NM Mine File No. 200

THE DEADWOOD MINE

By

Peter Joralemon

June 2, 1975

Prepared for

Monterey Mining & Oil Corporation

Frontispiece: Deadwood Mine headframe lookin north along the Queen vein to the Fanney Mine in the distance.

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PETER JORALEMON

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Summary and Conclusions

The Mogollon Mining District in southwestern New Mexico has produced about $25,000,000 in gold and silver since its discovery in 1879. The production came from many mines but the bulk of the ore came from three veins, the Fanney, the Maud S., and the Last Chance-Deadwood. The Deadwood Mine itself produced 83,000 tons of ore averaging 0.13 oz. Au and 6.96 oz. Ag.

The Mogollon District is underlain by a thick series of gently tilted Tertiary volcanics ranging in composition from andesite to rhyolite. The lavas are cut by two systems of normal faults, the master system trending northeast and the connecting branches striking northwest. Parts of these faults have been filled with vein material, the source of the district production.

The district is bounded on the east and west by wide and persistent northeast veins which are connected by a series of horsetailing northwest veins. The Last Chance-Deadwood, the Maud S., and the Fanney veins belong to the northwest group, bounded by the northeast Pacific vein on the west and the Queen vein on the east.

The veins are characteristic epithermal deposits of quartz-calcite-fluorite-rhodochrosite with pyrite, copper, lead, and zinc sulfides, and gold and silver.

The ore shoots are far greater in strike than in dip dimension and all important known ore shoots have occurred at a depth of less than 800 feet. About half the area of the major veins has been mined. The remainder was somewhat lower grade and was not touched in the early operations. The increasing gold and silver prices have made this remaining ore an attractive target for development and mining.

The Deadwood Mine develops the Last Chance vein at and near its junction with the Queen vein for a length of 2500 feet and to a depth of about 600 feet. The main shaft and parts of the six levels are now accessible but no mine production can be planned until a substantial amount of maintenance work is done on the shaft and drifts.

The Deadwood Mine contains three veins of possible value, the Queen vein on the hanging wall of the ore zone, the Deadwood (Last Chance) in the center, and an unnamed vein exposed in a footwall crosscut in the northern part of the mine. Only the Deadwood vein has been developed to any extent.

In 1930 an outside mining engineer calculated ore reserves for the Deadwood Mine with the plan to establish a purchase price for it. These calculations used hundreds of mine sample assays to establish width and grade of ore. The underlying data are no longer available but the conclusions presented in a longitudinal projection have been studied and checked with my own, very limited, sampling. I have accepted this earlier estimate as the basis for my ore reserve estimate, deducting the ore mined since the original estimate and adding ore since developed by driving one deep level.

Ore reserves are estimated in the following table. The location of the ore blocks is shown on the accompanying longitudinal projection.

Block	Probable Tons	Oz. Au	Oz. Ag	Possible Tons	Oz. Au	Oz. Ag
A	5,000	0.10	4.97			
B	19,500	0.13	6.60			
C	18,000	0.17	8.36			
D	23,000	0.12	5.89			
E	24,000	0.11	5.17			
F	18,000	0.11	5.17			
G	20,000	0.16	7.95			
H	42,000	0.15	7.15			
I	6,000	0.18	8.94			
K	5,000	0.17	7.95			
L	12,000	0.10	5.06			
O	47,500	0.18	8.84			
P	14,000	0.36	17.66			
Q				10,000	0.16	7.95
R				19,000	0.18	8.84
S				23,000	0.36	17.66
U				45,000	0.17	8.42

Total Probable Ore: 254,000 tons at 0.156 oz. Au and 7.76 oz. Ag
Total Possible Ore: 97,000 tons at 0.215 oz. Au and 10.64 oz. Ag
Grand total: 351,000 tons at 0.173 oz. Au and 8.56 oz. Ag
When subjected to carefully controlled cyanidization it should be possible to achieve at least an 85% recovery on this ore. Using $170 gold and $4.50 silver the recoverable value per ton is $57.74. The recoverable value of the total reserve is $20,267,000.

To establish the cash flow to be expected by Monterey it is necessary to deduct a mining cost estimated at $50 per ton and the royalty payment of $4.62. The cash flow is $3.12 per ton or $1, 095, 000 for the life of the reserves.

If the Deadwood Mine is to be operated as a unit separate from the rest of the district mines an expenditure of $760,000 is estimated to put the mine in operating condition and to construct a 100 tpd cyanide plant. Based on this pre-production expense over a 2 year period and the later cash flow for 300 day years,

the cash flow estimate, discounted at 15%, is shown below.

Year	Cash Flow	Discount Factor	Present Worth	Cumulative Total
1	(380,000)	0.870	(331,000)	(331,000)
2	(380,000)	0.756	(287,000)	(618,000)
3	94,000	0.658	62,000	(556,000)
4	94,000	0.572	54,000	(502,000)
5	94,000	0.497	47,000	(455,000)
6	94,000	0.432	41,000	(414,000)
7	94,000	0.376	35,000	(379,000)
8	94,000	0.327	31,000	(348,000)
9	94,000	0.284	27,000	(321,000)
10	94,000	0.247	23,000	(298,000)
11	94,000	0.215	20,000	(278,000)
12	94,000	0.187	18,000	(260,000)
13	94,000	0.162	15,000	(245,000)
14	94,000	0.141	13,000	(232,000)
	+368,000		(232,000)	

This shows that under present conditions the Deadwood can at best be only a marginal producer. Two factors which could greatly improve the profitability are recommended.The purchase agreement with the underlying owners of the Deadwood Mine sets forth entirely unrealistic terms which must be renegotiated. The mine should not be considered as an isolated operation but as an integral part of a unitized district. I believe the owners of the other mines would be agreeable to a reasonable unitizing proposal.

I suggest that low level adits be driven north and south from a site near the center of the district at an elevation of 6500 feet. This will tap the Deadwood and Last Chance ore bodies near their base and will cut the Fanney vein about midway through its productive zone. Using these two adits for main haulage, the bulk of the ore in the district can be delivered by gravity haulage to a larger mill located near the portal of the adits.

The depth of the productive ore zone in Mogollon has been pretty well established and there is very little chance of developing any significant ore below the present bottom levels in the various mines. The major mines should be able to supply about 3 million tons of ore with a value of over $50 to a mill from above the bottom levels. In addition, reworking the estimated 3 million tons in the major tailings piles should yield an operating profit of about $7.00 a ton.

In the past the Mogollon mines were forced to close, not because of lack of ore, but because each separate mine was buried in excessive overhead. If the district is unitized it should have as long a life ahead as it has already enjoyed.

PETER JORALEMON

THE DEADWOOD MINE
MOGOLLON MINING DISTRICT
CATRON COUNTY, NEW MEXICO

Introduction

Western gold and silver mines that last operated during the depression and that were forced to close by government order at the beginning of World War II are now subject to renewed interest as the prices of gold and silver rise toward their logical level. This renewed interest is based on the hypothesis that gold-silver mines that were operating profitably in 1941 could operate profitably today. That is, the substantial increase in gold and silver prices during the past three years merely discounts some of the effects of inflation realized since 1942.

Wages in that earlier period were from $3.00 to $5.00 a day for miners and supply costs were proportionately low, generally amounting to about 35% of the total costs in underground mines. The total costs at that time would amount to about $7.70 per man shift.

At the present time miner's wages average about $50.00 a day and, using the same ratio of supply costs to labor, the total cost per man shift becomes $77.00. Productivity today is somewhat lower than in 1941.

In the same period gold and silver prices have increased about five-fold. It is clear that the metal prices have not taken the full inflation rate into consideration and many knowledgable monetary experts look for a $275 gold price within the year. Silver is expected to increase proportionately.

Considerable interest has focused on the gold-silver districts of California, Nevada, Utah, and Colorado in the past year. Because of lack of information and publicity the mines of the Mogollon district in New Mexico have thus far escaped this attention. Monterey Petroleum Corporation is now investigating this old district and the Deadwood Mine in particular.

