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

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ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

2 of 3

PRIMARY NAME: HILLTOP MINE

ALTERNATE NAMES:
HAND

COCHISE COUNTY MILS NUMBER: 11

LOCATION: TOWNSHIP 16 S RANGE 30 E SECTION 32 QUARTER SE
LATITUDE: N 31DEG 59MIN 07SEC LONGITUDE: W 109DEG 17MIN 21SEC
TOPO MAP NAME: RUSTLER PARK - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
LEAD
ZINC SULFIDE
SILVER
COPPER OXIDE
GOLD LODE
MOLYBDENUM
CADMIUM DELETERIOUS?
TUNGSTEN

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HILLTOP MINE

CHIRICAHUA MOUNTAINS, CALIFORNIA MINING DISTRICT

COCHISE COUNTY, ARIZONA.

May 21, 1938

May 21, 1938

HILLTOP MINE

CHIRICAHUA MOUNTAINS, CALIFORNIA MINING DISTRICT

COCHISE COUNTY, ARIZONA

LOCATION

The Hilltop mine is located in the high, rugged, timber-covered mountains of the Chiricahua Range, at altitudes of from 6000 to 7200 feet above sea level, in the California Mining District, Cochise County, Arizona, northwest 23 miles from Rodeo, New Mexico, the nearest railway shipping point. The road from Rodeo -- about 3 miles across the state line -- partly graded and surfaced, and partly but "bladed" through mesquite-greasewood-cactus covered terrain, is in good condition, and the grade is gradual to Hilltop post office, situated on White Tail Creek 1.7 miles from the Hilltop mine camp. From the post office to the camp the rise in elevation is 940 feet; the real lift starts at a point 0.70 mile from the mine, but the ascent is easily made over a good, graded, mountain road.

HOLDINGS:

The property consists of twenty one (21) unpatented claims known, and recorded, as:

Empire, Empress, Imperial, Enterprise, Portland, W.G., Galena Queen, Spar, Hill Top, Hidden Treasure, Florence, Birthday, Hard Luck, Surprise, Tunnel, Outlook, Four-Point, Victory, Rocky Ford, Long Dump and Lion.

The first twelve of the above named claims have been held by exemption for the past few years, the next eight by assessment work, and the last, the Lion, is held by location made by the Mattox Brothers in May, 1938. The area covered amounts to approximately four hundred (400) acres.

The property is equipped with 300-H.P. diesel engine plant for power, and there are many buildings, in repair to be expected after 12 years of idleness. The files contain description of plant and buildings, and inventory of supplies and equipment, so it is not necessary to repeat here.

EXAMINATION.

I first visited the Hilltop property December 14, 1937 for a preliminary, two-day inspection. I returned to Hilltop January 10, 1938 and remained on the property until late in April, 1938. My mission was to open up the old inaccessible, workings for examination and study and to sample ores found in the old workings. Considering the territory to be covered, consisting of several miles of tunnels, and some under water, this was quite an undertaking. With the assistance of a crew of miners, timbermen and samplers and a surveyor, I had partially accomplished my mission when the geologists stated that sufficient ground had been opened for their work and the reclamation work was discontinued.

In my opinion further recovery work should have been done in the highest (Kasper) tunnel workings to open up territory that had apparently been but partially explored by the last operators, whose activity ceased in 1926, and in the lowest (Rehm) tunnel workings where base-metals ore bodies have been reported to exist by miners who worked there previous to the close down in 1926. The reported ore deposits are in workings from the top of a 195-foot raise from the main crosscut tunnel level. The upraise was in good condition when entrance was gained to same, and at both the 170-ft and 195-ft heights bedded ore are in evidence, but the crosscut and drifts to the reported ore bodies are inaccessible.

GEOLOGY:

The geology, and the ore occurrence of the Hilltop mine, and immediate district, have been covered by able geologists of National repute. Dr. Charles P. Berkey, from the Columbia School of Mines, New York City, spent several weeks in the Hilltop district, and with the help of assistants prepared wonderful, detail maps, and he wrote a voluminous report of 49 single-line space pages, and for a general understanding of the district I am quoting from his report made to the Hilltops Metals Mining Company dated May 21, 1920, a copy of which is in the files of the Company.

"The properties lie along the major mountain ridge which extends in a general N.W. and S.E. direction between Jhus Canyon and Hands Pass, just south of the San Simon Quadrangle on the north and the Chiricahua Quadrangle. The ground lies wholly within the Chirihahua topographic sheet of the U.S. Geological Survey near its northern margin at one of the narrowest parts of the Chiricahua Mountain Range."

"The top of this mountain range lies considerably above 7000 feet and the property lines on either side in places reach down to about the 6000-ft line."

"The maximum length of this property lies along the ridge more than 7 claims long or about 10500 feet actual measurement in a straight line, end to end - approximately 2 miles -- .... stretched out irregularly along a stretch of two miles over and along an exceedingly rugged mountain ridge."

"The Chiricahua mountains represent a partially eroded series of fault blocks, tilted and crowded against each other, cut by a considerable variety of igneous intrusions, which in places are covered by later lava flows and volcanic tuffs, the whole complex mass standing considerably higher than the surrounding country. The surrounding country, which formerly must have been much lower than it is now, has been filled in by the wash from this and other neighboring masses,- all of the waste from the mountains being deposited in the intervening valleys or basins until these places have become broad and comparatively flat lowlands, above which the Chiricahua mountains stand as a comparatively isolated group representing a series of tilted and injected fault blocks."

The Hilltop properties lie on one of these series of fault blocks constituting the Chiricahua group. None of the ground .. reaches beyond

the limits of this single fault block."

"This particular block, which might well be called the Hilltop Block, is made up chiefly of sedimentary rock formations including quartzite, marble, limestones, sandstones and shales, in a great continuous series which from bottom to top measured at least 10000 feet of total thickness. The sedimentary beds are cut by numerous intrusives in the form of dikes and larger masses, most of all of which probably are simply the upward or outward extreme reach of off shoots from a still larger bathylithic igneous mass lying beneath the whole district."

"Much of the sedimentary rock, especially the shaly limestones, have been metamorphosed by these igneous invasions with the development of great quantities of silicified and silicated rock, but in most cases the original nature of the rock is fairly well preserved in spite of these changes."

"This whole series of rocks was badly tilted at the time that the region broke up into blocks, and in subsequent crowding the east side of the block was jammed over to such amount that the beds now stand overturned along this margin. In the middle of the block the beds stand in place almost vertical, and long this portion the Hilltop Quartzite forms the crest of the range for some distance. On the west side of the ridge the beds all dip more and more gently to the west or southwest and the dip of them becomes comparatively flat along the extreme western edge of the block where the overlying andesitic lavas cover them. Thus the Hilltop block is essentially a mass of bedded rock 3 or 4 miles long and close to 2 mil s wide which has not only been tilted but has had the edges of its beds overturned and much crowded from one side until they now stand in an unsymmetrical trough."

"The crowding of the block resulted in a great deal of small thrust faulting and overriding of competent or hard beds over other weaker ones, to such extent that in some places the succession of strata is very much disturbed. In exceptional places some slipping or small faulting is encountered every few feet and it becomes particularly difficult to follow any but the most massive of competent beds. The igneous intrusions doubtless added to this disturbance and confusion but the regional crowding seems to have been more disturbing than the igneous invasions in this particular ground representing the Hilltop block. Toward the end of the series of disturbances small cross faulting developed along the whole ridge, and the breaks of this stage seem to be of particular importance in connection with the ore deposits and in mining operations."

"The ore deposits lie in these sedimentary rocks, the principal ones, as far as yet discovered, lie in or are associated closely with the Hilltop Quartzite, the bed which forms the highest portion of the ridge throughout most of the extent of this property. These ore deposits are undoubtedly intimately connected genetically with both the igneous and the dynamic history. The chief items of this history are as follows:

1. All of the primary ore has been introduced into and through fractures and bedding planes and other weaknesses during and especially at the close of the contact metamorphism produced by the igneous intrusive masses.

2. All of the valuable deposits as far as yet known were made at the very close of this contact history after most of the silication of the limestones had been completed and most of the rock formations had been so thoroughly transformed that it was not easy any more for the mineralizing solutions to penetrate the average rock. But wherever fractures were developed, especially the crossfractures with small fault movement, or wherever the rock had escaped earlier metamorphism and was inclined to be brittle and form connecting fractures

rather than to mash into new position, there it was still easy for the mineral bearing solutions to penetrate and deposit this mineral load.

3. Thus it happened that most of the ore bodies, as far as yet developed, are irregular branching and bunchy deposits of chimney-like form cutting up through the nearly vertical or steeply tilted Hilltop quartzite. This quartzite was the most brittle and least affected original member of the series at the time this mineralization began and consequently was formed a good final outlet for the mineral bearing solutions. Many of these cross fractures made especially good outlets, and in their vicinity deposits are usually found. But at other places also there are similar results, and at some of these intermediate points, that is between the cross fractures, the form of deposit is even more chimney like than at the cross fractures. But from the nature of the case, with such an origin, the deposit ought to be very irregular and obscurely connected or perhaps in some cases not connected laterally at all. Vertically, however, there must be much better and more continuous connection, and without doubt the mineral deposits can be followed much more successfully either by winzes or raises than by drifts. There is no way of determining where the next mineral chimney is, in exploring laterally, but in the other direction doubtless they branch and connect in a perfectly consistent manner, which in the actual working of the mine will not be found very confusing.

4. All of the primary mineralization came from below the igneous sources. The mineral bodies are only the conduits or courses of the escaping solutions.

5. The types of mineralization represented in the primary ore and the related effects include:

a-Silication of the limestones.
b-Introduction of pyrite and sometimes other sulphides during silication.
c-Replacement limestone and quartzite by other mineral material.
d-Vein and cavity and space filling by ore minerals.
e-Some silicification and development of quartz filling and replacement.

6. The chief development of valuable deposits belongs to "c" and "d" above, i.e., space filling and replacement. The principal primary minerals being sulphides of the common metals. In the workings thus far the principal ones are the sulphides of lead, iron, zinc, copper, molybdenum and arsenic (galena, pyrite, sphalerite, chalcopyrite, molybdenite and arseno pyrite). Doubtless there are others but they do not appear prominently.

7. The Hilltop quartzite, however, was either not very completely cemented by the mineralization process or it suffered still further disturbance with reopening of fractures, because in much later time after considerable erosion, surface wateer began to percolate down into and through this same mineralized ground. This began to alter and dissolve and move and reorganize the original ore deposit minerals. Some material has been dissolved and carried away leaving a cavernous habit at some places. In other places, where the structure is still tight and the surface waters did not succeed very well in penetrating, the primary minerals may still be found quite fresh and undisturbed in their original relation to each other and the country rock. In still other places some of the ores have been oxidized, and carbonated and otherwise recombined with portions of free mineral elements forming a whole series of secondary products. Among these are the sulphate and carbonate of lead (Anglesite and cerussite), the molybdate of lead (wulfenite), hydrous iron oxide (limonite(. Many others are to be found but no others of equal prominence.

8. As deep as exploration work has gone these secondary effects are to be seen; but it is not to be expected that such pronounced oxidation will extend to much greater depth.

9. The primary minerals, however, may be expected to continue and carry the valuable metals in even more recoverable form than do the secondary products; such a change of conditions may be looked forward to with more than usual satisfaction.

10. It is probable that in addition to this change to primary character of ore, there will also be some change in the mineral mixture or proportions of the chief constituents. Zinc may be expected to increase and also iron and copper and probably silver, but lead may be expected to decrease in proportion with greater depth.

11. No sudden changes of any kind are likely to be encountered but at a considerably greater depth than has yet been reached, the mineral bearing solutions must have crossed the underlying limestone beds in order to reach the quartzite and there it may well be that disseminated ore will be found replacing the limestone."

Unquote.

In incorporating Dr. Berkey's geology and theory of ore deposition of the Hilltop mine in this report, I am not unlike the reputed elderly gentleman who had an inscription of the Lord's Prayer on a banner hanging at the foot of his bed. Each night before retiring he would kneel and point to the inscription and say,-"Oh Lord, them is my sentiments", and then climb contentedly into bed.

During the several weeks I spent on the Hilltop property I had ample opportunity to study the geology and confirm Dr. Berkey's findings; all of the minerals he mentioned are in evidence, with exception of molybdenite, deposited in the forms and evidently under the conditions he stated, and his theory of ore deposition is indisputable and acceptable, for many valuable ore deposits have been found following the tenets of the theory he advances.

In the case of the Hilltop mine there is no question in regard to the extent, to great depth, of mineralization, the problem remaining being only to determine if the mineralization has been sufficiently intensive to make ore shoots of needed magnitude to permit extraction of the ores and conversion into profitable market products, and this can only be determined by further exploration work. In my opinion the development results to date are sufficiently encouraging to warrant further exploration in the upper regions of the property, and deeper prospecting.

As deposits of marketable minerals the ore shoots, though so far as explored proved to be but comparatively small chimneys of ore, are more than are ordinarily encountered. The mineralization extends laterally over the entire length of 2 miles of the property and for several hundred feet in width on the surface -- and proved to be of as great, or greater, extent underground -- from which profitable shipments have been made, and proved to a depth of over 1200 feet on the dip os the deposits. As stated by Dr. Berkey primary mineralization came from below the igneous sources. The sedimentary formations in which the ore deposits occur have been proved, and measured, to great depth; oxidation has extended to the 1200 feet depth reached by exploration indicating a still greater depth to the source of mineralization and deposition of commercial

The deposits as developed to date have proved to be but limited mineralization, or emanations, in the fractures of the quartzite and at times partial local replacement of the limestone, by the mineral solutions from depth seeking egress through dynamic produced planes and crushed zones. Except on, and near, the surface where the shattering has been the greatest, the frattures have not been sufficiently large, or the limestone in its original or metamorphosed condition, adequately pervious for the formation of large bodies of ore. Not all of the quartzite has been shattered, the shattered zones appearing irregularly, and usually marked by transverse faults and pressure breaks -- hence the irregular occurrence of the so-called pipes, or chimneys, of ore.

It is very improbable that all of the ore bodies existing in the ground have been found in the level workings, drifts and crosscuts, and the comparatively few winzes and upraises. It is only by happy chance, through promiscuous "rambling" that the orebodies found through horizontal workings have been discovered. Deposits thus found were stoped and followed in winzes and upraises only to the limits of the ore and no attempts made to follow in vertical direction, up or down, the shattered, receptive "chimney" zones. The very nature of the ore deposits is such, as explained at considerable length by Dr. Berkey, that contiguous deposits cannot be expected horizontally but there is reasonable assurance that exploration in vertical directions, in proved transverse-shattered zones will develop contiguous, or mineral-connected deposits of ore. It has been proved by past development that the shattered mineralized zones extend at least to a depth of not less than 1200 feet, on the dip of the deposits, below the outcrop of the most important deposit, here, and hereinafter referred to as th "Blacksmith", and beside showing a good body of ore from the outcrop to over 150-ft depth (as far as explored from the surface) which is still practically untouched, at depths of over 500 feet (the Kasper tunnel level) and over 800 feet (the Gray tunnel level) bodies of commercial ore, of good volume, were encountered. During the years of 1924, 1925, and 1926, the last years of Hilltop mine operations, the control-assay records of Hawley and Hawley, Douglas, Arizona show that 231 cars of ore, a tonnage of 11,424 dry tons, were shipped showing an average of:

Gold	Silver	Lead	Zinc	Copper	Iron
Oz.	Ozs.	%	%	%	%
Trace	5.24	23.06	8.06	0.347	

Mr. Pat Calbert, now residing in Douglas, Arizona, who was in charge of underground work during the period mentioned above, advised me that the tonnage shipped was taken from the Kasper and Gray tunnels working, principally from the Kasper.

Though no bodies of commercial ore have been found in the deepest (Rehm tunnel) workings, the mineralization has continued strong, in transverse-shattered zones to this (1200-ft) depth, and occurrences of ore, mainly base in character (sulphides of lead zinc and copper) are in evidence, and apparently in replacement deposits in the limestone, near quartzite.

For an understanding of rock formation,- especially that of the quartzite stratum, or reef, which plays such an important part in the ore deposition scheme,- and to show the relation of the different tunnel-workings the accompanying rouch tracing of map prepared by G.L. Schultz for Dr. Berkey in 1919 of geologic cross section through Hilltop mountain on bearing of N 37°20' E is presented.

Blacksmith Tunnel Ore shoot.

At the top of the mountain, above the Blacksmith workings, the Blacksmith ore shoot crops out strongly, for a considerable width and is traceable for a few hundred feet westerly and several hundred feet easterly, where it has been prospected by shallow shafts and opencuts. Samples taken in untouched outcrop, and in the shallow surface workings, along a length of over 300 feet gave following assay results:

Sample No	Description	Gold Oz Per Ton	Silver Ozs. Per Ton	Lead %	Zinc %	Copper %
14	3-ft cut outcrop above tunnel	tr	1.04	16.30	9.00	0.10
15	Selected from dumps along outcrop	"	2.60	28.50	6.10	0.08
42	Ore from shallow shaft easterly	0.02	13.00	54.70	0.60	---
43	From dump 5' open cut "	Tr	3.20	16.10	17.70	---
44	Selected from dumps of open-cut, shaft workings along 40 feet strike	Tr	7.60	41.30	11.00	---

Where intersected by crosscut tunnel at point less than 100 feet below the outcrops shows a width of 11.50 feet, and for this width sampled as shown by assay results samples Nos. 8 and 9 below.

8	5.5' channel cut NW face at station	Tr.	5.60	40.00	6.00	0.20
9	6.0' " " " " " " continuation of sample cut #8	0.00	0.80	16.00	4.50	0.08
10	5' cut back dr.6' SE face #8-9	Tr	2.10	22.30	7.10	0.07
11	14" cut HW 22' SE	Tr	1.70	14.60	10.30	0.08

From the tunnel level where samples #8 to #11 were taken a winze was sunk to a reported depth of 100 feet, from where crosscuts and short drifts were run, all workings according to statement of Mr. John Hand, original owner of the Blacksmith mine who did the work, in ore. The winze working was reclaimed to a depth of 55 feet and found, as stated by Mr. Hand, all in ore; ore in foot and hanging walls and in both ends. At about 50-ft depth I cut a sample across the easterly end of the winze for the entire width of winze, 6.50' which assayed:

28	6.50' easterly and Bth winze 50' d.	Tr.	6.00	21.30	12.60	---

At the depth of 55 feet the winze was entirely blocked, or filled, by an immense boulder of solid ore, of several tons weight, of same character, as represented by assay of sample #28. The geologists not caring to see deeper, work was discontinued in the winze -- and the working is still blocked with the block of ore which sloughed from a cross fracture in the hanging wall of the vein. A pile containing possibly a ton of the boulder of ore is piled on the dump at the entrance of the Blacksmith tunnel.

As stated above the Blacksmith winze does not extend more than 100 feet below the tunnel level -- and all in ore -- and this same shoot, on the Kasper tunnel level, immediately south of the main crosscut tunnel, produced

for a length of less than 250 feet along the strike of the vein (hanging wall blue limestone and footwall shattered quartzite) the major portion of the 11,424 tons shipped in 1924-5-6 by Pat Calvert, and from the best information I could obtain upraises and winzes, from which stopes were made, did not extend, vertical distances, more than 100 feet above and 150 below the Kasper tunnel level. The ground from above the 100 feet from the Kasper tunnel level practically to the outcrops of the Blacksmith deposit is virgin -- a height of not less than 425 feet vertical distance. With the proved ore area shown on the Kasper level (see Map #3, plan of southeast stoped workings immediately southeast of the main, crosscut, Kasper tunnel) and the explored, practically untouched area in the Blacksmith workings, there is a virgin block of ground, mineralized, of dimensions not less than 250' (length) by 425' height and 10' (width), or a volume of 1,062, 500 cubic feet. Taking into consideration the discontinued, erratic occurrences of the ore chimneys not less than 1/3 of this block should be productive of ore of tenor approximating that shown by thell,424 tons of record shipped. This would amount to approximately 29,514 tons (using figure of 12 cu feet per ton). And an equivalent tonnage should be forthcoming, in the Blacksmith shoot along, between the proved areas on the Kasper and Gray tunnel levels.

