production, together with a very good profit, is assured.

Respectfully,

(Signed) M. E. Pratt,  
Mining Engineer.

Octave, Arizona,  
February, 1938.

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7/1/40

Note 1.--Title to this property now rests in name of Chas. C. Miller, Jr., thru relocation. Weil C. Clark, Atty., 604 Heard Bldg., Phoenix, Arizona, representing Mrs. Koyek or Chas. C. Miller, Jr., is in a position to negotiate any agreement in respect to an early operation of the property.

Note 2.--No. 3 shaft and workings are of value as a secondary water storage reservoir to be used in case water in No. 2 shaft is depleted. No. 1 incline shaft following the ore has a total depth of 130' on the incline and intersects No. 2 shaft at a vertical depth of 83' where No. 2 cuts the vein. Water storage in No. 2 below this depth is considered ample for an operation now contemplated.

Note 3.--Removal of this block, 130' x 200' x 8', is contemplated at this time. Incline shaft to be used as working adit. Satisfactory mill site immediately above and ample water directly below. Any further headings necessary within this area would be entirely in ore.

Note 4.--It is the owner's idea to secure as an operator an individual or company that has at this time mill equipment that is idle and that has a capacity of 25 - 35 tons per day. With amortization costs thus avoided, and with a reasonably efficient operation, costs would be in the neighborhood of \$7.00 a ton; profits could be based on \$5.00 a ton upwards.

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
MINE OWNER'S REPORT

Geology & Mineralization

Date 8/16

1. Mine *Diamond Joe*
2. Location *9 mi N.E. of Wickenburg*
3. Mining District & County *White Picoacho Mining District  
Yavapai County*
4. Former name
5. Owner *Mrs. Nell Koyk*
6. Address (Owner) *1/2 Neil C. Clark  
Grand Bldg - Phoenix*
7. Operator *~~Geo. R. Koyk - Grand Bldg.~~*
8. Address (Operator)
9. President, Owing Co. —
- 9A. President, Operating Co. —
10. Gen. Mgr. —
14. Principal Minerals *Silver - Lead*
11. Mine Supt. —
15. Production Rate —
12. Mill Supt. —
16. Mill: Type & Cap.
13. Men Employed —
17. Power: Amt. & Type
18. Operations: Present *— none —*

19. Operations: Planned *from 25 to 30 ton capacity*  
*- install mill when finances available -  
 to handle shallow res & later re-open & further  
 develop mine for increased tonnage capacity*

20. Number Claims, Title, etc. *10 unpatented claims - held by Arizona Corporation  
 of which Mrs. Koyk - holds all stock in her name and  
 for the estate of Geo. R. Koyk of which Mrs. Koyk is  
 administratrix.*

21. Description: Topography & Geography *In foot hills at elevation of 3500 feet.  
 Desert climate with sparse desert vegetation.*

22. Mine Workings: Amt. & Condition *Total mine openings - 2550 feet*  
*No. 1. Shaft - 75 ft. incline - #2 - 180 feet vertical + #3 - 500 ft. vertical  
 From #3 shaft - 180 ft. level - 200 ft. of drifting - on 225 ft. level  
 430 feet of drifting - 83 ft. level - 160 feet of drifting and on  
 45 ft. level - 70 feet of drifting with raises totaling 175 ft.  
 (over)  
 on 15 ft. level*

23. Geology & Mineralization *A granodiorite formation - extensively intruded by dykes ranging from basic andesites to very acid rock. Oxidized lead + iron minerals in upper zone changing to sulphides in depth.*
24. Ore: Positive & Probable, Ore Dumps, Tailings *From surface indications and indications in mine it is fair to assume that the deposit will be 400 ft. long, 150 feet deep and 7 feet wide. ~~or~~ <sup>of oxidized ore</sup> about 25000 tons.*
- 24A. Dimensions and Value of Ore body *Larger tonnage from crown workings. Ore above the 85 foot level shows a weighted average - from a series of careful sampling - of 12.5% iron and 10.15% lead.*
25. Mine, Mill Equipment & Flow-Sheet *Metallurgical tests show a recovery of 75 to 85% of the iron and 85 to 93% of the lead - depending on fineness of grind - by flotation.*
26. Road Conditions, Route *Good auto road direct to mine from Molokai.*
27. Water Supply *A limited supply of water now available - sufficient for a 25 to 30 ton mill. Larger additional water can be developed for a larger installation.*
28. Brief History *Located about 20 years ago and developed mainly from 1926 to 1928.*
29. Special Problems, Reports Filed *Reports on file - from M.E. Pratt - Oelan, Ariz. A.E. Redgwick - Los Angeles, Calif. & Dan Finlayson - Molokai, Ariz.*
30. Remarks *Has sufficient ore in sight to warrant installation of a 25 to 30 ton mill at this time.*
31. If property for sale: Price, terms and address to negotiate. *See Neil C Clark for terms for sale or lease -*

32. Signature.....

33. Use additional sheets if necessary.