Location

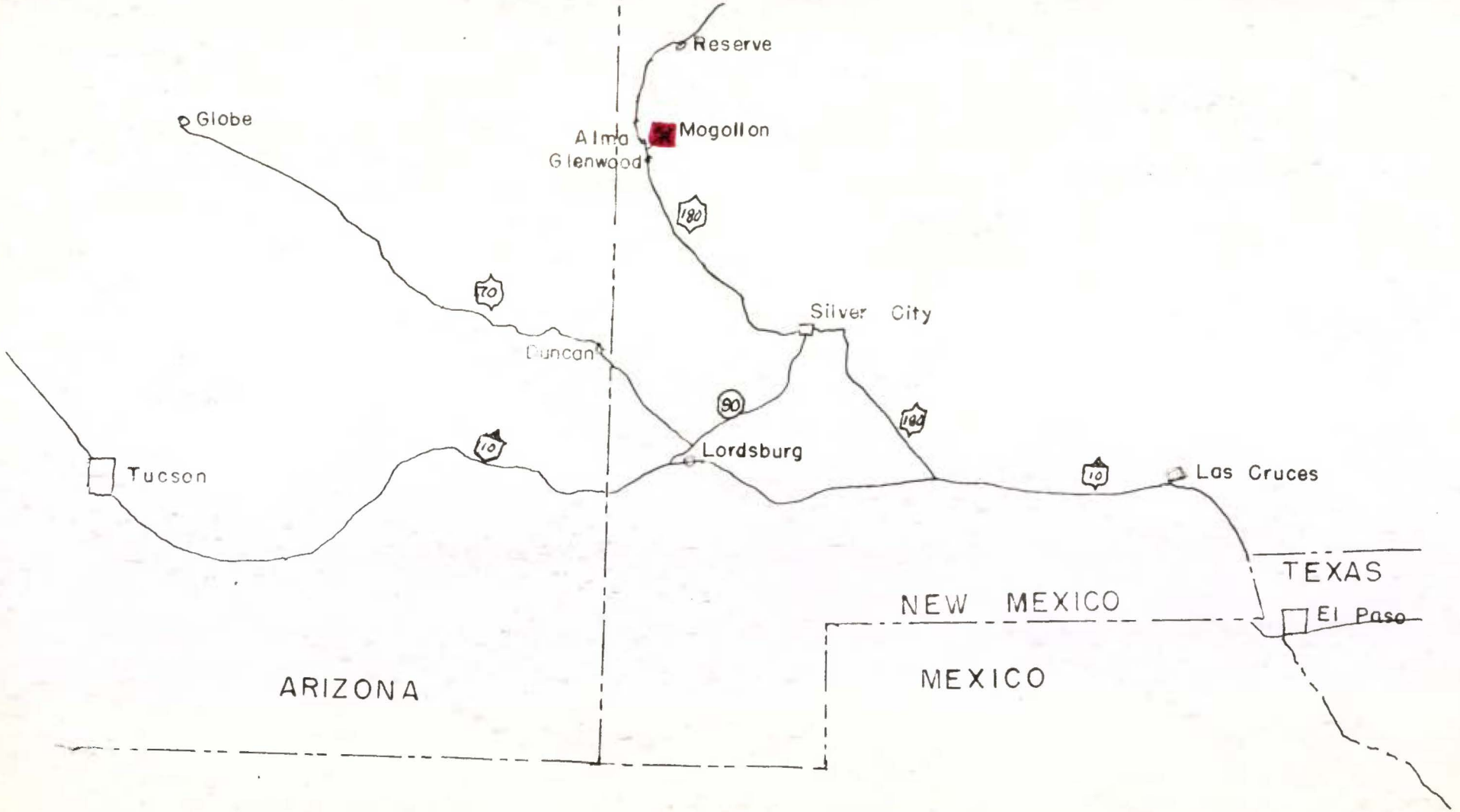
The Mogollon Mining District is about 10 road miles east of Glenwood, a small settlement on the San Francisco River, some 65 miles north of Silver City. The camp is 14 miles from the Arizona border as shown on the accompanying index map.

The town of Mogollon is at an elevation of 6500 feet and the mines of the district vary in surface elevation from 5500 to 7000 feet. The mountains are heavily timbered but much of the timber is unsuitable for mine uses. Water for the town comes from springs and an intermittent stream, Silver Creek.

The district and the town of Mogollon may be reached over a steep and winding paved road that leaves the main highway midway between Glenwood and Alma.

At present about a dozen families live in Mogollon but most residents are oriented more toward the tourist than the mining dollar.

The nearest railhead and supply source is at Silver City which is now the hub of two mammoth copper mining operations, Kennecott's Santa Rita and Phelps Dodge's Tyrone mines.



INDEX MAP SHOWING LOCATION OF MOGOLLON

History

Gold and silver were discovered a few miles north of the now Mogollon District in 1879. The Cooney Mine was the first producer in the area, substantially hindered by repeated Apache raids that killed, among others, discoverer James Cooney.

In the early days of mining Mogollon saw several dozen small operations on a number of narrow discontinuous veins. From 1880 to 1905 the district had produced some $5 million in gold and silver. These early operations were hampered by the limited size of each claim (see the multitude of claims shown on the accompanying claim map) and the necessity of equipping each small mine with mill, mining equipment, and technical staff. It is unlikely that more than a handful of these earlier operations were able to break even.

From 1905 to 1924 some of the smaller mines merged and the larger ones modernized and enlarged the scale of operations. In this period 1,387,000 tons of ore were produced in the district with a total content of 271,394 ounces of gold and 13,155,000 ouces of silver. The average ore tenor in this period was 0.20 oz. Au and 9.48 oz. Ag.

In 1924 the major part of the district, including the Last Chance, Deadwood, and Sunburst mines was owned by Mogollon Mines, Inc. The other major mines were the Little Fanney and the Maud S.

After 1924 production in the district was seriously curtailed but was stepped up again in the early 1930s with the increased gold price.

The Deadwood and Last Chance mines operated until 1939 as a single unit, with all ore hauled out through the Last Chance Tunnel and treated in the Last Chance mill.

The Fanney mine was in exceptionally rich ore in 1930 but the grade had dropped abruptly in 1933 when heads ran only $3.50 a ton. In the late 1930s this operation switched to a newly discovered ore shoot which was mined in open pit. This ore is reported to have run between $5.00 and 10.00 in 1942 when the mine was shut down by L-208. The ore shoot had been proved continuous from the surface to a depth of 700 feet.

Following the war an ambitious program was instituted in the district under the name of the Oaks Company with the Bradley Mining Company as prime mover. This company took control of most of the northern half of the district and drove a low level exploration tunnel from the west side of the district for several miles, passing a little north and slightly below the bottom level of the Little Fanney mine. An extensive diamond drilling program was carried out from this tunnel but no confirmed ore intersections were made and the project was abandoned.The Oak Tunnel proved rather conclusively that the Mogollon district is not exceptionally deep.

There has been no appreciable production from the district since 1942. Late records of production are not available but it is likely that the total district production is in the neighborhood of $25,000,000 from about 3 million tons of ore. About two thirds of the values were in silver, one third in gold. The various tailings piles, particularly from the Fanney mill, contain, at present metal prices, well over $10 million in recoverable gold and silver.

The Deadwood Mine is credited with a production of 10,500 oz. Au and 577,000 oz. Ag from 83,000 tons of ore. The average tenor is 0.13 oz. Au and 6.96 oz. Ag, somewhat lower than the district average.

In January 1975 Monterey Petroleum Corporation Ltd. optioned the Deadwood-Sunburst property. I was asked to make a study of the district with emphasis on the Deadwood Mine to determine if this mine could constitute a profitable operation at today's gold and silver prices.

Sources of Information

The Mogollon District is briefly described by D.B. Scott in AIME Transactions 63, 1920. It is discussed in detail in Ferguson's excellent U.S.G.S. Bulletin787, 1927.

A 1940 report by previous Deadwood Mine owner Earl Cleveland describes the Deadwood Mine and gives a fair appraisal of the future potential of this mine. This report is coupled with a composite plan and longitudinal projection, a copy of which is included here.

An earlier longitudinal projection was prepared by E.B. Godfrey, an AS&R mining engineer, in 1930, at the request of AS&R ore buyer Howard Field who was interested in buying the mine. Godfrey presented an ore reserve estimate based on hundreds of channel samples on every level of the Deadwood Mine. Unfortunately the underlying data are not available but Godfrey's summary of reserves appears valid.

Several progress reports on the Fanney Mine, written in the 1930s, help to give a district picture in the latter days of activity.

In the course of my investigation I talked with retired mining engineer Homer Hersch in his home in El Paso. Hersch had been active in Mogollon mining affairs for twenty years and his retirement has not dulled his wits. He has supplied me with a number of maps and reports not otherwise available.

In the past decade the chief engineer for the Phelps Dodge oper-

ation at Safford, Arizona, Elton Clark, has studied the Mogollon District with the goal of putting the entire district under one ownership and management. I have discussed the potential with Clark, a close associate for more than 30 years.