Character samples from the immediate southeast area of the Kasper tunnel workings assayed as follows:

Sample No.	Description	Gold Oz. Per Ton	Silver Ozs. Ton	Lead %	Zinc %	Copper %
29	Boulders of ore in gob Chute #1	Tr.	5.60	35.00	5.90	
30	Ore in place hanging wall, winze, under Chute #1	0.00	2.20	24.40	2.30	
34	6" cut ore in place in back of stope near raise from Gray tunnel	0.00	8.40	36.80	17.00	0.12

The mountain side from the portal of the Blacksmith tunnel slopes very rapidly, and there is very little patio, dump, room. Mr. Hand stated that when he was doing the work in the Blacksmith tunnel workings the ore taken out and placed on the dump subsequently was lost down the mountain side. From appearances fully 200 tons of ore of high lead content must have traveled down the mountain slope; possibly 100 tons lodged immediately below the tunnel-level dump and the rest is strewn for several hundred feet below. This work was done by Mr. Hand for operators of the mine previous to the time it was acquired by the Hilltop Metals Mining Company. And the mining of the Hilltop M.M.Co. must have been equally wasteful for in the waste dumps at the SW portal of the Kasper tunnel much ore can be seen; one lot of from 50 to 100 tons of base ore dumped to the side of the main waste dump, and partly buried, sampled:

2	High grade base ore buried in dump, southwest portal Kasper tunnel, selected sample	Tr	9.00	32.10	28.60	0.09

The area on the Gray tunnel level, covering the Blacksmith shoot, has, judging from the empty stopes, been productive of a very considerable tonnage that was shipped. Character samples taken from the immediate area southeast of the crosscut (main) tunnel gave assay results of:

Sample No.	Description	Gold Oz /Ton	Silver Ozs. Ton	Lead %	Zinc %	Copper %
17	From Chute Nos. G-1&2 SE Gray	Tr	0.30	9.60	0.90	
18	Carbonate H.W. below "	"	1.80	40.60	1.30	
44A	18" oxidized ore in place	"	5.60	39.80	17.20	1.20
45	Narrow streak " " " near 44A	0.01	7.00	38.40	16.00	

What I believe will prove to be the extension of the Blacksmith deposit to the Rehm tunnel level, approximately 1150, vertical distance, below the Blacksmith tunnel level is showing in apparent bedded deposits. No detail sampling was undertaken in the Rehm tunnel workings on account of work being suspended soon after the workings were made accessible, for reason given above, but the few samples taken showed following values:

32	Massive pyrite in bedded ore deposit in drift top 170-ft Raise #1 Rehm	0.00	3.20			
33	Selected from bedded deposit per above description	Tr	16.40	21.00	91.30	0.19
40	Bedded mineralized matter Rehm Raise #1 190' above level	Tr.	0.50	1.80	11.90	
39	do above E side raise	0.00	1.40	3.10	--	0.28
40	Selected ore in place in cross fissures NW Dr. Rehm tunnel	0.02	24.40	19.90	4.90	--

A 10-shovel sample taken from cut into dump of from 50 to 100 tons of base ore on side of waste dump from portal of the Rehm tunnel, which the party who trammed the ore out for the Hilltop Metals Mining Company said came from the caved workings from the top of the Chute #1, Rehm, above the190 ft. from tunnel level, gave the following:

27	Description above	Tr.	10.00	5.40	0.60	0.23

From the appearance of the ore sampled, the pile of which Sample #27 is representative, was mine-run of ore and rock taken out in search for oxidized, shipping, ore.

Map #4, on same sheet with Map #3, shows location of the Chute #1 (or Raise #1) Rehm samples.

Maps Nos.1 and 2 show sampling and assay results of ore (mainly base) occurring in shoots in the northwest workings of the Gray and Kasper tunnels workings. These shoots are entirely separated from the SE ore shoots of the Gray and Kasper and have not been explored above or below the tunnel levels to any great extent. Surface indications above these shoots are encouraging and the shoots should be prospected, vertically from the tunnel levels.

The ores in the two shoots to the northwest occur principally in cross fractures in the quartzite and limestone. Assay averages of samples for the two northwest shoots are:

Sample Nos.	Description	Gold Oz/T	Silver Oz/Ton	Lead %	Zinc %	Copper %
201-287	Cut samples Gray assay Map #1					
	Average 87 samples	Tr.	1.78	7.56	5.22	0.24
301-306						
311-319						
321-324	Cut samples Kasper assay map #2					
	Average 19 samples	Tr.	5.67	19.96	4.23	0.60

Other, character, samples taken in the northwest workings of the Gray and Kasper tunnel workings:

18A	10" cut sample base raise, NW drift Gray	0.00	Tr.	30.40	10.70	2.30
19	Blotches side NW Dr.Gray 150' NW sample #18A	0.00	1.60	20.30	10.54	5.60
288	From gob raise #1N Gray	Tr	12.00	27.90	0.80	Tr.
289	" " " " "	Tr	3.50	14.40	2.10	0.07
307	From gob stope #4 N Kasper	0.02	37.40	43.70	0.20	0.13
308	From gob stope #2 N "	Tr	6.40	20.50	7.50	0.27
309	" " " #3 N "	Tr	11.20	36.20	0.40	0.10
310	" " " #5 N "	Tr	11.80	39.80	0.40	0.16
31	" " " #2N "	0.11	41.00	48.10	0.40	0.19

The gold content result of sample #31 is the highest obtained in all the Hilltop samples.

Judging from the small stopes a limited tonnage was shipped from the northwest workings of the Gray and Kasper. The ore sampled, however, consisted for most of sulphides, in scattered veinlets, and an immense tonnage, which is not proved or indicated, would be necessary for profitable milling. However, ground above should be prospected for oxidized, high-grade chimney ore, and below for possible bedded base ores.

The Gray tunnel workings are open for inspection as far as developed, but there still remains much inaccessible ground in the Kasper workings. According to the plan shown on the large working map at the Hilltop mine office hhere is a large area of ground that has been productive beyond, southeasterly, the ground surveyed, and mapped by us (Map #3), beneath which above to the surface and below to the Gray level practically no exploration work has been done. The surface indications above this area are good, and good bodies of chimney ore have been found in the Dad Fife and Long Tunnel workings at considerable distances southeasterly beyond the fartherest extreme of the Kasper workings. This territory has good possibilities and should be prospected, both from the surface through the Dad Fife and Long Dump workings, and from the Kasper (southeast) level.

Samples from the Dad Fife and Long Dump workings assayed:

Sample No.	Description	Gold Oz/Ton	Silver Oz/Ton	Lead %	Zinc %	Copper %
16	Assorted ore on dump Dad Fife Tunnel	Tr	6.50	43.80	3.10	Tr.
35	Surface under outcrop cut N. shaft, Long Dump	0.02	35.20	41.60	0.00	0.00
36	8" cut ore north side S. shaft, (Long Dump) about 25' depth	0.02	41.40	57.00	0.20	Tr.
37	Assorted ore on dump, Long Dump	0.0	27.20	43.60	0.50	

The Dad Fife and Long Dump workings are at high elevations, and the Long Dump accessible only by trail; the workings are at the very top, or crest, of the quartzite spine of the range. The deposits, if found to be of commercial value, should be worked through extended Kasper tunnel workings.

The map shows the Dad Fife workings to consist of several hundred feet of crosscuts and drifts. The workings are caved and inaccessible.

The Long Dump workings are accessible to a depth of about 80 feet from the surface, through an incline shaft that is said to be 100 feet deep/ The workings show exposures of good ore, in oxidized zone. A very good looking prospect. Very little stoping has been done -- possibly a few hundred tons were produced, and the ore remaining is found at the sides of the stoped ground, from 10" to 18" in width.

The Kasper and Rehm tunnel workings are connected by a raise which from soundings is open, but devoid oftimbers from the Kasper to a little below the Gray tunnel level, from which point, to the Rehm level, it is evidently filled with rock and rotted timbers. Should ores in commercial bodies be developed in the Gray, Kasper, Blacksmith, Dad Fife and Long Dump areas it could be economically handled through the Rehm-Kasper raise, and delivered to a mill below the Rehm tunnel dump on the northeast side of the mountain, the present Hilltop camp location.

During the time I was at the Hilltop an average of about 60 gallons of water per minute flowed from the Rehm tunnel.

Appended to this report are sheets showing assay results of "promiscious" character samples, and cut samples in Kasper and Gray workings, taken during my stay on the property.

For future prospect I suggest, and recommend:

(DELETED)

* *

Going from Tucson the Hilltop property may be reached by a good road 27.7 miles from Sam Simon, or by taking a shorter route through the Chiricahua National Monument of the "Wonderland of Rocks", and down, four miles, of rough road in White Tail canyon -- a very picturesque, delightful drive.

Yours truly,

Tucson,Arizona,
June 9, 1938.

F.H. Lerchen

Add.

In the Tucson office of the Eagle-Picher Mining & Smelting Co. is a tracing drawn to scale of 150 feet to the inch showing the locations of all of the mining claims of the Hilltop mine, and all of the different workings, and triangulation points established by last opera-

tors. And in the office at the Hilltop mine is a workingmap, to scale of 1 inch equals 50 feet, showing all the workings in, of course, greater detail than the 150 to 1 scale map.

ASSAY RESULTS OF

CHARACTER SAMPLES TAKEN IN HILLTOP MINES
BY
F. H. LERCHEN
From December 14, 1937 to April 10, 1938

Sample No.	Description	Gold Ozs/T	Silver Oz/T	Lead %	Zinc %	Copper %	Iron %
1	In place 1st E. Dr. Kasper tunnel	0.02	16.00	65.80	0.20	0.18	4.80
2	High grade buried in Dump Kasper W.	Trace	9.00	32.10	28.60	0.09	3.00
3	Sulphides dump Rehm Adit - garnet	0.02	34.00	9.80	0.40	0.08	20.10
4	Base ore, garnet gangue Gray dump	Trace	3.00	15.80	3.30	2.36	11.80
5	Heavy black sulphide ore " "	0.01	7.60	35.00	21.10	0.50	2.30
6	Float, above kasper tunnel	0.00	0.50	9.10	---	---	---
7	Ore in place 29' E. sample #1	Trace	1.20	10.50	0.90	1.00	---
8	5.5' cut NW Face Blacksmith adit	"	5.60	40.00	6.00	0.20	8.70
9	6.0' cut continuation sample #8	0.00	0.80	16.00	4.50	0.08	3.40
10	5.0' cut back Dr. 8' SE #8 & #9	Trace	2.10	23.30	7.10	0.07	2.40
11	14' cut H.W. 22' SE from	"	1.70	14.60	10.30	0.08	3.30
12	Chute No. 5 N NW Dr. Gray Adit	0.00	1.40	23.30	10.00	0.12	1.70
13	Near 'raise extreme NW Dr. Gray	0.00	1.40	29.00	13.20	3.36	3.10
14	3' cut outcrop surface Blacksmith	Trace	1.04	16.30	9.00	0.10	---
15	Selected from Dumps surface "	"	2.60	28.50	6.10	0.08	---
16	Ore from Dump Fife adit	"	6.50	43.80	3.10	Tr.	--
17	Chutes G-1 & 2 S. S.E. Dr. Gray Adit	"	0.30	9.60	0.90	"	29.10
18	Carbonate (red) H.W. below above	"	1.80	40.60	1.30	--	7.40
18A	10" cut base 'raise NW Dr. Gray	00	Tr.	30.40	10.70	2.30	3.20
19	Blotches side Dr. 150' NW #18A	0.00	1.60	20.30	10.54	5.60	8.50
20	Disseminated ore in dump Rehm Adit	0.00	0.80	7.00	1.10	Tr.	0.50
21	Confirmation rejects Sample #3	Trace	2.30	1.80	---	---	---
22	Confirmation rejects Sample #5	0.00	7.20	32.80	---	---	---
23	Coned Fines crib plat. Rehm Dump	Trace	9.00	4.30	1.00	---	19.20
24	Broken (over) from above' coarse	"	15.80	6.20	1.20	---	---
25	Fines ore loading plat. Hands Pass	0.00	10.30	34.40	9.60	---	---
26	Coarse ore " " " "	Trace	5.80	23.90	25.20	---	---
27	10th shovel sample base ore Rehm Workings -- sample cut in Dump	Trace	10.00	5.40	0.60	0.23	9.90
28	50' depth winze Blacksmith, 6½ cut across S.E. Face, end, winze	"	6.00	21.30	12.60	---	---
29	Boulders ore in much Chute #5m Survey Station 23 S.E. Dr. Kasper	"	5.60	35.00	5.90	---	---
30	Ore in Place H.W. Winze Chute #1 Station #12, S.E. Dr. Kasper	0.00	2.20	24.40	2.30	---	---
31	From muck in Chute #2 N Kasper	0.11	41.00	48.10	0.40	0.19	---
32	Massive Pyrite Bedding Plane top 165-ft 'raise #1 Rehm	0.00	3.20	---	---	---	---
33	Selected from ore in place "do" 165' R	Trace	16.40	21.00	9.30	0.19	---
34	6" ore in place back stope near raise from Gray Adit, Kasper level S.E.	0.00	8.40	36.80	17.00	0.12	---
35	Under outcrop, Long Dump, N. Shaft	0.02	35.20	41.60	17.00	0.12	---
36	6" cut ore N. side S. Shaft Long Dump	0.02	41.40	57.00	0.20	Tr.	---
37	Assorted ore on dump, Long Dump Claim	0.04	27.20	43.60	0.50	---	---

Sample No.	Description	Gold Oz/T	Silver Oz/T	Lead %	Zinc %	Copper %	Iron %
38	Outcrop on surface above S.E. Dr. KasperTunnel	Trace	0.50	7.70	0.20	---	---
39	Bedded mineralized matter above Chute #1, 190' above adit, Rehm W. side	0.00	1.40	3.10	---	0.28	---
40	Bedded mineralized matter E. side raise, Rehm, 190' above level	Trace	0.50	1.80	11.90	0.08	---
39A	Selected ore in place Sur.Sta.0113, N.W. Drift Rehm	0.02	24.40	19.90	4.90	0.00	---
40A	Bedded ore in place, 18" cut, extreme N.W.workings Rehm workings	0.04	1.80	14.60	0.40	Tr	---
41	Selected from dumps old workings between Blacksmith and S.W. Kasper Tunnel portal -- shallow surface wks	Trace	8.20	36.50	2.70	---	---
42	Ore from shallow shaft near surface Survey Station #18, Blacksmith	0.02	13.00	54.70	0.60	---	---
43	Dump 5' open cut surface Blacksmith	Trace	3.20	16.10	17.70	---	---
44	From open cuts and shafts, dump ore, Survey stations 14-15-16 Blacksmith	Trace	7.60	41.30	11.00	---	---
44A	18" cut oxidized ore south side XC S.E. Gray workings. Sur. Sta. 216 S 55°W 29.00'	Trace	5.60	39.80	17.20	1.20	---
45	Narrow streak high grade ore south side XC, SE Gray Wks. Sur. Sta. 216 S 30°W 39.00'	0.01	7.00	38.40	16.00	Tr.	---

Note:

The average of 87 "cut" samples in Gray workings.

Trace	1.78	7.56	5.22	0.24	

The average of 19 "cut" samples in Kasper workings:

Trace	5.67	19.96	4.23	0.60	

Shipments of 231 cars of ore, total of 11,424 tons, from the Hilltop Mine (mainly from Kasper Tunnel workings) made in years 1924-25-26 show average:

Trace	5.24	23.06	8.06	0.347	16.20

Memo by F.H. Lerchen,
Tucson, Arizona,
May 12, 1938.

Assay Results
of
Cut Samples Taken in West Workings
Gray Tunnel-Hilltop Mine
February-March-April 1938.
By
F. H. Lerchen
(Sample cuts surveyed and mapped and marked in workings).

Sample No.	Description	Feet Cut	Gold Oz/T	Silver Oz/T	Lead %	Zinc %	Copper %
201	Horizontal S. side 15' S.W. Sur. Sta.0212	4.9	Tr.	3.90	15.80	1.00	---
202	" " " 9' " " " "	5.10	Nil	1.00	3.60	2.80	---
203	" " " 4' " " " "	5.70	Tr.	0.30	11.40	9.80	---
204	" W " 6' S.E. " " 0211	5.00	"	2.80	8.50	1.00	0.06
205	" " " 12' " " " 0212	5.00	"	0.20	8.10	1.10	0.05
206	" " " 15' " " " "	5.00	Nil	Tr	0.40	0.60	Tr
207	" N " 15' S.W. " " "	5.20	Tr.	1.00	20.40	9.20	--
208	" N " 12' " " " "	5.00	Nil	0.50	11.00	11.80	Nil
209	Across Back 13' " " " "	5.20	"	Tr.	5.20	3.40	0.08
210	" " 9' S.E. " " "	6.00	Nil	0.10	2.20	2.40	Nil
211	Across ramp floor Raise #3 N.	4.10	Tr.	2.00	17.20	3.80	1.38
212	" " 5' above sample #211	3.00	Tr.	0.50	6.20	3.40	0.36
213	" face Dr. " 9' S.E. 212	2.90	Tr	0.50	11.20	4.80	Tr
214	Back cut, width ore Sur. Sta. 0212	3.90	"	0.70	12.80	8.60	Nil
215	" " " " 19' SE "	4.70	Nil	Nil	1.00	13.30	Nil
216	Horizontal W. side 20' SE Sur. Sta 0212	4.90	"	0.30	1.20	0.40	Tr.
217	" " " 25' " " " " "	5.70	"	0.30	3.60	0.60	Nil
218	" " " 30 " " " " "	5.10	Tr.	1.10	16.90	4.10	0.37
219	" " " 34' " " " " "	4.10	Nil	1.20	7.10	3.60	Tr.
220	" " " 38' " " " " "	5.10	Tr.	2.30	28.80	3.40	Tr.
221	" " " 42' " " " " "	4.60	Nil	1.40	23.10	7.00	0.10
222	" " " 48' " " " " "	5.40	"	0.20	4.80	2.70	Tr.
223	" " " 52' " " " " "	5.00	"	0.60	6.60	7.60	"
224	Across back 42' " " " "	6.60	"	1.00	5.70	0.60	"
225	" " 27' " " " "	5.40	Tr	0.20	5.10	2.30	"
226	" " 55' " " " "	4.90	Nil	0.10	1.10	0.40	"
227	" " 19' S.W." " "	4.20	"	0.10	0.50	0.30	"
228	Horizontal E. " 10' S.E." " 0211	5.00	"	0.60	4.30	7.10	"
229	Vertical N. " 24' SW " " 0208	5.80	"	2.30	1.70	0.70	"
230	" " " 17' SW " " 0210	5.00	"	1.60	1.30	0.20	"
231	" S " 15' SW " " 0208	5.10	"	0.80	3.80	0.40	"
232	" E " 12' " " " 0210	4.90	Tr.	1.90	0.60	0.50	"
233	" N. " 18' " " " 0208	4.80	Nil	2.30	1.50	0.40	"
234	" E. " 25' " " " 0210	5.60	"	10.80	7.90	0.50	"
235	" S. " 20' " " " 0208	5.40	"	5.90	9.90	1.60	"
236	Across back 3' SE " " 0210	5.00	"	2.10	1.80	1.30	"
237	" " 16' SW " " 0208	6.00	"	0.40	0.50	0.60	0.64
238	" " 13' SW " " 0210	5.50	"	2.30	2.40	0.30	Tr.
239	Brow Back Dr.Raise 4N " " 0213	4.00	Tr	1.30	9.50	5.40	0.46
239	Check cut	4.00	Nil	2.70	11.20	2.40	0.85
240	Vertical S. side 9'E(near) " " 0215	5.70	Tr.	3.60	6.30	2.60	0.64
241	Across back Spad #1 37'E " " 0215	3.40	Tr.	4.00	3.70	1.80	0.64
242	" " 31' E " " 0215	3.00	"	6.60	5.70	2.40	0.28
243	Vertical S. side 25' E " " 0215	3.30	"	4.80	8.90	5.80	0.36
244	Across back 18' E " " 0215	3.50	Nil	2.90	10.40	5.30	0.20
245	Across ramp Raise #4 N. 42' E " 0215	2.00	Nil	1.20	12.60	11.90	2.12
246	Across back & Vert. 43' E " " 0215	3.70	Tr.	5.80	20.00	23.60	1.54