The owner of the Eberle Mine, Clifford James, is an elderly mining engineer now living in Palm Desert, California. Naturally James feels that the Eberle Mine is the hub of the district and can be used to tap deeper ore from all major mines in the area. I have studies several informal reports in which James defends this thesis.

In 1974 Superior Oil Co. made a brief and inconclusive study of the Deadwood Mine and prepared a short and shallow report which I have studied.

In looking into the background of the Oaks Tunnel I have spoken with J.P. Bradley, President of the Bradley Mining Company, and withBob Allsep who was a diamond driller in the Oaks Tunnel.

In May I made an inspection tour of all accessible parts of the Deadwood Mine, accompanied by Douglas Hanson of Duncan, Arizona, and spent several days in reconnaissance of the surface and certain of the underground workings in the Deadwood, Last Chance, Confidence, and Eberle Mines.

I have no personal interest in any of the Mogollon Mines and the opinions expressed in the following sections represent my best judgement, aided by 33 years of experience as an economic geologist.

Property Ownership

The Deadwood Mine is now held by C.F. Hanson and R.J. Dobson who have optioned it from the previous owner, Earl Cleveland. Hanson and Dobson in turn have optioned the mine to Monterey Mining and Oil Corporation. The Last Chance Mine is held jointly by Elton Clark of Safford, Arizona, and Mildred Walton of Silver City. The Ann Arbor and Confidence Mines are controlled by Paul Harvey of Mogollon.

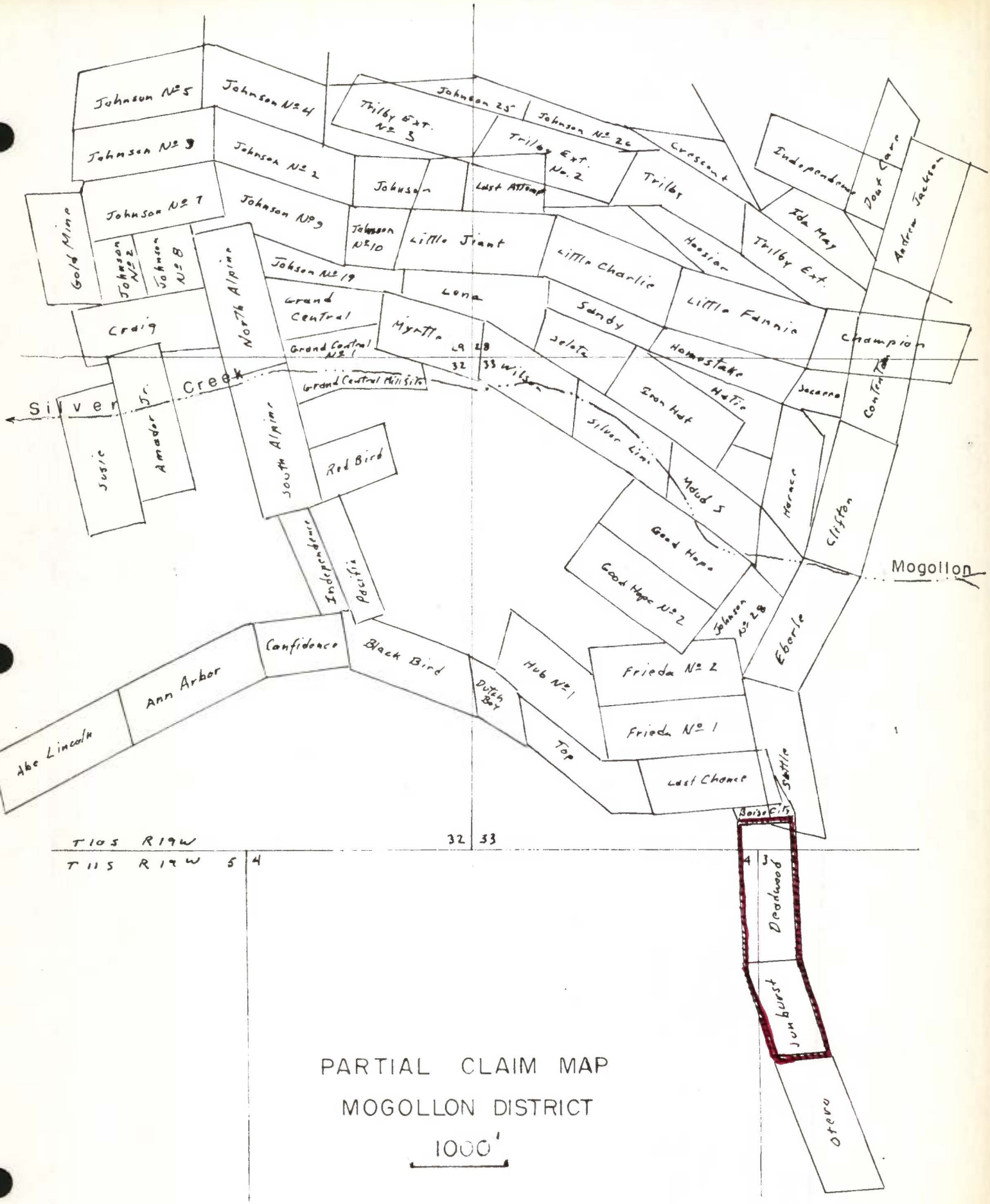
Clifford James of Palm Desert, California, holds the Eberle Mine. The Fanney Mine is owned by the Lehigh Metals Co., 500 Scranton Life Building, Scranton, Pa.

District Geology

The Mogollon District is underlain by volcanics and related fresh water sediments of Tertiary age. Rhyolite and andesite flows predominate but interbedded pyroclastics, snadstone, and conglomerates are also present. The early Tertiary volcanics were of intermediate composition but in later Tertiary times the volcanics showed a multiple rapid alternation between rhyolite and andesite.

The rocks in the district have been faulted by normal faults of two complex systems, one trending N 20°E and the other N 65° W. Both systems dip steeply. In general the district is bounded on the east and west by two persistent northeast faults connected by a series of northwest branches to form a number of cymoid loops or horsetail structures. The fault pattern is shown on the accompanying district map and sections.

Gold and silver mineralization in quartz-calcite veins follows the stronger faults and is restricted to an area 2 miles long in an east-west direction and a mile wide. This mineral zone is bounded on the east by the strong but little explored Queen Vein and on



PARTIAL CLAIM MAP

MOGOLLON DISTRICT

1000'

west by the Pacific vein, also trending N 20° E. Three major northwesterly branches join these two northeasterly veins: the Confidence-Last Chance-Deadwood vein on the south; the Maud S. in the center, and the Fanney vein on the north. The northwesterly branch veins show much the strongest mineralization and have been intermittently productive over lengths of several miles.

Ore shoots in the district have been generally blind, apexing several hundred feet below the surface. The deepest known ore has been at a depth of about 1100 feet in the Little Fanney mine but this was only a small and low grade pocket. The mining profits made in the district came from ore shoots at depths of less than 600 feet and deeper exploration has not been able to pay its way.

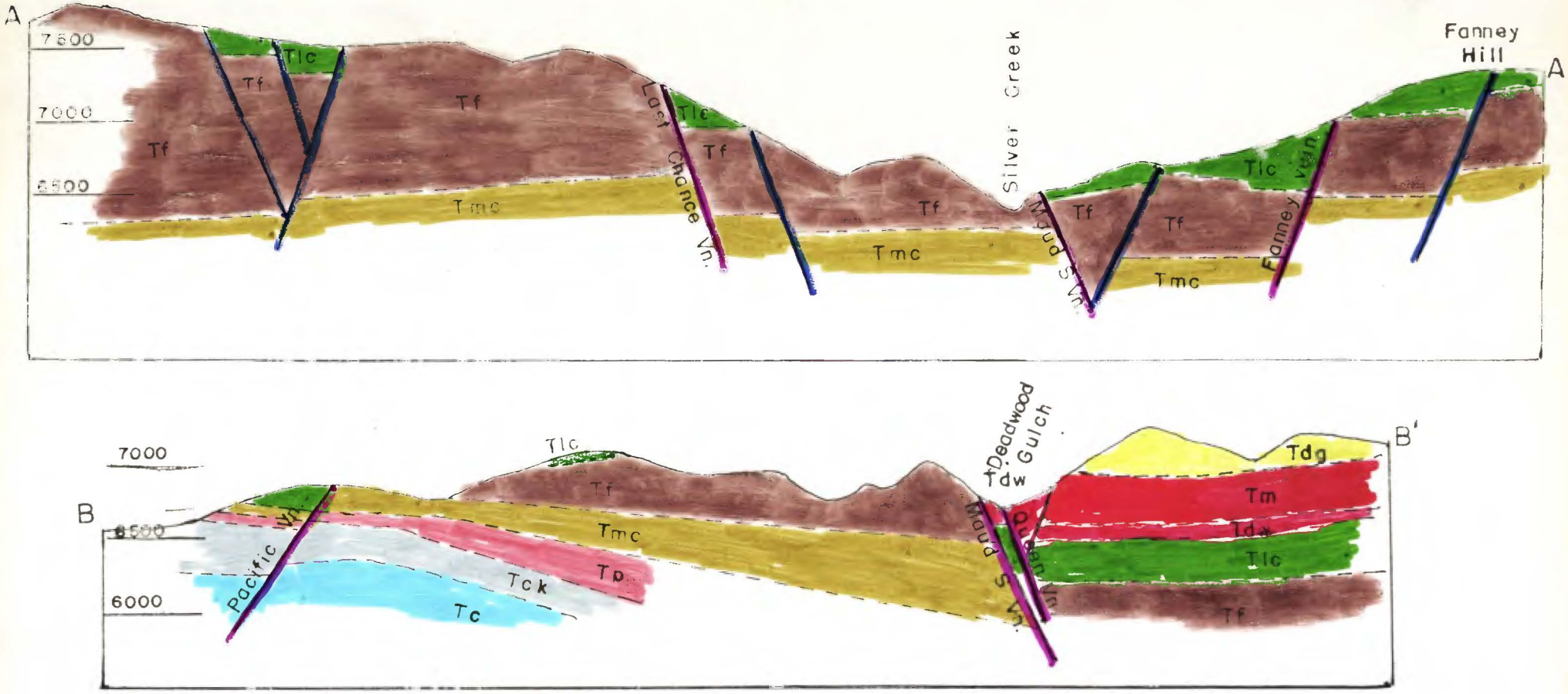
Mineralization

Gold and silver at Mogollon occur in characteristic epithermal quartz-calcite veins that dip generally steeply and cut the thick lava series. In the vicinity of the veins the volcanics have undergone moderate propyllitic alteration with chlorite, calcite, epidote, pyrite, and some quartz disseminated through the rocks.

The veins contain from 1 to 2% pyrite and, rarely, smaller amounts of chalcopyrite, tetrahedrite, and bornite with galena and sphalerite. Silver has been identified in stromeyerite and argentite and gold occurs both in free form and locked up in pyrite.

Quartz and chalcedony are the dominant gangue minerals, particularly in the more productive parts of the veins. Coarsely crystalline calcite forms the bulk of the vein in lean or barren sections. Rhodochrosite, manganiferous calcite, and fluorspar are associated with the better ore.

The veins show a well developed banded or ribbon structure. Vugs

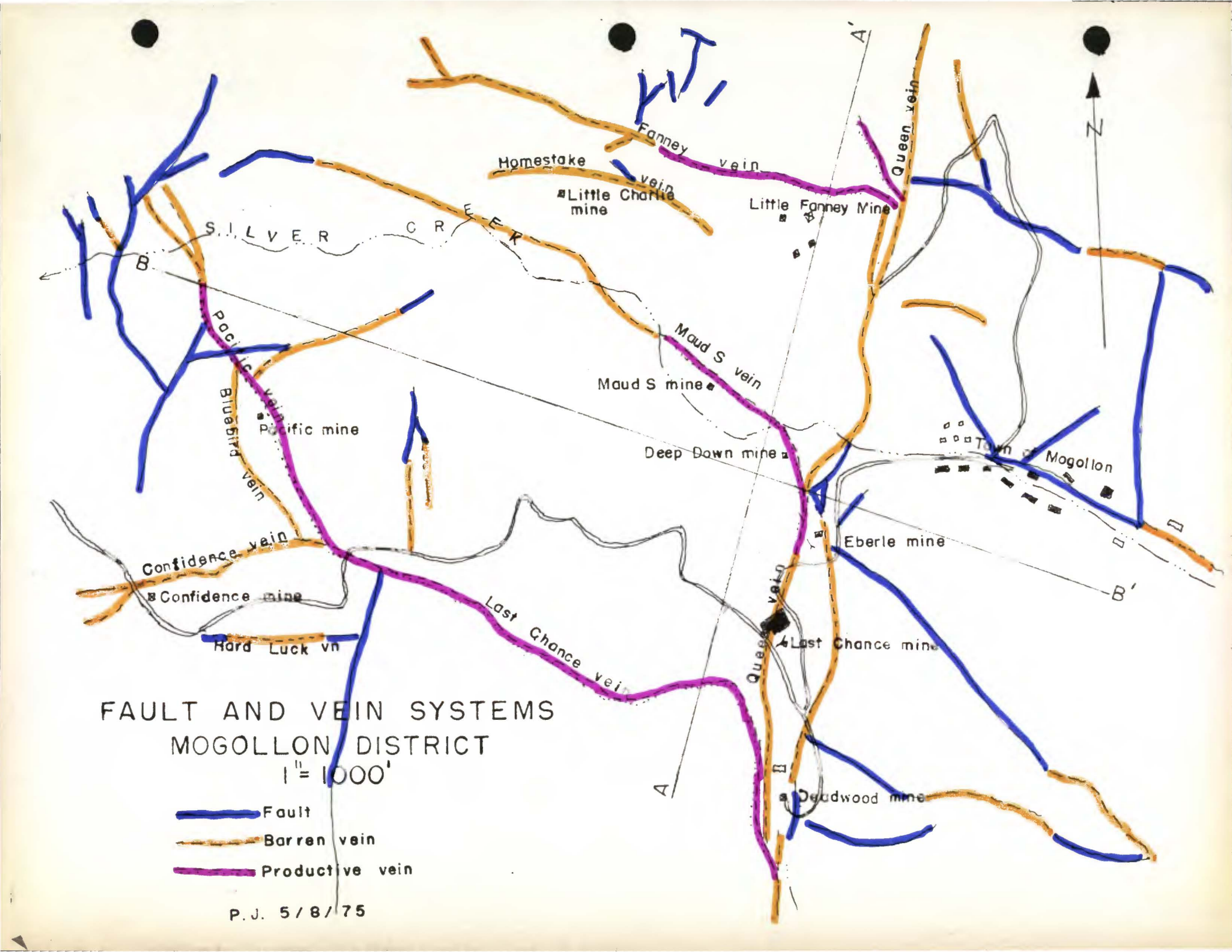


SECTIONS THROUGH MOGOLLON DISTRICT

1" = 1000'

Tdg	Dag Gulch conglomerate
Tm	Mogollon andesite
Tdw	Deadwood Gulch rhyolite tuff
Tlc	Last Chance andesite
Tf	Fanney rhyalite
Tmc	Mineral Creek andesite
Tp	Pacific quartz latite
Tck	Cranktown sandstone
Tc	Coaney quartz latite

Madified after U.S.G.S. Bull. 787


Fanney vein
Homestake vein
Little Charlie mine
Little Fanney Mine
Queen vein
S I L V E R C R E E K
B
B'
A
A'
N
Maud S vein
Maud S mine
Deep Down mine
Pacific vein
Pacific mine
Bluebird vein
Town of Mogollon
Eberle mine
Confidence vein
Confidence mine
Hard Luck vn
Last Chance vein
Queen vein
Last Chance mine
Deadwood mine
FAULT AND VEIN SYSTEMS
MOGOLLON DISTRICT
1" = 1000'
Fault
Barren vein
Productive vein
P.J. 5/8/75

are common and in places are large enough to have serves as major water courses. In some sections, particularly along the Queen vein, the texture is a striking quartz breccia with fragments of volcanics containing shells of pyrite embedded in a quartz-calcite matrix.

The veins vary in thickness from a few feet to over 50 feet -- the Queen vein is generally far wider than the more productive branches which seldom exceed 30 feet in width. In places the full vein width constitutes ore, elsewhere commercial values occur on one or both walls, leaving the core of the vein barren. Some ore shoots occur in the wider sections of the veins but this is not an infallible rule.

The ore shoots are generally longer than they are deep and are restricted to depths of less than 1000 feet below the surface. Although all known ore shoots are shallow, blind ore bodies are the rule in the district. Thus the productive part of the district may be visualized as a blanket about 600 feet thick that conforms to the land surface but is coevered by a barren zone one to two hundred feet thick. This feature is characteristic of epithermal veins.

Along the nearly 7000 foot length of the great Last Chance vein from the Deadwood to the Confidence mines, approximately half the vein area has been stoped. The remainder of the vein is not barren but was too low grade to allow a profitable operation in the peak mining days when no material under $9.00 a ton was considered ore.