Sample No.	Description	Feet Cut	Gold Oz/T	Silver Oz/T	Lead %	Zinc %	Copper %
247	Across back 52' E. Sur. Sta. 0215	1.47	Nil	3.10	1.50	0.03	0.08
248	Vertical S. side 15' E. Sur. Sta. 0215	3.10	"	0.60	8.80	5.50	1.28
249	" W " 3' S " " "	5.00	"	0.90	9.20	1.10	0.01
250	" E " 9' W " " 0213	5.60	"	1.20	5.50	1.00	0.54
251	" S " 12' E " " 0215	4.00	"	0.90	9.00	5.50	0.18
252	" " " 21' " " " "	5.40	"	3.50	6.10	2.50	0.10
253	" E " 15' W " " 0213	3.10	"	1.60	7.10	0.90	0.10
254	" " " 20' " " " 0213	3.40	"	1.40	11.80	1.30	0.08
255	" E " 1' W " " 0215	4.10	"	0.60	6.30	3.60	0.11
256	Raise #3N up 13' N side	4.00	"	0.80	13.80	7.90	0.10
257	" #5N up 15' north side	4.20	"	3.10	13.70	21.00	0.15
258	Vertical & back E side 25' W Sur. 0213	3.10	"	1.90	13.90	1.70	0.14
259	" S side 11' E. Sur. Sta 0219	3.00	"	1.20	12.50	9.80	0.13
260	Across back 6' E. Sur. Sta 0219	2.50	"	1.00	13.90	7.30	0.15
261	Horizontal S. side 12' E. Sur.Sta 0215	5.00	Tr.	0.60	7.60	5.20	0.82
262	Vertical S side ¼' W. " " 0219	5.10	Nil	9.10	8.20	0.90	0.07
263	Across back 5' E. " " 0215	3.10	Tr.	1.00	7.80	7.10	0.27
264	" " 6' W " " 0219	2.80	Nil	1.30	3.40	0.30	0.08
265	" " 30' W " " 0213	3.50	"	1.80	2.50	0.20	0.06
266	Vertical W side 35' W. " " "	3.70	"	1.70	8.60	0.50	0.14
267	Across E. side Raise #5 N up 20'	3.80	"	3.00	21.80	27.80	0.64
268	" N " " #3 N up 18'	2.00	"	0.90	12.20	11.80	1.66
269	" W " " #5 " " 20'	2.90	"	2.30	20.40	12.70	0.17
270	Horizontal N. side 1' E. Sur.Sta. 0212	4.90	"	1.00	8.20	3.80	0.10
271	Vertical S side 30' S Sur Sta 0202	6.10	"	0.80	6.60	7.00	0.08
272	" S " 35' S " " 0202	5.20	"	2.60	1.40	0.50	0.11
273	" " " 25' " " " "	5.00	"	2.70	11.20	6.00	0.09
274	" " " 20" " " " "	2.50	"	0.80	9.80	4.60	0.08
275	" " " 13' W " " 0206	5.60	"	1.80	14.50	12.70	0.80
276	Across back 46' S " 0202	4.90	"	1.00	8.40	5.20	0.05
277	Vertical S side 8' W " 0206	6.70	"	0.80	7.80	9.40	0.05
278	" S " 1" " " 0206	6.20	"	1.80	6.20	8.70	0.04
279	" " " 6' E " "	5.10	"	2.80	17.00	19.30	0.31
280	" N " 1' E " "	2.60	"	0.80	3.90	5.50	0.06
281	Across back 3' E " "	4.60	"	2.40	6.00	14.20	0.08
282	Vertical & Across back N side 10' E "	5.10	"	2.00	5.90	6.20	0.10
283	" S side 15' E Sur. Sta "	5.20	"	0.90	5.60	3.60	0.06
284	" & back 10' W " " 0219	4.80	"	0.50	0.30	0.50	0.05
285	Across back 65' E. " " 0217	3.60	"	5.00	6.40	11.00	0.05
286	Raise 5 N. up 27' N side	5.10	"	1.60	14.50	12.30	1.35
287	v " " " " 27' S side	2.70	"	1.60	4.80	4.00	0.94
288	Ore selected from gob pulled from R 1 N Coarse		Tr.	12.00	27.90	0.80	Tr.
289	" " " " " " R 2 N "		Tr.	3.50	14.40	2.10	0.07
	Note: Average of 87 cut samples			1.78	7.56	5.22	0.24

Samples 239 "check cut" and 288 and 289 were excluded in determining average above.
Memo by F.H. Lerchen, May 20, 1938.

Assay Results of

Channel-Cut and Stope-Fill (gob) Samples Taken in The
Kasper Tunnel Workings of the Hilltop Mines
Cochise County, Arizona
March-April, 1938
By
F.H. Lerchen

(Sample cuts surveyed, and mapped, and marked in workings: stope-fill (gob) samples consisted of selected coarse ore and "grab" fines).

Sample No.	Description	Feet Cut	Gold Oz/T	Silver Oz/T	Lead %	Zinc %	Copper %
301	Across vein bottom winze Station 0314	5.10	Nil	2.40	19.80	8.60	0.09
302	" " 25' W 'winze) " "	3.00	"	9.40	20.50	0.70	0.14
303	" " 20' W " " "	2.00	0.02	12.20	20.60	0.30	0.47
304	" " collar winze 17' W "	1.50	0.02	7.40	33.00	0.30	0.04
305	Back cut 19' S. Station 0327	3.00	Tr.	2.80	11.60	5.50	0.13
306	Horizontal" " " "	3.00	Tr	3.80	19.60	6.40	0.10
307	Selected ore from Stope #4 N	---	0.02	37.40	43.70	0.20	0.13
308	" " " " #2 "	---	Tr.	6.40	20.50	7.50	0.27
309	" " " " #3 "	---	Tr.	11.20	36.20	0.40	0.10
310	" " " " #5 "	---	Tr.	11.80	39.80	0.40	0.16
311	Horizontal wall 10' E.old Sur.Sta 86	5.00	Tr.	2.40	13.00	0.60	0.08
312	" " 15' W. " " " 86	5.00	Tr.	5.40	18.30	0.50	0.42
313	Back cut 3' W Sur. Sta 0328	3.00	Tr.8	3.80	11.80	0.20	0.11
314	Horizontal wall 16' W. "	5.00	Tr.	0.40	8.40	3.10	Tr.
315	Face drift 37' W "0329	2.00	Tr.	4.80	18.50	0.30	Tr.
316	Back cut 15' E. " 0329	3.00	Tr.	9.60	27.10	0.40	0.05
317	" " 5' W " 0329	3.00	0.02	6.20	35.40	0.30	0.10
318	Horizontal 36' W " 0327	3.00	0.04	23.40	38.10	0.80	0.05
319	Back cut 12' N. old Sur.Sta. #84	3.00	Tr.	5.00	21.80	1.00	0.35
320	Vertical cut South W. 110' S Sur.Sta #7	1.00	Tr	0.30	7.70	10.80	0.07
321	Fines from gob in #4 N. Stope	000	Tr.	2.80	6.10	0.40	Tr.
322	Vertical cut South W. 3' S. Sur.Sta 6	1.00	Tr.	3.60	20.10	14.60	3.51
323	" " " " 12' " " " 6	1.00	Tr.	3.80	20.40	24.10	4.21
324	" " " " 157' " " " 7	1.00	Tr.	0.30	13.40	1.90	1.58
	Average 19 cut samples per assays above		Tr.	5.67	19.96	4.23	0.60

Control assay certificates of Hawley & Hawley, As ayers, Douglas, Arizona, in the files, office of the Hilltop Mines, Hilltop, show shipments of 231 cars of ore, principally from the Kasper Tunnel workings, made in the years 1924-25-26,

Tr	5.24	23.06	8.06	0.347

Memo by
F.H. Lerchen,
Tucson, Arizona,
May 21, 1938

11/18/40 Tucson - Mrs. L.

Hilltop Mine - Cochise County

O. O. Mattox, owner.
Velardena - Durango, Mexico.
H. O. Ward - resident representative.
Hilltop - via Rodeo, New Mexico.
Has working interest and authority from Mattox to make deal, subject to mortgage held by Eagle Picher Co. of about $18,000 (includes interest).

Deal:

Want $50,000 for mine.
$20,000 cash to clean mortgage. Difference advance royalty.
Balance 10% royalty on smelter returns.
Ward would like to run store and post office.
Minimum $250 a month - applied royalty.

History:

Operations started about 1913.
Hilltop Metals and Mining Co. sold about $5,000,000 in stock - spent $1,500,000 at mine.
Shut down in 1925 - due S.E.C. complications. Ten men (stockholders) let wages accumulate to $10,000. Labor then foreclosed and the 10 bought in at Sheriff's sale in 1926.
Mattox took option in 1935.
Interested Eagle Picher in 1937. Made 4 months examination - 16 men working - Lerchen - engineer - OK'd property.
A geologist said it would not stand 400 ton mill.
Eagle Picher advanced cash to clear title for Mattox on Lerchen report - contemplated taking over - until geologist reported.

Location:

From Rodeo, New Mexico to mine - 25 miles dirt road.
From San Simon to mine - 25 miles dirt road.
All easy grades on both roads.
Elevation camp - 5900'
Top of mountain - over Kasper Tunnel 7700'
Rhem Tunnel 6050'
Gray Tunnel 6450'
Kaspar " 6750'
Blacksmith " 7220'
20 adjoining claims in group.
Mattox holds 6 other adjoining claims.

General:

The old company shipped 11,000 tons lead-silver ores.
Ample water for camp and probably for a 50-ton mill from Rhem Tunnel.
In valley - 1/2 mile from camp - well could be driven to give 200 ton mill ample water - lift from valley to camp - 330 feet.
Buildings - 1-7 room modern house.
16 camp houses - 2 to 3 rooms
P.O. Bldg., warehouse, power house, change room, office, assay office.
All in liveable condition needing only slight repair.
Running water in camp from Rhem Tunnel.
On east slope - 8 to 10" of snow - maximum - may stay on

2 to 3 weeks. 1 mile from camp no snow.

Blacksmith Tunnel - Elevation 7220 feet.
400 ft. of drift
60 ft. of winze (all in good ore) - 8 ft. wide at bottom of winze.
Outcrop shows 400 ft. in length on surface.

Kasper Tunnel - Elevation 6750 ft.
3,000 ft. or over - open both sides of mountain.
4,500 ft. of lateral drifting.

Gray Tunnel - Elevation 6450 feet.
2,000 ft. straight away.
1,800 ft. lateral drifting.

Rhem Tunnel - Elevation 6050 feet.
4,000 feet straight away.
1,500 feet lateral drifting.

Rhem, Gray and Kasper Tunnels are interconnected with an ore pass (raise).

Ore Shipments:
Main shipments - 11,000 tons from ore body on and above Kasper tunnel.
Same ore body - cut - but not well developed on the Gray and Rhem tunnels.
Ore in Blacksmith Tunnel winze not cut on Kasper tunnel.
Ore body 250 to 300 ft. long - 10 to 30 ft. wide.
Various crosscuts and raises on all tunnels.
Some show limited ore bodies.

Major Equipment:
Twin Snow Diesel Engine - Direct connected with Allis-Chalmers generator - 300 to 320 HP.
Slowspeed compressor - 2 - 10 x 14 cyl.
Laidlow - Motor mounted between cylinders
10 ton overhead crane.
Switch Board - Water softner and oil filter.
Equipment - old - heavy - in fine shape however.
New in 1916 - used 9 years.
Fully overhauled just before shut down.

Remarks:
Only one sizeable ore body exposed.
Numerous small showings of ore elsewhere.
Good ore in Blacksmith Tunnel - not cut in Kasper Tunnel.
Main values - lead and silver.
Ore body a lime replacement.

REPORT

Report on property of North Hill-Top Extension Mining Company, by Dean G. M. Butler, Geologist and Mining Engineer, Dean College of Mines and Engineering, Univ. of Arizona.

COPY

SOURCE OF DATA HEREIN PRESENTED:

This report is based on a personal examination of the property of the North Hill-Top Extension Mining Company and adjacent territory, made by the undersigned on June 10th and 11th, 1917.

Most of the first day was spent on the property of this company; the rest of the time was occupied in studying the geological conditions in the district and the occurrence of the ore deposits in the neighboring mines and prospects, including the property of the Hill Top Metals Mines Company which, through the kindness of Mr. R. O. Fife, it was possible to examine in some detail.

The time available for the examination was insufficient to merit of the accurate tracing of the veins or contacts, but a good general idea of the conditions prevailing on the property of the North Hill-Top Extension Mining Company was secured, and it is believed that the conclusions herein stated, although necessary somewhat tentative, are conservative, and are thoroughly justified by the facts observed.

OBJECT OF THE EXAMINATION:

The examination was made for the purpose of ascertaining whether the ore deposits known to exist on the property under consideration are of such size and contain ore of sufficient high grade as to make it possible to mine them profitably. Information was also sought relative to the possibility of developing larger ore bodies or richer ores beyond the shallow workings of the property. It was recognized that too little work has been done to make it possible to estimate the probable tonnage or the grade of the ore available, so little sampling was attempted, and most of the time was expended upon geological observation.

EXTENT AND LOCATION OF THE PROPERTY:

The property of the North Hill-Top Extension Mining Company consists of thirty full mining claims (unpatented) which lie about twenty miles a little west of south of San Simon, Arizona, on the eastern side of the Chiricahua Mountains, in the California Mining District. There are fair automobile roads from San Simon, and Rodeo, New Mexico, to the property, and at comparitively small expense these can be put in good shape for the use of auto trucks, giving down hill haul to railroads at San Simon, Arizona, and Rodeo, New Mexico.

The writer made no attempt to investigate the title of the property.

Note: We hold only 10 of the most important claims now, those where assays were made from in this report.

GEOLOGY OF THE DISTRICT:

The ore involved was once an extensive body of water in which thick layers of carboniferous limestone and lesser amounts of sandstone and a little shale were laid down in nearly horizontal layers. Probably these were covered with thick deposits of other sediments afterwards removed by erosion, and then the whole mass covering the area now included in the Chiricahua Mountains was squeezed, folded, and warped upward until a large part of the sediments mentioned occupied a position far from and above their original position.

The pressure and other factors involved in this upswelling changed some of the limestone to marble, the sandstone to quartzite, and the shale to slate, and tilted the beds upward until they are now usually more vertical than horizontal. At some time after the beds were laid down (probably during or after the upfolding) quantities of molten earth material were forced upward through fissures from one or more reservoirs far below the surface. On cooling this material formed quartz-porphyry, ryholite, andesite, diabase, basalt or malpais (known locally as the iron dike), and perhaps other varieties of igneous rocks. These occur as dikes cutting across the sediments and as more or less irregular intrusions of various extent. Their presence complicated the structure, and a detailed geological map would have to be prepared before the course of events could be outlined with any degree of exactitude.

Sometime after the formation of the beds or strata of limestone and quartzite and of the igneous dikes and intrusions of mineral solutions (expelled probably from the solidifying reservoirs of molten material below) across through fissures, zones full of closely spaced cracks, or along contacts, and gradually deposited the ore and gangue materials as veins and shear-zones. Some percolation of mineral solutions and consequent deposition of the ore in the adjacent rocks occurred, and it is likely that at certain points, mineral solutions, dissolved and replaced with ore.

Finally, wind, rain, and stream erosion have worn down the valleys, carved out the mountain peaks and exposed beds, dikes, veins, etc., one deeply buried.

NATURE OF THE ORE DEPOSITS:

A considerable number of veins or shear-zones have been located on the property and several open cuts or shallow shafts have been put in on them, but most of the latter contained water at the time of the examinations, so could not be examined. Although some of the other deposits may possess merit, it appears probable that two are more important than the others. One of these, which is herein designated the Razzle-Dazzle vein, has been exposed in two shallow shafts in the bottom of the gulch on the Razzle-Dazzle claim. As these shafts contained water, the deposit could not be examined, but Mr. E. D. Hall states that one shaft showed four feet of ore, and there is certainly a quantity of good ore on the dump. It contains considerable galena (lead sulphide) and some pyrite (iron sulphide), and a general sample assayed 26.5 ozs. of silver per ton, a trace of gold, 0.14% copper and 31.6% lead. Leaving the small amount of copper present out of consideration, such ore is worth at the prices current at this date about $96.35 a ton. This ledge can be traced to the northwest at least to the middle of Midnight No. 1 claim, and the appearance of the outcrop

indicated that it is a shear-zone rather than a fissure vein. It is in rhyolite near and parallel to a dike of diabase. Near the two shafts just mentioned, another shaft which could not be examined is said to have exposed a lead of good copper ore.

COPY

Some distance north of the workings just mentioned, on the Midnight No.1 claim, some shallow openings exposed a small fissure vein, herein designated the Midnight No. 1 vein. This varies from nothing up to about eight inches wide in the exposure mentioned, strikes south about 40° W. (magnetic), and dips 55° N.W. The country rock is quartz porphyry. The vein contains considerable galena, and a sample of the ore on the dump assayed 55.1 ozs. silver per ton, 0.13 ozs. gold per ton and 62.9% lead, worth about $196.28 per ton at current quotations.

The vein last mentioned can be easily traced to the southwest and intersects the Razzle-Dazzle vein near the center of the Midnight No. 1 claim. Southwest of this intersection on the Midnight No. 2 claim in the bottom of the gulch, a shallow incline shaft now partially filled with water has been sunk on the Midnight No. 1 vein, which here is at least thirty-six inches wide, and is in quartzporphyry. The footwall half contains considerable sphalerite (zinc-sulphide), arsenopyrite (arsenic iron sulphide), and a little galena; and the wall rock adjacent thereto is quite heavily impregnated with sphalerite and galena. The hanging wall half of the vein is minerallogically exactly like the material shown on Midnight No. 1 claim, and practically all the ore mined therefrom is said to have run very well in silver and lead, and has been shipped.

A considerable quantity of the foot wall ore is on the dump, and a sample of this assayed 3.5 ozs. silver per ton, 0.07 ozs. gold per ton, 6.7% lead, and 14.7% zinc, worth at present quotations about $46.25 per ton, provided the sphalerite can be separated from the galena. This may present some difficulties, but equipment suitable for this purpose can doubtless be secured. A specimen of the mineralized wall-rock adjacent to the foot wall of this vein assayed 3.1 ozs. silver per ton, a trace of gold, 6.1% lead and 2.25% zinc, worth $21.20 per ton at current quotations. Some distance up the hillside above the incline in the bottom of the gulch on the Midnight No. 2 claim, a short tunnel has been driven on Midnight No. 1 vein, but this tunnel was allowed to swing to the right, and the vein is probably 10 or 15 feet southeast of the breast. A thick belt of limestone occurs not far beyond breast of this tunnel and it is quite possible that the Midnight No. 1 vein may be accompanied by large replacement deposits in this limestone. About 200 feet south of the mouth of the tunnel just mentioned an open cut has exposed a shear-zone three to four feet wide. A sample taken therefrom assayed 2.0 ozs. silver per ton, 0.01 ozs. gold per ton, 1.1% lead, 8.7% zinc, worth about $20.65 at current metal prices.

promising prospect, not a mine, so its value is largely speculative. The geological conditions are, however, favorable and good ore certainly exists on the property. The limestone, quartzite, basalt, (iron dike), and other formations on the property under consideration can be traced directly into the ground of the Hill-Top Metals Mines Company, where similar igneous intrusions exist, and where a very large amount of first-class ore has been blocked out. At numerous points in the vicinity quantities of ore have been mined profitable from deposits whose outcrops look no more promising than those on the property under consideration.

One can not spend any time in the district without being impressed by the wide extent of the mineralization that has occurred therein, and everything seen indicated that this property is well worth exploitation along the lines recommended to the directors.

It should not be supposed that the value of the ore will check very closely with the assays given in this report. These were made in some cases on single chunks, which may not be at all representative of the whole deposit, although some care was exercised to select the average material. The figures given suffice, however, to prove the presence of the valuable metals and their nature. It should be remembered that, if developments show such action to be justified, a mill for concentration of the ore will doubtless be erected, and that the value of the concentrates will almost certainly will run above any figures given in this report. In connection with the subject of concentration, it should be noted that most of the important mines in the vicinity lie at greater altitudes than the property under consideration, and that in the former the ores are highly oxidized. The ores on the property under consideration are sulphides, however, and these are much more amenable to concentration by ordinary methods than are oxidized ores. Further, flotation can hardly be considered when the ores are oxidized, although readily applicable to sulphides.

Stated in a sentence, I conclude that everything seen justifies the hope that a profitable mine may be developed on the ground owned by the North Hill-Top Extension Mining Company.

Respectfully submitted,

(signed) G. M. Butler
Dean, College of Mines & Engineering,
University of Arizona

COPY

HILLTOP MINES, HILLTOP, ARIZONA
O. O. Mattox, Owner.

MINING CLAIMS--Twenty unpatented

LOCATION--Chiricahua Mountains, California Mining District, Cochise Co. State of Arizona. 45 miles west of Lordsburg, New Mexico, 25 miles from Rodeo, N. M.; 26 miles from San Simon, Arizona, and 22 miles from Bawtery Siding, Arizona. All of above on paved highway and railroads. Leaving the highway at Bawtery Siding there is a good graded State road to the mine.

FORMATION--Limestone with porphyry intrusions and large quartzite ledge.