Ferguson observed that the best ore occured in veins that had different rock types in the foot and hanging wall. Thus the productive zone in the Last Chance vein occurred mainly in that section in which rhyolite is the hanging wall of the vein is in fault contact with olivine andesite in the footwall. This may be a valid observation but it seems equally plausible to assume

that, in the productive depth zone, the hanging wall of the vein is accidentally in a different rock type than the footwall formation.

The Deadwood Mine

As the westerly trending Last Chance vein approaches the wide Queen vein to the east, the former swings abruptly to a southern strike, closely paralleling the Queen vein and separated from it by only a few feet of silicified volcanics. This southerly trending section of the Last Chance vein is developed in the Deadwood mine, the southeasternmost of the productive mines in the Mogollon District.

The Deadwood Mine is developed by an old and now caved 100 foot shaft and by an accessible 600 foot shaft and by about 5000 feet of drifts and crosscuts on seven levels, shown on the accompanying composite plan and section. The lower levels are interconnected with workings from the Last Chance Mine.

The Deadwood main shaft is collared in the hanging wall of both the Deadwood (Last Chance) and Queen veins and its passes through both veins above the 5th level.

Most drifts have been driven in the hanging wall of the Deadwood vein and a number of stub crosscuts lead to draw points on this vein. Because the Deadwood vein is generally greater than drift width, its full width can only be seen in stope backs or in occasional accessible crosscuts.

The Queen vein is cut in a number of hanging wall crosscuts and has been drilled by many short holes but it is only followed by one short section of drift on the 4th level.

Mine Workings

The volcanics in the Mogollon district make excellent mining ground. The wall rock for the most part stands indefinitely with no support and large open areas such as the Last Chance underground hoist room, entirely unsupported, show no signs of sloughage. All ore mining was by shrinkage stoping and the minimum number of pillars left have supported the steep stopes with surprisingly little caving.

The old 100 foot Deadwood shaft is caved but a brisk passage of upcast air in the 150 level indicates that the shaft is not sealed tight. The 1st (150) level in the Deadwood mine is open for its full length. The second and third levels are blocked close to the main shaft by sloughage from the old open stopes and the rotten chute timber makes it unsafe to cross under or over these old stopes. The fourth and fifth levels are open to the south faces and are blocked by sloughage and rotten timber in the center of the stoped areas north of the shaft.

The sixth level appears to be flooded with about four feet of water at the shaft station, but this could be quickly removed with a one day pumping program. The mine does not make much water and is entirely dry above the 4th level. The 5th level, south end, makes about 100 gmp and most of this flows to the 6th level and out through the Last Chance workings to the Confidence and Eberle mines.

The main Deadwood shaft is structurally in good shape because in no place did it intersect heavy ground. Where the few shaft sets have been laced, the lacing is now rotten but still stands because of lack of weight. The principal function of the wall plates in the shaft is to give support for the landings and ladders and the skip guides. The shaft timbers are insufficient for a safe operation and many of the ladders and lagging timbers are perilously rotten. Having escaped from this shaft once I would not willingly choose to climb down again.

The rail on most levels is still intact although the supports over open stopes are rotten and need replacement. It is probable that the track could quickly be made servicable all the way to the Last Chance shaft. Air and water pipe have been removed.

During the main productive period a steel headframe capped the main shaft and a one-ton skip was used to hoist ore. The skip that was used is now stored in Glenwood and could be reused.

In the late 1930s the steel headframe was removed and the Deadwood shaft was used only as an emergency exit. All ore was trammed into the Last Chance Mine, hoisted up the inclined shaft, and run through the Last Chance mill.

After World War II the temporary wooden headframe now standing was erected to allow an abreviated shaft retimbering job. Most of the timber installed at that time is now rotten.

If the main Deadwood shaft is to be put into operating condition for hoisting ore it will cost between $20,000 and 30,000 to re-timber the shaft and install a new headframe. Depending on the availability of equipment a used hoist, rope, and skip may cost about $60,000. While some power is available is Mogollon it is likely that a hoist would have to be powered by a generator at the mine.

Deadwood Mine Reserves

The Deadwood Mine includes 2500 feet of strike length on the Last Chance vein between the unexplored Otero claim to the south and the Last Chance Mine to the northwest. The Deadwood Mine contains three veins of possible or probable value, the Queen vein in the hanging wall of the ore zone, the Deadwood (Last Chance) vein in the center, and a 30-foot footwall vein exposed in one crosscut on the 4th level. There are not enough accessible exposures of ore on any of the veins to allow calculation of any

proven reserves.

As previously mentioned, E.B. Godfrey prepared a longitudinal projection of the Deadwood Mine, a modified copy of which accompanies this report. Since Godfrey's work a substantial tonnage of his reserves have been stoped but these reserves were more than replaced when the 6th level was driven from the Last Chance mine to connect with the Deadwood shaft. Cleveland reports that the two raises that were driven to the 5th level (see the accompanying section) were in good ore for most of their length.

In Godfrey's study the ore values of the various reserve blocks were calculated on the basis of hundreds of channel samples available to him but apparently no longer in existence. Rather than breaking down his values into ounces of gold and silver, Godfrey assigned dollar values to his ore blocks based on $20.00 gold and $0.50 silver.

In order to convert Godfrey's reserve figures to ounce values from which the present ore values can be calculated, it is necessary to make several assumptions. The average gold and silver content of all past Deadwood production has been 0.175 oz. Au and 8.40 oz. Ag, giving a gold:silver ratio of 1:48.6. At the then existing metal prices gold accounted for 45% of the total ore value and silver for 55%. Assuming that the same gold:silver ratio will obtain in the reserve ore blocks it is possible to calculate with a fair degree of reliability the gold and silver content of Godfrey's reserve blocks.

For example, Godfrey's ore block "A" is shown with an average value of $4.52. Of this, 45% is in $20 gold. The gold content is calculated at 0.10 oz. per ton. 55% of the value is in $0.50 silver giving 4.97 oz.

In the course of my examination I was able to take two underground samples from each of three of Godfrey's ore reserve blocks. The

comparison between the average values in my sampling and Godfrey's values is shown on the following table.

Godfrey' Block	Godfrey Value			Check Sample Avg.			Change
	Au	Ag	1930$ Value	Au	Ag	1930$ value	
"F"	0.11	5.17	$4.79	0.279	20.4	$15.78	+$10.99
"L"	0.10	7.94	5.87	0.081	5.05	4.17	-$1.70
"P"	0.36	17.66	16.03	0.12	8.28	6.54	-$7.75

Net change +$1.54

It is clear that my six samples cannot be expected to exactly check the many hundreds of assays available to Godfrey. However they do serve to indicate a certain degree of reliability of Godfrey's estimate.I will accept his figures as a basis for my own estimate. Since I have not personally examined either all of the workings or the old assay maps I cannot assign any ore to the "proven" category. Those blocks shown on the accompanying longitudinal projection above the 5th level are classified as "probable" ore. The three blocks below the 5th level and the one block on the Queen vein, being less well developed, are classified as "possible".

Because of the lack of evidence neither the footwall vein exposed in the 4th level north crosscut or the No.4 (southern) ore body cut by the 3rd level south drift are included in the reserve estimate. Earl Cleveland suggested that the former vein where cut in the crosscut may have averaged $3 to 5 a ton in 1940, or perhaps $15-25 at the present priced. He reports that the latter ore shoot was probed years ago by a shaft that cut $10 ore at a depth of 30 feet above the 3rd level intersection.

In calculating reserves I have deducted from Godfrey's figures the approximate amount of each block removed in post-1930 mining.

My reserve estmate is given in the following table, calculated to three significant figures, the limit of accurace of the underlying data.

Block	Probable Tons	Oz. Au	Oz. Ag	Possible Tons	Oz. Au	Oz. Ag
A	5,000	0.10	4.97			
B	19,500	0.13	6.60			
C	18,000	0.17	8.36			
D	23,000	0.12	5.89			
E	24,000	0.11	5.17			
F	18,000	0.11	5.17			
G	20,000	0.16	7.95			
H	42,000	0.15	7.15			
I	6,000	0.18	8.94			
K	5,000	0.17	7.95			
L	12,000	0.10	5.06			
O	47,500	0.18	8.84			
P	14,000	0.36	17.66			
Q				10,000	0.16	7.95
R				19,000	0.18	8.84
S				23,000	0.36	17.66
U				45,000	0.17	8.42

Total probable ore: 254,000 tons at 0.156 oz. Au and 7.76 oz. Ag
Total possible ore: 97,000 tons at 0.215 oz. Au and 10.64 oz. Ag
Grand total: 351,000 tons at 0.173 oz. Au and 8.56 oz. Ag
Present value ($170 Au and $4.50 Ag) $67.93 per ton
When subjected to carefully controlled cyanidation it should be possible to achieve at least an 85% recovery on this ore. At the present prices the recoverable value per ton is $57.74. The recoverable value of the total reserve is $20,267,000.

Of these reserve blocks, blocks "E", "F", "G", "I", "K", "L", "O", "P", "R", and "S" are minable after the shaft has been repaired and the drifts cleaned out and track reinforced. It is questionable how much of the reserve ore can be stoped without gobbing at least a part of the present open stopes.

Blocks "A", "B", "C", and "D" will be available when the first and second levels are driven south to the ore limits. Block "Q" will not be minable until the 6th level is driven to the southern

ore limits. Block "U" cannot be mined until drifted on on the 4th and 5th levels.

Economics

While it is apparent that the Deadwood Mine could be most effectively worked as a part of the Last Chance Mine the following economic study assumes that all Deadwood ore will be hoisted through the Deadwood shaft and treated in a local 100 tpd cyanidation plant. I further assume that mining will be turned over to a contract mining firm such as Hullinger-McFarland of Toole, Utah, and that this firm will furnish all mining equipment, amortizing the cost as a part of the per ton charge for mining the ore. The costs presented are estimates based on past experience and are subject to change as mining progresses.

Preproduction Costs

Shaft Repair, hoist and headframe installation	$90,000
Cyanide plant	500,000
Drift repair	50,000
2000 feet drifts at $60 a foot	120,000
	$760,000

Until the mining conditions and costs are determined by actual mining it is difficult to establish the cost for shrinkage stoping of these veins. Under normal conditions and with an eye toward an economical "rawhide" operation the Deadwood mine should produce 2 tons of ore per man shift at the mine and 10 tons of ore per man shift at the mill. Assuming a total cost of $ 80.00 per man shift the cost of mining and milling a ton of ore is $44.00. If the contractor is granted a profit of $6.00 a ton over this cost the total cost to Monterey becomes $50.00 a ton.

The reserves shown in the estimate are valued at $57.74 a ton after metallurgical losses. The agreement between the underlying owners of the mine and Monterey is exceedingly complex but the most important term calls for payment of 8% of the net smelter receipts

after other minor charges have been paid. This amounts to $4.62 per ton, leaving an operating profit to Monterey of $3.12 per ton, $312 per day, or $1,095,000 for the life of the reserves. The indicated life of the reserves is about 12 years. At this royalty rate the $1.5 million property purchase price will be paid in just under the life of the indicated reserves.

The cash flow estimate is presented in the following table. All costs and income are discounted at 15%, a rate commensurate with the risks involved in such an underground operation.

Year	Cash Flow	Discount Factor	Present Worth	Cumulative Total
1	(380,000)	0.870	(331,000)	(331,000)
2	(380,000)	0.756	(287,000)	(618,000)
3	94,000	0.658	62,000	(556,000)
4	94,000	0.572	54,000	(502,000)
5	94,000	0.497	47,000	(455,000)
6	94,000	0.432	41,000	(414,000)
7	94,000	0.376	35,000	(379,000)
8	94,000	0.327	31,000	(348,000)
9	94,000	0.284	27,000	(321,000)
10	94,000	0.247	23,000	(298,000)
11	94,000	0.215	20,000	(278,000)
12	94,000	0.187	18,000	(260,000)
13	94,000	0.162	15,000	(245,000)
14	94,000	0.141	13,000	(232,000)
	+368,000		(232,000)	

Future of the District

At the present metal prices and costs an operation at the Deadwood mine appears to be marginal or only slightly profitable. There are a number of factors that should be changed if this is possible. If possible the contract with Hanson and Dobson should be renegotiated to reduce the royalt rate from 8% of the net smelter returns to a more reasonable figure such as 3%. Or, if this is not possible, the purchase price for these 351,000 tons of probable and possible

ore should be reduced from $1.5 million or $4.27 a ton to a more reasonable figure such as $150,000 or $0.43 a ton-- a price in keeping with custom and with the problems and anticipated earnings from this operation. The present owners are purchasing the mine from the previous owner, Earl Cleveland, for a total price of $75,000. At least a part of this original purchase price is to be paid by Monterey out of earnings. Hanson and Dobson appear to be selling the mine for 20 times the original price while asking the purchaser to pay off the original purchase as well.

Royalty rates are customarily set to allow a fair income to the seller while offering sufficient profit to encourage the buyer to continue the operation. I know of no successful operation in which the seller earns more in royalties than the buyer does in his cash flow.

A profitable operation is not indicated at the Deadwood Mine under present conditions but there are a number of ways in which these conditions can be improved in addition to modifying the present purchase agreement. The principal change that could turn the Deadwood mine into a profitable operation is to make this mine a part of a district-wide venture and to amortize such costs as mill construction over the entire district reserves. I propose that serious consideration be given to the possibility of unitizing the district, entering into operating agreements with the owners of the Little Fanney, Maud S., Eberle, and Last Chance mines. By such an agreement all mines would be operated under single management and all ores treated in a single mill.

Consider the saving to the Deadwood: by using the haulage system to the Last Chance Mine, installation of the entire hoisting unit at the Deadwood can be avoided to save $90,000; because ore would not have to be hoisted through the small Deadwood shaft the mining cost could be reduced by perhaps $2.00 a ton; with other mines available to furnish ore for the early operation it would not be necessary to drive the 2000 feet of drift at the Deadwood before

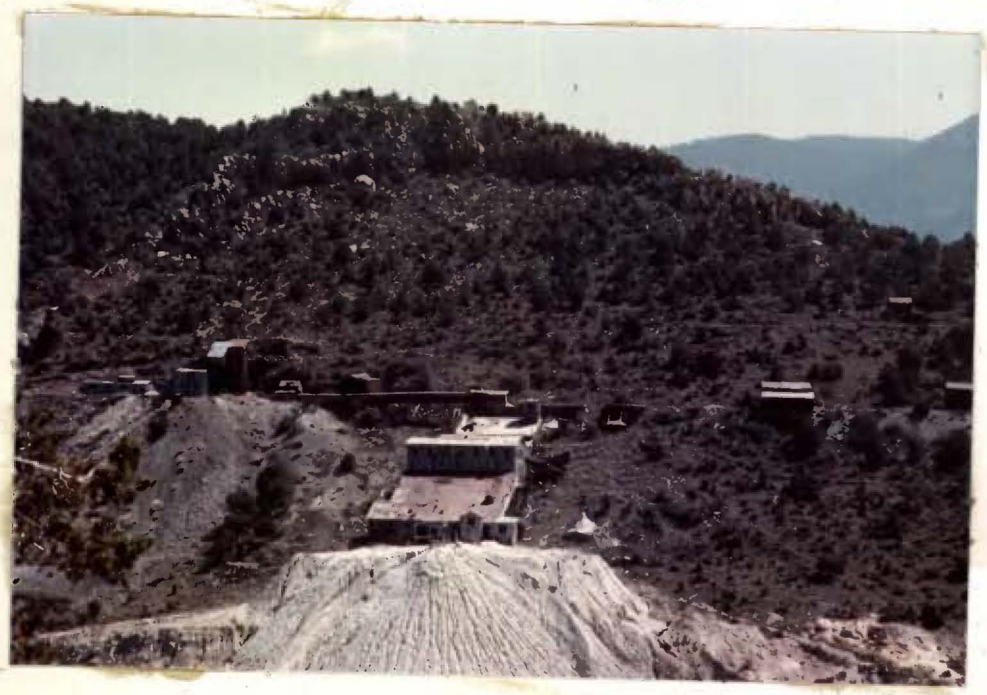
production started, saving a preproduction expense of $120,000; amortizing a 500 tpd mill over the entire district reserves could bring about a savings in amortization of about $0.60 a ton; and overhead costs such as engineering and management would be proportionately reduced.

Homer Hersch believes that the Last Chance Mine contains substantially more ore and of a better grade than does the Deadwood. The Eberle Mine at the junction of theQueen and Maud S veins has not been exhausted and my pillar sample from the main Eberle adit shows 0.17 oz. Au and 6.16 oz. Ag, about the same grade as the Deadwood. I have no data on the grade of the remaining ore blocks in the Little Fanney but believe that as much ore still remains there as has thus far been mined.