DEVELOPMENT--Rhem tunnel, elevation 6150 feet, approximate length 3,800 feet with drifts, cross-cuts and stopes. Gray tunnel, elevation 6450 feet, approximate length 3,500 feet with drifts, cross-cuts, stopes and winzes. Kasper tunnel,-cuts clear through the mountain and is open at both ends; elevation 6750 feet, approximately 3,600 feet in length, with drifts, cross-cuts, stopes and winzes. Blacksmith tunnel, elevation 7220 feet, approximate length 150 feet, with 80 foot winz and short drifts. (Estimated about 7 miles of tunnels, drifts and cross-cuts in the three main tunnels, Rhem, Gray and Kasper).

CHARACTER OF ORE--Silver, lead and zinc, with some gold, copper and molybdenum.

ORE OCCURRANCE--In fractures, ore bodies and contact veins along the quartzite ledge.

TYPE OF ORE--Greatest portion sulphides--small amount of oxide.

MINE HISTORY--Developed by Hilltop Metal Mining Company from 19[illegible] to 1926. Very small amount of work done since that date. A few ore shipments have been made from assessment work and cleaning out of old workings. The property was purchased outright by the present owner in 1937.

ORE SHIPMENTS--by the old Hilltop Mining Company from 1924 to 1926; 11,424 tons averaging, silver 5.24 ozs., lead 2[illegible]%, zinc 8%, copper .34%,-no pay gold.

RECENT ASSAYS--taken by F. H. Larchen for the Eagle-Picher Lead Co., from 12/14/37 to 4/10/38:

KASPER TUNNEL--average from 19 cut samples; silver 5.67 ozs., lead 19.96 %, zinc 4.24%, copper .6%.

Gray TUNNEL--average from 54 cut samples: silver 4.50 ozs. lead 15.40%, zinc 7.22%.

RHEM TUNNEL--Massive pyrite bedding, for silver only, 3.2 ozs.
Selected ore in place, silver 16 ozs, lead 21%, zinc 9%
" " " silver 24 ozs, lead 20%, zinc .4%
Bedded ore in place silver 1.8ozs, lead 15%, zinc 4.8%

BLACK SMITH TUNNEL--average of 7 cutsamples, silver 6 ozs. lead 32%, zinc 7 %. Practically all of these ores are sulphides and cut across the veins or deposits in width from 2 to 6 feet.

DUMPS--some ore has been shipped from the old dumps but there still remains considerable milling ores.

WATER SUPPLY--seepage from Kasper and Gray to lower Rhem where it flows out by gravity. There is sufficient water in the Kasper and Gray for general purposes, but the larger portion of these tunnels is dry. Estimated flow from the Rhem the year round is approximately 300 gallon per minute. This is good, pure water for all purposes.

,MILL TESTS--tests have been made on sulphide and oxide ores by F. O. Bacon, Sr., and in selective flotation the recovery is easy, economical and give a high recovery.

MILL SITE--Ideal location with gravity feed of both ore and water and space for tailing dump.

REPORTS--Reports, maps, plans and assay sheets are to be found in the mine office.

GENERAL INFORMATION-- The tunnels and other workings are in fairly good condition. There are some cave-ins which should be cleaned, but most of them are safe and accessible.

BUILDINGS--12 two room dwelling houses, 1 large warehouse, 1 large store building, 1 boarding house, two-story club house, bath and change house with toilets and running water, 1 two room office building, 1 six room manager's residence with garage, etc. all in good condition.

MACHINERY--1 Snow oil engine, size 20 x 40 Horizontal Twin, 300 H.P. direct connected Allis-Chalmer generator, 2300 volt, 3 phase, 60 cycle 180 r.p.m., direct connected Westinghouse exciter, 5 k.w., direct current. One Worthington-Laidlow Compressor, horizontal duplex size 18 x 10 x 14 with direct connected Westinghouse motor, 150 H.P. with belted exciter, 5 k.w. direct current. One permuitt water softening plant, capacity 3000 gallons each ten hours. One centrifugal oil filter with electric motor. Large, commplete switchboard and control pannels.1Extra parts and wrenches. 15 ton overhead crane chain block hoist on 60 foot I beam. All this housed in steel and framed, fire proof building 45 x 60 x 24 feet, sides and roof covered with corrugated iron.

EQUIPMENT-- 20 ore card, 3 Ingersoll-Rand drill sharpners and punches, Rails and air and water pipes inside the mine, blacksmith shop, electric transformers, swith boards, assay equipment, etc.

TITLES--Titles to the property are in good, legal form and proposition canbe handled direct with the owner.

PRICE--The price is $40,000. (Forty Thousand Dollars) Terms. Favorable proposition to anyone who will install a mill. Would dispose of a one-half interest for $20,000.

O. O. Mattox
Hilltop, Arizona
(Via Rodeo, N. M.)

REPORT ON HILLTOP MINES

--by--

Louis D. Huntoon, C.M.E.

The Hilltop Mining Company has developed a mine which has most promising prospects. The rock formation consists of limestone with intrusive porphyries and a bedding plane of quartzite, or silicified lime, which is the mineralized zone. The general strike is north-west and south-east; on the northeast side of the mountain the limestones dip to the northeast, whereas on the southwest side they dip to the southwest. The dip of the mineralized zone, or quartzite, is to the southwest. The 800 foot Kasper tunnel has been driven through the mountain with portales on the southwest and northeast sides. Entering the Kasper tunnel by the northeast portal the formations are:--limestone dipping to the north-east, a light colored porphyry intrusive; limestone dipping to the southwest; a well defined mineralized falt with an east-west strike; a silicified lime bedding plane or quartzite which is the ore bearing formation, so far as the present development goes; limestone to contact with the quartzite; an irregular brownish intrusive porphyry which probably is related to the fault, and then limestone to the southwest protal. The geology in this section is very complex, with many pronounced faults and before geological sections can be made or an opinion expressed a very careful study would be required. The first porphyry mentioned has also been developed in the 1100 foot Gray tunnel.

Lead-silver ores have been developed in or adjacent to the quartzite where faulted and cross-faulted. They appear to be chimneys of irregular dimensions depending on the extent of brecciation at the points of faulting. These chimneys occurred as small surface deposits, or pockets, and have been developed on the 500, 800, and 1100 foot levels in the Fife, Kasper, and Gray tunnels. The ores are oxidized with now and then pockets of galena. There have been no raises (connections) driven between the levels to determine the size of the individual chimneys.

The extensive exploration and development work was based on the large number of surface pits from which small quantities of ore had been shipped. I understand the first work consisted of driving the Fife tunnel on the 500 foot level. The portal of this tunnel is located on the Lyon claim, on the southwest side of the mountain, and 500 feet below the crest of the mountain. The tunnel was driven through limestone about 1500 feet northeast to the mineralized quartzite bedding plane. (Since then drifts were run 250 feet showing good ore.)

The southwest portal of the Kasper tunnel on the 800 foot level, which was driven through the mountain, is located about 3000 feet northwest of the first tunnel, on the southwest side of the mountain, and 800 feet below the crest (300 feet below the first tunnel). The total length of this tunnel is about 3500 feet. The mineralized zone was crossed about midway in the tunnel. Drifts were run southeast about 1600 (now 3000 feet), and northwest about 1000 feet (now 1300). The drift to the southeast follows the mineralized zone for 600 to 800 feet. A fault is developed at this point offsetting the mineralized zone. Further exploration work to the southeast again developed the mineralized zone and the continuation of the drift follows the mineralized zone. Several deposits or chimenys of rich silver-lead ore have been developed by this southeast drift. The face of the drift was in a pocket or chimeny of ore at the time of my visit. To the northwest the drift for a considerable distance was exploratory in search of the mineralized zone which had been offset by the first fault mentioned. The mineralized zone was finally developed and in the last 200 feet ore bodies similar to those in the southeast drift were being developed.

The third tunnel (the Gray) is located about 700 feet northeast of the second

(Kasper) tunnel, on the northeast side of the mountain, and 1100 feet below the crest (300 feet below the second tunnel). This tunnel has been driven southwest about 1800 feet through limestone and an intrusive porphyry to the mineralized zone. Drifts to the southeast and northwest have been started along the mineralized zone. These drifts have developed pockets or chimneys of lead-silver ore similar to those in the tunnel above.

The fourth, or Rhem, tunnel is located about 1000 feet northeast of the Kasper tunnel, on the northeast side of the mountain, and 1400 feet below the crest (400 feet below the third tunnel). This tunnel has been driven several hundred feet (now 3840 feet) southwest; the portal of the tunnel is about 3000 feet northeast of the mineralized quartzite bedding in the limestone.

The ore bodies are most irregular in shape and size, and complicated. Further and more careful study will probably probe that this irregularity is due to a replacement of the limestone along the cross fractures.

From the many esposures of ore on the 800 foot level in the Kasper tunnel I am of the opinion that development between the raises will probe the ore to occur in the form of irregular chimneys which will at times open out into large chambers of ore connected by narrow veins and smaller chambers of ore. At this time there have been no raises driven following the Hilltop chimenys to determine the outline of the ore bodies between the levels. (Note: There are now many raises and winzes in ore.)

Signed. Louis D. Huntoon
June 20, 1919

Mr. Huntoon adds:

"The property is a most interesting one and in many respects appears to be quite similar to the ore deposits of the Tintic District, Utah.

Douglas, Arizona
August 19. 1981

Dear Sir,

Do you have any maps of the underground workings of the old Hilltop Mine, by Paradise, Arizona? Or any other material on this mine. I have been in the old "Casper Tunnel" as I have my claims over it. The air is very bad, and there are a lot of cave-ins. In the old Galena-Queen claim, which is my Ebner #1 to the East of my Silver Cup #5 there is a mass of drifts and stopes where the area is all caved in. I sure need a copy of this underground workings if you have any. I will be working with the owners of the Hilltop #1 thru #7 group, which are Mr & Mrs Miller, and also Mr Hains & Lorrow as they also own the Sullivan Group of Pat. claims.

I talked to Mr Bill Sanders 89 years old who had worked this mine at one time, and he advised that there should be a map made up by a Mr. Richard Brittain. If so do you have a copy? It would be nice to know of any escape drifts if any when I go back to map this out.

This area will be all lead with silver, some copper, and I found a very nice vein of turquoise with native silver.

Thank you for any information that you can give me. If there is any cost for any of this material I will send it to you.

Sincerely,

Charles J Ebner

Charles J. Ebner
P.O. BOX 699
Douglas, Az.
85607

602-364-4965

Forward to Tucson
(might check maps part)

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Hilltop Mine Date June 5, 1964

District California (Chiricahua) Dist., Cochise Co. Engineer Axel L. Johnson

Subject: Field Engineers Report. Information from Ralph Morrow, Portal.

References Report of Dec. 8, 1953, May 14, 1953, & Feb. 11, 1953, et. al.

Location Sec. 34 -- T 16 S -- R 30 E.
About 14 miles north-west of Portal , Ariz.

Number of Claims Reported to be 44 unpatented claims.

Owners Piedmont Mines, Inc., Escondido, Calif.
Annual assessment work is reported to be kept up by the owners.

Principal Minerals Lead and Zinc.

Present Activity Mine is idle and has been idle since April 15, 1955.

Present Status According to Mr. Morrow, the American Zinc, Lead and Smelting Co. has given up their lease on the property, and removed all their portable equipment. Mr. Morrow purchased the mine buildings at a delinquent tax sale, and is now tearing them down, and salvaging some of the lumber and hardware from same.

Hilltop, Ariz.
May 16 - 44

Mr. J. S. Coupal

Dear Mr Coupal,

I am writing you for a favor
I wish you would write me
a letter "To whom it may
concern," — That you were here
& examined the Hilltop mine
& found it so & so — as you
care to recomend it.
As a party who wants this mine
& put it up to some people for
the money — they sent an Engineer
here who happened to be an enemy
of the fellow & of course turned
it down — I am trying to help
collect enough evidence to get
them to send another Engineer
If you will do this I will
certainly appreciate it.
looking for an answer soon —

I am yours truly
H. O. Ward.

How is your new
work & can you
bring a buyer here —

TELEPHONE
LEXINGTON 2-7600

Johns-Manville

TWENTY-TWO EAST FORTIETH STREET
NEW YORK, N. Y.

February 4, 1944

Mr. J. S. Coupal,
520 Title & Trust Bldg.,
Phoenix, Arizona

Hilltop Mine
Cochise Co., Arizona

Dear Mr. Coupal:

Some parties here in New York are endeavoring to interest us in taking over the Hilltop Mine on a lease and possibly option basis. To get a quick overall idea of the possibilities I asked one of my engineer friends out there about it, and apparently he knows about the property, as I assumed he would.

Below I quote a few pertinent excerpts from his letter:

"The people who own the mortgage on the property are lead-zinc operators and if they believed the mine valuable enough they could work it themselves and get their money back.

"Others who know the property have passed it up although they too could have worked it to their advantage."

Sponsors for the deal are not at all in agreement with the conclusion one might very well draw from these remarks and say it is typical, and I quote "Now, I am not much surprised at this Bisbee engineer's report - as they never come to see this property and make reports from hearsay".

Further it is suggested that you have first hand knowledge of the property in question and ....."Now, if you want to write to a party (engineer) who has been here and went over the property once and only a part of it at that - you write to J.S.Coupal. Just ask him if there is anyone here and etc. Be sure and write him".

That explains this letter and reason for taking the liberty to address you as we have. Anything you have to say will be appreciated.

Very truly yours,

JOHNS MANVILLE CORPORATION

C. H. SHOEMAKER
Consulting Mining Engineer

P.S. Have you seen our mutual friend, Edmonson, of late?

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Hilltop Mine --- Blacksmith Tunnel Lease Date Dec. 8, 1953

District California (Chiricahua Dist.) Cochise Co. Engineer Axel L. Johnson

Subject: Report of Mining Operations. Information from R. L. Brittain.

Location Sec. 34 -- T 16 S -- R 30 E.
About 11 miles north-west of Portal, Ariz.

Owners Piedmont Mines, Inc., Escondido, Calif.

Lessees American Zinc, Lead and Smelting Co., 1600 Paul Brown Bldg., St. Louis, Mo. R. L. Brittain, Supt., Portal, Ariz.

Sub-Lessees and Operators David DuBois and D. F. Morris, P Portal, Ariz., doing business as the Queen Mining Co., Portal, Ariz. Sub-Lease covers the Blacksmith tunnel only. Royalty paid by operators is 25 %.

Principal Metals Lead and Zinc.

Number of Men Working 4

Production Rate Sub-Lessees have been xxk at work on the property now for 12 months (leased in Dec. 1952). The first 6 months were devoted to road building, and getting ready for production. (See my report of May 14, 1953.) The past 6 six months have been devoted to ore production. Operators, during this time, have shipped 13 cars of ore, or a little better than 100 tons per month.

Ore Values The ore is a mixture of sulphides and carbonates, and has been shipped to the A. S. & R. smelter at El Paso, Texas. Ore shipped has run about 15 % in Lead, 13 % in Zinc, 8.20 % Copper, and 1.35 Oz. in Silver. (No pay received for the Zinc.)

Present Operations Stoping ore from a winze about 65 ft. deep below the Blacksmith tunnel.

Remarks Operations marginal on account of low price of Lead, high royalty rate, and not being able to realize any pay for the Zinc content in the ore.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Hilltop Mine Date Dec. 8, 1953

District California (Chiricahua Dist.) Cochise Co. Engineer Axel L. Johnson

Subject: Mine Report ---- Personal Visit.

Location Sec. 34 -- T 16 S -- R 30 E
About 14 miles north-west of Portal, Ariz.---28 miles south of San Simon.

Owners Piedmont Mines, Inc., Escondido, Calif.

Lessees and Operators American Zinc, Lead and Smelting Co., 1600 Paul Brown Bldg., St. Louis, Mo. ---- R. L. Brittain, Supt., Portal, Ariz. ---Lease with option to buy. A sub-lease on the Blacksmith tunnel area given to David Dubois and D. F. Morris of Portal, Ariz. (See separate report on same).

Principal Metals Lead and Zinc.

Number of Men Employed 10 men

Production Rate No ore production shipped at present. Development work is being continued. Ore encountered in development work is stockpiled or stored in raises .

Topography Steep mountains. Altitude of mining operations from 6050 to 7220 ft.

Ore Values See previous report of May 14, 1953.

Present Operations Development work is being continued. Plans are to develop ~~xxxxxxxx~~ sufficient ore reserves to warrant the construction of a mill to mill the ore. Development work is now done in the sulphide zone. Since company started work on the property in Dec. 1951, it has completed approx. 600 ft. of drifting and 6150 ft. of raising.

Past Production Production of the mine before American Zinc, Lead and Smelting took over was estimated by Mr. Brittain as 11,000 tons.
Production since company took over in Dec. 1951 has been about 8,000 tons. This ore was produced in doing development work and shipped to partially defray expense. No more ore is shipped at present, but stockpiled and stored in raises.

Proposed Plans Company intends to continue the development work in order to prove up ore reserves. Mr. Brittain states that their operations have now reached the minimum that is practicable, and will not be cut any further.

References For further information see my report on this mine under date of May 14, 1953.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Hilltop Mine Date Feb.11, 1953

District California Mining District, Cochise Co. Engineer Axel L. Johnson

Subject: Report of Mining Operations

The Hilltop Mine is located in the California Mining District, Cochise County at Hillbop, Ariz., approxiamtely 28 miles south of San Simon. The property consists of 44 unpatented claims along the northern slopes of the Chiricahua Mts.

At present, the mine is being operated by American Zinc, Lead and Smelting Co., 1600 Paul Brown Bldg., St. Louis, Mo. This company holds a lease with option to buy from Piedmont Mines Inc., of Escondido, Calif. The mining operations of the American Zinc, Lead and Smelting Co. are in charge of R. L. Brittain, Supt., Portal, Ariz.

The company started operations on the property in December, 1951, and shipped the first ore in August, 1952. The company has been confining their attentions , so far, to exploration and development to prove up the ore reserves of the property. Consequently, all the work so far has consisted of drifting and raising, and about 1000 ft. of diamond drilling from the underground workings. Further drifting and raising and an additional 4000 ft. of diamond drilling will be done before any stoping operations will be conducted.

The company has shipped about 4000 tons of Lead and Zinc ore since starting shipments in August of last year. Prior to Jan. 1st, the ore was shipped to the Peru mill at Deming, N. Mex., and was all sulphides. Since Jan. 1st, the ore has been shipped to the A. S. & R. Co. Smelter at El Paso, Texas, and has been all oxidized ores. The company has found that they can come out better shipping the oxidized ores, as they are of higher grade and require less treatment charge. The oxidized ores, being shipped now is reported by Mr. Brittain to contain from 13 to 15 % Lead and 7 to 9 % Zinc, while the sulphides previously shipped ran about 8 to 9 % Lead and about 6 % Zinc. At present, 13 men are employed by the compnay in underground operations, and from 1 to 3 carloads of ore per week is being shipped to the A. S. & R. smelter at El Paso.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Hilltop Mine Date Feb. 11, 1953

District California Mining Dist., Cochise Co. Engineer AXEL L. JOHNSON

Subject: Report of Mining Operations

The Hilltop Mine has been developed by 4 main adits and tunnels into the mountain, as follows:

(1) The Blacksmith adit at an elevation of 7220 ft., about 300 ft. in length.

(2) The Kasper tunnel at an elevation of 6750 ft. going straight through the mountain, about 3000 ft. in length, with a drift to the SE about 3000 ft. long, and a drift to the NW about 1500 ft. long. About 11,000 tons of oxidized ore is reported to have been mined from this tunnel in 1924 to 1926 by the Hilltop Metals and Mining Co., who operated the mine from 1912 to 1929.

(3) The Gray adit at an elevation of 6450 ft. going 1200 ft. into the mountain, with a drift 1200 ft. long to the NW, and a drift 600 ft. long to the SE.

(4) The Rehm adit at an elevation of 6050 ft. about 3800 ft. in length, with a drift to the NW 1200 ft. long, and a drift to the SE 600 ft. long.

Axel F. Johnson

9-23-54

Notes

From 1952 thesis of Kapke

Hilltop Mine

½ mile south of Hilltop settlement in N. part of Chiricahua Mts. in Cochise Cy. Ariz. 84 unpatented claims in Coronado Forest making the Hilltop and Hilltop Extension groups. Owned by American Zinc Lead and Smelting Co. Elevation about 6000 ft.

4 main levels accessible by adits:

Blacksmith	Elev. 7260	Portal at N.E. side of main ridge
Kasper	6757	Thru main ridge
Gray	6465	From N.E. side main ridge
Rehm	6055	"
5th level - Dad Fife - caved at the portal	6990	is N. from SW side of ridge and is

Blacksmith 400 ft of drifts, part open. Portal is short distance down from quartzite member and adit is driven to hanging wall of the Qtzt where is raise to surface and incline winze down 65 ft. Ore being mined from winze in 1952.

Kasper 3200 ft long NE through Mtn. Near top of Qtz member drifts go both ways along bedding and X-cuts outline member. Numerous stopes. Much of past production from this level. Raise from Gray level served as ore pass.

Gray 1800 ft to hanging wall of Qtzt member then drifts along Qtzt - limestone contact. Number of stopes. Ore passed to Rehms level. Poor drainage.

Rehm About 3800 ft of adit with 3 X-cuts. Exploratory. Quartzite not encountered except in Raise #1 with upper contact 170 ft up, and in Raise #2 165 ft up. In both raises are small sub-levels near top of quartzite.

Claims originally located in 1880's by Jack Dunn at shallow shaft near Blacksmith adit. Indian trouble. 1897-1913 intermittent work by Frank and John Hands. Ore by burro to mill at Paradise. In 1913 Hilltop Metal Mining Co. took over. Camp built on SE side mtn., later moved to present site on NE side in 1916-17 and power house and other bldgs put up. Dad Fife, Kasper, Gray and Rehm driven.

Most of ore production 1924-6. It came from the Kasper and Gray and Heineman and Elsing give production for that period: 5,000,000 lbs lead, $50,000. silver, total value of ore $500,000. About 11,000 tons. Operations curtailed after 1926 with drop in prices.

About 1915 a group had gotten hold of Hilltop Extension group. Group later came back to Hilltop Met. Mng. Co.

1926-1949 little production, with claims relocated several times and much of equipment sold or removed.

1949 Piedmont Mines, Inc. took over and mined from Blacksmith level, closing in May 1951. Late 1951 Amer. Zinc took over and in spring of 1952 cleaned up mine.

The ore deposit is combination of replacement and fissure filling - mesothermal. A pyrometasomatic stage followed main sufide deposition. Principal economic metal is lead generally accompanied by zinc. Small amounts of copper, tungsten, silver and gold. Permian. Principal shoots are in Hilltop quartzite and mainly located along its hanging wall. Main channel is Blacksmith fault near which basal beds of overlying Pinery limestone are mineralized, and Hardluck limestone also. Not much association of ore with igneous rocks. Most ore shoots are where high angle faults cross the quartzite - Pinery limestone contact. Blacksmith fault is most important and is exposed on all 4 levels and contact with quartzite is explored on all except Rehm. Main strand of Blacksmith fault may be in unexplored ground just W of the drifts on Gray level. Strike of Blacksmith fault is from N60E to E-W.

Average of 23 assays of ore exposures by Piedmont Mines:
Pb 20.2%, Zn 3.9%, Ag 5.7 oz., Cu 0.6%, Au Tr.

Sulphide ore is galena, sphalerite, chalcopyrite, some scheelite

Maps show very extensive workings. Well mapped.

- -

From Schrader - USGS Bull. 582, 1915

Duquesne - Pocahantas Claim

Just NE of Washington Camp

Produce large amount in the 80's - treated at smelter built for the purpose 6 miles east on the San Raphael ranch

Mine is on granite porphyry - limestone contact. Large body of silver bearing lead carbonate ore from the surface to 50 ft depth where it gave way to soft decomposed conglomerate or breccia like formation in which no ore had been found. One of first properties bought by Duquesne Co. in 1889.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Hilltop Mine --Blacksmith Tunnel Lease Date May 14, 1953

District California (Chiricahua Dist.) Cochise Co. Engineer Axel L. Johnson

Subject: Report of Mining Operations -- Information from Sub-Lessees, Queen Mining Co.

Location Sec. 34 --T 16 S -- R 30 E
About 14 miles north-west of Portal, Ariz.

Owners Piedmont Mines Inc., Escondido, Calif.

Lessee and Operators American Zinc, Lead and Smelting Co., 1600 Paul Brown Bldg., St. Louis, Mo. ---- R. L. Brittain, Supt., Portal, Ariz. -- Lease with option to buy.

Sub-Lessees David DuBois and D. F. Morris, Portal, Ariz., doing business as the Queen Mining Co., Portal, Ariz. Sub-Leasing from the American Zinc, Lead and Smelting Co. Royalty of 25 %. Sub-Lease covers Blacksmith tunnel only.

Principal Minerals Lead, with some zinc.

Number of Men Employed 3

Production Rate No production as yet. Expect to be ready to produce ore in about two weeks. Just finished road into the property. Repaired 4 miles of old road and built about 1 /4 mile of new road at a cost of about $5,000. Now building ore bin.

Ore Values Ore body scheduled for mining operations by the sub-lessees is in and above the Blacksmith adit at an elevation of 7220 ft. The Blacksmith adit is approx. 300 ft. in lenght. Ore is said to run between 15 and 36 % Lead, with an average of about 20 % Lead. Silver averages about 6 oz. Zinc runs about 12 %. The lead ore is mixes sulphides and carbonates. The zinc occurs as mostly carbonates.

Geology Ore body occurs along a fault slip between the quartzite and the limestone, the ore making in the quartzite, rather than the limestone. Ore formation is from 4 ft. to 9 ft. thick.

Ore In Sight 5 to 6 carloads (250 to 300 tons)

Marketing facilities Intend to ship to A. S. & R. smelter at El Paso, Texas.

Present Mine Workings The Blacksmith adit --- 300 ft. in length.

Present Operations Building ore bin. Expect to be ready for mining operations in about two weeks.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Hilltop Mine ✓ Date Sept. 11, 1952.

District California (Chiricahua) Dist., Cochise Co. Engineer Axel E. Johnson

Subject: Mine Report --- Information obtained at A. S. M. O. A. meeting in Douglas.

Location Sec. 34 -- T 16 S -- R 30 E
About 14 miles north-west of Portal, Ariz.

Number of Claims Some 30 to 40 unpatented claims.

Lessees ~~Owners~~ American Lead ✓ and Zinc Co. ——— Owners Piedmont Mines Co, Escondido, Calif. ✓
1600 Paul Brown Bldg, St. Louis, Mo.

Operators Same as above.

Officers Richard Britten ✓, Manager and Engineer, Portal, Ariz.

Principal Minerals Lead ✓ and Zinc

Number of Men Employed 12 to 14 men --- day shift only---- 6 days per week.

Marketing and Milling Hauling the ore to San Simon, and shipping the ore from there to their own mill at Deming, N. Mex.

Present Operations Stoping. Taking present ore out of the Gray Tunnel (elev. 6450 ft.)

Proposed Plans Expect to do some diamond drilling to prove up more ore. Have been doing some diamond drilling the past few weeks. Expect to do additional diamond drilling down from the Ream tunnel, at an elevation of 6050 ft.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT
Page 1.

Mine Hilltop- Paradise District Date May 14, 1953

District California (Chiricahua) Mining District Engineer Axel L. Johnson
Cochise County.

Subject: Report of Mining Operations

Hilltop Mine

The Hilltop Mine suspended shipments of ore for the time being. The reason given is that that no ore has been obtained from the exploration work that the company has conducted in recent weeks. The company hopes to beshipping ore again, as soon as their exploration work gets into some of the ore horizons. Exploration work is being conducted between the Gray and Casper tunnels (see report of Feb. 11, 1953). The company employs the same number of men, as they have for the past several months (13), and reports that there has been no cut in wages. See report of Feb. 11, 1953.

Hilltop Mine (Blacksmith Sub-Lease)

The Blacksmith Adit, the top workings in the Hilltop Mine, has been sub-leased to David DuBois and D. F. Morris of Portal, ARIZ., DOING BUSINESS AS THE QUEEN MINING CO., PORTAL, ARIZ. The stipulated royalty is 25 %. The sub-lease covers the Blacksmith tunnel and vicinity only, near the top of the mountain at an elvation of 7220 ft.

The sub-lessees, Mr. DuBois and Mr. Morris have completed a road into the property at a reported cost of over $5,000, and are now building an ore bin. They expedt to be ready to produce ore in about two weeks. They claim to have 5 to 6 carloads of ore in sight, and this ore is said to average about 20 % Lead, 12 % zinc, and 6 oz. of Silver. The ore is mixed carbonates and sulphides. Shipments will be made to the A. S. & R. smelter at El Paso, Texas, 3 men are employed at present.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Hilltop Mine ✓ Date May 14, 1953

District California (Chiricahua Dist.) Cochise Co. Engineer Axel E. Johnson

Subject: Mine Report --- Personal Visit.

Location Sec. 34 -- T 16 S -- R 30 E
About 14 miles north-west of Portal, Ariz., and 28 milessouth of San Simon.

Owners Piedmont Mines Inc.✓, Escondido, Calif.

Lessees and Operators American Zinc, Lead and Smelting Co.✓, 1600 Paul Brown Bldg., St. Louis, Mo. ---- R. L. Brittain, Supt., Portal, Ariz. ---Lease with option to buy.✓ A sub-lease on the Blacksmith tunnel area was given recently to David DuBois and D. F. Morris of Portal, Ariz. (See separate report on same).

Principal Metals Lead and Zinc.

Number of claims ~~Some 30 to 40~~ 44 unpatented claims.

Number~~xxx~~ men employed 13

Production Rate No production of ore at present, as no ore is now being obtained from the exploration work that the company has conducted in recent weeks. The company hopes to be shipping ore again, as soon as their exploration work encounters some of the ore horizons.

Topography Steep mountains. ~~xAltitudexxxAltitude~~ Altitude of the mining operations from 6050 to 7220 ft.

Ore Values ~~Leadxrunsxfrom~~ Lead runs from 13 to 15 % in the oxidized zone, and from 8 to 9 % in the sulphide zone. Zinc runs from 7 to 9 % in the oxidized zone, and from 5 to 6 % in the sulphide zone.

Ore in Sight No information on same obtainable.

Milling and Marketing Facilities The company has shipped about 4000 tons of Lead and Zinc ore since starting shipments in August of last year. Prior to Jan. 1st, the ore was shipped to the Peru mill at Deming, N. Mex. and was all sulphides. Since Jan. 1st and until shipments were suspended a few weeks ago, the ore has been shipped to the A. S. & R. Co smelter at El Paso, Texas. and was all oxidized ore. The company found that they could come out better shipping the oxidized ore to the smelter, as it was of higher grade and required less treatment charge.

Present Mine Workings The Hilltop Mine has been developed by 4 main adits and tunnels into the mountain, as follows:

(1) The Blacksmith Adit, at an elevation of 7220 ft., ~~xxxx~~ about 300 ft. in length.

Mine Hilltop Mine ✓ Date May 14, 1953

District California (Chiricahua Dist.) Cochise Co. Engineer Axel L. Johnson

Subject: Mine Report --- Personal Visit.

(2) The Kasper Tunnel at an elevation of 6750 ft., going straight through the mountain, about 3,000 ft. in length, with a drift to the SE about 3,000 ft. in length, and a drift to the NW about 1,500 ft. in length. About 11,000 tons of oxidized ore is reported to have been mined from this tunnel in 1924 to 1926 by the Hilltop Metals and Mining Co., who operated the mine from 1912 to 1929.

(3) The Gray Adit at an elevation of 6450 ft., driven 1,200 ft. into the mountain, with a drift 1,200 ft. in length to the NW, and a drift 600 ft. in length to the SE.

(4) The Rehm Adit at an elevation of 6050 ft., about 3800 ft.in length, with a drift to the NW about 1,200 ft. in length, and a drift to the SE about 600 ft. in length.

Present Operations The company started operations on the property in December, 1951, and shipped the first ore in August, 1952. The company has been confining their attentions, so far, to the exploration and development to prove up ore reserves on the property. Consequently, all the work, so far, has consisted of drifting and raising, and about 1,000 ft. of diamond drilling from the underground workings. Further drifting and raising, and an additional 4,000 ft. of diamond drilling will be done before any stoping operations will be conducted.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Hilltop Mine Date Dec. 8, 1953

District California (Chiricahua Dist.) Cochise Co. Engineer Axel L. Johnson

Subject: Mine Report ---- Personal Visit.

Location Sec. 34 -- T 16 S -- R 30 E
About 14 miles north-west of Portal, Ariz.---28 miles south of San Simon.

Owners Piedmont Mines, Inc., Escondido, Calif.

Lessees and Operators American Zinc, Lead and Smelting Co., 1600 Paul Brown Bldg., St. Louis, Mo. ---- R. L. Brittain, Supt., Portal, Ariz. ---Lease with option to buy. A sub-lease on the Blacksmith tunnel area given to David Dubois and D. F. Morris of Portal, Ariz. (See separate report on same).

Principal Metals Lead and Zinc.

Number of Men Employed 10 men

Production Rate No ore production shipped at present. Development work is being continued. Ore encountered in development work is stockpiled or stored in raises .

Topography Steep mountains. Altitude of mining operations from 6050 to 7220 ft.

Ore Values See previous report of May 14, 1953.

Present Operations Development work is being continued. Plans are to develop sufficient ore reserves to warrant the construction of a mill to mill the ore. Development work is now done in the sulphide zone. Since company started work on the property in Dec. 1951, it has completed approx. 600 ft. of drifting and 6150 ft. of raising.

Past Production Production of the mine before American Zinc, Lead and Smelting took over was estimated by Mr. Brittain as 11,000 tons.
Production since company took over in Dec. 1951 has been about 8,000 tons. This ore was produced in doing development work and shipped to partially defray expense. No more ore is shipped at present, but stockpiled and stored in raises.

Proposed Plans Company intends to continue the development work in order to prove up ore reserves. Mr. Brittain states that their operations have now reached the minimum that is practicable, and will not be cut any further.

References For further information see my report on this mine under date of May 14, 1953.

[redacted]

S. Min World 4/1953

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Hilltop Mine --- Blacksmith Tunnel Lease Date Dec. 8, 1953

District California (Chiricahua Dist.) Cochise Co. Engineer Axel L. Johnson

Subject: Report of Mining Operations. Information from R. L. Brittain.

Location Sec. 34 -- T 16 S -- R 30 E.
About 14 miles north-west of Portal, Ariz.

Owners Piedmont Mines, Inc., Escondido, Calif.

Lessees American Zinc, Lead and Smelting Co., 1600 Paul Brown Bldg., St. Louis, Mo.
R. L. Brittain, Supt., Portal, Ariz.

Sub-Lessees and Operators David DuBois and D. F. Morris, Portal, Ariz., doing business as the Queen Mining Co., Portal, Ariz. Sub-Lease covers the Blacksmith tunnel only. Royalty paid by operators is 25 %.

Principal Metals Lead and Zinc.

Number of Men Working 4

Production Rate Sub-Lessees have been at work on the property now for 12 months (leased in Dec. 1952). The first 6 months were devoted to road building, and getting ready for production. (See my report of May 14, 1953.) The past six months have been devoted to ore production. Operators, during this time, have shipped 13 cars of ore, or a little better than 100 tons per month.

Ore Values The ore is a mixture of sulphides and carbonates, and has been shipped to the A. S. & R. smelter at El Paso, Texas. Ore shipped has run about 15 % in Lead, 13 % in Zinc, 0.20 % Copper, and 1.35 Oz. in Silver. (No pay received for the Zinc.)

Present Operations Stoping ore from a winze about 65 ft. deep below the Blacksmith tunnel.

Remarks Operations marginal on account of low price of Lead, high royalty rate, and not being able to realize any pay for the Zinc content in the ore.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Hill Top Mine Date June 15, 1955.

District California Dist., Cochise County Engineer Axel L. Johnson

Subject: Present Status. Personal Visit.

For location and other information, see previous reports.

Present Status Most of the employees of the American Zinc, Lead and Smelting Co. were laid off on Feb. 1, 1955, and the superintendent, R. L. Brittain was transferred to another operation. Two men were left working at the mine, doing cleaning up operations until about April 15, 1955, when the mine was closed down completely.

Mr. Ralph Morrow, Portal, engineer received information on the Hilltop Mine. Mr. Morrow stated that American Zinc, Lead and Smelting Co., has now given up their lease on the Hilltop Mine, and removed all their equipment. He stated he purchased the mine buildings at a delinquent tax sale, and is now tearing them down. He said Piedmont Mines, Inc., Escondido, California, still holds the claims, which are unpatented, and does their annual assessment work on same.

ALJ WR 6/5/64

ZONA DEPARTMENT OF MINE[illegible]L RESOURCES
Mineral Building, Fairgrounds
Phoenix, Arizona

+ Mine visit

1. Information from: Ralph A. Pursley Tel: 824-3544
   Address: Dos Cabezas
2. Mine: HILL TOP
3. No. of Claims - Patented ____
   Unpatented ?
4. Location: ____
5. Sec 34 Tp T16S Range R30E 6. Mining District California
7. Owner: Mr. Pursley did not know their names
8. Address: ____
9. Operating Co.: ____
10. Address: ____
11. President: ____ 12. Gen. Mgr.: ____
13. Principal Metals: ____ 14. No. Employed: ____
15. Mill, Type & Capacity: none
16. Present Operations: (a) Down ☐ (b) Assessment work ☐ (c) Exploration ☒
    (d) Production ☐ (e) Rate ____ tpd.
17. New Work Planned: ~~Sinking~~ ~~starting~~ Cleaning out shaft or winze in the Black Smith Tunnel Appox 40' down
18. Miscl. Notes: Plan on opening up some ore and shipping to El Paso.

Date: 3-27-74

(Signature) (Field Engineer)

ARIZONA DEPARTMENT OF MINERAL RESOURCES
Mineral Building, Fairgrounds
Phoenix, Arizona

1. Information from: Ralph A. Pursley + Mine Visit Tel: 824-3544
   Address: Nos Cabezas
2. Mine: Hill Top 3. No. of Claims - Patented ____
   Unpatented ?
4. Location: ____
5. Sec 34 Tp T16S Range R30E 6. Mining District California
7. Owner: Mr. Pursley did not know their names
8. Address: ____
9. Operating Co.: H.R.M. INVESTMENT CORP
10. Address: 7030 E. BROADWAY TUCSON 85710
11. ~~President:~~ SUPT John Pursley 12. ~~Gen. Mgr.:~~ SEC Ed Moore
13. Principal Metals: ____ 14. No. Employed: 4
15. Mill, Type & Capacity: none
16. Present Operations: (a) Down ☐ (b) Assessment work ☐ (c) Exploration ☒
    (d) Production ☐ (e) Rate ____ tpd.
17. New Work Planned: ~~Sinking~~ ~~Station~~ Cleaning out shaft or winze in the Black Smith Tunnel Appox 40' down
18. Miscl. Notes: Plan on opening up some ore and shipping to El Paso.
    Mine Mailing address Rte 1, Box 14 Douglas Ac.

5-7-74

Note- HRM INVESTMENTS belongs to Frank Hardy, Chuck Richardson & Ed Moore. According to Chuck Richardson, the mine belongs to PIEDMONT MINES whose principal officers are Clinch N. Crocker and Standly Hill. The lease is assigned to John Pursley with an 8% override.

The Tucson Directory lists a Frank Hardy at 2320 E. Camino Lustre Tel: 299-6320

Date: 3-27-74 ____ (Signature) (Field Engineer)

Phones - Office - [illegible]ual 4830
Res. - La[illegible]yette 8276

FRANK R. WICKS
Consulting Mining and Industrial Engineer
315 West Fifth St., Los Angeles 13, Calif.

Copy submitted

THE HILLTOP GROUP MINES
Cochise County, Arizona

GENERAL DESCRIPTION, and
PROGRESS REPORT OF CURRENT OPERATIONS.

Date of this Report: November 3, 1948

Dates of most recent examination: Oct. 29--Nov. 1, 1948.

Preliminary Statement: The information contained herein is based on personal knowledge of the property and its development since June 11, 1947, including five months of resident supervision as engineer-management in 1947.

Type of Ores: Lead, zinc, copper, tungsten and silver minerals; named in the order of their importance. Base metals.

Location: In the east-central portion of Cochise County, Ariz., which is in the southeast corner of the State. 26 miles south of San Simon, Ariz., and the same distance northeast of Rodeo, New Mexico. In Sections 32and 33 of T-16-S:R-30-E;Gila & Salt River B & M. Approximately adjoining the easterly boundary of the Wonderland of Rocks National Monument. In the Chiricahua Mountains.

Holdings: 26 claims in original group, mostly full sized, 600' x 1500', all of which are unpatented lode locations, as one contiguous group. 20 of these have been mapped and surveyed, and were all located prior to the year 1920, and the identity of each one has been maintained since that year.

6 additional claims approximately adjoining, but of more recent location, which have not been surveyed. These have some overlaps with claims of other ownerships, but are mostly off of the main structure.

19 other claims of recent location covering ground that was formerly contained in the original group, upon which titles had lapsed prior to 1947, but relocated and joined to the group.

Area: Combined area is almost 1,000 acres, covering about three miles in length along the main ore zones.