Between the Fanney, Maud S., and Last Chance veins it is possible that over 3 million tons of ore remain, averaging $50 or more at the present metal prices. In addition there are an estimated 3 million tons of tailings in the two main tailings piles with an indicated recoverable grade of $10.15 a ton. These tailings could probably be reworked at a cost of less than $3.00 a ton.

All past operations have been basically shaft mines although transportation has been aidid where possible by haulage through adits. By unitizing the district and driving low-level adits it should be possible to mine the bulk of the remaining ore and delivering it to a mill with no hoisting. It is obvious that when all ores can be passed down to a single low level adit and out to a mill large enough to handle all district ores, the mining and milling costs will be substantially reduced.

A 3000 foot adit with portal near the Deep Down Mine on the Maud S. vein could reach the Last Chance vein at an elevation of 6500 feet or about the 5th level of the Deadwood Mine. All ore above that level could be delivered to the surface by gravity. The small amount of ore below that level could be hoisted by local winzes



LITTLE FANNEY MINE, MILL, AND TAILINGS: LOOKING NORTH FROM CONFIDENCE MINE.

at minimum additional cost. Shaft maintenance at the Last Chance and Deadwood mines would be cut to almost nothing.

A similar 2000 foot adit driven north from the same portal site would reach the Fanney vein 500 feet below its outcrop.

The Oak Tunnel project was unsuccessful because it was based on the premise that Mogollon ores would persist to far greater depth than yet developed. Had these operators paid more attention to Ferguson's 1927 report they would have realized that the mines were already reaching the maximum depth of profitable operations. A shorter adit several hundred feet higher would have had entirely different results.

The above proposal would tap the largest mines well within the proven productive depth zone with about half the adit length used in the Oak Tunnel. A unitized operation could increase the present value of the Deadwood mine by several million dollars. If such a plan is attractive every effort should be made to discuss it with the owners of the Last Chance and Little Fanney Mines. With proper management the Mogollon District is now only half way through its potential life.

Tonopah, Nevada
June 2, 1975

Peter Joralemon

Appendix I

SOUTHWESTERN ASSAYERS & CHEMISTS, Inc.

REGISTERED ASSAYERS

FELIX K. DURAZO
ARIZONA REG. NO. 6205
WIL WRIGHT
ARIZONA REG. NO. 8875

P.O. BOX 7517
TUCSON, ARIZONA 85725

710 E. EVANS BLVD.
PHONE 602-294-5811

Mr. Peter Joralemon
P.O. Box 1002
Tonopah, Nevada 89049

JOB # 017578
RECEIVED 5-6-75
REPORTED 5-16-75

SAMPLE NUMBER	GOLD OZ.*	SILVER OZ.*	LEAD %	COPPER %	ZINC %	MOLYBDENUM %
4-1	.460	37.00	20' vein in crosscut 500' south of 400 Station			
2	.098	3.89	10' exposed vein, crosscut, 350' south of 400 Station			
3	.120	7.94	10' pillar Over drift 200' north of 400 Station			
4	.042	2.16	Chute muck 150' north of 400 Station			
5-1	.140	3.70	Pillar under Block "P", 5th level north			
2	.110	12.87	Chute muck under Block "P", 5th level			
S-1	.004	.27	Outcrop Queen vein at collar, Deadwood shaft			
E-1	.170	6.16	4' pillar, main adit, Eberle Mine			

REGISTERED ASSAYER CERTIFICATE NO. 8888 Priyanendra Amrutlal Shah SIGNED Arizona U.S.A.

Shah 5/16/75

CHARGE $ 48.00 Paid Check

* Gold and Silver reported in troy oz. per 2,000 lb. ton.

INVOICE

Appendix II

PROFESSIONAL RECORD OF PETER JORALEMON

Education: B.S. in Geology, Yale University 1942

M.A. in Geology, Harvard University, 1948
Ph.D. in Geology, Harvard University, 1949

Employment: Geologist, U.S. Geological Survey 1943-1946
Leave of Absence for Naval Service, 1944-1946
Chief Geologist, Getchell Mine, Nevada 1947-50
Geologist and General Superintendent,
New Park Mining Co., Utah 1950-1954
Director of Exploration, Lucky Mc Uranium
Corp. 1953-55
Consulting Geologist with Office at 315 Montgomery
St., San Francisco, 1954- 1972
Consulting Geologist with Office in Tonopah, Nevada,
1972-75

Past or present clients include:

Exploration	Operating	Valuation
Bradley Mining Co.	Bradley Mining Co.	Bradley Mining Co.
Copper Range Co.	Copper Range Co.	Copper Range Co.
New Park Mining Co.	New Park Mining Co.	Ashland Oil & Ref. Co
Pennwalt Corp.	Pennwalt Corp.	Zapata Offshore Co.
Ashland Oil & Ref. Co.	Arthur McKee & Co.	Ferore Corp.
Zapata Offshore Co.	Amer. Potash & Chem.	Merril Lynch, pierce,
St. Joseph Lead Co.		Fenner, & Smith
Northfield Mines and others		Johns-Manville Prods.
controlled by Thayer Lindsley		Flinkote Co.
Paine, Webber, Jackson,&Curtis		State of Calif.
Homestake Mining Co.		Rosario Resources
Humble Oil & Ref. Co.		
Kewanee Oil Co.		
Phelps Dodge Corp.		

This experience includes work in the United States, Canada, Mexico, Guatemala, Costa Rica,Honduras, Panama, Venezuela, Ecuador, Bolivia, Colombia, Chile, Brazil, New Zealand, Thailand, India, Southwest Africa, and Cyprus.

Former Director: Lucky Mc Uranium Corp., 1954-57
New Park Mining Co. 1953-62
Former President and director of Exploration,
New Zealand Mines Ltd. 1960-65

Professional Societies: Amer. Inst. of Mining, Met., and Petroleum Eng.,
Past chairman, San Francisco Section
Society of Economic Geologists
Mining&Metallurgical Society of America

Authorized by State of California Board of Registration for Geologists and for Civil and Professional Engineers.

BUSINESS AND EXECUTIVE OFFICES
1451 PASEO DE ANZA
PALM SPRINGS, CALIFORNIA 92262
TELEPHONE: (714) 323-5226

Monterey MINING & OIL CORPORATION

REGISTERED OFFICE
FIRST NATIONAL BANK BUILDING
302 EAST CARSON AVENUE
LAS VEGAS, NEVADA 89101

June 23, 1975

James R. Keighley, Esq.
1450 - East End St.
Reno, Nevada.
89502

Dear Jim:

I have a drilling rig to do the Bishop hole. Keith Robertson from Carson, Nevada, will be the contractor and will start around the lst of next month.

Enclosed please find the report Peter Joralemon did for me on our New Mexico Gold Property.

I think his estimate of $50.00 per ton to mine the property is high? What do you think?

I also think he is correct in suggesting we put a Unit together with a common milling operation. I am persuing some of the other mine owners to see if we can put a satisfactory Unit together.

Drop me a note re your comments on this report, if you have time.

Many thanks for your help in securing a drill rig. I appreciate your efforts and hope I can do the same for you some day.

Best personal regards,

Yours very truly,

Bill

W. McMahon

JAMES R. KEIGHLEY
Mining Geologist

1450 EAST SECOND ST.
RENO, NEVADA 89502

(702) 329-7827
(702) 329-8477

June 26, 1975

Mr. William McMahon
Monterey Mining & Oil Corp.
1451 Paseo de Anza
Palm Springs, California 92262

Dear Bill:

I just finished talking to Bill Sharp on the telephone and he says you will be leaving Vancouver for Palm Springs, so I am sending this letter there. I received the report on the Deadwood Mine by Peter Joralemon this morning and have read it over but I cannot understand his $50.00 per ton, which I presume is mining and milling, but is much higher than what we are accustomed to in our operations. A small operation in Alpine County, California, run by Claude Lovestedt, has a mining and milling cost of about $25 to $27, and this is his cost as of this week. Claude is producing under 100 tons a day and is making considerable money. He is concentrating his gold/silver ore by flotation and is trucking the concentrate 800 mi. to Helena, Montana. Peter Joralemon does not say how he came by these costs. All I can figure is that the average width of the veins may be less than a mining width or might need considerable timbering. He does not say what the average width is but states they vary from a few feet to over 50 feet. Certainly the Queen vein, which is the widest, would be cheap mining. We also do not know how much development this figure includes - perhaps he has included a high development cost. Bill, you should ask him what he considers what the average width of the veins to be and how well they will stand.