Titles: Under purchase lease to Gould & Watson, and being operated by Piedmont Mines, Inc., an Arizona Company controlled by them. Chain of titles has been well established and is of record and all title papers are in escrow pending completion of purchase payments.

Roads: Paved highway to San Simon, Route #666. Thence graded, gravelled, road south 20 miles on slight grade. Then 6 miles westerly on mountain road with moderate to steep grades to camp buildings at lower edge of property on the Empire and Empire claims. Additional side road about five miles up Whitetail Creek canyon to upper workings on Hilltop and Hidden Treasure Claims.

Post Office Address: Portal, Arizona. Reached by RFD daily mail deliveries to Hilltop, Arizona. Former postoffice at Hilltop could probably be reopened if desired. Telephone line to headquarters house on properties, but nearest present phone service is about two miles.

Shipping Points: San Simon, on the main line of the Southern Pacific R.R., where there is an existing lease for a loading ramp and where local freight and express can be sent and received. San Simon is about 200 miles from the El Paso smelting works. Concentrate mill products and ore can be shipped by truck from the properties to a milling plant at Lordsburg, New Mexico, a distance of 50 miles, of which 30 miles is on main paved highway. This is referred to later in this report.
Rodeo, Hidalgo County, New Mexico is also an alternate shipping point, being the same distance from the mines and slightly nearer the smelter.
Willcox, Arizona, is an alternate shipping point for ores from westerly portals of the property, a distance of about 40 miles. A loading ramp there is available on rental if ever needed.

Supply Points: San Simon, 26 miles for camp supplies. Tucson 150 miles; El Paso 200 miles; Phoenix 265 miles. Lordsburg 50 miles.

Elevations above sea level:

San Simon	3611 ft.	
Hilltop Townsite	5840 ft.	
Rhem tunnel	6050 ft.	
Gray tunnel	6450 ft.	
Masper tunnel	6750 ft.	
Blacksmith workings, east portal		7200 ft.
Blacksmith workings, west portal		7130 ft.
Apex above Blacksmith workings		7300 ft.
Highest point on property		7550 ft.

Mining District: California. Forest Reserve: Coronado.

Timber: Small timber for camp fuel and ties on the ground. No large timber. Nearest saw mills at Duncan or nearby on the Arizona-New Mexico line, northerly from Hill top.

Climatic Conditions: Properties can be operated all year from lower tunnels; upper workings are frequently snow-bound for short periods in winter.

Power: Deisel and gasoline engines now in use; probability of obtaining government single phase power at an early date, as it is understood that a projected line will cross directly over the claims. May and probably will be converted to a three-phase power line soon thereafter. Transcontinental compressed gas line passes within 10 miles of the properties. It is believed that gas for both power and furnace processes could be obtained therefrom at prices that would make the consideration of local smelting and local power development attractive.

Present Operations: Now in operation with a small crew on opening, sampling and repair of main workings and on the installation of equipment. No ore shipments or direct ore mining has yet been attempted but preparations for doing so are nearing completion.

Total Underground Development: These are approximate but conservative estimates, showing the magnitude of the development and mining program that the properties have experienced.

Main cross-cut tunnels and adits, in excess of 12,250 feet or about 2½ miles.
Main drifts on ore zones and now accessible, in excess of 10,000 feet.
Main drifts now not accessible, but most of which can be reopened if desired, about 2500 feet.
Stopes, raises and chutes open for use about 2000 feet.
Stopes, raises and chutes closed by caving, about 3000 feet.
Shafts, winzes and miscellaneous about 1,000 feet.

Deepest underground penetration on ore: 1250 feet below the outcrop on vertical line, equivalent to about 1700 feet on the dip of the vein.

From the above it will be noted that almost five miles of underground workings are now open for examination and use. Nearly all crosscut workings stand and are in good condition without timber.

Water: About 125 gallons of water per minute natural flow from the lower, or Rehm tunnel, though this varies slightly from season to season. All the remainder of the mine is dry except for an underground spring on the main intermediate tunnel, the Kasper, where a small basin is provided for use on that level.

Mining Equipment: 3 to 4 miles of mine track underground and on mine dumps, installed and in use.

About 20 mine cars, of which most are serviceable. One Deisel driven air compressor on wheels.
Air tools for two mining crews, drills, hose, [illegible], steel and miscellaneous items.
Two trucks, both late model and in good condition.
Electric lighting plant 15 k.w. gasoline portable type.
About 1½ to 2 miles of water and air piping.
Miscellaneous stock of small tools and parts.

Milling Equipment: One Universal semi portable crushing plant complete with extra coarse crusher, extra Deisel drive for same, and with two two-compartment roughing jigs for making bulk, rough concentrate, installed below lower mine workings.

Surface Equipment:

There is one steel building, 40 x 60 in area, 20 feet high for power plant and shops, with heavy overhead crane. There are 29 additional buildings of frame construction, comprising a 8-room headquarters house and office, warehouse, store, laboratory, cabins ranging from two rooms to four rooms each. Nearly all are in usable condition and many have recently been partially overhauled. Water System in townsite and lighting system to most of the buildings.

General Description of the Properties:

These Hilltop properties taken as a whole, form one of the largest all-tunnel development projects in Arizona.

The principal claims, on which the outcrops are found, lie along a high ridge of the Chiricahua Mountains, and the bordering claims cover areas on both sides of thesteep slopes of the Range. Thus, to get from the campsite on the northeast sideline to the Kasper portal, near the southwest edge of the property means a climb of 1500 feet by road or trail and a descent of 900 feet.

To illustrate the mining problem and mineralization graphically in terms understandable by persons not versed in mining terms, it is best to picture the section of the mountain under discussion as a tent-shaped structure, with a ridge of the tent, along the outcrops of the vein, nearly two miles long, and the width 3/4 of a mile.

The mineral zone can be represented by a partition, roughly 100 feet thick extending from the ridge down-ward through the workings for 1700 feet to the lowest of the three tunnels and probably far below. This partition-like ore zone leans or dips southwesterly at about 15 degrees from the vertical in the upper sections but gradually flattens to 18 or 20 degrees.

on, in and immediately above the lowest workings.

To continue the illustration in similar terms, the mineralized zone or partition, is made up of a series of up-and-down bands or vertical stripes in an awning. The whole of the zone is mineralized, but only certain bands contain enough mineral to be of commercial value. These are called ore shoots. They may be wide or narrow horizontally, and they may continue for long distances up or down, or they may be relatively short lenses.

Extensive crosscutting was done in order to get at the ore bodies without hoisting. In retrospect this seems to have been ill-advised, but from the present standpoint it is certainly of primary importance for immediate and future operations. It makes for very low-cost operations as compared with conventional shaft mining with the result that much lower grade ores can be considered commercial than would otherwise be possible.

History: It is reported to me that the original discoveries of lead and silver in the District were made near the present Blacksmith or upper workings, on this property, in the years of 1880 to 1890. Some mining was done then. The main interest appears to have been in the high grade silver sulphide minerals. There are many shallow shafts and other hand drilled openings along the outcrops where ore was mined and sorted.

Subsequently a discovery of copper ore on what is now the Birthday Claim, caused the Kasper tunnel to be driven from what is now the southwest portal. The Kasper was later driven 1800 feet to the main ore zone and extensive mining was begun, with almost two miles of drifting and miscellaneous work. A further extension of the Kasper crosscut was eventually made, 1500 feet beyond the ore zone, to an opening on the easterly side above the present townsite.

Two long crosscuts below the Kasper were driven later and used for main haulage ways for Kasper ore in addition to serving for more limited mining operations on those levels.

The Blacksmith property with its upper tunnels and workings comprising the Hilltop Claim and those immediately adjoining, was under separate ownership for many years. It was inactive and did not become a part of the project until later years. Thus substantially all of the past production of ore came from the Kasper workings or immediately above and below the 6750 elevation.

The old company which owned the group, comprising 38 claims at the time, in 1938, spent huge sums on development. That company mined only about 12,000 tons of ore. The production was limited mainly to hand sorted clean lead sulphide and to oxidized lead-silver ores which had relatively high silver value and little or no lead. The remainder of the ores encountered during that work was not attractive to them because of the lack of processing equipment and because of very low metal prices.

The average price of lead bullion at New York, upon which smelter settlements are based, during the 11 year period of 1928 to 1938, inclusive, was under five cents per pound. This is equal to about 3 cents per pound at the smelters and not more than two cents for contained lead in the ore at the mines. Silver prices during the same period were approximately half of the current price per ounce. Thus this is one more instance where conditions quite apart from the mining property itself determine the difference between success and failure, or determine when and if a property may be operated.

After the original company abandoned the property, there were numerous sampling and examination programs by others. One complete survey and sampling project is reported to have cost $14,000. Excellent maps and assay records from this work are now available to us and have proven quite accurate. Reports were generally unfavorable as to the shipment of crude ore but favorable as to mill processing even in the face of much lower metal prices than are now in effect.

This means that it is necessary to recast the calculations as to commercial value of remaining ores, based on current prices for metals and current operating and supply costs. In doing so, it is realized that the huge amount of prior development which was theretofore unprofitable, is now of very great importance from the standpoint of both time and production costs.

Metallurgical Discussion: First it is well to know that the Hilltop mines ore carries but little gold; no pay quantities are present in the general run but gold does occur in spots in connection with copper ores. I have the impression that there is a definite tendency for increase in gold content with depth but data are too limited as yet to be definite.

The main mineralization is in lead, as galena, the sulphide form and as cerrusite or sand carbonate, with a lesser proportion of anglesite, the sulphate of lead. The two latter minerals can of course be considered as results of secondary alteration in place or as secondary re-precipitation after alteration of galena.

After some months of experience with these ores, I have developed the theory that the mineralization of the Hilltop structure had best be considered as representing three separate phases, or perhaps separate periods of mineralizing influences, in such manner as to present for consideration at least three main types of ore:

1. Banded or ribbon like agglomerations of mixed sulphide minerals, representing primary unaltered ores shown in the lower levels, principally in the Hahn tunnel workings. In this ore, the lead assay runs from 10% to 15% lead, somewhat less in zinc, about 1 to 2% copper and a silver content of almost an ounce per unit of lead. In this ore the gold content seems slightly higher than elsewhere.

2. Replacement types of lenticular deposits of mixed sulphides, wherein the minerals are relatively coarse crystalline, where the ore is partly oxidized throughout, and where we find ore of this type in silicified limestone bedding as well as in and along transverse lines of weakness near cross dike-faults. In these ores we find sulphide minerals at and near the surface and in the outcrops, but we also find oxidation products more than a thousand feet below the surface.

3. Massive or nearly solid oxidized mixed minerals of lead carbonate, lead sulphate and zinc carbonate which appear to be replacement lenses and sheets of great size and length. Herein we find oxidation extending from the surface down to as deep as present workings extend. These are in siliceous gangue or silicified limestone and occur as parallel deposits along the same bedding planes as the banded primary ores.

In the replacement type lenses of the #2 class the silver content is extremely high in spots but averages low. In the #3 class the silver is somewhat less than the primary ores, averaging perhaps half that in the banded type.

All the ore seems to contain a more or less constant iron percentage of 8% to 10%. The gangue minerals in the ores are varied. Free silica predominates in ores along the contact zones. Calcite, kaolinite, barite and fluorite are noted in decreasing proportions in the order named.

In recent months, mainly because of intensive investigations made by Dr. Watson, it has been shown that the primary ores carry substantial amounts of tungsten, mostly as scheelite but also a wolframite. Information on this subject is not yet complete, but the tungsten minerals appear to be directly associated with the banded ores as a part of the original mineralization and also occur separately in places quite apart from the sulphide zones. No definite percentages can be stated as yet, but the wide distribution of these minerals in the lower and second tunnels indicate that tungsten may be a very important product in mill processing.

Much of the zinc mineral in the ores is marmatite, which is a black zinc sulphide with varying proportions of iron sulphide in solid solution. A limited amount of the normal zinc sulphide, sphalerite is noted in the primary ores. There is no definite relationship as to proportions of lead and zinc minerals. It is significant to note, however, that the zinc minerals carry very little, if any, of the silver or gold. The silver seems to be associated almost entirely with lead minerals.

From this metallurgical discussion, it will be seen that mill processing, for the separation of the several useful minerals is paramount. No revenue whatever can be realized from either zinc or tungsten if ores containing these metals are shipped to lead smelters even though they may and probably do represent at least half of the theoretical assay value. Likewise, lead smelters and processors do not like to handle high zinc crude ore at all, and apply direct or indirect penalties accordingly. Hand sorting of crude ore, such as was formerly tried, is now more or less out of the question because of high labor costs for so doing.

Milling Program: In order to take care of this problem, and to make it possible to get into early production, a plan has been worked out, for at least temporary operation, whereby crude ore can be given a preliminary or rough concentration at the properties; the product resulting from this roughing operation will then be trucked to a flotation, concentration plant at Lordsburg where separate products of lead, zinc and tungsten minerals will be made for shipments to suitable finishing plants.

Some of the highly oxidized ores can and will no doubt be shipped direct because of high silver content, but these must in most cases be mined at the same time that the mill ores are taken out, so that for the most part the whole program hinges on mill processing.

The Lordsburg milling plant, is 50 miles from the Hilltop properties, and is not a part of the Hilltop holdings but is under lease by Watson & Gould as a separate property. The plant is a very important factor in the proposed program; was operated for many years as a flotation concentrator, and will need some remodeling for adequate selective flotation of mixed sulphide ores. It is now equipped with a crusher, a ball mill, two batteries of flotation cells, an excellent assay plant, and numerous items of equipment necessary in connection, including electric power. It is alongside of the railroad on a separate siding, with loading bins for carlot shipments. I understand that additional ground has been acquired for tailing storage.

Ore showings in the Hilltop mines: It must be understood that while many places in the mine workings have been extensively mined, the total tonnage of ore removed is but a fraction of the ore in sight and available based on current metal prices and assuming that mill treatment will be available.

The most notable feature may be described as a single ore shoot which may be followed from the surface down through the workings of each of the main levels for a total distance of almost 2,000 feet on the westerly walls of the shoots, and which appears to be wider, stronger and richer at the lowest known point than in workings above. This shoot which is well over 100 feet in width and 30 feet in thickness in a raise just above the Rahn or lowest tunnel, was extensively mined from the Kasper level to near the surface and from the same level downward for about 100 feet. It was somewhat less mined from the intermediate Gray level but has only been tapped by the Rahn workings. At this point the primary, sulphide ore is over 30 feet thick and a few feet above there is a parallel deposit of 5 or 9 feet of oxidized ore such as previously described. This showing is at the head of a raise 170 feet above the Rahn tunnel. Further extension of the main adit will almost certainly show this same chute at the tunnel level, but it has not yet been opened at that point.

Roughly paralleling this huge shoot, and apparently almost adjoining it at the lower level, is a similar but smaller shoot. Extending both ways from these main showings throughout the mine, and particularly on the Kasper level there are many ore shoots on which extensive mining was done during early operations but very little ore was taken below the Kasper, leaving some 900 to 1,000 feet of ore on the rake of the shoots that is open and ready to mine.

At the time of my original examination, it was my guess that we would find approximately 200,000 tons of ore of one kind or another in workings above the Rohm level, of which perhaps 40 to 50,000 tons would be represented by broken ore, stope fill and by-passed pillars from the former operations. I see nothing in subsequent exploration of old workings to substantially change that original estimate. I was particularly pleased, however, to be able to observe during my most recent trip to the properties, that the primary ores were so much in evidence in lower workings heretofore inaccessible for examination.

On the Kasper tunnel level there are at least 20 places where relatively small amounts of ore can be taken, and from this level upwards to the Blacksmith property it seems evident that a large amount of ore is in place that is well shown by wide vein in the Blacksmith east winze but which has never been followed up from the Kasper level. Each of these sheets can reasonably be expected to continue down into and through the lower workings, as some are now known and identified but others await more extensive development from below.

Recommended Program: The Hilltop properties have great merit. At current prices and with reasonable expenditures for equipment and facilities, a profitable project can be developed in a few months. Some small shipments for revenue can be expected in the meantime. The ultimate program and the overall production can not be predicted. Metal prices will determine this to a considerable extent and of course, the general trend in such prices is and has been upward for some months.

The mineral content and characteristics of ores below the present workings will have an important influence on the future production, and the main features of this phase lead to most optomistic conclusions.

Taken as a whole, I strongly recommend the Hilltop and the project as now outlined. In making these recommendations, I am fully aware that there are certain metallurgical problems to be met and that mine-labor costs are extremely high, but these are conditions that can be successfully met. I recommend the acquisition of certain outlying claims and properties, particularly on the easterly side of the Hilltop holdings, not only as sources of additional ores but for convenience in providing space for waste disposal and townsite areas. These things have been verbally discussed in detail.

Respectfully submitted,

Frank R. Wicks /s/
Consulting Mining Engineer
Registered engineer #2370, Calif.

HILLTOP MINES, Hilltop, Arizona.
O. O. Mattox, Owner.

MINING CLAIMS--Twenty unpatented.

LOCATION--Chiricahua Mountains, California Mining District, Cochise Co. State of Arizona. 45 miles west of Lordsberg, New Mexico, 25 miles from Rodeo, N. M.; 26 miles from San Simon, Arizona, and 22 miles from Bawtery Siding, Arizona. All of above on paved highway and railroads. Leaving the highway at Bawtery Siding there is a good graded State road to the mine.

FORMATION--Limestone with porphyry intrusions and large quartzite ledge.

DEVELOPMENT--Rhem tunnel, elevation 6150 feet, approximate length 3,800 feet with drifts, cross-cuts and stopes. Gray Tunnel, elevation 6450 ft., approximate length 3,500 feet with drifts, cross-cuts, stopes and winzes. Kasper Tunnel,-cuts clear through the mountain and is open at both ends; elevation 6750 ft., approximately 3,6000 feet in length, with drifts, cross-cuts, stopes and winzes. Blacksmith Tunnel, elevation 7220 ft., approximate length 150 feet, with 80 foot winz and short drifts. (Estimated about 7 miles of tunnels, drifts and cross-cuts in the three main tunnels, Rhem, Gray and Kasper.)

CHARACTER OF ORE--Silver, lead and zinc, with some gold, copper and molybdenum.

ORE OCCURRANCE--In fractures, ore bodies and contact veins along the quartzite ledge.

TYPE OF ORE--Greatest portion sulphides--small amount of oxide.

MINE HISTORY--Developed by Hilltop Metals Mining Company from 1916 to 1926. Very small amount of work done since that date. A few ore shipments have been made from assessment work and cleaning out of old workings. The property was purchased outright by the present owner in 1937.

ORE SHIPMENTS--by the old Hilltop Mining Company from 1924 to 1926 11,424 tons averaging, silver 5.24 ozs., lead 23 %, zinc 8 %, copper .34 %,-no pay gold.

RECENT ASSAYS--Taken by F. H. Lerchen for the Eagle-Picher Lead Co., from 12/14/37 to 4/10/38:

KASPER TUNNEL--average from 19 cut samples; silver 5.67 ozs., lead 19.96 %, zinc 4.24 %, copper .6 %.

GRAY TUNNEL--average from 54 cut samples; silver 4.50 ozs., lead 15.40 %, zinc 7.22 %

RHEM TUNNEL--Massive pyrite bedding, for silver only, 3.2 ozs.
Selected ore in place, silver 16 ozs, lead 21 %, zinc 9 %
" " " , silver 24 ozs. lead 20 %, zinc .4 %
Bedded ore in place silver 1.8 " , lead 15 %, zinc 4.8 %

BLACK SMITH TUNNEL--average of 7 cut samples, silver 6 ozs. lead 32 %, zinc 7 %. Practically all of these ores are sulphides and cut across the veins or deposits in width from 2 to 6 feet.

DUMPS--Some ore has been shipped from the old dumps but there still remains considerable milling ore.

WATER SUPPLY--Seepage from Kasper and Gray to lower Rhem where it flows out by gravity. There is sufficient water in the Kasper and Gray for general purposes, but the larger portion of these tunnels is dry. Estimated flow from the Rhem the year round is approximately 300 gallon per minute. This is good, pure water for all purposes.

Mill Tests--Tests have been made on sulphide and oxide ores by F. O. Bacon, Sr., and in selective flotation the recovery is easy, economical and give a high recovery.

MILL SITE--Ideal location with gravity feed of both ore and water and space for tailing dump.

REPORTS--Reports, maps, plans and assay sheets are to be found in the mine office.

GENERAL INFORMATION--The tunnels and other workings are in fairly good condition. There are some cave-ins which should be cleaned, but most of them are safe and accessible.

BUILDINGS--12 two room dwelling houses, 1 large warehouse, 1 large store building, 1 boarding house, two-story club house, bath and change house with toilets and running water, 1 two room office building, 1 6 room manager's residence with garage, etc. all in good condition.

MACHINERY--1 Snow oil engine, size 20 x 40 Horizontal Twin, 300 H.P. direct connected Allis-Chalmer generator, 2300 volt, 3 phase, 60 cycle 180 r. p. m., direct connected Westinghouse exciter, 5 k.w., direct current. 1 Worthington-Laidlow Compressor, horizontal duplex size 18x10x14 with direct connected Westinghouse motor, 150 H. P. with belted exciter, 5 k. w. direct current. One permuitt water softening plant, capactity 3000 gallos each ten hours. One centrifugal oil filter with electric motor. Large, complete switchboard and control pannels. Extra parts and wrenches. 15 ton overhead crane chain block hoist on 60 foot I beam. All this housed in steele & framed, fire proof building 45 x 60 x 24 feet, sides and roof covered with corrugated iron.

EQUIPMENT--20 ore cars, 3 Ingersoll-Rand drill sharpners and punches, Rails and air and water pipes inside the mine, blacksmith shop, electric transformers, swith boards, assay equipment, etc.

TITLES--Titles to the property are in good, legal form and the proposition can be handled direct with the owner.

PRICE--The price is $40,000. (Forty Thousand dollars.) Terms.
Favorable proposition to anyone who will install a mill.
Would dispose of a one-half interest for $20,000.

O. O. Mattox,
Hilltop, Arizona.
(Via Rodeo, N. M.)

O O Mattox

This is Copy of Sealed orig.

UNIVERSITY OF ARIZONA

Tucson

College of Mines and Engineering

Office of the Dean.

REPORT ON PROPERTY OF THE

NORTH HILL-TOP EXTENSION MINING COMPANY.

Source of Data Herein Presented.

This report is based on a personal examination of the property of the North Hill-Top Extension Mining Company and adjacent territory, made by the undersigned on June 10th. and 11th. 1917. Most of the first day was spent on the property of this Company; the rest of the time was occupied in studying the geological condition in the district and prospects, including the property of the Hill-Top Metals Mines Company which, though the kindness of Mr. R.O. Fife, it was possiable to examine in some detail.

The time available for the examination was insufficient to permit of the accurate tracing of the veins or contacts, but a good general idea of the conditions prevailing on the property of the North Hill-Top Extention Mining Company was secured, and it is believed that the conclusions herein stated, although necessarily somewhat tentative, are conservative and are thoroughly justified by the facts observed.

Object of the Examination.

The examination was made for the purpose of ascertaining wheather the ore deposits known to exist on the property under consideration are of such size and contain ore of sufficiently high grade as to make possible to mine them profitably. Information was also sought relative to the possibility of developing larger ore bodies or richer ores beyond the shallow workings of the property. It was recognized that too little work has been done to make it possible to estimate the probable tonnage or the grade of the ore available, so little sampling was attempted, and most of the time was expended upon geological observations.

Extent and Location of the Property.

The property of the NORTH HILL-TOP EXTENTION MINING COMPAN

Consist of twenty-five full mining claims (unpatented) which lie about twenty-five miles a little west of south of San Simon, Arizona, on the eastern side of the Chiricahua Mountains, in California Mining District. There is a fair road from San Simon to the property, and at comparatively small expense this can be put in good shape for the use, of auto trucks, giving a down-hill haul to the railroad at San Simon.

The Writer made no attempt to investigate the title of the property.

Geology of the District.

The area involved was once an extensive body of water in which thick layers of carboniferous limestone and lesser amount of sandstone and a little shale were laid down in nearly horizontal layers. Probably these were covered with thick deposits of other sediments afterwards removed by erosion, and then the whole mass covering the area now included in the Chiricahua Mountains was squeezed, folded, and warped upward untill a large part of the sediments mentioned occupied a position far above their original altitude. The pressure and other factors involved in this up-swelling changed some of the limestone to marble, the sandstone to quartzite, and the shale to slate; and tilted the beds upward untill they are now usually more nearly vertical then horizontal. At some time after the beds were laid down (probably during or after the up-folding) quantities of molten earth material were forced upward though fissures from one or more reservoirs far below the surface. On cooling, this material formed quartz-porphyry, rhyolite, andesite, diabase, basalt or malpais (known locally as the "iron dike"), and perhaps other varieties of igneous rocks. These occur as dikes cutting across the sediments and as more or less irregular intrusions of various extent. Their presence complicates the structure, and a detailed geological map would have to be prepaired before the course of events could be outlined with any degree of exactitude.

Some time after the formation of the beds or strata of limestone and quartzite and of the igneous dikes and intrusions, minerals solutions (expelled probably from the solidifying reservoirs of moulten material below) arose though fissures, zones full of closely spaced cracks, or along contacts; and gradually deposited the ore and gangue materials as veins or shear-zones. Some percola-tion of minmerals solution and consequent deposition of the ore in the adjacent rocks occurred; and it is

Likely that at a certain points,especially in the limestone, the country rock was attacted by the mineral solutions, dissolved, and replaced with ore.

Finally, wind,rain, and steam erosion have worn down the valleys, carved out the mountain peaks, and exposed beds, dikes, veins,ect. once deeply buried.

Natura of the leposit.

A consider a ble number of veins or shear-zones have been located on the property, and several open cuts or shallow shafts have been put in on them,but most of the later contained water at the time of the examination, so could not be examined.

Although some of the other deposits may possess merit,it appears probable that two are more important than the others. One of these which is herein designated the Razzle Dazzle vein has been exposed in two shallow shafts in the bottom of the gulch on the Razzle Dazzle claim. As these shafts contained water, the deposit could not be examined, but Mr. H.D.Hall states that one shaft showed four feet of ore, and there is certainly a considerable amount of good ore on the dump. It contains considerablegalena (lead sulphide) and some pyrite,(iron sulphide), and a general sample assayed 26.5 ozs of silver per ton,a trace of gold,0.14 % copper, and 31.6 lead. Leaving the small amount of copper present out of consideration,such ore is worth at the present prices current on this date about $06.35 a ton. This ledge can be traced to the northwest at least to the middle of the Midnight No.I claim, and the appearance of the outcrop indicates that it is a shear-zone rather than a fissure vein. It is in rhyolite near and parallel to a dike ofdiabase. Near the two shafts just mentioned, another shallow shaft which could not be examined is said to have exposed a lead of good copper ore.

Some distance north of the workings just mention, on the Midnight No.I claim,some shallow openings exposed a small fissure vein herein designated the Midnight No.I vein. This varies from nothing up to about eight inches wide in the exposure mention,strikes about S.40 W. (magnetic), and dips 55 N.W. The country rock is quartz porphyry. This vein contains considerable amount of galena,and sample of the ore on the dump assayed 57.1 ozs silver per ton, 0.13 ozs gold per ton,and 62.9 %

lead worth about $196.25 per ton at current quotations. The vein last mentioned can easly be traced to the southwest, and intersects the razzle dazzle vein near the center of Midnight No.1 claim. Southwest of this intersection, on the Midnight No.2 claim in the bottom of the gulch, a shallow incline now partially filled with water has been sunk on the Midnight No.1 vein which is here at least thirty-six inches wide, and is in quartz porphyry. The footwall half contains considerable quantities of sphalerite (zinc sulphide) arsenopyrite (arsenic-iron sulphide), a little galena, and the wall-rock adjacent thereto is quite heavily impregnated with sphalerite and galena. The hanging-wall half of the vein is mineralogically exactly like the material shown on the Midnight No.1 claim, and practically all the ore mined therefrom is said to have run very high well in silver and lead and has been shipped. A considerable quantity of the foot-wall ore on the dump, and a sample of this assayed 3.5 ozs. silver per ton, 0.07 ozs. gold per ton, 6.7% lead, and 14.7 % zinc, worth at present quotation about $46.25 a ton provided the sphalerite can separated from the galena. This may present some difficulties, but equipments suitable for this purpose can doubtless be secured. A specimen of the mineralized wall-rock adjacent to the foot-wallthis vein assayed 3.1ozs. silver per ton, a trace of gold, 6.1 % lead, and 2.25 % zinc, worth about $21.2 per ton at currant quotations.

Some distance up the hill-side above the incline in the bottom of the gulch on the Midnight NO.2 claim a short tunnel has been driven on the Midnight No.1 vein, but this tunnel was allowed to swing to the right, and the vein is probably ten or fifteen feet southeast of the breast. A thick belt of limestone occurs not far Beyond the breast of t this tunnel, and it is quite possible that the Midnight No.1 vein may be accompanied by large replacement deposits in this limestone.

About two hundred feet south of the mouth of this tunnel just mentioned an open cut has exposed a shear-zone three to four feet wide. A sample taken there from assayed 2.0 ozs. silver per ton, 0.01 ozs. gold per ton, 1.1 % lead, and 8.78 % zinc, worth about 20.65 at current metal prices.

POSSIBLE Change in the Grade of the Ore.

Throughout the district a strong tendency was observed for the segregation of unusually high grade masses of ore into shoots, pipes, or lenses, seperated from one another by lower grade material of by nearly barren stringers. A similar state of affairs may be expected in the deposits under consideration, although the thoroughness of the mineralization in and adjacent to the Midnight No.1 vein may somewhat nutralize this dendency in that deposit.

In many copper or silver deposits and in some containing zinc rain water, sinking though those portions of the ore bodyabove the ground water levels, has leached out varying propottions of the metals mentioned, carried them downward to a point usually close to the ground water level, and precipitated them there, giving rise to a very valuable mass masses of ore known as secondary enrichments. The ores left behind in the leached portion of the deposits are usually in the form of oxides, carbonates, sulphates, or silicates, with small residual masses of sulphides; and are usually of relatively low grade unless the origonal ores contain lead or gold. The former is rarely transported in this manner outlined, and the latter remains in its origonal position unless peculiar conditions exist such as were not noted dureing this examination.

Below the ground water level leaching ceases except locally along strong water courses, and no secondary enrichment need be expected below the point where considerable masses of primary sulphides occur.

Since practically all the ore seem on the the property of the Hill-Top Metals Mines Company is in the sulphide form, it seems evident that it is either near or below the ground water levels, or that the ground level has been lowered to recently to premit of much leaching and enrichmets to occur below the present opening. Some enriched deposit of silver may be encountered, however, and it seems worthy of note that the Hill-Top Metals Mines Company fully expect to find secondary enrichments of Silver ore below the lead carbonate in which they are now working and which constitutes the bulk of their ores.

Water and Timber.

Several good springs occure on yhe property, and running water was seen in one of the gulches. It seems quite certain that sufficient water for milling purposes could be developed without difficulty.

A large amount of good timber exists on the property. As all the openings examined stand up well, comparatively little timber will be required.

Personnel of the Promoters.

The writer had an opportunity to meet all of the officers and Directors of the Company, and to become well acquainted with several of them. He was impressed by their honesty and sincerity and evident desire to give everyone intrested in the Company a squire deal. It seems to him certain that the funds of the Company will be expended economically and wisely in a determined effect to develop a good mine.

Conclusions

The property of the North Hill-Top Extension Mining Company is a prospect, not a mine, so its value is largely speculative. The geological conditions are, however, favorable to the occurrence of ore, and good ore certainly exists on the property. The limestone, quartzite, basalt, (iron Pike) and other formations on the property under consideration can be traced directly into the ground of the Hill Top Metals - Mines Company where similar igneous intrusion exist, and where a very large amount of first-class ore has been blocked out. At numerous point in the vicinity quantities of ore have been mined profitable from deposits whose outcrops look no more promising than those on the property under consideration.

One cannot spend any time in the district without being impressed with the wide extent of the mineralisation that has occured therein, and everything seem indicates that this property is well worth exploitation along the lines recommended to the Directors.

It should not be supposed that the value of the ore will check very closely with the assays given in this report. These were made in some cases on single chunks which may not be at all representative of the whole deposit, although some care was exercised to select

average material. The figures given suffice, however, to prove the presence of the valuable metals and their nature. Itshould be remembered that,if developments show such action to be justified, a mill for concentration of the ore will doubtless be erected,and that the value of the concentrates will almost certainly run well above any figures given in this report. In connection with the subject of concentration,it should be noted that most of the the important mines in the vicinity lies at a greater altitude than the property under consideration, and that there the ores are highly oxidized. The ores on this property under consideration are sulphides,however, and these are much more amenable to concentration by ordinary methods than are oxidized ores. Further, flotation can hardly be considered when the ores are oxidized although readily applicableto sulphides.

Stated in a sentence, I conclude that everything seen justifies the hope that a profitable mine may be developed on the ground own by the North Hill-Top Extension Mining Company.

Respectfully submited,

Signed G.M.Butler

Dean,College of Mines and Engineering,
UNIVERSITY OF ARIZONA.

June 23rd.1917.

San Simon,Cochise County, Arizona.
June 27th.1917.

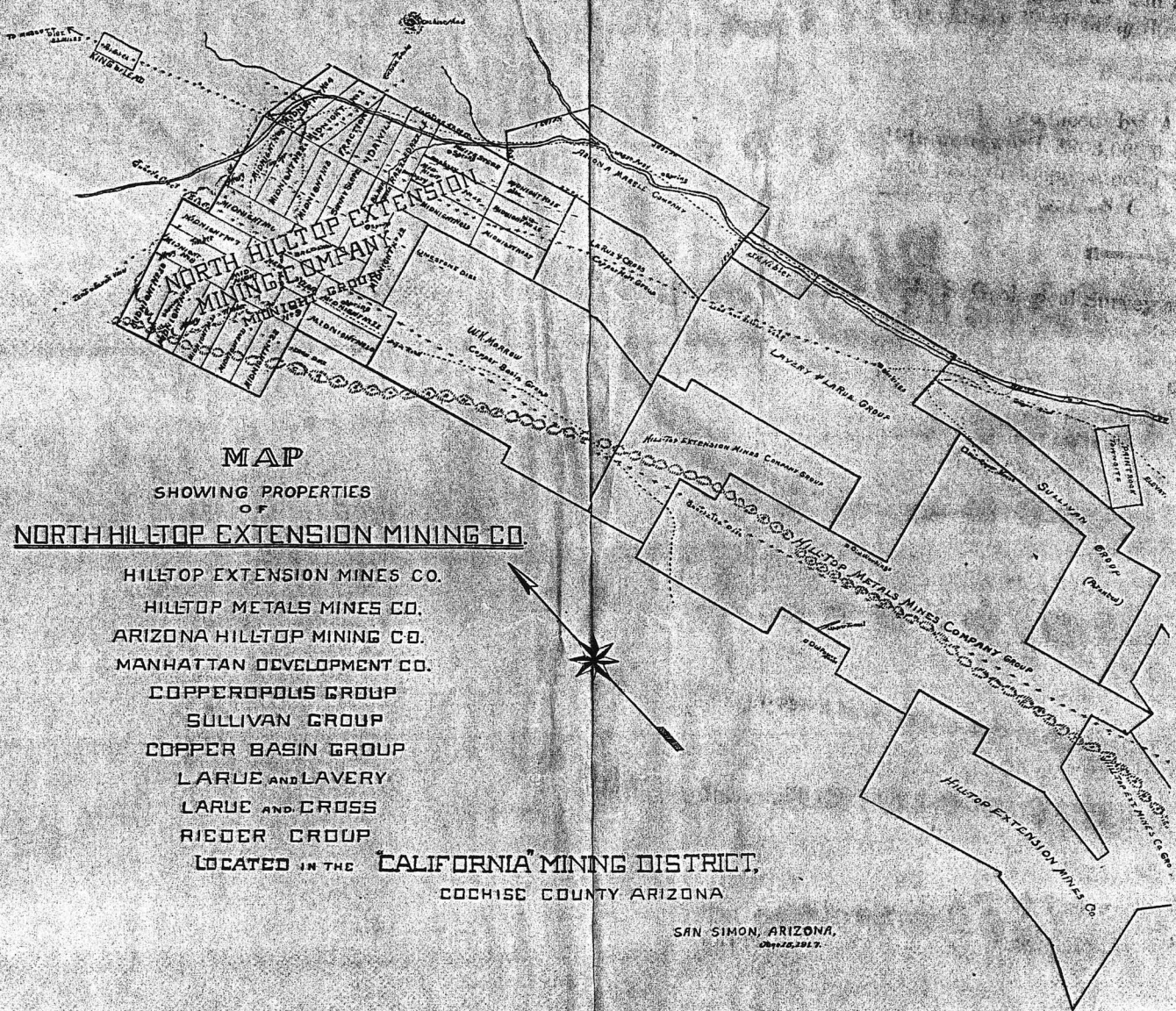
To Whom Presented:

This is to certify that the above written report made by Dean G.M.Butler, University of Arizona,is a true,and correct copy ,on file withe the Secretary of the company.

North Hill-Top Extension Mining Company,

Frank P.Crane
President.

George H. Ebken
Secretary.



MAP

SHOWING PROPERTIES

OF

NORTH HILLTOP EXTENSION MINING CO.

HILLTOP EXTENSION MINES CO.

HILLTOP METALS MINES CO.

ARIZONA HILLTOP MINING CO.

MANHATTAN DEVELOPMENT CO.

COPPEROPOLIS GROUP

SULLIVAN GROUP

COPPER BASIN GROUP

LARUE AND LAVERY

LARUE AND CROSS

RIEDER GROUP

LOCATED IN THE "CALIFORNIA" MINING DISTRICT,

COCHISE COUNTY ARIZONA

SAN SIMON, ARIZONA,

Oct 15, 1917.

This is only Copy of orig. Sealed!

Hill Top Extension Mining Co.
Rodeo,
New Mexico.

Dear Sirs:

I beg to submit herewith my report on your property in the Chiricahua Mountains, California Mining District, Cochise County, Arizona, The original report will be delivered to Mr. Henning Pearson of New York and carbon copy will be mailed to Mr. John Blumberg, Rodeo, New Mexico.

Permission was granted to me and all facilities offered by Mr. Raleigh Fife, Manager of the adjoining property, owned and developed by the Hill Top Metals Mining Co., to study their geology, development work, and ore deposits. As the prospective value of your property is based on conditions on the adjoining group of claims I also embody in this report a brief summary on the geology, development work, and ore deposit of the H.T.M.M.Co.

Various rock specimens were selected by me from both properties for petrographic examination. These were submitted to Professor Charles P. Berkey of Columbia University, and I attach hereto his petrographic report together with my notes. I am mailing copy of Professor Berkey's report to Mr. Raleigh Fife.

It is with pleasure that I am submitting to you a favorable report with recommendations to continue your exploratory work.

Respectfully submitted,

(Signed) Louis D. Huntoon, Consulting Ming. Engr.

115 Broadway, New York.

June 20, 1919.

SUMMATION.

In connection with an examination of the Hill Top Mines the examining engineer should study the "Geology and Ore Deposits of the Tintic District", Utah; professional paper No. 107, U.S. Geological Survey. The geology and general character of the deposits, so far as developed, appear to be quite similar.

The Hill Top Metals Mining Company own a large group of claims in the limestone formation of the Chiricahua Mountains upon which chimneys, or shoots of oxidized lead-silver ores have been developed to a depth of 1100 feet by tunnels. A large number of chimneys have been developed on the 800 foot level; further exploration of these chimneys by raises may prove that they interlock, forming an almost continuous vein of lead-silver ore. The ores which have been developed are either in faulted and brecciated zones of a quartzite bedding plane in the limestone, or on a contact of the quartzite and the lime. The Hill Top must be considered as a mine with a most promising future.

An examination of the attached claim map, Plate No. 3, shows the northwest workings of the HillTop M.M.Co, to be within 600 to 800 feet of the southeast corner of your Eureka claim. The face of this drift has recently developed heavy faulting, brecciation, and what appear to be large chimneys of lead-silver ore associated with the quartzite bedding plane in the limestone; this area is most

promising. The surface above this promising ground has a few shallow pits.

A further examination of the claim map shows your Eureka tunnel to be advancing along the contact of quartzite and lime directly towards the northwest promising ground of the Hill Top. The cross faulting and brecciation in your Eureka tunnel to date has not been of sufficient extent to produce large chimneys of lead-silver ore such as have been developed on the Hill Top.

This may be due to your Eureka tunnel not being of sufficient length. This claim is a most interesting prospect and I recommend that either the Eureka tunnel be advanced to the southeast corner of the claim or better still that arrangements be made with the Hill Top M.M. Co. to advance their tunnel to the northwest thru your Eureka claim. I do not know the comparative elevations of your Eureka tunnel and the 800 foot tunnel of the H.T.M.M. Co. due to lack of surveys.