Some of our vein mines, even though they are operated completely inefficiently and have excess labor, do not have mining and milling over $25 per ton, except at Sunshine and the Coeur d'Alene in Idaho, where they are down a mile or more and were never completely streamlined. Some of these have gone to as high as Joralemon's figure.

This area could be put together as a Unit but it must be under one operator and then a deal will have to be reasonable. Where Units are run by several there is often trouble supplying the mill. This has been a good district and certainly has significant reserves. Since the U.S. government silver sales will fall off within about 12 months, and consumption will be 16% greater than world supply, the silver price is bound to rise and therefore this district could become very important.

I am going on another trip beginning this week-end and should you ever be coming this way please let me know ahead of time so I can be here in Reno to take you to dinner.

I wish you every success with your drill hole in Bishop.

Best regards,

James R. Keighley

JRK/ew

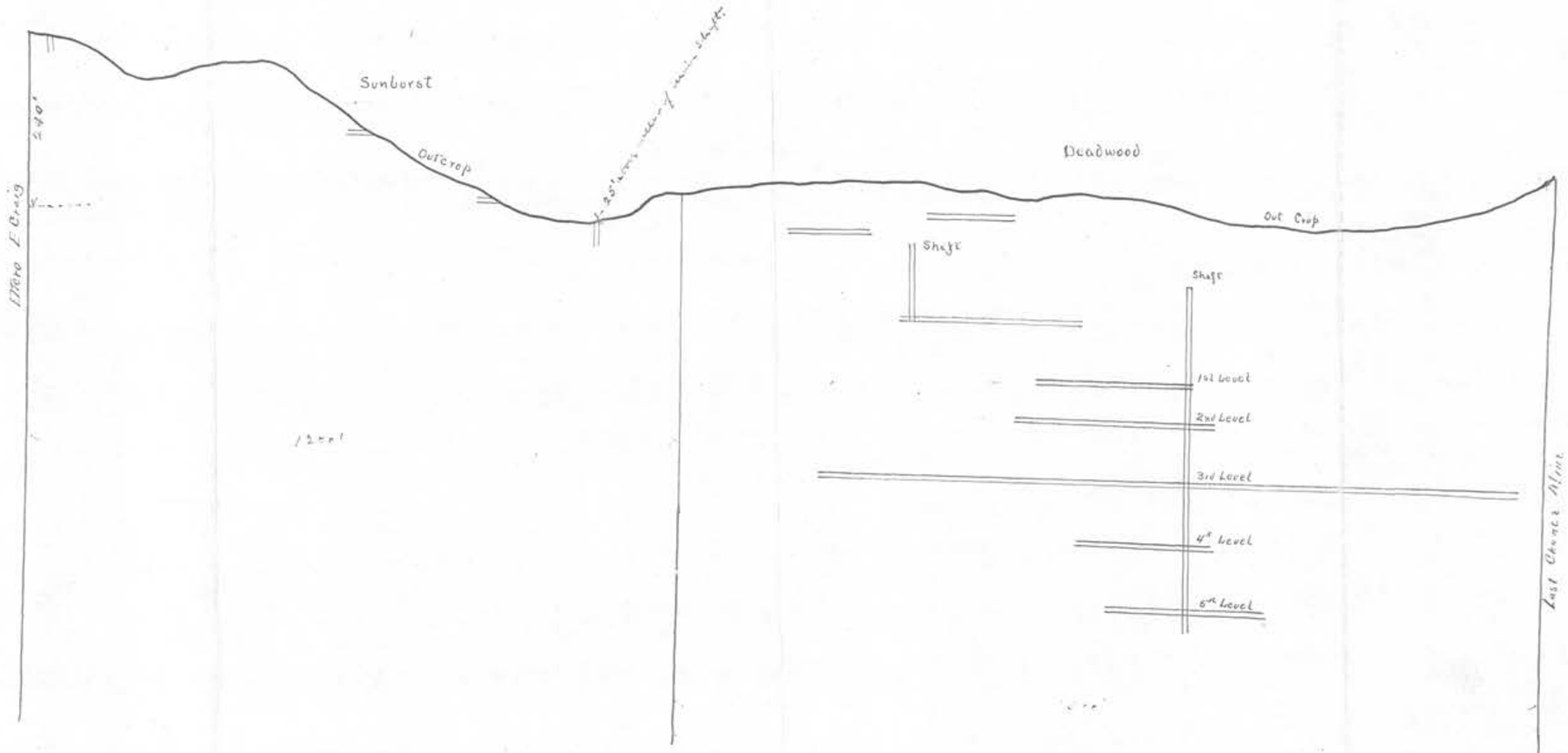
JAMES R. KEIGHLEY
MINING GEOLOGIST

Deadwood & Sunburst

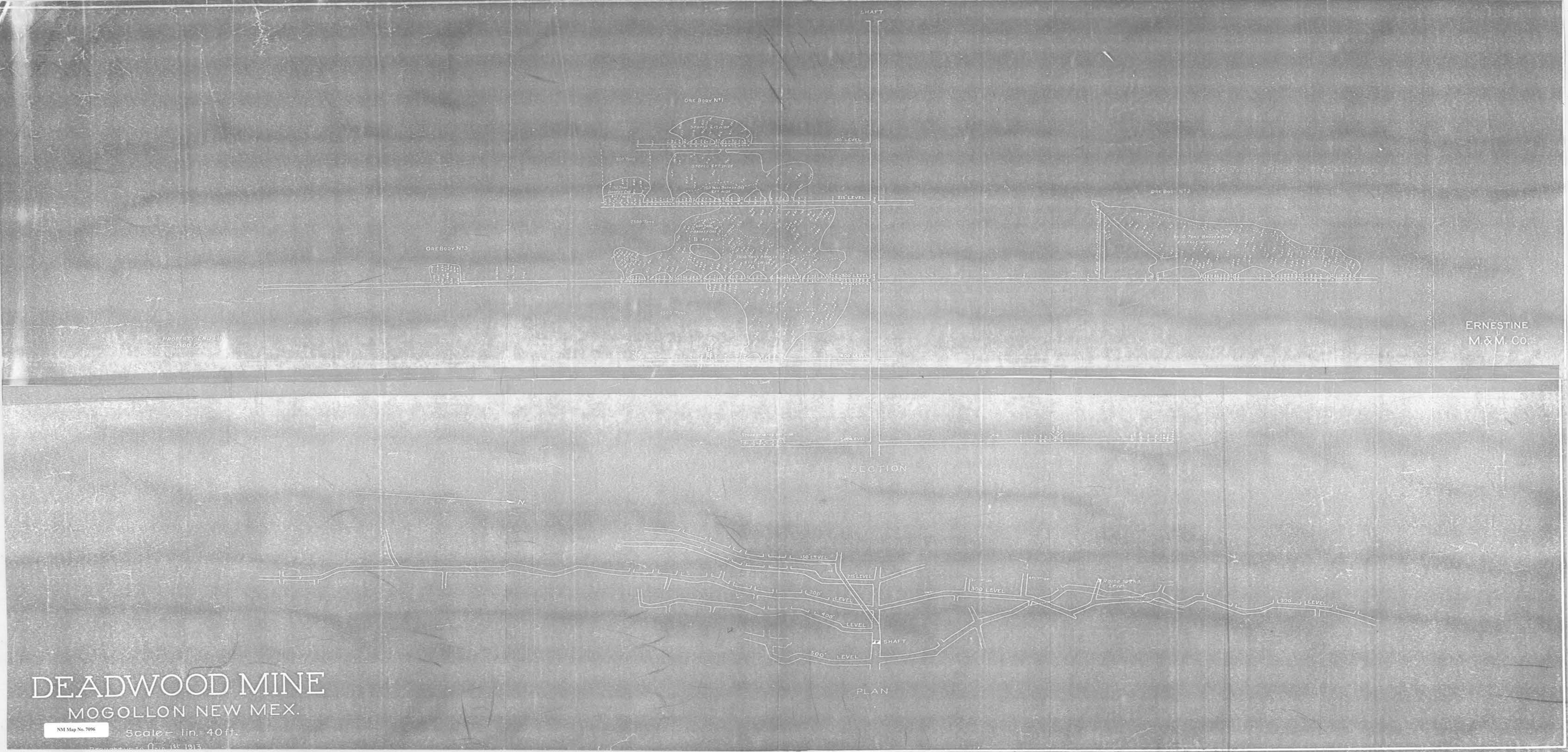
Profile

Scale 1 in = 150 ft

NM Map No. 7114



MOGOLLON DIST



DEADWOOD MINE

MOGOLLON NEW MEX.

Scale- 1in.-40ft.

Drawn up to April 1st 1913