Your Lead Lilly claim is also most interesting. There are a large number of shallow shafts, pits, and one tunnel on this claim from which ore has been shipped. The location of the Lead Lilly, the general strike of the faults, and a careful study of the ore deposits of the Tintic district, indicate to me that the Lead Lilly Claim may have a parallel deposit of lead-silver ore in the limestone quite distinct from the quartzite deposit of the H.T.M.M.Co. There has not been sufficient work done onthis claim to draw definite conclusions and I cannot advise where prospecting should be done

without accurate surveys upon which all surface pits, faults, and geology are plotted. The surface indications on the Lead Lilly fully justify surveys followed by exploration. The Whale group apparently covers very little of the mineralized quartzite extension. The formations comprise limestone and quartz with porphyritic intrusions. The group must be considered as a prospect which warrants the mapping of present pits, faults, and the geology in general, followed by further exploration.

My recommendations are:-

Connect your lower Eureka tunnel with the northwest workings of the Hill Top Metals Mining Co.

Employ a young trained engineer to survey and map not only your holdings but all surface pits and underground workings and plot so far as he can the general geology.

Do further prospecting on the Whale group of claims and map the workings, faults, and geology.

With the developed ore bodies on the property of the E.T.M.M. Co. your group of claims, covering the extension of the mineralized zone, must be considered as a favorable propsect fully warranting further exploration.

DETAILED REPORT.

LOCATION: The properties of the Hill Top Extension Mining Company and the Hill Top Metals Mining Company are located in the California Mining District of the forest Reserve at Sands Pass, in the Chiricahua Countains, eastern portion of Cochise County, Arizona. They may be reached from Douglas, Arizona, by auto or train to Rodeo, New Mexico, a distance of about 30 miles northeast and from Rodeo by auto, a distance of about 20 miles northwest.

EXTENT OF PROPERTY. Your company, the Hill Top Extension Mining Co., own two separate groups of claims which cover the extension of a developed mineralized zone owned by the Hill Top Mining Co. Upon the attached claim map, showing your holdings, the outcrop of the mineralized zone has been plotted from maps obtained in the district. This outcrop I checked in several places and have every reason to believe it is approximately correct. The important mine workings of the H.T.M.M.Co. were copied from their large map. The location of the Eureka tunnel portal is approximately as there was no map to work from.

There is not a complete claim map of your holdings and it is very important that you should have such a map showing all surface workings and their elevations.

To the northwest of the Hill Top Metals Mining Company the extension of the mineralized quartzite is covered by your Lead Lilly group comprising the following eight claims:- Maud, Ida, Eureka, Prince, Prince No. 2, Lead Lilly, Alma and Clance. I understand that you also own the Morrow's group of

claims, and claims adjoining the Maud and Ida on the northwest.

To the southeast and south, I understand you own seventeen (17) claims known as the Whale group. Your claim Whale No. 2, in this group, is supposed to cover the cropping of the mineralized quartzite. Comparatively little work has been done on the Whale group and very little time was devoted to an examination of these claims. The man most familiar with this group of claims was sick and unable to visit the claims with me.

HISTORY: The Chiricahua Mountains, in Cochise Co. Arizona have from time to time attracted considerable attention. A large amount of exploratory work has been done on prospects in the igneous rocks which so far as I know have not produced mines; the sedimentaries were also prospected and more or less lead-silver ore shipped from surface pits and comparatively shallow shafts. On the showings of these surface pits in the sedimentary rocks a group of thirty-four (34) claims was acquired a few years ago by the Hill Top Metals Mining Co. This company has expended considerable money in the development of a lead-silver mine which is most promising.

The Hill Top Extension Mines Co. was organized in 1916 by Mr. John Blumberg and associates, after acquiring an option on five (5) claims owned by Mr. Criss Grower, located adjacent to and northwest of the Hill Top group, and seven (7) claims of the Whale group, owned by Mr. G.T.Colvin, and located adjacent to and southeast of the Hill Top group. At later dates

more claims were acquired by the Hill Top Extension M. Co., covering the extension of the Hill Top mineralized quartzite both to the northeast and southwest.

The driving of the lower Eureka tunnel, by hand, was started about November 1916. The tunnel has advanced to the southeast about 1000 feet, and the further driving by hand was being carried on at the time of my visit.

DEVELOPMENT: The exploration and development work consists of many surface pits, shallow shafts, tunnels, winzes, and raises, from which more or less lead-silver ore has been shipped in past years. There are no official records covering past shipments.

On the Eureka claim (see Plate 1) an inclined shaft, marked shaft No. 1, was sunk years ago, following a chimney of ore, to a reported depth of 70 feet. The finings here must have been favorable as this work was followed by the driving of the "upper Eureka tunnel" from which the inclined shaft (marked winze B on map) was sunk to a further reported depth of 146 feet, following the same chimney of ore. This winze or shaft has been connected with your lower tunnel by a vertical raise (marked raise B on map). The upper Eureka tunnel was accessible; the shaft was not. The upper Eureka tunnel crosses the lime formation for a distance of 86 feet; at this point, quartzite, similar to that in which the ore bodies on the Hill Top Metals Mining Co's property occur, is crossed for a distance of 15 to 20 feet. The shaft is sunk either

in the quartzite or on the contact of the quartzite and lime; the quartzite is faulted and mineralized. Beyond the quartzite the tunnel is in limestone. A drift, following a mineralized fault plane along the contact of the quartzite and the lime was driven southeast; at a distance of 100 feet in a chimney of ore was developed. An inclined winze (marked"Winze D" on map) was sunk on this chimney and ore mined. The winze was inaccessible but had the appearance of having been sunk between 100 and 200 feet. The same chimney of ore was raised on. Beyond the winze, to the southeast, the drift was caved and inaccessible. The pitch or direction of this second chimney of ore is the same as the one on which the inclined shaft was sunk and connection made with the lower tunnel. If possible these chimneys should be surveyed and longitudinal cross sections mapped including the lower tunnel.

The lower Eureka tunnel is reported to be 320 feet below the upper tunnel. This tunnel was started by your company about Nov. 1916. It has been driven southeast approximately 1000 feet and appears to be headed directly for the ore bodies being developed in the northwest end of the property owned by the Hill Top Metals Mining Co. I consider it advisable to continue this tunnel and connect with the workings of the H.T.M.M.Co. The first 320 feet of the tunnel follows faults in the limestone which have a general direction paralleling the quartzite. At 320 feet, Survey Station No. 6, the quartzite, is developed; beyond this point the tunnel follows the contact of the lime and quartzite. Between Stations 7 and 9 (see Plate No. 1) the

formation is more or less mineralized with lead ores both sulphide and oxidized . At this point a raise was driven about ten feet following a mineralized zone and crossfaulting. The formation is rather tight and not favorable for a large deposit of ore. At station No. 10 a vertical raise was driven to connect with the inclined shaft from the upper tunnel. The southeast face of the tunnel, Survey Station No. 16, was in very interesting ground; there was considerable faulting and the ground was highly mineralized.

In summing up the workings on the Eureka claim I wish to call attention to the following:- The quartzite or silicified lime developed in both the upper and lower tunnels is a bedding plane in the limestone having a general strike of south 30° to 35° east. This strike coincides with the extension of the Hill Top quartzite upon which chimneys of ore have been developed in their northwest face. The two chimneys of ore developed in the upper tunnel were followed to the surface and for a considerable distance below the upper tunnel. The most westerly chimney,(marked "Winze B" on the map), pitches north 63° west; the easterly chimney,("Winze D" on the map,)pitches at an angle of 56°, north 70° west. The two chimneys appear to be approximately parallel and both have a northwest pitch. The question as to where these chimneys should be developed in the lower tunnel is most difficult to determine without maps of the workings. A longitudinal section of the workings between "Winze B" upper level and "Raise B" lower level, indi-

cates that the western chimney of ore should have been developed near or northwest of "Raise A", lower tunnel. A longitudinal section of the workings between "Winze D", upper tunnel, and the lower tunnel, indicate that this chimney ofore should have been developed at a point near "Raise B" of the lower tunnel. The crossfaulting and mineralization at the face of the lower tunnel appears to be a third chimney of ore. The surface, about 300 feet southeast of "Shaft No. 1", should be prospected for the cropping of this third chimney of ore.

The Maud and Ida claims, northwest of the Eureka, are covered with a rhyolite flow. Very little work has been done on these claims.

Northwest of and adjacent to the Eureka claim are the Prince and Prince No. 2 claims. On the Prince claim is a prominent blowout of what appears to be a brecciated vein quartz in the limestone having an east-west strike. The assessment work on the Alma claim is in quartz and practically due east of the Prince quartz. The quartzite (?) where developed in the lower Eureka tunnel, at Survey Station No. 6, is along an east-west fault. The locations and general directions of the two quarts croppings and quartzite where first developed in the lower Eureka tunnel indicate a relationship which should be investigated. A proper survey and map may result in valuable information.

One of your most interesting claims is your Lead Lilly, located adjacent to and northeast of claims owned by the U.S.M.M.Co. There are a number of surface pits, shallow shafts, and one tunnel on this claim. The location of the

pits are such that one might assume that there are several mineralized cross-fractures or faults (northeast and southwest) connecting the "Prince Quartz" with the Hill Top quartzite. I examined several of these pits and found no indication of such cross fracturing or faulting. I am of the opinion that further prospecting will prove that these pockets or chimneys of ore occur along fractures paralleling the ~~east~~ side of the Hipp Fol quartzite. They may develop into parallel ore bodies quite independent of the Hill Top quartzite or they may be offshoots from the Hill Top quartzite. Most of the mineralized fractures and faults on this claim have a general strike to the northwest, paralleling the quartzite. The surface pits were sunk years ago. An inclined shaft, located near the center of the north side line was sunk to a depth of 60 feet, following a narrow vein. This vein appears to be along a contact of lime and quartz; the strike is south 5° east (see Plate No.2) The shaft dump contains gossan and oxidized lead-silver ore. Southeast of the shaft, 135 feet, a tunnel was driven southwest a distance of 200 feet. The tunnel is in limestone. About 50 to 60 feet from the portal the tunnel cuts a faulted and brecciated mineralized zone. Drifts, following the faulted zone were driven 35 feet northwest and 42 feet southwest. At the face of the southwest drift a winze was sunk 58 feet, and a drift driven from the bottom of the winze, south 15° east, about 20 feet; the drift followed a narrow mineralized fracture in the limestone. I am of the opinion that this vein or fracture is the same one developed by the inclined shaft to the northwest of the tunnel. It is reported

tthat the winze produced 3 or 4 carloads of lead-silver ore. In the main tunnel, southwest of the portal 108 feet, a second fault and brecciated zone in the limestone is developed. A drift following this fault has been driven north 15° west, twenty (20) feet; at a distance of 140 feet from the portal a short drift has been driven northwest following a brecciated zone in the limestone. The developments in this tunnel indicate parallel faults having a general trend to the northwest and conform to the strike of the mineralized quartzite. East of the tunnel is located the Shim shaft. The statement was made that the shaft was sunk over 15 years ago and produced considerable ore. The shaft appears to have been sunk to a depth of over 80 feet.

There are many other pits on the Lead Lilly claim. So far as I could judge, without detailed maps, these pits are along fractures and faults in the limestone, paralleling in a general direction the quartzite, but quite distinct from the quartzite. This claim should be surveyed and all pits and faults carefully noted.

WHALE GROUP: Comparatively little prospecting has been done on the Whale group of claims. This group covers a large acreage in very rough country. From the several test pits I examined I consider you are fully warranted and I recommend that the group be prospected and that all workings and croppings be mapped.

On the Whale claim an exploratory tunnel was driven and an inclined shaft sunk about 40 feet. The shaft followed a narrow vein of oxidized ore; the vein appeared to be

on a contact of porphyry and quartzite. About one car of ore had been mined from the shaft and was on the dump. The prospect warrants further testing.

HILL TOP METALS MINING COMPANY.

Thru the courtesy of Mr. Raleigh Fife, General Manager, I was permitted to examine the workings, geology, and ore deposits of the Hill Top Metals Mining Co. Mr. Fife and his assistant, Mr. Joe Drosser, discussed with me their opinion of the geology and ore deposits. I am indebted to both of these gentlemen for valuable information and for their permission to follow me to impart this information to you.

The H.T.M.M.Co. has developed a mine which has most promising prospects. The rock formations consist of limestone with intrusive porphyries and a bedding plane of quartzite or silicified lime, which is the mineralized zone. The general strike is northwest - southeast; on the northeast side of the mountain the limestones dip to the northeast whereas on the southwest side they dip to the southwest. The dip of the "mineralized zone", or quartzite, is to the southwest. The 800 foot tunnel has been driven thru the mountain with portals on the southwest and northeast sides. Entering the 800 foot tunnel by the northeast portal the formations are:- limestone dipping to the northeast; a light colored intrusive porphyry; limestone dipping to the southwest; a well defined mineralized fault with an east-west strike; a silicified lime bedding plane or quartzite which is the ore bearing formation so far as the present development goes; limestone in contact with the quartzite; an irregular brownish intrusive porphyry which probably is related to the fault; and then limestone to the southwest portal.

The geology in this section is very complex, with many pronounced faults, and before geological sections can be made or an opinion expressed a very careful study would be required. The first porphyry mentioned has also been developed in the 1100 foot tunnel.

Lead-silver ores have been developed in or adjacent to the quartzite where faulted and cross-faulted. They appear to be chimneys of irregular dimensions depending on the extent of brecciation at the points of faulting. These chimneys occured as small surface pockets and have been developed on the 500,800 and 1100 foot levels. The ores are oxidized with now and then pockets of galena. There have been no raises (connections) driven between the levels to determine the size of the individual chimneys.

The extensive explorations and development work was based on the large number of surface pits from which small quantities of ore had been shipped. I understand the first work consisted of driving the 500 foot tunnel. The portal of this tunnel is located on the Lyon claim, southwest side of the mountain, and 500 feet below the crest of the mountain. The tunnel was driven thru limestone about 1500 feet northeast to the mineralized quartzite bedding plane.

The southwest portal of the 800 foot tunnel, which was driven through the mountain, is located about 3000 feet northwest of the first tunnel, on the southwest side of the mountain, and 800 feet below the crest (300 feet below the first tunnel). The total length of this tunnel is about 3500 feet. The mineralized zone was crossed about midway in the tunnel.

Drifts were run southeast about 1800 to 2000 feet and northwest about 1000 feet. The drift to the southeast follows the mineralized zone for 600 to 800 feet. A fault is developed at this point offsetting the mineralized zone. Further exploration work to the southeast again developed the mineralized zone and the continuation of the drift follows the mineralized zone. Several pockets or chimneys of rich lead-silver ore have been developed by this southeast drift. The face of the drift was in a pocket or chimney of ore at the time of my visit. To the northwest the drift for a considerable distance was exploratory in search of the mineralized zone which had been offset by the first fault mentioned. The mineralized zone was finally developed and in the last 200 feet ore bodies similar to those in the southeast drift were being developed. These ore bodies are within about 800 feet of the Eureka claim

The third tunnel is located about 700 feet northeast of the second tunnel, on the northeast side of the mountain, and 1100 feet below the crest (300 feet below the second tunnel). This tunnel has been driven southwest about 1800 feet thru limestone and an intrusive porphyry to the mineralized quartzite zone. Drifts to the southeast and northwest have been started along the mineralized zone. These drifts have developed pockets or chimneys of lead-silver ore similar to those in the tunnel above.

The fourth tunnel is located about 1000 feet northeast of the third tunnel, on the northeast side of the mountain, and 1400 feet below the crest (300 feet below the

third tunnel). This tunnel has been dr ven several Hundred feet southwest; the portal of the tunnel is about 3000 feet northeast of the mineralized quartzite bedding in the limestone.

The ore bodies are most irregular in shape and size and are complicated. Further and more careful study will probably prove that this irregularity is due to a replacement of the minestone along the cross fractures. From the many exposures of ore on the 800 foot level I am of the opinion that development between the raises will prove the ore to occur in the form of irregular chimneys which will at times open out into large chambers of ore connected by narrow veins and smaller chambers of ore. On the Hill Top Extension the two chimneys developed have a decided pitch along the dip to the northwest. There have been no raises driven following the Hill Top chimneys to determine the outline of the ore bodies between the levels.

The property is a most interesting one and in many respects appears to be quite similar to the ore deposits of the Tintic District, Utah.

June 20,1919.

Hill Top Extension Mining Co.,

Rodeo,

New Mexico.

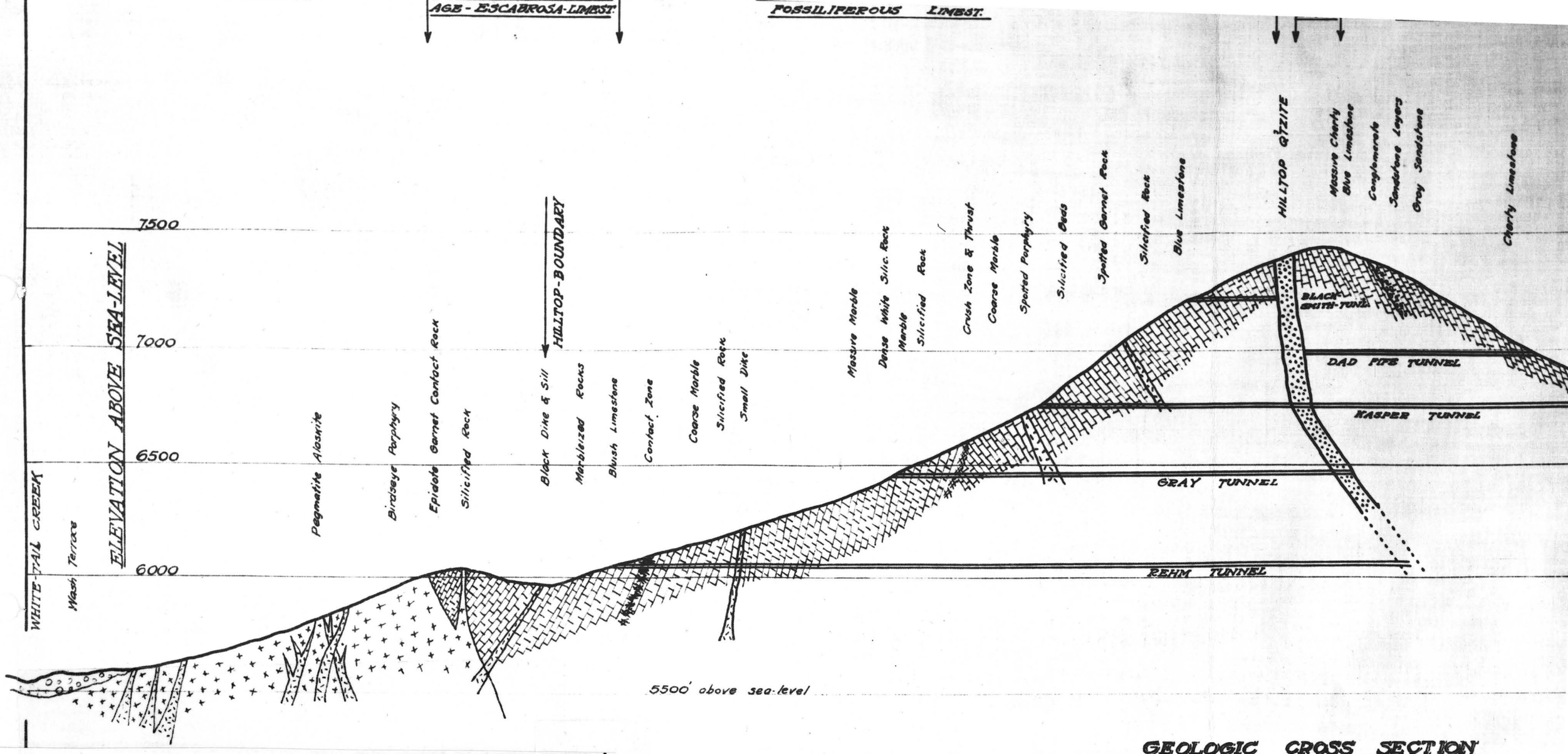
Dear Sirs:-

I have been delayed in receiving petrographic reports from Professor Berkey for which he is not responsible as he has been unable to obtain delivery of slides for microscopic examination. His report in no way will change my opinion on your property but it might change my rock classifications.

To prevent further delay I am delivering you my report and will forward you Professor Berkey's report when received.

Very truly,

(Signed) Louis D.Huntoon.



TUNNELS PROJECTED TO SAME PLANE
SCALE ONE INCH EQUALS 500 FEET
Survey by G.L. Schmutz.
December 1919.

GEOLOGIC CROSS SECTION
THRU
HILLTOP MOUNTAIN
BEARING
N. 37°-20' E.
BY
CHARLES P BERKEY